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The enclosed electronic media contains the requested Final Status Survey Report for Naval Surface Warfare Center, Dahlgren Division (Mail Control No 608846) and Naval Research Laboratory Chesapeake Beach Detachment (Mail Control No 698820) is being forwarded from the DoD Contracting Agency on behalf of the Department of Navy.

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**FINAL STATUS SURVEY REPORT
BLDG. 218, HYPERVELOCITY GUN FACILITY
NAVAL RESEARCH LABORATORY, CHESAPEAKE BAY
DETACHMENT, CHESAPEAKE BEACH, MD**

For the:



U.S. ARMY JOINT MUNITIONS COMMAND

ROCK ISLAND, IL

Project No. USN 2017-012

Contract No. W52P1J-08-D-0034/DO:0104

November 20, 2018

Rev. 2

Prepared by:



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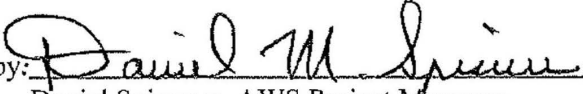
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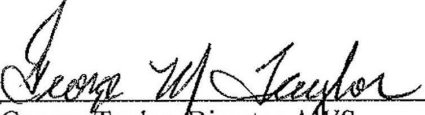
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Approvals Page

FINAL STATUS SURVEY REPORT

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ATTACHMENTS AND APPENDICES

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Appendix F	QA Audit Report
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ABBREVIATIONS AND ACRONYMS

ALARA	As Low As Reasonably Achievable
ANS	American Nuclear Society
ANSI	American National Standards Institute
AOC	Areas of Concern
BLDG	Building
Ci	curie(s)
CFR	Code of Federal Regulations
cpm	Counts per minute
CV	Critical Value
DCGLs	Derived Concentration Guideline Limits
D&D	Decontamination and Decommissioning
DOD	Department of Defense
dpm/100 cm ²	disintegrations per minute per 100 square centimeters
DQO	Data Quality Objectives
DU	Depleted Uranium
ϵ_i	Instrument Efficiency
ϵ_s	Surface Efficiency Factor
EPA	Environmental Protection Agency
ft	Feet
ft ²	square feet
FOP	Field Operation Procedure
FSSI	Field Support Services Inc.
HASP	Health and Safety Plan
ISO	International Organization for Standardization
LLRW	Low Level Radioactive Waste

m	Meter
m ²	square meter
MARSSIM	Multi Agency Radiation Survey & Site Investigation Manual
MDC	Minimum Detectable Concentration
MDCR	Minimal Detectable Count Rate
MML	Master Materials License
MOU	Memorandum of Understanding
mrem/y	millirem per year
N/A	Not Applicable
NaI	Sodium Iodide
NIST	National Institute of Standards and Technology
NRC	Nuclear Regulatory Commission
NRMP	Navy Radioactive Materials Permit
NWE	New World Environmental, Inc.
OSHA	Occupational Safety and Health Administration
Pa-234 ^m	Protactinium-234 ^m
Lead	Lead
pCi/g	Picocuries per gram
PM	Project Manager
PPE	Personal Protective Equipment
PWS	Performance Work Statement
QA	Quality Assurance
QC	Quality Control
RASO	Naval Sea Systems Command Detachment, Radiological Affairs Support Office
RAMSA	Radioactive Material Storage Area
Rn	Radon
RWP	Radiation Work Permit
SDS	Safety Data Sheets

SOPs	Standard Operating Procedures
TEDE	Total Effective Dose Equivalent
Th-234	Thorium-234
TLD	thermoluminescent dosimeter
U-234	Uranium-234
U-235	Uranium-235
U-238	Uranium-238
$\mu\text{R/h}$	microRoentgen(s) per hour
WRS	Wilcoxon Rank Sum
Y	Year

RECORD OF REVISIONS

Revision Number	Description	Date
0	Draft Final Status Survey Report	8/17/2018
1	Draft Final Status Survey Report	11/16/2018
2	Final Status Survey Report	11/20/2018

1.0 INTRODUCTION

Aleut World Solutions (AWS) was under contract by the U.S. Army Joint Munitions Command (JMC) to perform radiological Final Status Surveys at Building 218 located at the Naval Research Laboratory Chesapeake Bay Detachment (NRLCBD) facility located in Chesapeake Beach, MD. The work was performed from 2 April 2018 to 27 April 2018.

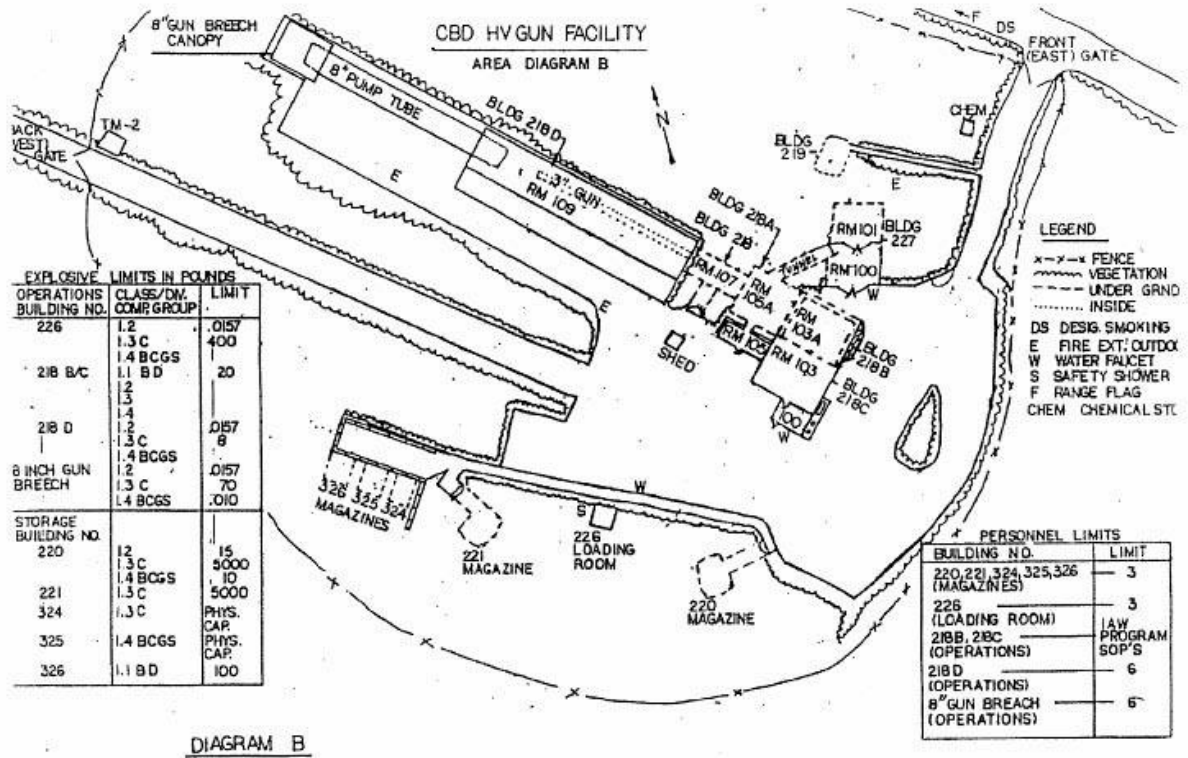
A satellite image showing the location of NRL Chesapeake is provided in Figure 1.

A map showing the layout of Building 218 is provided in Figure 2.

Figure 1 NRLCBD HVGF Satellite View



Figure 2 NRLCBD HVGF Layout Map



1.1 Scope of Work Performed

The work that was performed included:

- Performed final status surveys of the floors, walls, and overhead/ceiling areas of Building 218. These surveys included gross alpha/beta-gamma scan, direct measurement, and swipe surveys.

- All work was done in accordance with the previously approved Decommissioning Plan (NWE, 2008) and the Addendum Work Plan (AWS, 2017a).

1.2 License History

The Atomic Energy Commission (AEC) issued Source Materials License (SMB-448) on October 6, 1972 to NRL. The license authorized NRL to use the following radioactive materials: natural uranium, depleted uranium, and thorium for research and development. In 1974, the authority to regulate byproduct materials in the United States was transferred from the AEC to the Nuclear Regulatory Commission (NRC). License No. SMB-448 was renewed on August 23, 1978. The authorized use was possession of natural uranium, depleted uranium, and thorium for research and development including hypervelocity impact studies.

The AEC also issued a Type A License of Broad Scope (No. 08- 01393-02) on January 8, 1957 to NRL, which authorized the possession of any byproduct material in any chemical or physical form in “unspecified” amounts for research and development purposes. NRC License No. 08-01393-02 was converted into the current Navy Radioactive Materials Permit (NRMP No. 08-00173-E1NP) when the Department of the Navy was issued a Master Materials License for the use and control of radioactive material within the Navy and Marine Corps by the NRC in 1987. Similarly, License No. SMB-448 was converted to NRMP 08-00173-S1NP. NRMP No. 08-00173-E1NP was amended on June 13, 1988 to include the use of depleted uranium and NRMP 08-00173-S1NP was terminated. NRMP No. 08-00173-E1NP, Amendment 14 was approved by the Naval Radiation Safety Committee on August 26, 2002 and was to expire on March 31, 2007. In September of 2006 the NRL filed its renewal package and is currently operating under a timely filed letter.

1.3 Building 218 History

The NRL Radiation Safety Committee issued RSR2884 on 14 Jun 77 to authorize purchase of depleted uranium and begin research at the Chesapeake Bay Detachment Hypervelocity Gun Facility.

The NRL Radiation Safety Committee issued RSR4099 on 17 Jun 88 which authorized the storage and use of DU in high velocity impact studies in the Building 218C target chamber and Building 227 vault.

High velocity projectiles were impacted on depleted uranium and, in some cases, depleted uranium and explosives. Depleted uranium targets were located in the spherical target chamber with target debris contained in the target chamber and the flight tube. In a few tests, the quick closing valve did not function and allowed target debris from explosive tests to blow back through the flight tube into the orthogonal room, shadowgraph tube, and blast tank as far as the muzzle of the projectile launch tube. DU remains embedded in some walls of the blast tank.

Surveys were conducted periodically and areas decontaminated. It is possible that DU was lodged in inaccessible areas that were not affected by periodic cleaning and decontamination. The last use of depleted uranium (DU) at the NRLCBD Hypervelocity Gun Facility was in the fall of 1992. Other non-DU tests were conducted in the gun after the fall of 1992 and for the first several tests, some DU dust shook loose from nooks and crannies and was collected for disposal as low-level radioactive waste. The facility is currently not in use.

1.4 Conceptual Site Model

Based on historical information provided in the performance work statement (PWS) the radionuclide of concern was DU. The potential receptors would have been workers walking through a contaminated area that had fixed and removable contamination.

1.5 Release Criteria

The building surface release criteria was developed and approved by the NRC in the previously approved Decommissioning Plan (NWE, 2008).

1.5.1 Equipment, Material and Tools

For equipment, material, and tools the surface activity limits as stated in the “Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses, By-product, Source, or Special Nuclear Materials, (NRC 1987)” were used.

Table 1 identifies the limits.

Table 1 Surface Activity Limits for Equipment, Materials, and Tools

Radionuclide	Removable in dpm/100cm ²	Fixed + Removable Average ¹ in dpm/100cm ²	Fixed + Removable Maximum ² in dpm/100cm ²	Radiations Emitted
U-238	1,000	5,000	15,000	α
1. Measurements of average contaminant should not be over more than 1 m ² 2. The maximum contamination level applies to an area of not more than 100 cm ²				

1.5.2 Building Surfaces (Gross Alpha DCGL)

The site specific DU gross alpha DCGL for building surfaces was 1,150dpm/100 cm². The DU DCGL was calculated using DandD Version 2.1 and NUREG1720 "Re-evaluation of the Indoor Resuspension Factor for the Screening Analysis of the Building

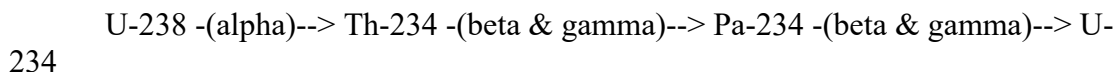
Occupancy Scenario for NRC's License Termination Rule". DU for purposes of this calculation consisted of 99.7% U-238, 0.250% U-235, and 0.005% U-234 by weight.

Using the formula for gross activity DCGL found in MARSSIM Equation 4-4, and DandD Version 2.1 results in a DCGL of 81 dpm/100 cm² (42 dpm/100cm² U-238 + 39dpm/100cm² U-234). Adjusting for a revised resuspension factor resulted in 81 dpm/100cm² x (1 x 10⁻⁶)/1.42 x 10⁻⁵ which equals 1,150 dpm/100 cm² for building surfaces. The adjustment uses the ratio of the default resuspension factor at the 90th percentile from DandD 2.1 compared to the resuspension factor recommended by NUREG 1720 for the 90th percentile. This is the only adjustment to the default screening values used by DandD 2.1. The use of a revised suspension factor is appropriate since surveys demonstrate that the contamination is not easily removed from building surfaces.

1.5.3 Building Surfaces (Gross Beta DCGL)

A gross beta DCGL was developed below as a surrogate for measurement of alpha radiation.

In the case of U-238, the decay product is thorium-234 (Th-234), which is also radioactive and which has a very short half-life (24.1 days) compared to the half-life of U-238 (4.51 billion years). Thorium-234 decays by emitting a beta particle and a gamma ray, producing protactinium-234 (Pa-234). Protactinium-234 is radioactive (half life 6.75 hours) and it also decays by beta particle and gamma ray emission, producing uranium-234, which has a half life of 247,000 years. In fact, there are 14 steps between U-238 and Pb-206 which is a stable, non-radioactive substance. There are no primary beta emitters from U-234 and progeny until past Rn-222. These first three steps of the radioactive decay sequence can be depicted with the following equation:



Therefore for every single atom of U-238 that disintegrates-one alpha particle, two beta particles and two gamma rays are emitted. A Gross Beta DCGL of 1,192 dpm/100cm² was applied for the final status surveys.

Table 2 presents a summary of the building surface DCGL's

Table 2 Building Surface DCGL Summary Table

Type of Measurement	Fixed Activity in dpm/100cm ²	Removable Activity in dpm/100cm ²
Gross Alpha	1,150	115
Gross Beta	1,192	119

1.6 Types of Surveys Performed/Instrumentation

The final status surveys consisted of gross alpha/beta-gamma scan surveys, systematic gross alpha/beta-gamma direct (static) measurements. Swipe surveys for gross alpha/beta-gamma removable contamination were also performed at each systematic gross alpha/beta-gamma direct measurement location.

Instruments were selected that were suitable for the physical and environmental conditions at the site. The instruments and measurement methods selected were able to detect the radionuclide(s) of concern and radiation types of interest, and in relation to the survey or analytical technique, capable of measuring levels that were equal to or less than the release limits.

The instruments used for the final status surveys were a combination of large area scintillation detectors coupled to scalers/ratemeters and a large area floor monitor (gas proportional detector). Audible indicators were used during the surveys. Swipes were counted on a dual channel phoswich scintillation counting system.

1.7 License Number, Status, and Authorized Activities

All work detailed in this report was performed under the AWS Nuclear Regulatory Commission (NRC) Broad Scope Radioactive Materials License # 50-29273-01.

A Memorandum of Understanding (MOU) was completed between RASO, JMC, and AWS prior to the start of the final status survey activities defining the license responsibilities between the organizations.

A copy of the MOU is presented in Appendix A of this report.

1.8 Results/Conclusions

The results of the final status surveys indicated that, based on the criteria in Sections 1.5.1, 1.5.2, and 1.5.3 some Building 218 areas/survey units require additional remediation in order to release the areas for unconditional use.

2.0 PROJECT BACKGROUND INFORMATION

2.1 Facilities

2.1.1 Site Location and Description

The Chesapeake Bay Detachment occupies a 168-acre site near Chesapeake Beach, Maryland in Calvert County and provides facilities and support services for research in radar, electronic warfare, optical devices, materials, communications, and fire research. The Hypervelocity Gun Facility is located approximately two miles south of the center of Chesapeake Beach and approximately 1000 feet west of the Chesapeake Bay on the west side of Bayside Drive.

Figure 2 shows a layout of the Hypervelocity Gun Facility. The gun facility consists of a light gas gun, a blast tank at the gun muzzle, a shadowgraph tube with optics to measure the projectile velocity, an orthogonal room, a quick closing gate valve, a flight tube between the orthogonal room and the spherical target chamber that is 12 feet in diameter. All components are steel except for aluminum in a quick closing valve and the shadowgraph tube. Part of the gas gun is enclosed by concrete walls and ceilings and buried in the hill. The entire blast tube is buried in the hillside with a small access to crawl into the tube. The optics room containing the shadowgraph tube and orthogonal room are surrounded by concrete walls and ceilings and partly buried in a hill. The optics room is easily accessible. The target chamber is contained in a structure called the environmental room. This part of the facility contained the areas of residual contamination from past operations.

2.2 Radiological Status of the Facility

Building 218 rooms and areas underwent a decommissioning from January 2011 until March 2011 by New World Environmental (NWE). A summary of the final status survey findings is provided in their report (NWE, 2014).

3.0 RADIOLOGICAL CONTROL REQUIREMENTS

3.1 Radiation Work Permit

A Radiation Work Permit (RWP) was prepared and specified the activities to be performed and all radiological safety requirements for the work. All personnel assigned to site work were required to read and sign the RWP, acknowledging that they understood the requirements of the RWP, prior to beginning work.

The RWP was also used as an information document for industrial safety. Hazards other than radiological were included in the RWP so proper protection could be taken for all possible hazards.

The RWP listed tasks and specific levels of protection for each worker covered by the RWP. The RWP also detailed the dosimetry requirements, the protective clothing requirements, and the expected radiation and contamination levels to be encountered during the decontamination and field survey activity.

A copy of the RWP is presented in Appendix B.

3.2 Personnel Monitoring and Dosimetry

Even though the work consisted of area decontamination and surveys, and the likelihood that personnel would receive any external or internal exposure was very minimal, Aleut World Solutions administrative policies require the use of external dosimetry on any field project that has the potential for exposure to radioactive material. The Project Manager (PM) was responsible for ensuring that all AWS personnel assigned to perform the decontamination and surveys were appropriately monitored for exposure to ionizing radiation. Each individual working at the site wore the dosimetry devices specified in the RWP. The PM specified the requirement for work assignments. Personnel were issued appropriate personnel monitoring devices consisting of a thermoluminescent dosimeter (TLD). The issuance of monitoring devices was documented on a Badge Issue Log.

3.3 Proper Location for Wearing Dosimetry Devices

Personnel monitoring dosimetry was worn on the front of the body between the neck and the waist.

3.4 Official Exposure Determination and Project Dose Estimate

The official and permanent record of accumulated external dose received by individuals was obtained from the processing of the personnel monitoring devices. The vendor TLD processing report showed that no personnel received any detectable whole body exposure greater than 10 millirem, which is the detection threshold of the TLDs.

A copy of the vendor TLD report can be furnished upon request.

4.0 SITE PREPARATION, EQUIPMENT AND PERSONNEL

4.1 Accessibility

Access to the active work areas were restricted using barricades, and boundary rope/tape. The appropriate postings were displayed. This limited access to only those personnel performing work in the areas.

4.2 Restroom Facilities/Office Space

A temporary office trailer and restrooms were utilized during the task.

4.3 Electrical Power

Electrical power in Building 218 was used.

4.4 Training

Prior to the start of work, all site personnel attended a briefing that discussed expected radiological conditions and radiological controls that will be implemented at the site.

4.5 Personnel

Task personnel consisted of the following:

Project Manager - Responsible for the overall operations and safety of the project team.

Health Physics Technicians - Perform surveys, sampling operations.

All AWS personnel were trained and experienced at the tasks to be performed.

4.6 Survey Unit Gridding

Prior to the commencing of surveys in the survey units, all of the survey units were gridded into sub grids. For building surface survey units, the survey units were divided into 3' by 3' grids.

Copies of the grid maps are presented along with the survey data in the applicable attached Appendix to this report.

5.0 PLANNING PHASE OF RADIOLOGICAL SURVEYS

The design of this final status survey incorporated the methods and locations for performing gross alpha/beta/gamma scanning, direct measurements, and gross alpha/beta swipe surveys in order to assess the nature and extent of the depleted uranium contamination in Bay 4 and the adjacent outdoor areas.

5.1 Radionuclide of Concern

Based on historical information, the radionuclide of concern is depleted uranium (DU). See Table 3 below for the composition of depleted uranium. Therefore, the residual surface activity release limits were determined for this radionuclide constituent of potential concern.

The radionuclide of concern is the radionuclide at a particular site that could contribute significantly to the dose received by the public.

Table 3 Radionuclide of Concern

DU	Fraction by Weight	Specific Activity Ci/g	Activity Ci	Fraction Total Activity
U-234	.005%	6.19 x 10 ⁻³	3.10 x 10 ⁻⁷	47.84%
U-235	.250%	2.10 x 10 ⁻⁶	5.25 x 10 ⁻⁹	.81%
U-238	99.7%	3.3 x 10 ⁻⁷	3.32 x 10 ⁻⁷	51.35%
		Total:	6.47 x 10 ⁻⁷	

5.2 Data Quality Objectives

Data quality objectives (DQOs) were developed for this final status survey effort in accordance with the guidelines outlined in Appendix D of MARSSIM and using the U.S. Environmental Protection Agency's (EPA's) seven-step DQO process described in *EPA QA - G4: Guidance for the Data Quality Objective Process* (EPA, 2006). Below is a summary of the seven-step process and the resulting project-specific DQOs.

5.2.1 Statement of the Problem (Step 1)

The problem is determining the nature and extent of DU contaminated building surfaces in Building 218. The objective of the final status survey activities described in this report was to obtain data of sufficient quality and quantity to support the decision

that areas have or have not been impacted by radiological activities at the site.

5.2.2 *Identification of Decisions (Step 2)*

The principle study question for this project through completion of the Final Status Surveys/ is:

- Have areas in Building 218 been impacted by the radiological activities at the site?

Potential actions include: additional investigation of radiologically impacted areas (i.e., additional review of existing data, collection of additional environmental data, and/or additional remediation) or release of non-impacted areas from radiological controls. Impacted areas have a possibility of containing residual radioactivity in excess of natural background (NRC, 2000). Non-impacted areas have no reasonable possibility of residual radioactivity. All areas are either impacted or non-impacted.

5.2.3 *Inputs to the Decision (Step 3)*

Radiological surveys and sampling required to support the unrestricted release of the areas included:

Locate and survey a background reference area where meaningful background radiation levels were determined;

100 % gross alpha/beta-gamma scan surveys of the Class 1 surface areas (floor and lower walls below 6') in Building 218 with large area scintillation detectors or equivalent were performed;

Systematic gross alpha/beta-gamma 2 minute direct (static) measurements in the Class 1 survey units of Building 218 with large area scintillation detectors or equivalent were performed;

Gross/alpha beta analysis of swipe samples collected at each of the gross alpha/beta-gamma direct measurement locations;

50 % gross alpha/beta-gamma scan surveys of the Class 2 surface areas (upper walls above 6') in Building 218 with large area scintillation detectors or equivalent were performed;

Systematic gross alpha/beta-gamma 2 minute direct (static) measurements in the Class 2 survey units of Building 218 with large area scintillation detectors or equivalent were performed;

Gross/alpha beta analysis of swipe samples collected at each of the gross

alpha/beta-gamma direct measurement locations;

25 % gross alpha/beta-gamma scan surveys of the Class 2 surface areas (overhead, ceiling areas) in Building 218 with large area scintillation detectors or equivalent were performed;

Systematic gross alpha/beta-gamma 2 minute direct (static) measurements in the Class 2 survey units of Building 218 with large area scintillation detectors or equivalent were performed;

Gross/alpha beta analysis of swipe samples collected at each of the gross alpha/beta-gamma direct measurement locations;

Statistical analysis of collected data.

5.2.4 Definition of Study Boundaries (Step 4)

The spatial boundary for this survey effort was the entire Building 218 interior floor, walls, and ceiling areas.

5.2.5 Development of a Decision Rule (Step 5)

The primary parameters of interest are depleted uranium, and associated decay progeny in secular equilibrium.

The decision rules for this final status survey effort were as follows:

5.2.5.1 Building Surfaces

If the radioactivity concentration exceeded the DCGLs (see Section 1.5) then the areas were designated as radiologically contaminated and marked for decontamination/further investigation.

5.2.5.2 Investigation Level

Investigation levels are specific levels of radioactivity used to indicate when additional investigation may be necessary. Investigation levels also serve as a Quality Control (QC) check. For example, in addition to indicating potential contamination, a measurement that exceeds the investigation level may indicate a failing instrument.

When determining an investigation level using a statistical-based parameter (e.g., standard deviation), the following may be considered: survey objectives, underlying radionuclide distributions (e.g., normal, log normal, non-parametric),

data population descriptors (e.g., standard deviation, mean, median), and prior survey and historical information.

If an investigation level is exceeded, the measurement would have to be confirmed to ensure that the initial measurement/sample actually exceeded the particular investigation level. This involved taking further measurements to confirm the initial result, and as appropriate, to quantify the area of elevated residual radioactivity.

For the gross alpha surveys the investigation level was established at 1,035 dpm/100cm² (90% of the DCGL).

For the gross beta surveys the investigation level was established at 1,070 dpm/100cm² (90% of the DCGL).

5.2.6 *Limits on Decision Errors (Step 6)*

Actions to minimize errors need to be implemented during the data collection phase of the radiological survey. Qualified radiation survey personnel performed the survey and record the data. Additional actions, such as instrument calibration, daily instrument source checks, and backup surveys with separate instruments provided the primary steps to be taken to avoid errors in the data collection phase of the survey process.

In order to minimize errors, the applicable requirements of AWS Standard Operating Procedures (SOPs) for performing surveys and instrumentation calibration and use will be followed.

Data collection and transcribing is the first phase where errors may arise. To avoid data errors for manual surveys, experienced personnel will record and transcribe the data.

The ongoing on-site analyses and evaluation of survey results provides a final check for errors, which if detected, were corrected.

There are two types of decision errors that can be made when performing the statistical tests described in this plan. The first type of decision error, called a Type I error, occurs when the null hypothesis is rejected when it is actually true. A Type I error is sometimes called a “false positive.” The probability of a Type I error is usually denoted by α . The Type I error rate is often referred to as the significance level or size of the test.

The second type of decision error, called a Type II error, occurs when the null hypothesis is not rejected when it is actually false. A Type II error is sometimes called a “false negative.” The probability of a Type II error is usually denoted by β . The power of a statistical test is defined as the probability of rejecting the null hypotheses when it is

false. It is numerically equal to $1-\beta$, where β is the Type II error rate.

This final status survey is designed to limit Type I and Type II errors to 5%. It is important to minimize the chances that survey units exceeding the release limits will be missed (Type I Error) and survey units meeting the release limits will be rejected as too high (Type II Error). The probability of either of these occurring was set at a maximum of 5%.

Radioactive source readings were used to check instruments for consistency prior to use in each daily shift. The instrument was only to be used after readings were compared and agree within $\pm 3\sigma$ of the predetermined responses. The Project Manager reviewed the data to verify that equipment was operating satisfactorily.

5.2.7 Optimizing Data Collection (Step 7)

The survey and sampling activities described in the following sections of this document constitute a final status survey approach that can achieve the stated project objectives within the available resource and schedule constraints. This approach represents the optimal design for surveying the Building 218 areas based on the currently available information.

Scan surveys for alpha/beta-gamma radiation were performed using a Ludlum Model 2360 data logger equipped with either a Ludlum Model 43-93 ZnS(Ag) scintillation detector or Ludlum Model 43-37 large area gas proportional detector. Any areas exceeding the release criteria were swipe sampled and static surveyed in accordance with SOP-001, Radiation and Contamination Survey Techniques. The swipe sample was used to identify removable alpha/beta contamination.

Static surveys for alpha/beta/gamma radiation were performed using a Ludlum Model 2360 data logger equipped with a Ludlum Model 43-93 ZnS(Ag) scintillation detector.

Swipe samples for gross alpha/beta-gamma removable surface contamination were counted on a Ludlum Model 2929 dual channel scaler.

5.2.7.1 Sampling Process Design

The types of samples and sampling matrices for the Final Status Survey of the areas are gross alpha/beta-gamma scans, alpha/beta-gamma direct measurements, and swipe samples.

The sampling frequency at the areas was set at a minimum of 16 direct measurements/swipe and soil samples for each of the survey units.

6.0 IMPLEMENTATION PHASE OF SURVEYS

6.1 Building Surface Background Reference Radiation Levels

A site background reference area was chosen that had similar physical, chemical, geological, radiological, and biological characteristics as the survey unit being evaluated. Background reference areas are normally selected from non-impacted areas, but are not limited to natural areas undisturbed by human activities.

The site background count rate levels were established for the final status surveys by obtaining sixteen, 2-minute static gross alpha/beta readings (with each instrument used), taken at ¼” from building surfaces from areas unlikely to be affected by the residual radioactive materials that could be present at the different survey areas. The average value for these readings was used as the area background radiation levels.

Figure 3 presents a map of the indoor background reference area locations.

Table 4 presents a summary of the background reference area data.

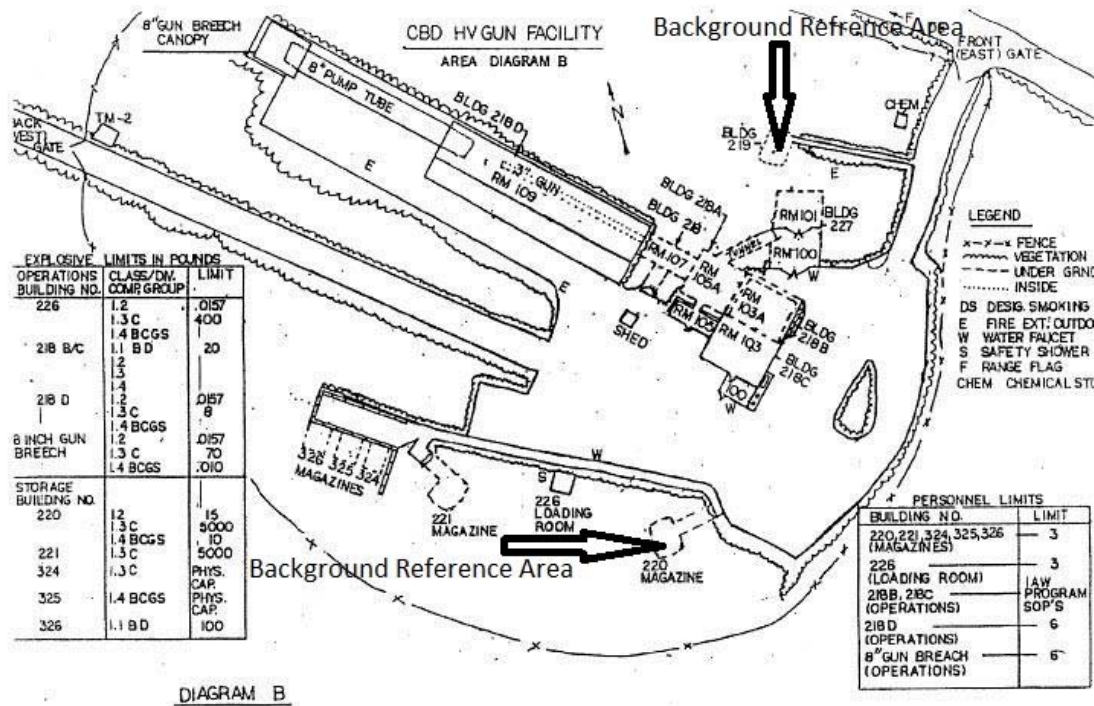
The background reference data sheets are present in this report in Appendix C.

Table 4 Background Reference Area Data

Instrument/Probe Serial Number	Probe Size In cm ²	Alpha 2π/4π Instrument Efficiency %	Beta 2π/4π Instrument Efficiency %	Mean Gross Alpha Background Activity in dpm/100cm ²	Mean Gross Beta- Gamma Background Activity in dpm/100cm ²	Gross Alpha Scan Probability %	Gross Alpha Static MDC in dpm/100cm ²	Gross Beta Scan MDC in dpm/100cm ²	Gross Beta Static MDC in dpm/100cm ²	Calibration Due Date
Cinder Block										
184949/268605	100	42.3/21.3	26.8/14.7	46	3,512	100	83	1,264	630	03/06/19
193668/326725	100	49.7/25.1	32.7/18.0	25	3,242	100	59	1,099	547	08/15/18
268488/190672	582	30.2/15.3	37.0/18.2	13	1,459	100	21	1,256	142	10/27/18
268497/093965	582	31.0/15.7	35.2/17.3	11	1,720	100	19	1,398	158	10/10/18
297743/302111	582	31.9/16.1	38.4/18.9	18	1,804	100	32	1,187	116	10/10/18
297758/299597	100	44.4/22.5	31.3/17.2	61	4,033	100	90	1,253	623	02/14/19
297766/323074	100	40.4/20.4	25.4/14.0	49	4,206	100	87	1,421	707	12/20/18
Concrete Floor										
184949/268605	100	42.3/21.3	26.8/14.7	17	1,689	100	56	780	391	03/06/19
193668/326725	100	49.7/25.1	32.7/18.0	18	2,180	100	52	901	451	08/15/18
268488/190672	582	30.2/15.3	37.0/18.2	13	1,091	100	22	1,086	123	10/27/18
268497/093965	582	31.0/15.7	35.2/17.3	11	1,158	100	19	1,147	130	10/10/18
276990/190620	582	28.7/14.5	39.5/19.5	8	940	100	25	976	110	03/20/19
297743/302111	582	31.9/16.1	38.4/18.9	14	1,353	100	29	1,187	134	10/10/18
297758/299597	100	44.4/22.5	31.3/17.2	16	2,379	100	76	963	481	02/14/19
297766/323074	100	40.4/20.4	25.4/14.0	21	2,853	100	62	1,170	585	12/20/18
Concrete Wall										
184949/268605	100	42.3/21.3	26.8/14.7	11	1,689	100	48	876	441	03/06/19
193668/326725	100	49.7/25.1	32.7/18.0	13	1,402	100	46	723	364	08/15/18
268488/190672	582	30.2/15.3	37.0/18.2	13	594	100	21	801	91	10/27/18
268497/093965	582	31.0/15.7	35.2/17.3	9	717	100	18	903	102	10/10/18
297743/302111	582	31.9/16.1	38.4/18.9	11	799	100	19	790	78	10/10/18
297758/299597	100	44.4/22.5	31.3/17.2	15	1,679	100	52	809	406	02/14/19
297766/323074	100	40.4/20.4	25.4/14.0	19	1,892	100	60	953	479	12/20/18

Corrugated Metal										
184949/268605	100	42.3/21.3	26.8/14.7	7	1,659	100	41	869	438	03/06/19
193668/326725	100	49.7/25.1	32.7/18.0	10	1,302	100	42	697	351	08/15/18
297758/299597	100	44.4/22.5	31.3/17.2	8	1,491	100	42	762	384	02/14/19
297766/323074	100	40.4/20.4	25.4/14.0	9	2,023	100	46	985	495	12/20/18
Metal										
184949/268605	100	42.3/21.3	26.8/14.7	7	1,362	100	61	787	398	03/06/19
193668/326725	100	49.7/25.1	32.7/18.0	7	1,142	100	37	653	330	08/15/18
268488/190672	582	30.2/15.3	37.0/18.2	7	558	100	16	777	88	10/27/18
268497/093965	582	31.0/15.7	35.2/17.3	7	630	100	17	846	96	10/10/18
276990/190620	582	28.7/14.5	39.5/19.5	5	567	100	15	758	501	03/20/19
297743/302111	582	31.9/16.1	38.4/18.9	9	644	100	18	819	541	10/10/18
297758/299597	100	44.4/22.5	31.3/17.2	11	1,296	100	46	710	358	02/14/19
297766/323074	100	40.4/20.4	25.4/14.0	11	1,733	100	49	912	460	12/20/18

Figure 3 Background Reference Areas



6.2 Area Classifications

For the purposes of establishing the sampling and measurement frequency and pattern, the Bay 218 areas were divided into impacted areas with one of three following classifications:

Class 1 Areas: Areas that have, or had prior to remediation, a potential for radioactive contamination (based on site operational history) or known contamination (based on previous radiation surveys) above the release limits. Examples of Class 1 areas include:

- site areas previously subjected to remedial actions
- locations where leaks or spills are known (or suspected) to have occurred
- radioactive material storage areas

- areas with contaminants in discrete solid pieces of material or high specific activity

Class 2 Areas: Areas that have, or had prior to remediation, a potential for radioactive contamination or known contamination but are not expected to exceed the DCGL's provided in Section 1.4. To justify changing the classification from Class 1 to Class 2, there should be measurement data that provides a high degree of confidence that no individual measurement would exceed the release limits. Other justifications for reclassifying an area, as Class 2 may be appropriate, based on site-specific considerations. Examples of areas that might be classified as Class 2 include:

- locations where radioactive materials were present in an unsealed form
- areas downwind from the main areas of concern (AOC)
- areas handling radioactive materials
- areas on the perimeter of former contamination control areas

Class 3 Areas: Any impacted areas that are not expected to contain any residual radioactivity, or are expected to contain levels of residual radioactivity at a small fraction of the release limits, based on site operating history and previous radiation surveys. Examples of areas that might be classified as Class 3 include buffer zones around Class 1 or Class 2 areas and areas with very low potential for residual contamination but insufficient information to justify a non-impacted classification.

Based upon process knowledge, and operational history, the Building 218 rooms floors and lower walls (below 6') were classified as *Class 1* areas, the upper walls and ceiling/overhead areas were classified as *Class 2* areas.

6.3 Survey Units

Table 5 below presents the classifications and number of survey units of the areas where radiological surveys were performed during this effort.

Table 5 Building 218 Survey Unit Summary Table

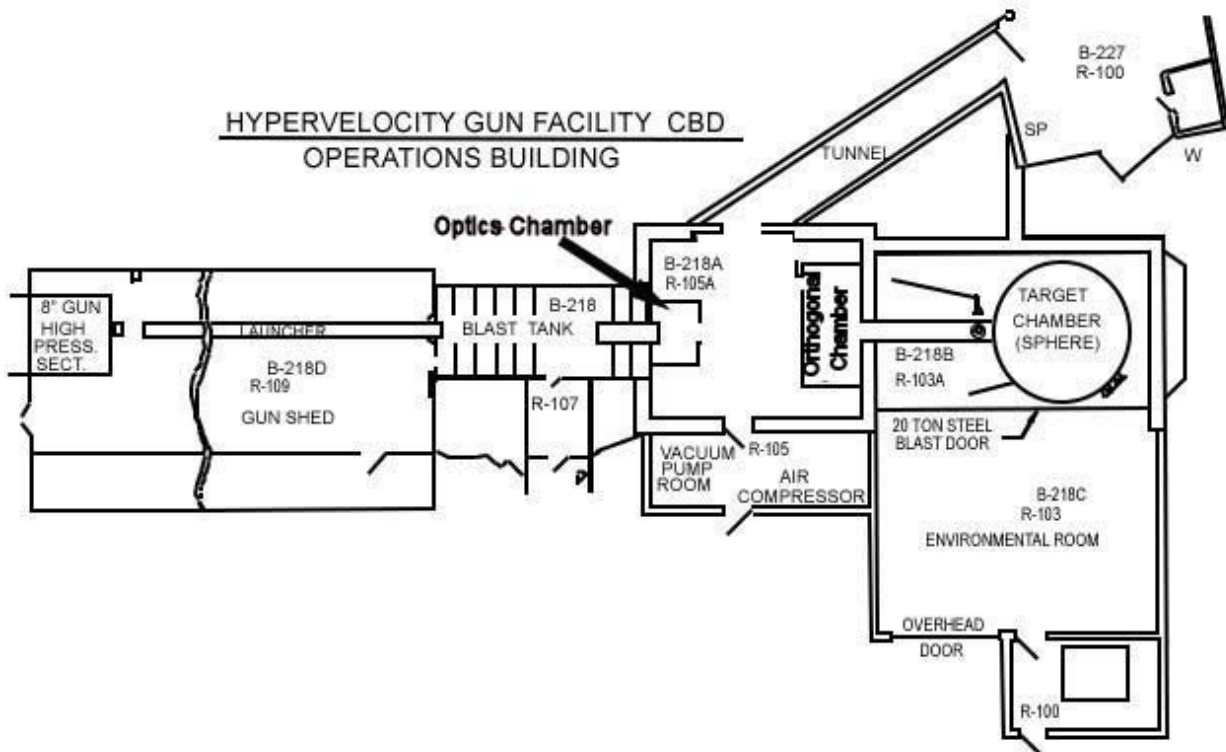
Area/Location	MARSSIM Classification	Total Surface Area (m ² /ft ²)	Radionuclide(s) of Concern	Number of Survey Units	Number of Direct Measurements/S wipe Samples	Length of Grid Pattern in Meters/Feet
Bldg. 218 Room 100 Floor	Class 1	~9/96	DU	1	16	~ 0.8/2.5
Bldg. 218 Room 100 Lower Walls	Class 1	~22/240	DU	1	16	~ 1.2/4
Bldg. 218 Room 100 Upper Walls	Class 2	~22/240	DU	1	16	~ 1.2/4
Bldg. 218 Room 100 Ceiling	Class 2	~9/96	DU	1	16	~ 0.8/2.5
Bldg 218 Room 103 Floor	Class 1	~152/500	DU	1	16	~ 1.8/6
Bldg 218 Room 103 Lower Walls	Class 1	~164/540	DU	1	16	~1.8/6
Bldg 218 Room 103 Upper Walls	Class 2	~246/810	DU	1	16	~ 2.3/7.5
Bldg 218 Room 103 Ceiling	Class 2	~152/500	DU	1	16	~ 1.8/6
Bldg 218 Room 103A Floor	Class 1	~114/375	DU	1	16	~ 1.5/5
Bldg 218 Room 103A Lower Walls	Class 1	~146/480	DU	1	16	~ 1.8/6
Bldg 218 Room 103A Upper Walls	Class 2	~219/720	DU	1	16	~ 2.1/7
Bldg 218 Room 103A Ceiling	Class 2	~114/375	DU	1	16	~ 1.5/5
Bldg 218 Room 105 Floor	Class 1	~44/143	DU	1	16	~ 0.9/3
Bldg 218 Room 105 Lower Wall	Class 1	~96/318	DU	1	16	~ 1.5/5
Bldg 218 Room 105A Floor	Class 1	~93/306	DU	1	16	~ 0.9/3
Bldg 218 Room 105A Lower Walls	Class 1	~190/624	DU	1	16	~ 2.1/7
Bldg 218 Room 105A Ceiling	Class 1	~93/306	DU	1	16	~ 0.9/3
Tunnel Floor	Class 1	~13/45	DU	1	16	~ 0.6/2
Tunnel Ceiling	Class 2	~13/45	DU	1	16	~ 0.6/2
Tunnel Wall	Class 1	~74/246	DU	1	16	~ 1.2/4
Bldg 227 Room 100 Floor	Class 1	~77/255	DU	1	16	~ 1.2/4
Bldg 227 Room 100 Lower Wall	Class 1	~117/384	DU	1	16	~ 1.5/5
Target Sphere Bottom	Class 1	~21/226	DU	1	16	~0.9/3
Target Sphere Top	Class 1	~21/226	DU	1	16	~0.9/3
Blast Tank	Class 1	~ 71/766	DU	1	N/A	N/A
Optics Chamber	Class 1	~34/368	DU	1	N/A	N/A
Orthogonal Chamber	Class 1	~ 36/386	DU	1	N/A	N/A

Survey units are limited in size based on classification, exposure pathway modeling assumptions, and site-specific conditions. MARSSIM (Rev. 1, August 2000) recommends areas for survey units according to the following:

Classification	Suggested Area
Class 1 Building Surfaces	up to 100 m ² /1,076 ft ² floor area
Class 2 Building Surfaces	100 m ² /1076 ft ² to 1,000 m ² /10,763 ft ²
Class 3 Building Surfaces	no limit
Class 1 Outdoor Areas	up to 2,000 m ² /21,528 ft ²
Class 2 Outdoor Areas	2,000 m ² /21,528 ft ² to 10,764 m ² / ft ²
Class 3 Outdoor Areas	no limit

Figure 4 presents a map showing the locations of the rooms and areas.

Figure 4 Building 217 Room/Area Location Map



6.4 Reference Grids

A reference coordinate system was laid out for each survey unit to obtain survey data and sample location points. A square grid system was used for the Final Status Surveys in the Bay 4 areas. The length, L, of a side of the square grid is determined by the total number of samples or measurements to be taken. The length of the square determined the distance between direct measurements (MARSSIM, 2000). The length or spacing of the grids was calculated for the survey unit using the following equation:

Where,

$$L = \sqrt{\frac{A}{N}}$$

L = length of squares grids (ft);

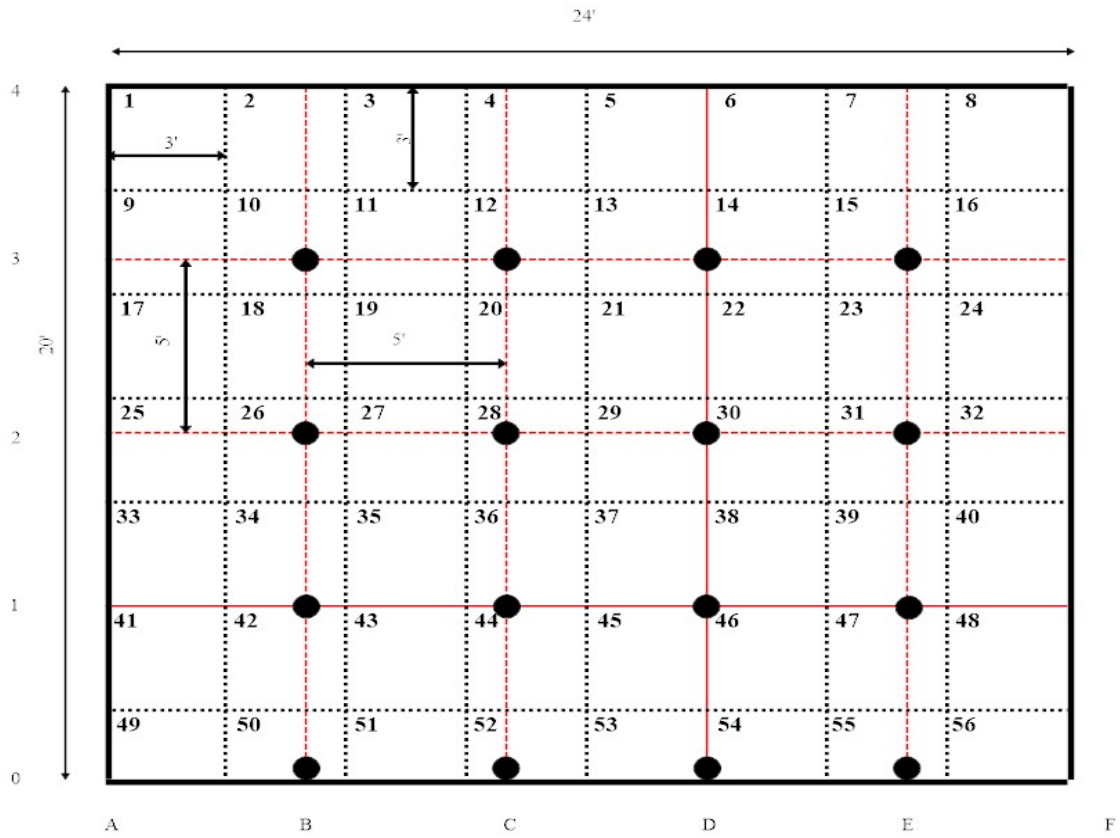
A = surface area of the survey unit (ft²); and

N = statistically calculated number of samples.

NOTE: Figures 5, 6, 7, and 8 present illustrative diagrams of the survey units for the Room 103 floor, lower walls, upper walls, and ceiling. Other survey units were laid out in the same manner as described above, but are not illustratively presented in the body of this report, but are included in the applicable attached Appendix with the survey reports of the survey unit. A minimum of 16 direct measurement/swipe or soil samples were collected in each survey unit.

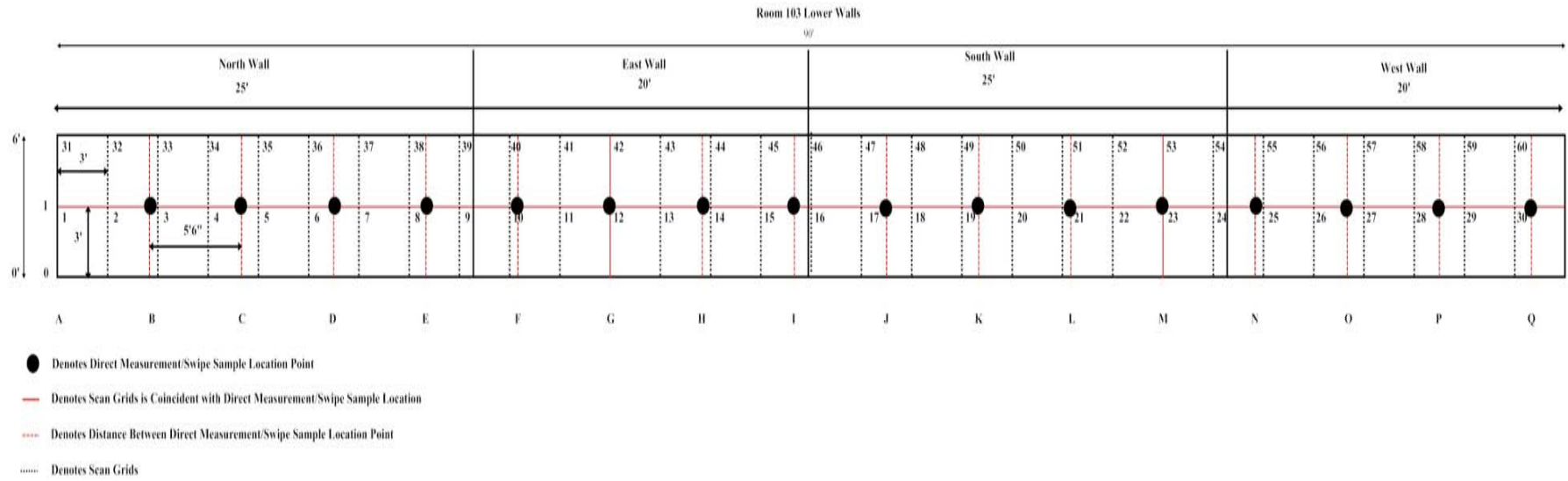
Figure 5 Room 103 Floor Survey Unit Layout Diagram

Room 103 Floor Static Point and Scan Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- - - Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids

Figure 6 Room 103 Lower Walls Survey Unit Layout Diagram



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Figure 7 Room 103 Upper Walls Survey Unit Layout Diagram

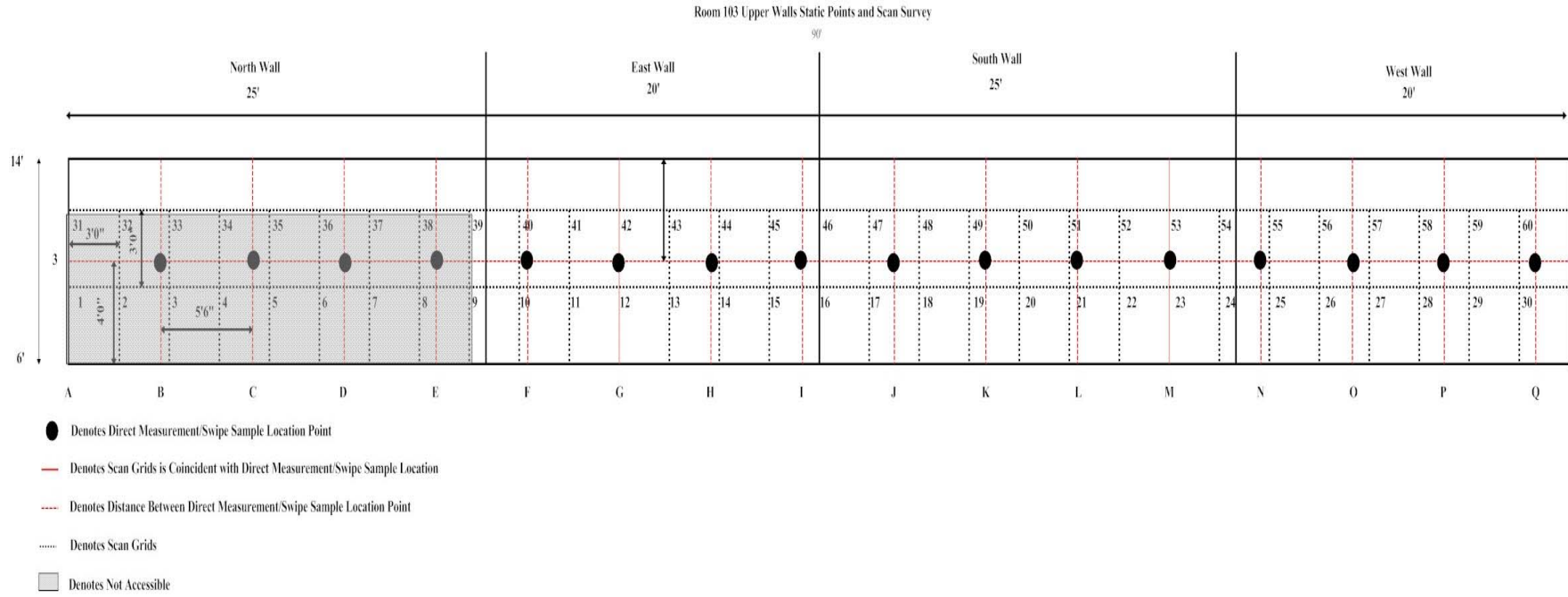
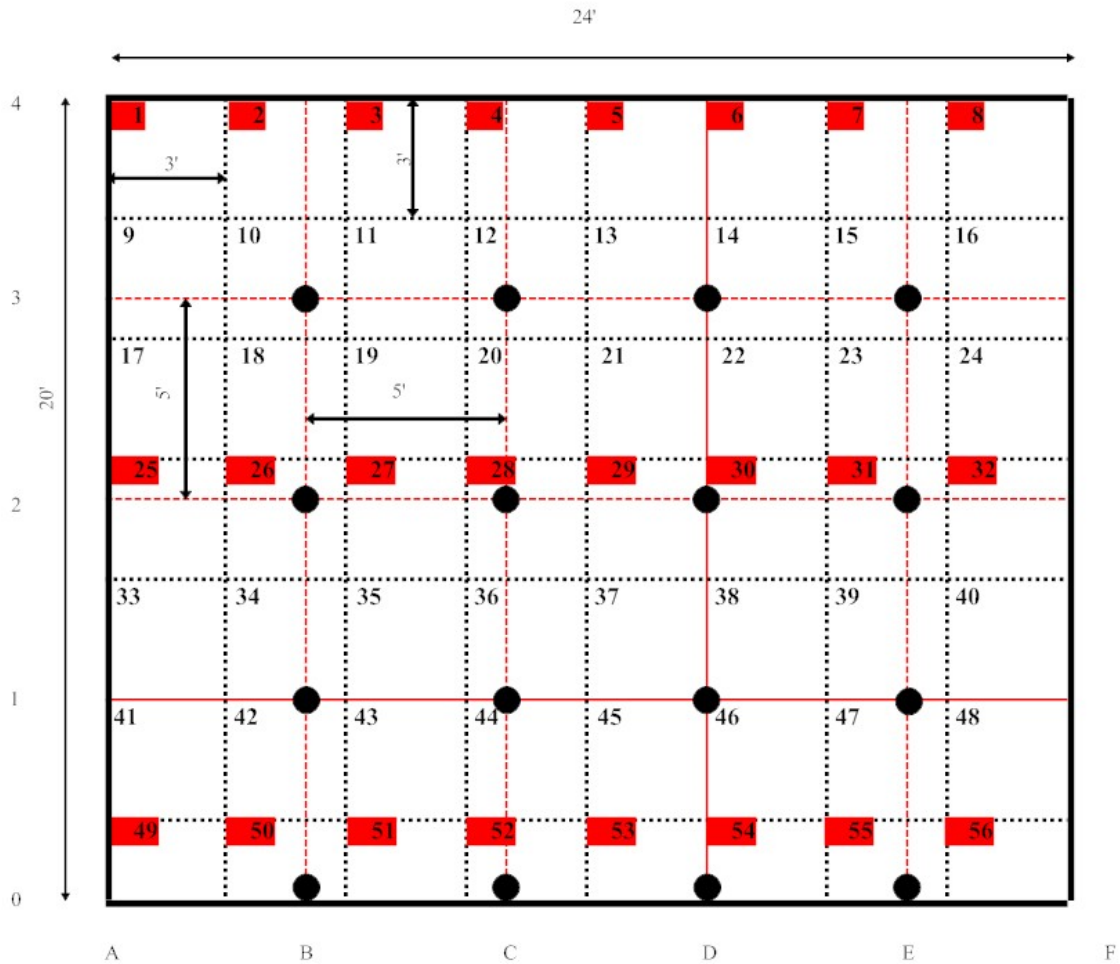


Figure 8 Room 103 Ceiling Survey Unit Layout Diagram
 Room 103 Ceiling Static Point and Scan Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- - - Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids
- Denotes Locations of Scanned Areas, 25% or Better.

6.5 Systematic vs. Biased Sampling

It is important to randomly survey a site, so that each part of the site has an equal chance of being surveyed. This type of survey is called systematic. However, knowledge of the site can identify areas that are more likely to contain contaminants. These were examined closely. This type of survey is called biased.

Systematic and biased sampling was employed during the surveys. Systematic direct measurement/swipe samples were collected in all of the survey units. However, in addition to these systematic direct measurement/swipe samples, other direct measurement/swipe samples were collected only where the gross alpha/beta-gamma scan surveys indicated elevated levels of residual contamination, that were discovered.

6.6 Survey Instrumentation

6.6.1 *Instrumentation Selection*

Instruments were selected that are suitable for the physical and environmental conditions at the site. The instruments and measurement methods selected were able to detect the radionuclide of concern or radiation types of interest, and are, in relation to the survey or analytical technique, capable of measuring levels that are equal to or less than the release limits.

6.6.2 *Instrument for the Scan Surveys for Alpha and Beta Surface Activity (Personnel)*

Surface scan surveys for alpha and beta radiation were conducted with Ludlum Model 44-9 thin windowed GM probes or equivalent, coupled to Ludlum Model 3 survey meters or equivalent. The probes had $1.7 \text{ mg/cm}^2 \pm 0.3 \text{ mg/cm}^2$ thick mica windows. The detectors were moved over the surface being surveyed at a rate of 0.5 cm per second. The detectors were held within ¼" of the surface being surveyed. Audible indicators were used during the surveys

6.6.3 *Instrument for the Scan Surveys for Alpha and Beta Surface Activity (Walls, Floor, and Ceiling Building Surfaces)*

Surface scan surveys for alpha and beta radiation were conducted with Ludlum Model 43-37 large area gas proportional detectors, coupled to Ludlum Model 2360 Data Loggers. The probes had 0.8 mg/cm^2 thick mylar windows. The detectors were moved over the surface being surveyed at a rate of 0.7 to 1.5 cm per second. The detectors were held within ¼" of the surface being surveyed. Audible indicators were used during the surveys

6.6.4 *Instrument for the Direct Measurements for Alpha and Beta Surface Activity (Walls, floor, and Ceiling Building Surfaces, Equipment, and Tools)*

Direct surface contamination surveys for alpha and beta radiation were conducted with Ludlum Model 43-93 large area scintillation detectors, coupled to Ludlum Model 2360 Data Loggers. The probes had 1.2 mg/cm² thick mylar windows. Direct measurements were conducted with the detector ¼" or less away from the surface for a period of 2 minutes.

6.6.5 *Gross Beta-Gamma-Alpha Loose Surface Contamination Surveys*

Loose surface contamination surveys of alpha and beta/gamma emitters were performed using cloth smears.

The swipe survey was performed by wiping over an area of 100 cm² (~ 4" by 4") with a cloth smear, and applying moderate pressure.

The smears were analyzed with a Ludlum Model-2929 Dual Channel Scaler phoswich detector or equivalent.

6.6.6 *Instrument for the Measurement of Gamma Exposure Rates*

Gamma exposure rate measurements were performed using a Ludlum Model 19 microR/meter. The Ludlum Model 19 is a high sensitivity gamma microR/meter employing an internally housed 1-inch diameter by 1-inch thick NaI crystal.

6.6.7 *Instrument for the Measurement of Gamma Count Rate*

Gamma count rate measurements were performed using a Ludlum Model 2350-1 data logger coupled to a Ludlum Model 44-10 2" by 2" Na I detector.

NOTE: The following sections are for informational purposes. The actual calculated values are listed along with the background reference area data presented in Table 4.

6.7 **Detection Sensitivity—Static and Scan Minimum Detectable Concentration (MDC), Gross Alpha-Gross Beta Surveys**

6.7.1 *Determination of Instrument Efficiency (ϵ_i) for Alpha and Beta Surface Activity Measurements*

The instrument efficiency (ϵ_i) is determined during calibration and is defined as the ratio between the net count rate (in counts per minute (cpm)) of the instrument and the surface emission rate of the calibration source for a specified geometry. The surface emission rate is the 2π particle fluence that is affected by both the attenuation and backscatter of the radiation emitted from the calibration source. Equation 1 was used

to calculate the instrument efficiency in counts per particle, although efficiency is typically reported as having no units or unitless.

Equation 1

$$\epsilon_i = \frac{R_{S+B} - R_B}{q_{2\pi} \left(\frac{W_A}{S_A} \right)}$$

Where,

R_{S+B} = the gross count rate of the calibration measurement (cpm)

R_B = the background count rate in cpm

$q_{2\pi}$ = surface emission rate of the calibration source (NIST traceable)

W_A = Active Area of the detector window (cm²)

S_A = Area of the source (cm²)

Note: This equation assumes that the dimensions of the calibration source are sufficient to cover the window of the instrument detector. If the dimensions of the calibration source are smaller than the detector's window, set W_A equal to the dimensions of the calibration source, i.e., set the quotient of W_A and S_A equal to 1.

The instrument efficiency was determined during calibration by obtaining static counts with the detector over a calibration source that has a National Institute of Standards and Technology (NIST) traceable surface emission rate. The 2π particle fluence rate is corrected for decay, attenuation and scatter, then; the surface emission rate of the source must be corrected for the area subtended by the probe. Factors that can also affect the instruments efficiency are discussed below:

Calibration Sources: The calibration sources selected emit alpha or beta radiation with energies similar to those expected from the contaminant in the field, i.e., similar to the expected radionuclide(s) of concern.

Source Geometry Factors: The instrument efficiency is determined with a calibration source equal to or greater than the area of the probe.

Source-to-Detector Distance: The detector is calibrated at a source-to-detector distance that is the same as the detector-to-surface distance used in the field.

Window Density Thickness: The detector is calibrated with a probe window density thickness that is the same as the probe window density thickness used in the field.

Detector-Related Factors - Ambient Conditions: If ambient conditions such as the

temperature, pressure, and humidity vary significantly, during calibration and during field use, corrections to the detector's response will be considered.

6.7.2 Static MDC

The static MDC is the level of radioactivity, on a surface, that is practically achievable by the overall measurement process. The conventional equation, Equation 2, was used to calculate instrument MDCs in dpm per 100 cm² when the background and sample are counted for the same time intervals.

Equation 2

$$MDC = \frac{3 + 4.65\sqrt{C_B * T_B}}{\varepsilon_i \varepsilon_s \frac{W_A}{100 \text{ cm}^2} T_B}$$

where;

C_B = background count rate (cpm)

T_B = background counting time (min)

ε_i = instrument efficiency (count per particle)

ε_s = contaminated surface efficiency (particle per disintegration)

W_A = area of the detector window (cm²)

If the background and sample are counted for different time intervals, Equation 3 was used to calculate the MDC in dpm per 100 cm².

Equation 3

$$MDC = \frac{3 + 3.29\sqrt{R_B T_{S+B} \left(1 + \frac{T_{S+B}}{T_B}\right)}}{\varepsilon_i \varepsilon_s \frac{W_A}{100 \text{ cm}^2} T_{S+B}}$$

where;

R_B = background count rate (cpm)

T_B = background counting time (min)

T_{S+B} = sample counting time (min)

ε_i = the instrument efficiency (count per particle)

ϵ_s = the contaminated surface efficiency (particle per disintegration)
 W_A = the area of the detector window (cm^2)

6.7.3 *Surface Efficiency (ϵ_s) for Surface Activity Measurements*

The surface efficiency term in Equations 2 and 3 is used to determine the 4π total efficiency for a particular surface and condition. Suitable values are based on the radiation and radiation energy, and are primarily impacted by the backscatter and self-absorption characteristics of the surface on which the contamination exists in the field. Backscatter is most affected by the energy of the radiation and the density of the surface material. Self-absorption characteristics or attenuation are also a function of the radiation's energy and surface condition. Surfaces typically encountered in the field include concrete, wood, dry wall, plaster, carpet, and metal. Surface conditions include both physical effects, such as scabbled concrete, and the effect of surface coatings, i.e., dust, paint, rust, water, and oil.

In the absence of experimentally determined surface efficiencies, ISO-7503-1 and NUREG 1507, provide conservative recommendations for surface efficiencies. ISO-7503-1, recommends a surface efficiency of 0.5 for maximum beta energies exceeding 0.5 MeV, and to use a surface efficiency of 0.25 for beta energies between 0.15 and 0.4 MeV and for alpha emitters (ISO, 1998), (NRC, 1997). NUREG-1507 provides surface efficiencies based on studies performed primarily at ORISE. In general, NUREG-1507 indicates that the ISO rule-of-thumb for surface efficiencies is conservative, particularly for beta-emitting radionuclides with end-point energies between 0.25 MeV and 0.4 MeV.

The surface condition on the building surfaces were concrete and metal surfaces that were slightly covered with dust. The surface efficiency for alpha emitters used in accordance with ISO-7503-1 is 0.25 and for beta emitters is 0.375. The weighted surface efficiency for the beta emitter is based upon the beta energy of 2.2 MeV for the decay of Pa-234m.

6.7.4 *Probe Area Correction Factor for Surface Activity Measurements*

In Equation 2, W_A is the size of the "active" area of the detector window. If the area of the detector window (cm^2) does not equal 100 cm^2 , it is necessary to convert the detector response to units of dpm per 100 cm^2 .

NOTE: The following calculations are for illustrative purposes only. Actual values were calculated using site specific (background, instrument efficiencies, etc.) data.

6.7.5 *Scanning Minimal Detectable Count Rate, (MDCR)*

The minimum detectable number of net source counts in the scan interval, for an ideal observer, can be arrived at by multiplying the square root of the number of background counts (in the scan interval) by the detectability value associated with the

desired performance (as reflected in d') as shown in Equation 4.

Equation 4

$$MDCR = d' \sqrt{b_i} \times 60/i$$

where,

d' = index of sensitivity (α and β error) – MARSSIM Table 6.5

b_i = number of background counts in scan time interval (count)

i = scan or observation interval (s) (time that a typical source remains under the probe during the scan)

6.7.6 Scan MDCs for Building Surfaces, Equipment, Material, and Tools (Beta-Gamma, 100cm² probe)

The scan MDC is determined from the minimum detectable count rate (MDCR) by applying conversion factors that account for detector and surface characteristics and surveyor efficiency. As discussed below, the MDCR accounts for the background level, performance criteria (d'), and observation interval. The observation interval during scanning is the actual time that the detector can respond to the contamination source. This interval depends on the scan speed, detector size in the direction of the scan, and area of elevated activity.

The scan MDC for building, equipment, material, and tool surfaces was calculated using Equation 5.

Equation 5

$$Scan\ MDC = \frac{MDCR}{\sqrt{p} \ \varepsilon_i \varepsilon_s \ \frac{W_A}{100\ cm^2}}$$

Where;

MDCR = discussed in Section 6.7.5

p = surveyor efficiency factor

ε_i = instrument efficiency (count per particle)

ε_s = contaminated surface efficiency (particles per disintegration)

W_A = area of the detector window (cm²)

6.7.7 *Scan MDCs for Building Surfaces, Equipment, Material, and Tools (Alpha, 100cm² probe)*

Scanning for alpha emitters differs significantly from scanning for beta and gamma emitters in that the expected background response of most alpha detectors is very close to zero. The following section cover scanning for alpha emitters and assumes that the surface being surveyed is similar in nature to the material on which the detector was calibrated. In this respect, the approach is purely theoretical. Surveying surfaces that are dirty, non-planar, or weathered can significantly affect the detection efficiency and therefore bias the expected MDC for the scan. The use of reasonable detection efficiency values instead of optimistic values is highly recommended.

Since the time a contaminated area is under the probe varies and the background count rate of some alpha instruments is less than 1 cpm, it is not reasonable to determine a fixed MDC for scanning. Instead, it is more practical to determine the probability of detecting an area of contamination at a predetermined DCGL for given scan rates.

For alpha survey instrumentation with backgrounds ranging from <1 to 3 cpm, a single count provides a surveyor sufficient cause to stop and investigate further. Assuming this to be true, the probability of detecting given levels of alpha surface contamination can be calculated by use of Poisson summation statistics.

Given a known scan rate and a surface contamination release limit, the probability of detecting a single count while passing over the contaminated area was calculated using Equation 6 below:

Equation 6

$$P(n \geq 1) = 1 - e^{-\frac{GE d}{60v}}$$

Where;

P(n≥1) = probability of observing a single count

G = contamination activity (dpm)

e = 2.7182818

E = detector efficiency (4π)

d = width of detector in direction of scan (cm)

v = scan speed (cm/s)

$$100\% = 1 - 2.7182818^{\frac{-1150 \cdot 182 \cdot 8}{60 \cdot 1.5}}$$

Once a count is recorded and the guideline level of contamination is present the surveyor should stop and wait until the probability of getting another count is at least 90%. This time interval can be calculated using Equation 7 below:

Equation 7

$$t = \frac{13,800}{CAE}$$

Where

- t = time period for static count(s)
- C = contamination guideline (dpm/100cm²)
- A = physical probe area (cm²)
- E = detector efficiency (4π)

6.7.8 Scan MDCs for Alpha Emitters (582 cm² probe)

The larger (582cm²) gas proportional detectors have background count rates on the order of 5 to 10 cpm, and a single count will not cause a surveyor to investigate further. A counting period long enough to establish that a single count indicates an elevated contamination level would be prohibitively inefficient. For these types of instruments, the surveyor usually will need to get at least 2 counts while passing over the source area before stopping for further investigation.

Assuming this to be a valid assumption, the probability of getting two or more counts was calculated by Equation 8 below.

Equation 8

$$P(n \geq 2) = 1 - e^{-\frac{(GE+B)t}{60}} \left(1 + \frac{(GE+B)t}{60} \right)$$

Where

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$P(n \geq 2)$	=	probability of getting 2 or more counts during the time interval t
t	=	d/v , dwell time over source (s)
G	=	contamination activity (dpm)
e	=	2.7182818
E	=	detector efficiency (4π)
B	=	background count rate (cpm)

Using Equation 8 above, the scan probability calculation is illustrated below using the parameters of one of the instruments actually used during the surveys at a scan rate of 1.5 cm/s:

$$100\% = 1 - 2.7182818^{\frac{(1150 * 0.157 + 4.9)9}{60}} \left(1 + \frac{(1150 * 0.157 + 4.9)9}{60} \right)$$

6.7.9 Scan MDC (Alpha)

Using the following equation (Abelquist, 2001), one can calculate the activity of a 100 cm² “hot spot” with a 90 % probability of detection using Equation 9 below.

Equation 9

$$\alpha \text{ scanMDC} = \frac{[-\ln(1 - P(n \geq 1))]60}{t \epsilon_s \epsilon_i}$$

Where

t	=	dwell time over source (seconds)
ϵ_i	=	Instrument efficiency (counts per particle)
ϵ_s	=	contaminated surface efficiency (particles per disintegration)

6.8 Survey Design

6.8.1 Building 218 Rooms, Floor, Lower Wall Class 1 Survey Units

6.9.1.1 Gross Alpha/Gross Beta Scan Surveys

100% coverage surface scan surveys for gross alpha and beta radiation were conducted with a Ludlum Model 43-37 large area gas proportional detector, coupled to a Ludlum Model 2360 Data Logger. The probes had 0.8 mg/cm² thick mylar windows. The detector was moved over the surface being surveyed at a variable rate of 0.75 to 1.5 cm per second. The detector was held within ¼" of the surface being surveyed. Audible indicators were used during the surveys. The data loggers were setup to record a gross alpha and gross beta count rate every 6 seconds (due to the limitations of the data logger, count rates were recorded every 11-12 seconds).

6.9.1.2 Gross Alpha/Gross Beta-Gamma Direct Measurements

The surveys consisted of 2 minute direct measurement surveys for alpha-beta radiations using a large area scintillation detector system (Ludlum Instruments Model 2360 Data Logger coupled to a Ludlum Instruments Model 43-93 scintillation detector).

The results of the direct measurements were recorded on form AWS-001RCS, Radiation Contamination Survey Cover Sheet or equivalent electronic spreadsheet.

6.9.1.3 Gross Beta-Gamma-Alpha Loose Surface Contaminations Surveys

Loose surface contamination surveys of alpha and beta/gamma emitters were performed using cloth smears.

The swipe survey was performed by wiping over an area of 100 cm² (~ 4" by 4") with a cloth smear, and applying moderate pressure.

The smears were analyzed with a Ludlum Model-2929 Dual Channel Scaler phoswich detector or equivalent in accordance with AWS SOP IOP-2, "Operation and Calibration of the Ludlum Model 2929 Dual Channel Scaler".

One swipe sample was collected at each gross alpha/beta direct measurement location.

The results of the smears were recorded on form AWS-006, Smear Counting Analysis Report or equivalent electronic spreadsheet.

6.8.2 *Building 218 Rooms Upper Wall Class 2 Survey Units*

6.9.1.1 Gross Alpha/Gross Beta Scan Surveys

80 % coverage surface scan surveys for gross alpha and beta radiation were conducted with a Ludlum Model 43-37 large area gas proportional detector, coupled to a Ludlum Model 2360 Data Logger. The probes had 0.8 mg/cm² thick mylar windows. The detector was moved over the surface being surveyed at a variable rate of 0.75 to 1.5 cm per second. The detector was held within ¼” of the surface being surveyed. Audible indicators were used during the surveys. The data loggers were setup to record a gross alpha and gross beta count rate every 6 seconds (due to the limitations of the data logger, count rates were recorded every 11-12 seconds).

6.9.1.2 Gross Alpha/Gross Beta-Gamma Direct Measurements

The surveys consisted of 2 minute direct measurement surveys for alpha-beta radiations using a large area scintillation detector system (Ludlum Instruments Model 2360 Data Logger coupled to a Ludlum Instruments Model 43-93 scintillation detector).

The results of the direct measurements were recorded on form AWS-001RCS, Radiation Contamination Survey Cover Sheet or equivalent electronic spreadsheet.

6.9.1.3 Gross Beta-Gamma-Alpha Loose Surface Contaminations Surveys

Loose surface contamination surveys of alpha and beta/gamma emitters were performed using cloth smears.

The swipe survey was performed by wiping over an area of 100 cm² (~ 4" by 4") with a cloth smear, and applying moderate pressure.

The smears were analyzed with a Ludlum Model-2929 Dual Channel Scaler phoswich detector or equivalent in accordance with AWS SOP IOP-2, "Operation and Calibration of the Ludlum Model 2929 Dual Channel Scaler".

One swipe sample was collected at each gross alpha/beta direct measurement location.

The results of the smears were recorded on form AWS-006, Smear Counting Analysis Report or equivalent electronic spreadsheet.

6.8.3 *Building 218 Rooms, Ceiling/Overhead Class 2 Survey Units*

6.9.1.1 Gross Alpha/Gross Beta Scan Surveys

30 % coverage surface scan surveys for gross alpha and beta radiation were conducted with a Ludlum Model 43-37 large area gas proportional detector, coupled to a Ludlum Model 2360 Data Logger. The probes had 0.8 mg/cm² thick mylar windows. The detector was moved over the surface being surveyed at a variable rate of 0.75 to 1.5 cm per second. The detector was held within ¼” of the surface being surveyed. Audible indicators were used during the surveys. The data loggers were setup to record a gross alpha and gross beta count rate every 6 seconds (due to the limitations of the data logger, count rates were recorded every 11-12 seconds).

6.9.1.2 Gross Alpha/Gross Beta-Gamma Direct Measurements

The surveys consisted of 2 minute direct measurement surveys for alpha-beta radiations using a large area scintillation detector system (Ludlum Instruments Model 2360 Data Logger coupled to a Ludlum Instruments Model 43-93 scintillation detector).

The results of the direct measurements were recorded on form AWS-001RCS, Radiation Contamination Survey Cover Sheet or equivalent electronic spreadsheet.

6.9.1.3 Gross Beta-Gamma-Alpha Loose Surface Contaminations Surveys

Loose surface contamination surveys of alpha and beta/gamma emitters were performed using cloth smears.

The swipe survey was performed by wiping over an area of 100 cm² (~ 4" by 4") with a cloth smear, and applying moderate pressure.

The smears were analyzed with a Ludlum Model-2929 Dual Channel Scaler phoswich detector or equivalent in accordance with AWS SOP IOP-2, “Operation and Calibration of the Ludlum Model 2929 Dual Channel Scaler”.

One swipe sample was collected at each gross alpha/beta direct measurement location.

The results of the smears were recorded on form AWS-006, Smear Counting Analysis Report or equivalent electronic spreadsheet.

6.8.4 *Building 218 Blast Tank, Target Sphere, Orthogonal Chamber, Optics Chamber*

6.9.1.1 Gross Alpha/Gross Beta Scan Surveys

100% coverage surface scan surveys for gross alpha and beta radiation were conducted with a Ludlum Model 43-93 large area scintillation detector, coupled to a Ludlum Model 2360 Data Logger. The probes had 1.2 mg/cm² thick mylar windows. The detector was moved over the surface being surveyed at a variable rate of 0.75 to 1.5 cm per second. The detector was held within ¼" of the surface being surveyed. Audible indicators were used during the surveys. Due to the confined nature of these areas, the data loggers were not setup to record a gross alpha and gross beta count rate, instead, the surveyor manually recorded the count rate ranges during the survey.

6.9.1.2 Gross Alpha/Gross Beta-Gamma Direct Measurements

The surveys consisted of systematic and biased 2 minute direct measurement surveys for alpha-beta radiations using a large area scintillation detector system (Ludlum Instruments Model 2360 Data Logger coupled to a Ludlum Instruments Model 43-93 scintillation detector).

The results of the direct measurements were recorded on form AWS-001RCS, Radiation Contamination Survey Cover Sheet or equivalent electronic spreadsheet.

6.9.1.3 Gross Beta-Gamma-Alpha Loose Surface Contaminations Surveys

Systematic and biased loose surface contamination surveys of alpha and beta/gamma emitters were performed using cloth smears.

The swipe survey was performed by wiping over an area of 100 cm² (~ 4" by 4") with a cloth smear, and applying moderate pressure.

The smears were analyzed with a Ludlum Model-2929 Dual Channel Scaler phoswich detector or equivalent in accordance with AWS SOP IOP-2, "Operation and Calibration of the Ludlum Model 2929 Dual Channel Scaler".

The results of the smears were recorded on form AWS-006, Smear Counting Analysis Report or equivalent electronic spreadsheet.

7.0 HEALTH AND SAFETY CONSIDERATIONS

The final status surveys at NRLCBD were conducted in accordance with the AWS Site Health and Safety Plan (SHASP). All on site personnel read and understood the contents of the plan prior to beginning work on the project.

7.1 Hazard Analysis

The job hazard analysis identifies potential safety, health and environmental hazards and provides for the protection of personnel, the community, and the environment.

7.1.1 Radiological Exposure

Residual amounts of low-level radioactive material were present on the building surfaces in Building 218. Personnel performing the final status surveys and sampling wore dosimetry and modified Level D PPE as described in Sections 3.2 and 7.2.2 of this report.

7.2 Hazard Controls

The following control measures were implemented during the survey activities. The control measures were intended to supplement the HASP.

7.2.1 Radiation Work Permit

A Radiation Work Permit (RWP) was prepared and specified the activities to be performed and all radiological safety requirements for the work. All personnel assigned to site work were required to read and sign the RWP acknowledging that they understand the requirements prior to beginning work.

The RWP was also used as an information document for industrial safety. Hazards other than radiological were included in the RWP so proper protection could be taken for all possible hazards from one controlling document. Implicit in any RWP is the need for a briefing on the radiological conditions present in the work environment.

The RWP listed tasks and specific levels of protection for each worker covered by the RWP. The RWP also detailed the dosimetry requirements, the protective clothing requirements, and the expected radiation and contamination levels to be encountered during the job.

A copy of the RWP is presented in Appendix B.

7.2.2 PPE

Personnel performing the work at NRLCBD wore modified Level D PPE in accordance with the PPE selection matrix in the SHASP.

The modified Level D PPE consisted of:

- Steel-toed shoes;
- Safety glasses;
- Latex rubber or equivalent gloves (when collecting swipe samples).

7.2.3 Safety Equipment

In addition to other equipment specified in this report, the following safety equipment were staged at the NRLCBD job site:

- First aid kit
- Eye wash kit

7.3 Training

Personnel performing activities associated with the NRLCBD work activities received training, which included a review of the Work Plan, SHASP, and Sampling and Analysis Plan (SAP).

All on-site project personnel have completed at least 40 hours of hazardous waste operations-related training, as required by the Occupational Safety and Health administration (OSHA) Regulation 29 CFR Part 1910.120. Those personnel who had completed the 40-hour training more than 12 months prior to start of field activities had completed an 8-hour refresher course within the past twelve months.

The Project Manager had completed an additional 8 hours of relevant supervisory health and safety training.

Personnel operating the survey detection equipment were qualified ANSI 3.1 Senior Health Physics Technicians based on training and experience outlined in Section 4.4.6 and 4.5.3.2 of ANSI standard ANSI/ANS-3.1-1993 (ANSI/ANS, 1993).

A formal review of the key personnel qualifications to perform the required work was made by management and verified during the pre job briefing that was conducted prior to start of work.

The personnel were familiar with the handling and storage of radioactive materials, contamination controls, and the use of radiation survey equipment.

7.4 Hazard Communications

The Project Manager ensured that crewmembers understand their obligation to safety and ensure that members were familiar with the elements of the safety program. A copy of the applicable work plans were maintained in the on-site project office.

Daily tailgate safety meetings were conducted and documented as specified in the Site Health and Safety Plan. Material Safety Data Sheets (MSDSs) for all hazardous substances and materials that were used on site were maintained in the on-site project office.

8.0 QUALITY ASSURANCE

8.1 Instrument Calibration

The instruments and systems used for the survey effort were calibrated on an annual frequency using the manufacturer's calibration protocol to National Institute of Standards and Technology (NIST) traceable sources.

The instrumentation calibration paperwork is presented in Appendix D of this report.

8.2 QC Source and Background Checks

Prior to daily use, instruments were QC checked by comparing the instruments' response to a designated radiation source and to ambient background. Prior to the commencement of field operations a reference location was used for performance of these checks. Background checks were performed in an identical fashion with the source removed.

During QC checks, instruments used to obtain qualitative radiological data were inspected for physical damage, current calibration, and erroneous readings in accordance with applicable procedures and protocols. Instrument response to the designated QC check source was evaluated against the average established at the start of the field activities. . The instruments were used after readings were compared and agreed within $\pm 3\sigma$ of the true source reading in accordance with the requirements of ANSI Standard N323A-1997, "American National Standard Radiation Protection Instrumentation Test and Calibration, Portable Survey Instruments".

The daily instrument response check data is presented in Appendix E of this report.

8.3 Records and Reports

The Project Manager was responsible for reviewing data for accuracy and completeness before on-site activities are concluded. Electronic records may be substituted, provided appropriate access authorization procedures are in place and quality assurance requirements are met.

All data, notes, measurements, calibrations, and other information pertinent to a survey site must be recorded and maintained. Records must conform to the following basic requirements:

- Marked with date of entry.

- Signed or initialed (by hand or electronically) by the author of the entry.
- Written or printed in a legible manner.
- Contain all pertinent information in a concise, accurate entry.

Column headings or requested information on record data forms may be inappropriate or incorrect for specific site situations. If so, appropriate handwritten changes must be made on the forms. When certain information requested on the presented form is not required, the space or columns should be crossed through or marked "NA" (not applicable) as an indication that such information was not required, rather than having possibly been forgotten.

If data corrections are necessary a single line will be drawn through the entry. New data, initials of the surveyor, and date of correction will be recorded. Data will not be obliterated by erasing or with the use of white-out.

All training records were maintained. The training records included brief biographies (resumes) certifications, or documents that demonstrate the qualifications of the personnel performing the work.

This Final Status Survey Report contains records and information necessary to document and support the Final Status Survey effort. All generated records for the project were maintained in the on-site office. Records that must be controlled and maintained during the project and presented in this Final Status Survey Report, in addition to site activities may have included but were not limited to:

- Description of survey design;
- Instrument calibration data;
- Daily instrument performance check data;
- Instrument efficiency determination data;
- Survey records;
- Dates surveys were performed;
- Survey results and data;
- Description of instrumentation used;
- Instrumentation MDC calculations;
- Smear sample location records;

- Identification of release limits used;
- Sample analysis results;
- Survey maps;
- Quality control data;

Listed records were maintained on site during project activities. All listed records were transmitted with the final project report and are maintained on the secure file server located in the AWS corporate office in Anchorage, AK.

8.4 Quality Control Swipe Samples

Field duplicate swipe samples were collected at a frequency of 10%. The results of the QC field duplicate samples were compared to each other. A maximum deviation of $\pm 20\%$ was the satisfactory objective of the comparison of the samples. All field duplicate swipe samples results were within 20% goal.

8.5 Data Management

Data was maintained in the on-site office. Backup copies of data was made routinely and maintained on the computer provided. Further, backup copies of survey and sample results were routinely made to CDs or other removable electronic media.

8.6 QA Audit

An independent QA audits was conducted for the survey activities. The audit was completed by Mr. Brad Squibb of Solutient Technologies, LLC who was not on site or part of daily activities.

The result of the QA audit was satisfactory. The following data was reviewed during the audit;

- Radiological Survey Reports
- Daily Instrument Response Check Data
- Instrument Calibration Data
- Chi Square Test Data
- Instrument Background Data
- Field and Sample Log Books

- Laboratory Data Reports
- Sample Collection
- Sample Labeling
- Sample Delivery
- Supporting Documentation for Sample Collection (COC's, etc.)
- Sample Containers
- Adherence to Applicable SOP's

The QA audit report is presented in Appendix F of this report.

8.7 Data Validation

Independent data validation was conducted for solid sampling activities. The data validation was completed by Mr. Paul Wall who was not on site or part of daily activities.

All soil sample data was validated at 80 percent EPA Level III and 20 percent EPA Level IV frequencies.

EPA Level III-equivalent data validation included the comparison of QC parameters to the appropriate criteria or limits. (QC parameters include holding times, tune, calibration, blanks, spikes, surrogates, and internal standards, as applicable.) EPA Level IV-equivalent data validation included not only what was performed in a Level III-equivalent validation but also review of raw data and backup documentation (for calibrations, standards, analysis run logs, etc.). This information was used for checking calculations of quantified analytical data during a Level IV-equivalent data validation review.

The Data Validation reports is presented in Appendix G of this report.

9.0 SURVEY ANALYSIS AND RESULTS

9.1 Surface Activity Measurements

Measurements to quantify surface activity levels represent the fundamental compliance measurements for buildings and structures. ISO-7503, NUREG-1507, and ASTM were used as technical guidance to ensure the accurate measurement of surface activity.

Equation 10 was used to document and calculate the surface activity in dpm per 100 cm².

Equation 10

$$A_S = \frac{R_{S+B} - R_B}{\varepsilon_i \varepsilon_s \frac{W_A}{100 \text{ cm}^2}}$$

Where;

A_S = total surface activity (dpm/100 cm²)

R_{S+B} = the gross count rate of the measurement in cpm,

R_B = the background count rate in cpm

ε_i = the instrument efficiency (counts per particle)

ε_s = the contaminated surface efficiency (particles per disintegration)

W_A = the area of the detector window (cm²)

This equation has two efficiency terms, which account for differences between the conditions under which the detector is calibrated, and conditions under which the detector is used in the field. The instrument efficiency (ε_i) is discussed in Section 6.7.1, and is determined under ideal conditions in the laboratory. The surface efficiency, is discussed in Section 6.7.3, and is used to determine the 4π total efficiency for a particular surface and condition.

9.2 Investigation Level Calculations

The gross alpha and beta investigation levels in net cpm, discussed in Section 5.2.5.2 were calculated using Equations 11 and 12 below:

Equation 11

$$\text{Net CPM } \alpha = 1035 * \left(\varepsilon_i \varepsilon_s \frac{W_A}{100 \text{ cm}^2} \right)$$

Equation 12

$$\text{Net CPM } \beta = 1070 * \left(\varepsilon_i \varepsilon_s \frac{W_A}{100 \text{ cm}^2} \right)$$

9.3 Data Assessment

Basic statistical quantities were calculated for the data in order to identify patterns, relationships and any type anomaly.

The Project Manager reviewed data at the end of each phase of the survey to determine the validity of the results and adequate coverage of the survey areas.

9.4 Building 218 Room 100 Floor Class 1 Survey Unit

9.4.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.4.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

The H₀ is rejected for the survey unit as the survey unit means (average) are less than the gross alpha release criteria, and there was no evidence of small areas of elevated activity.

Table 6 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.4.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.4.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

Table 6 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 6 Building 218 Room 100 Floor Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Room 100 Floor	30/269	3/19	2/0	0/0

9.4.5 Biased Alpha-Beta Measurements of Survey Unit, Analysis and Results

No biased measurements were collected in this survey unit.

9.5 Building 218 Room 100 Lower Walls Class 1 Survey Unit

9.5.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were

detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.5.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

The H₀ is rejected for the survey unit as the survey unit means (average) are less than the gross alpha release criteria, and there was no evidence of small areas of elevated activity.

Table 7 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.5.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.5.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

Table 7 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 7 Building 218 Room 100 Lower Walls Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Room 100 Lower Walls	0/647	0/84	5/0 ¹	0/0

¹ Actual results are recorded even though the results are below the MDC of the counting system. The value of the alpha result is above the maximum fixed alpha results which could be attributed to the counting uncertainty of the instrument.

9.5.5 *Biased Alpha-Beta Measurements of Survey Unit, Analysis and Results*

No biased measurements were collected in this survey unit.

9.6 **Building 218 Room 100 Upper Walls Class 2 Survey Unit**

9.6.1 *Alpha Scan Surveys of Survey Unit, Analysis and Results*

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.6.2 *Fixed Alpha Measurements of Survey Unit, Analysis and Results*

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 8 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.6.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

Some elevated areas of activity distinguishable from background levels were detected during the scan surveys. Biased readings were collected from these areas and are discussed in Section 9.6.5.

The scan survey results are provided in Appendix H of this report.

9.6.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. Two of the individual readings exceeded the release criteria.

Table 8 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 8 Building 218 Room 100 Upper Walls Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Room 100 Upper Walls	0/612	0/147	5/4 ¹	0/0

¹ Actual results are recorded even though the results are below the MDC of the counting system. The value of the alpha result is above the maximum fixed alpha results which could be attributed to the counting uncertainty of the instrument.

9.6.5 Biased Alpha-Beta Measurements of Survey Unit, Analysis and Results

No biased measurements were collected in this survey unit.

9.7 Building 218 Room 100 Ceiling/Overhead Class 2 Survey Unit

9.7.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.7.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 9 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.7.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.7.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM

guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. None of the individual readings exceeded the release criteria.

Table 9 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 9 Building 218 Room 100 Ceiling/Overhead Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Room 100 Ceiling/Overhead	13/545	0/407	5/2	0/0

9.7.5 Biased Fixed Alpha-Beta Measurements of Survey Unit, Analysis and Results

No biased measurements were collected in this survey unit.

9.8 Building 218 Room 103 Floor Class 1 Survey Unit

9.8.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.8.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release

criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 10 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.8.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.8.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. None of the individual readings exceeded the release criteria.

Table 10 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 10 Building 218 Room 103 Floor Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in	Average Fixed Net Alpha/Beta Results in	Maximum Net Removable Alpha/Beta Results in	Average Net Removable Alpha/Beta Results in

Aleut World Solutions

	dpm/100cm ²	dpm/100cm ²	dpm/100cm ²	dpm/100cm ²
Room 103 Floor	24/230	9/0	11/4	3/0

9.8.5 Biased Alpha-Beta Measurements of Survey Unit, Analysis and Results

No biased measurements were collected in this survey unit.

9.9 Building 218 Room 103 Lower Walls Class 1 Survey Unit

9.9.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.9.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 11 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.9.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.9.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. None of the individual readings exceeded the release criteria.

Table 11 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 11 Building 218 Room 103 Lower Walls Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Room 103 Lower Walls	3/264	0/54	2/0	0/0

9.9.5 Biased Alpha-Beta Measurements of Survey Unit, Analysis and Results

No biased measurements were collected in this survey unit.

9.10 Building 218 Room 103 Upper Walls Class 2 Survey Unit

9.10.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.10.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 12 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.10.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.10.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. None of the individual readings exceeded the release criteria.

Table 12 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 12 Building 218 Room 103 Upper Walls Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm²	Average Fixed Net Alpha/Beta Results in dpm/100cm²	Maximum Net Removable Alpha/Beta Results in dpm/100cm²	Average Net Removable Alpha/Beta Results in dpm/100cm²
Room 103 Upper Walls	7/115	0/5	8/0	2/0

9.10.5 Biased Fixed Alpha-Beta Measurements of Survey Unit, Analysis and Results

No biased measurements were collected in this survey unit.

9.11 Building 218 Room 103 Ceiling/Overhead Class 2 Survey Unit

9.11.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.11.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 13 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.11.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

A few elevated areas of activity distinguishable from background levels were detected during the scan surveys. These were mostly on the top of horizontal surfaces such as I-Beams and light fixtures. Biased readings were collected from these areas and the results are discussed in Section 9.11.5 of this report.

The scan survey results are provided in Appendix F of this report.

9.11.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. None of the individual readings exceeded the release criteria.

Table 13 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 13 Building 218 Room 103 Ceiling/Overhead Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Room 103 Ceiling/Overhead	21/518	3/275	2/24	0/0

9.11.5 Biased Alpha-Beta Measurements of Survey Unit, Analysis and Results

Biased measurements were collected in this survey unit and the results are summarized in Table 14 below.

The biased survey results are present in Appendix J of this report.

Table 14 Building 218 Room 103 Ceiling Survey Unit Biased Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Estimated Total Area of Elevated Activity Areas In ft ²
Room 103 Overhead/Ceiling	56/4,893	27/3,268	30

Gross large area masslin swipe surveys were conducted in the biased survey locations. No detectable gross alpha/beta-gamma activity above background was found on any of the masslinn swipes.

9.12 Building 218 Room 103A Floor Class 1 Survey Unit

9.12.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.12.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release

criteria. No individual reading exceeded the release criteria.

Table 15 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.12.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

Numerous areas of elevated areas of activity distinguishable from background levels were detected during the scan surveys. Biased reading were collected in these areas and the results are discussed in Section 9.12.5 of this report.

The scan survey results are provided in Appendix H of this report.

9.12.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 6 located on page 33 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. One of the individual readings exceeded the release criteria.

Table 15 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 15 Building 218 Room 103A Floor Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Room 103A Floor	24/2,026	9/597	5/7	0/0

9.12.5 Biased Alpha-Beta Measurements of Survey Unit, Analysis and Results

Biased measurements were collected in this survey unit and the results are summarized in Table 16 below.

The biased survey results are present in Appendix J of this report.

Table 16 Building 218 Room 103A Floor Survey Unit Biased Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Estimated Total Area of Elevated Activity Areas In ft ²
Room 103A Floor	24/4,192	8/2,627	20

Gross large area masslin swipe surveys were conducted in the biased survey locations. No detectable gross alpha/beta-gamma activity above background was found on any of the masslinn swipes.

9.13 Building 218 Room 103A Lower Walls Class 1 Survey Unit

9.13.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.13.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments

used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 17 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.13.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

Numerous areas of elevated areas of activity distinguishable from background levels were detected during the scan surveys. Biased reading were collected in these areas and the results are discussed in Section 9.13.5 of this report.

The scan survey results are provided in Appendix H of this report.

9.13.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. Three of the individual readings exceeded the release criteria.

Table 17 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 17 Building 218 Room 103A Lower Walls Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed	Average Fixed Net	Maximum Net Removable	Average Net Removable
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Aleut World Solutions

	Alpha/Beta Results in dpm/100cm ²	Alpha/Beta Results in dpm/100cm ²	Alpha/Beta Results in dpm/100cm ²	Alpha/Beta Results in dpm/100cm ²
Room 103A Lower Walls	25/2,719	5/499	2/9	0/0

9.13.5 *Biased Alpha-Beta Measurements of Survey Unit, Analysis and Results*

Biased measurements were collected in this survey unit and the results are summarized in Table 18 below.

The biased survey results are present in Appendix J of this report.

Table 18 Building 218 Room 103A Lower Walls Survey Unit Biased Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Estimated Total Area of Elevated Activity Areas In ft ²
Room 103A Lower Walls	24/4,420	8/1,967	40

Gross large area masslin swipe surveys were conducted in the biased survey locations. No detectable gross alpha/beta-gamma activity above background was found on any of the masslinn swipes.

9.14 Building 218 Room 103A Upper Walls Class 2 Survey Unit

9.14.1 *Alpha Scan Surveys of Survey Unit, Analysis and Results*

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.14.2 *Fixed Alpha Measurements of Survey Unit, Analysis and Results*

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate

reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 19 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.14.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

Numerous areas of elevated areas of activity distinguishable from background levels were detected during the scan surveys. Biased reading were collected in these areas and the results are discussed in Section 9.14.5 of this report.

The scan survey results are provided in Appendix H of this report.

9.14.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. Five of the individual readings exceeded the release criteria.

Table 19 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 19 Building 218 Room 103A Upper Walls Survey Unit Direct Measurement Alpha/Beta Results

Aleut World Solutions

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Room 103 A Upper Walls	13/2,645	2/856	2/9	0/0

9.14.5 *Biased Alpha-Beta Measurements of Survey Unit, Analysis and Results*

Biased measurements were collected in this survey unit and the results are summarized in Table 20 below.

The biased survey results are present in Appendix J of this report.

Table 20 Building 218 Room 103A Upper Walls Survey Unit Biased Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Estimated Total Area of Elevated Activity Areas In ft ²
Room 103A Upper Walls	24/8,620	9/3,804	100

Gross large area masslin swipe surveys were conducted in the biased survey locations. No detectable gross alpha/beta-gamma activity above background was found on any of the masslinn swipes.

9.15 Building 218 Room 103A Ceiling/Overhead Class 2 Survey Unit

9.15.1 *Alpha Scan Surveys of Survey Unit, Analysis and Results*

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.15.2 *Fixed Alpha Measurements of Survey Unit, Analysis and Results*

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate

reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 21 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.15.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

A few areas of elevated areas of activity distinguishable from background levels were detected during the scan surveys. Biased readings were collected in these areas and the results are discussed in Section 9.15.5 of this report.

The scan survey results are provided in Appendix H of this report.

9.15.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. None of the individual readings exceeded the release criteria.

Table 21 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 21 Building 218 Room 103A Ceiling/Overhead Survey Unit Direct Measurement Alpha/Beta Results

Aleut World Solutions

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Room 103A Ceiling/Overhead	13/631	0/260	2/4	0/0

9.15.5 Biased Alpha-Beta Measurements of Survey Unit, Analysis and Results

Biased measurements were collected in this survey unit and the results are summarized in Table 22 below.

The biased survey results are present in Appendix J of this report.

Table 22 Building 218 Room 103A Ceiling Survey Unit Biased Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Estimated Total Area of Elevated Activity Areas In ft ²
Room 103A Ceiling	31/3,719	21/2,881	10

Gross large area masslin swipe surveys were conducted in the biased survey locations. No detectable gross alpha/beta-gamma activity above background was found on any of the masslinn swipes.

9.16 Building 218 Tunnel Floor Class 1 Survey Unit

9.16.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.16.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 23 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.16.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.16.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. None of the individual readings exceeded the release criteria.

Table 23 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 23 Building 218 Tunnel Floor Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Tunnel Floor	19/173	1/0	5/4	1/0

9.16.5 Biased Fixed Alpha-Beta Measurements of Survey Unit, Analysis and Results

No biased measurements were collected in this survey unit.

9.17 Building 218 Tunnel Lower/Upper Walls Class 1 Survey Unit

9.17.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.17.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 24 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.17.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

A few areas of elevated areas of activity distinguishable from background levels were detected during the scan surveys. Biased readings were collected in these areas and the results are discussed in Section 9.17.5 of this report.

The scan survey results are provided in Appendix H of this report.

9.17.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. None of the individual readings exceeded the release criteria.

Table 24 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 24 Building 218 Tunnel Lower/Upper Walls Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Tunnel Lower/Upper Walls	93/483	13/274	2/0	0/0

9.17.5 Biased Fixed Alpha-Beta Measurements of Survey Unit, Analysis and Results

Biased measurements were collected in this survey unit and the results are summarized in Table 25 below.

The biased survey results are present in Appendix J of this report.

Table 25 Building 218 Tunnel Lower/Upper Walls Unit Biased Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Estimated Total Area of Elevated Activity Areas In ft ²
Tunnel Lower/Upper Walls	31/1,191	23/1,128	3

Gross large area masslin swipe surveys were conducted in the biased survey locations. No detectable gross alpha/beta-gamma activity above background was found on any of the masslinn swipes.

9.18 Building 218 Tunnel Ceiling/Overhead Class 2 Survey Unit

9.18.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.18.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 26 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.18.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels was detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.18.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. None of the individual readings exceeded the release criteria.

Table 26 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 26 Building 218 Tunnel Ceiling/Overhead Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Tunnel Ceiling/Overhead	17/328	1/237	2/4	0/0

9.18.5 Biased Fixed Alpha-Beta Measurements of Survey Unit, Analysis and Results

No biased measurements were collected in this survey unit.

9.19 Building 218 Room 105A Floor Class 1 Survey Unit

9.19.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were

detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.19.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 27 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.19.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.19.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. None of the individual readings exceeded the release criteria.

Table 27 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 27 Building 218 Room 105A Floor Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Room 105A Floor	24/132	2/0	2/4	0/0

9.19.5 Biased Fixed Alpha-Beta Measurements of Survey Unit, Analysis and Results

No biased measurements were collected in this survey unit.

9.20 Room 105A Lower/Upper Walls Class 1 Survey Unit

9.20.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.20.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 28 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.20.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

A few elevated areas of activity distinguishable from background levels were detected during the scan surveys. Biased readings were collected from these areas and are discussed in Section 9.20.5.

The scan survey results are provided in Appendix H of this report.

9.20.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. None of the individual readings exceeded the release criteria.

Table 28 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 28 Room 105A Lower/Upper Walls Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Room 105A Lower/Upper Walls	25/430	9/134	5/4	2/0

9.20.5 Biased Fixed Alpha-Beta Measurements of Survey Unit, Analysis and Results

Biased measurements were collected in this survey unit and the results are summarized in Table 29 below.

The biased survey results are present in Appendix J of this report.

Table 29 Room 105A Survey Unit Biased Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Estimated Total Area of Elevated Activity Areas In ft ²
Room 105A Lower/Upper Walls	24/1,582	11/1,366	8

Gross large area masslin swipe surveys were conducted in the biased survey locations. No detectable gross alpha/beta-gamma activity above background was found on any of the masslinn swipes.

9.21 Building 218 Room 105A Overhead/Ceiling Class 2 Survey Unit

9.21.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.21.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 30 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.21.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.21.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. None of the individual readings exceeded the release criteria.

Table 30 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 30 Building 218 Room 105A Ceiling/Overhead Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Room 105A Ceiling/Overhead	13/294	2/151	2/9	0/0

9.21.5 Biased Fixed Alpha-Beta Measurements of Survey Unit, Analysis and Results

No biased measurements were collected in this survey unit.

9.22 Building 218 Room 105 Floor Survey Unit

9.22.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were

detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.22.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 31 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.22.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.22.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. None of the individual readings exceeded the release criteria.

Table 31 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 31 Building 218 Room 105 Floor Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Bldg. 218 Room 105 Floor	24/132	2/0	2/4	0/0

9.22.5 Biased Fixed Alpha-Beta Measurements of Survey Unit, Analysis and Results

No biased measurements were collected in this survey unit.

9.23 Building 218 Room 105 Lower/Upper Walls Class 1 Survey Unit

9.23.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.23.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 32 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.23.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.23.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. One of the individual readings exceeded the release criteria.

Table 32 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 32 Building 218 Room 105 Lower/Upper Wall Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Room 105 Lower/Upper Walls	11/473	0/121	2/4	0/0

9.23.5 Biased Fixed Alpha-Beta Measurements of Survey Unit, Analysis and Results

No biased measurements were collected in this survey unit.

9.24 Building 227 Room 100 Floor Class 1 Survey Unit

9.24.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were

detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.24.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 33 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.24.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.24.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. None of the individual readings exceeded the release criteria.

Table 33 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 33 Building 227 Room 100 Floor Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Bldg. 227 Room 100 Floor	24/277	10/79	2/22	0/0

9.24.5 Biased Fixed Alpha-Beta Measurements of Survey Unit, Analysis and Results

No biased measurements were collected in this survey unit.

9.25 Building 227 Room 100 Lower Walls Class 1 Survey Unit

9.25.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix H of this report.

9.25.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 34 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix I of this report.

9.25.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

A few areas elevated area of activity distinguishable from background levels were detected during the scan surveys. Biased readings were collected from these areas and the results are discussed in Section 9.25.5.

The scan survey results are provided in Appendix H of this report.

9.25.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. None of the individual readings exceeded the release criteria.

Table 34 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix I of this report.

Table 34 Building 227 Room 100 Lower Walls Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Maximum Net Removable Alpha/Beta Results in dpm/100cm ²	Average Net Removable Alpha/Beta Results in dpm/100cm ²
Bldg. 227 Room 100 Lower Walls	9/622	0/226	2/10	0/0

9.25.5 Biased Fixed Alpha-Beta Measurements of Survey Unit, Analysis and Results

Biased measurements were collected in this survey unit and the results are summarized in Table 35 below.

The biased survey results are present in Appendix J of this report.

Table 35 Building 227 Room 100 Lower Walls Survey Unit Biased Direct Measurement Alpha/Beta Results

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Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Estimated Total Area of Elevated Activity Areas In ft ²
Bldg. 227 Room 100 Lower Walls	11/3,202	5/1,871	10

9.26 Target Sphere Interior Survey Unit

9.26.1 Alpha Scan Surveys of Survey Unit, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix K of this report.

9.26.2 Fixed Alpha Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of alpha measurements were conducted in the appropriate reference (background) areas and in the survey unit. The alpha survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate alpha surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross alpha release criteria for the radionuclide of concern was 1,150 dpm per 100 cm².

The mean (average) alpha levels for the survey unit was less than the release criteria. No individual reading exceeded the release criteria.

Table 36 presents a summary of the survey results for the survey unit

Alpha results are provided in Appendix K of this report.

9.26.3 Beta-Gamma Scan Surveys of Survey Unit, Analysis and Results

Numerous areas elevated area of activity distinguishable from background levels were detected during the scan surveys. Biased readings were collected from these areas and the results are discussed in Sections 9.29.3 and 9.30.3.

The scan survey results are provided in Appendix K of this report.

9.26.4 Fixed Beta-Gamma Measurements of Survey Unit, Analysis and Results

This final status survey was implemented in accordance with MARSSIM guidelines. One complete set of beta-gamma measurements were conducted in the appropriate reference (background) areas and in the survey unit. The beta-gamma survey data was converted to units of dpm per 100 cm² so the results could be compared directly to the release criteria. Table 2 located on page 24 of this report presents a summary of the instruments used to evaluate beta-gamma surface activities and the efficiencies used to convert instrument readings to DCGL units. It also provides a summary of the instrument sensitivities. The gross beta-gamma release criteria for the radionuclide of concern was 1,192 dpm per 100 cm².

The mean (average) beta levels for the survey unit was less than the release criteria. One of the individual readings exceeded the release criteria.

Table 36 presents a summary of the survey results for the survey unit.

Beta-Gamma results are provided in Appendix K of this report.

Table 36 Target Sphere Interior Survey Unit Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm²	Average Fixed Net Alpha/Beta Results in dpm/100cm²	Maximum Net Removable Alpha/Beta Results in dpm/100cm²	Average Net Removable Alpha/Beta Results in dpm/100cm²
Target Sphere Interior	11/3,448	2/299	8/2	2/0

9.27 Target Sphere Upper Exterior

Due to the confined space and irregular shape of this item, gross alpha/beta-gamma scan results were manually recorded.

9.27.1 Alpha Scan Surveys of Item, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix K of this report.

9.27.2 Beta-Gamma Scan Surveys of Survey Item, Analysis and Results

Numerous elevated areas of activity distinguishable from background levels were detected during the scan surveys. Biased readings were collected from these areas and the results are discussed in Section 9.27.3.

The scan survey results are provided in Appendix K of this report.

9.27.3 Biased Fixed Alpha-Beta Measurements of Item, Analysis and Results

Biased measurements were collected on this item and the results are summarized in Table 37 below.

The biased survey results are present in Appendix K of this report.

Table 37 Target Sphere Upper Exterior Biased Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Estimated Total Area of Elevated Activity Areas In ft ²
Target Sphere Upper Exterior	20/19,717	8/13,080	25

9.28 Target Sphere Lower Exterior

Due to the confined space and irregular shape of this item, gross alpha/beta-gamma scan results were manually recorded.

9.28.1 Alpha Scan Surveys of Item, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix K of this report.

9.28.2 Beta-Gamma Scan Surveys of Survey Item, Analysis and Results

Numerous elevated areas of activity distinguishable from background levels were detected during the scan surveys. Biased readings were collected from these areas and the results are discussed in Section 9.28.3.

The scan survey results are provided in Appendix K of this report.

9.28.3 Biased Fixed Alpha-Beta Measurements of Item, Analysis and Results

Biased measurements were collected on this item and the results are summarized in Table 38 below.

The biased survey results are present in Appendix K of this report.

Table 38 Target Sphere Upper Exterior Biased Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Estimated Total Area of Elevated Activity Areas In ft ²
Target Sphere Lower Exterior	16/11,890	5/5,400	10

9.29 Target Sphere Upper Interior

Due to the confined space and irregular shape of this item, gross alpha/beta-gamma scan results were manually recorded.

9.29.1 Alpha Scan Surveys of Item, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix K of this report.

9.29.2 Beta-Gamma Scan Surveys of Survey Item, Analysis and Results

Numerous elevated areas of activity distinguishable from background levels were detected during the scan surveys. Biased readings were collected from these areas and the results are discussed in Section 9.29.3.

The scan survey results are provided in Appendix K of this report.

9.29.3 Biased Fixed Alpha-Beta Measurements of Item, Analysis and Results

Biased measurements were collected on this item and the results are summarized in Table 39 below.

The biased survey results are present in Appendix K of this report.

Table 39 Target Sphere Upper Interior Biased Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Estimated Total Area of Elevated Activity Areas In ft ²
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Target Sphere Upper Interior	26/82,658	9/15,598	20
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9.30 Target Sphere Lower Interior

Due to the confined space and irregular shape of this item, gross alpha/beta-gamma scan results were manually recorded.

9.30.1 Alpha Scan Surveys of Item, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix K of this report.

9.30.2 Beta-Gamma Scan Surveys of Survey Item, Analysis and Results

Numerous elevated areas of activity distinguishable from background levels were detected during the scan surveys. Biased readings were collected from these areas and the results are discussed in Section 9.30.3.

The scan survey results are provided in Appendix K of this report.

9.30.3 Biased Fixed Alpha-Beta Measurements of Item, Analysis and Results

Biased measurements were collected on this item and the results are summarized in Table 40 below.

The biased survey results are present in Appendix K of this report

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Table 40 Target Sphere Lower Interior Biased Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Estimated Total Area of Elevated Activity Areas In ft ²
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Aleut World Solutions

Target Sphere Lower Interior	26/15,642	11/11,536	15
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9.31 Orthogonal Chamber

Due to the confined space and irregular shape of this item, gross alpha/beta-gamma scan results were manually recorded.

9.31.1 Alpha Scan Surveys of Item, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix K of this report.

9.31.2 Beta-Gamma Scan Surveys of Survey Item, Analysis and Results

Numerous elevated areas of activity distinguishable from background levels were detected during the scan surveys. Biased readings were collected from these areas and the results are discussed in Section 9.31.3.

The scan survey results are provided in Appendix K of this report.

9.31.3 Biased Fixed Alpha-Beta Measurements of Item, Analysis and Results

Biased measurements were collected on this item and the results are summarized in Table 41 below.

The biased survey results are present in Appendix K of this report.

Table 41 Orthogonal Chamber Interior Biased Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Estimated Total Area of Elevated Activity Areas In ft ²
Orthogonal Chamber Interior	24/10,096	14/7,057	30

Gross large area masslin swipe surveys were conducted in the biased survey locations. No detectable gross alpha/beta-gamma activity above background was found on any of the masslinn swipes.

9.32 Optics Chamber Interior

Due to the confined space and irregular shape of this item, gross alpha/beta-gamma scan results were manually recorded.

9.32.1 Alpha Scan Surveys of Item, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix K of this report.

9.32.2 Beta-Gamma Scan Surveys of Survey Item, Analysis and Results

Numerous elevated areas of activity distinguishable from background levels were detected during the scan surveys. Biased readings were collected from these areas and the results are discussed in Section 9.32.3.

The scan survey results are provided in Appendix K of this report.

9.32.3 Biased Fixed Alpha-Beta Measurements of Item, Analysis and Results

Biased measurements were collected on this item and the results are summarized in Table 42 below.

The biased survey results are present in Appendix K of this report.

Table 42 Optics Chamber Interior Biased Direct Measurement Alpha/Beta Results

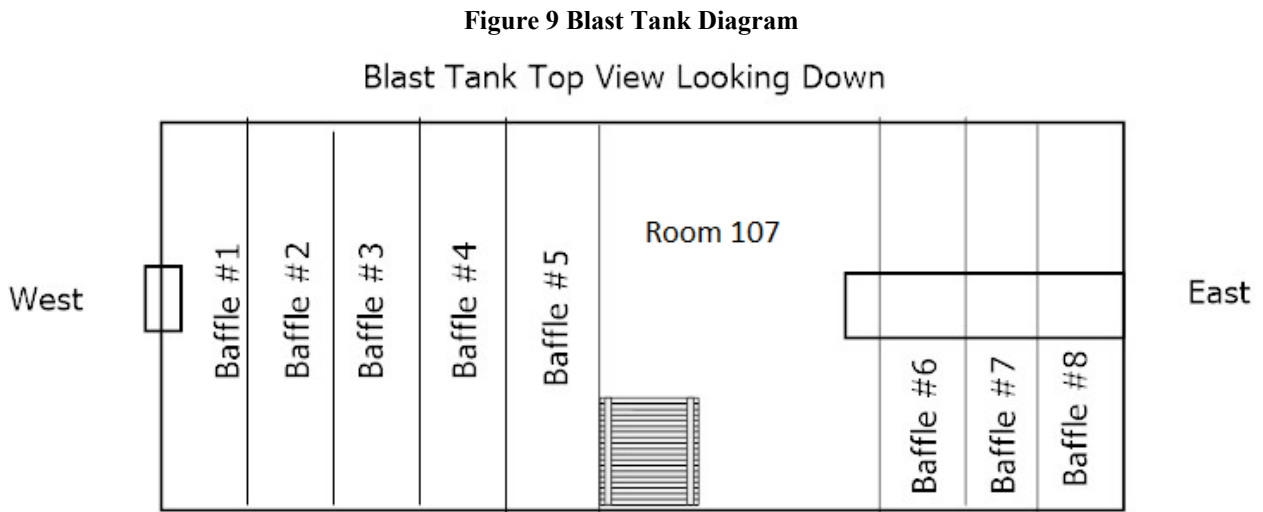
Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Estimated Total Area of Elevated Activity Areas In ft ²
Optics Chamber Interior	29/15,423	11/2,420	8

Gross large area masslin swipe surveys were conducted in the biased survey locations. No detectable gross alpha/beta-gamma activity above background was found on any of the masslinn swipes.

9.33 Blast Tank Interior

Due to the confined space and irregular shape of this item, gross alpha/beta-gamma scan results were manually recorded.

In order to more accurately identify areas of the blast tank, Figure 8 was generated to identify the different areas of the blast tank.



9.33.1 Alpha Scan Surveys of Item, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix K of this report.

9.33.2 Beta-Gamma Scan Surveys of Survey Item, Analysis and Results

Numerous elevated areas of activity distinguishable from background levels were detected during the scan surveys. Biased readings were collected from these areas and the results are discussed in Section 9.33.3.

The scan survey results are provided in Appendix K of this report.

9.33.3 Biased Fixed Alpha-Beta Measurements of Item, Analysis and Results

Biased measurements were collected on this item and the results are summarized in Table 43 below.

The biased survey results are present in Appendix K of this report.

Table 43 Blast Tank Interior Biased Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Estimated Total Area of Elevated Activity Areas In ft ²
Baffle #1 Interior	34/42,530	14/7,254	8
Baffle #2 Interior	17/2,863	4/2,241	5
Baffle #3 Interior	2/1,522	0/1,453	5
Baffle #4 Interior	60/4,587	16/2,068	6
Baffle #5 Interior	49/4,326	25/4,021	6
Baffle #6 Interior	24/3,437	7/1,959	5
Baffle #7 Interior	30/3,592	8/2,928	6
Baffle #8 Interior	59/10,025	17/4,126	6
Room 107 Interior	30/6,672	12,3,087	10

Gross large area masslin swipe surveys were conducted in the biased survey locations. No detectable gross alpha/beta-gamma activity above background was found on any of the masslinn swipes.

9.34 Flight Tube

Due to the confined space and irregular shape of this item, gross alpha/beta-gamma scan results were manually recorded.

9.34.1 Alpha Scan Surveys of Item, Analysis and Results

No elevated areas of activity distinguishable from background levels were detected during the scan surveys.

The scan survey results are provided in Appendix K of this report.

9.34.2 Beta-Gamma Scan Surveys of Survey Item, Analysis and Results

Numerous elevated areas of activity distinguishable from background levels were detected during the scan surveys. Biased readings were collected from these areas and the results are discussed in Section 9.34.3.

The scan survey results are provided in Appendix K of this report.

9.34.3 Biased Fixed Alpha-Beta Measurements of Item, Analysis and Results

Biased measurements were collected on this item and the results are summarized in Table 44 below.

The biased survey results are present in Appendix K of this report.

Table 44 Flight Tube Interior Biased Direct Measurement Alpha/Beta Results

Area/Location	Maximum Net Fixed Alpha/Beta Results in dpm/100cm ²	Average Fixed Net Alpha/Beta Results in dpm/100cm ²	Estimated Total Area of Elevated Activity Areas In ft ²
Flight Tube Interior	29/51,213	13/17,483	25

Gross large area masslin swipe surveys were conducted in the biased survey locations. No detectable gross alpha/beta-gamma activity above background was found on any of the masslinn swipes.

9.35 Miscellaneous Surveys

Other miscellaneous surveys were performed during the project. These included swipe surveys and miscellaneous item surveys. All of the survey results were were below the release criteria/DCGL.

The miscellaneous surveys are presented in this report in Appendix M.

10.0 WASTE MANAGEMENT

Two 55-gallon drums of dust/debris were generated in preparing the area surfaces for surveys. HEPA vacuums were used to prepare the areas. The two HEPA vacuums were packaged into one 55-gallon drum and the debris/dust collected from the vacuum cleaners were packaged into the other 55-gallon drum.

Composite waste profiles sample was collected from the drums and sent to the offsite laboratory for isotopic uranium (alpha spectroscopy) and TCLP metals analysis. The results of the samples are summarized in Table 45 below.

The laboratory data report is presented in Appendix L of this report.

Table 45 Waste Profile Sample Summary Table

Sample ID#	U-233/234 Results in pCi/g	U-235/236 Results in pCi/g	U-238 Results in pCi/g	TCLP Lead Results in mg/l
NRLCBD-1	3.38	0.305	19.4	N/A
NRLCBD-2	N/A	N/A	N/A	11

11.0 CONCLUSION

The results of the final status surveys indicated that, based on the criteria in Sections 1.5.1, 1.5.2, and 1.5.3 some Building 218 areas/survey units require additional remediation in order to release the areas for unconditional use.

12.0 REFERENCES

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Appendix A
Memorandum of Understanding (MOU)

MEMORANDUM OF UNDERSTANDING

Between

**Naval Sea Systems Command Detachment, Radiological Affairs Support Office
U.S. Army Joint Munitions Command, Rock Island, Illinois, and
Aleut World Solutions (Contractor)**

RE: PERFORMANCE OF FINAL STATUS SURVEYS UNDER ALEUT WORLD SOLUTIONS NRC LICENSE NO. 50-29273-01 AT NAVAL RESEARCH LABORATORY CHESAPEAKE BAY DETACHMENT, CHESAPEAKE BEACH MD

1. Background

a. The Naval Sea Systems Command Detachment, Radiological Affairs Support Office (NAVSEADET RASO) has requested that Aleut World Solutions (AWS) provide radiological services in support of final status survey actions at the Building 218 located at the Naval Research Laboratory Chesapeake Bay Detachment (NRLCBD), Chesapeake Beach, MD. These services have been contracted by the U.S. Army Joint Munitions Command (JMC), Rock Island, Illinois, through the Naval Low Level Radioactive Waste (LLRW) Disposal Program which functions as part of the Department of Defense LLRW Disposal Program managed by JMC. As a requirement of the contract, radiological services will be performed under AWS's Nuclear Regulatory Commission (NRC) Radioactive Materials License No. 50-29273-01.

b. For the purposes of this memorandum of understanding (MOU), AWS will perform final status surveys in Building 218.

c. The intent of this memorandum is to outline the general applicability and responsibilities of each organization as it applies to the performance work statement, approved work practices, health and safety plan, radiation health plan, and license implementation.

2. Organizational Responsibilities. Each organization has distinct areas of responsibility as defined by their respective functions.

a. AWS shall:

(1) Perform work using radiologically sound work practices following standard operating procedures approved under their NRC license, approved work practices, health and safety plan, radiation health plan, and performance work statement.

(2) Maintain training and dose records for AWS employees and subcontractors, as appropriate.

(3) Control radioactive materials used for operational checks of radiation detection and laboratory equipment.

(4) Control access to individual work areas under AWS control for activities where radioactive materials are known or suspected of being present.

(5) Issue and maintain Radiation Work Permits for work controlled by AWS.

(6) Submit reports and other administrative requirements concerning the work, including daily progress reports, to the NAVSEADET RASO, JMC, NRLCBD, or additional Navy offices as requested. Information will be provided regarding the radiological conditions of all work areas, radioactive contamination found, and status of any identified radioactive waste.

(7) In the event that radioactive waste is generated, even though none is expected, NRLCBD will maintain custody of the waste under their Radioactive Material Permit under the Navy's NRC Master Materials License # 45-23645-01NA.

b. NAVSEADET RASO shall: Ensure that AWS performs work using radiologically sound standard operating procedures, health and safety, and work plans. The NRLCBD RSO and ARSO will provide oversight for RASO of onsite activities.

c. JMC shall: Provide necessary contracting services to ensure AWS performs radiologically sound work practices following standard operating procedures approved under their NRC license, approved work practices, health and safety plan, radiation health plan, and performance work statement.

3. Responsibilities for Performance of Site Work

a. AWS shall:

(1) Perform radiological final status surveys in accordance with approved work practices, standard operating procedures, and direction from NAVSEADET RASO and JMC.

(2) Secure the AWS work areas allocated by NRLCBD by use of a method controlled by AWS during performance of work.

(3) Assess contamination levels on building materials, outdoor areas and materials and equipment.

(4) Free release of all equipment, areas, and spaces used during the performance of this project.

(5) Control access to all work and storage areas under their NRC license and post, and secure such areas as appropriate.

(6) Coordinate public health and safety assurance issues with NAVSEADET RASO, and NSWCDD.

(7) AWS Site Project Manager will be Mr. Dan Spicuzza.

b. NAVSEADET RASO shall:

(1) Monitor site work by performing on-site visits, tracking on daily site reports and/or participating in conference calls.

(2) Review all site investigative data.

(3) Work with the contractor to address any unexpected contamination or radiological control issues.

(4) Provide assistance with public health and safety assurance issues, in coordination with NRLCBD and the contractor.

- (5) Approve public statements regarding radiological issues before issuance.
- (6) Approve clearance of areas prior to turnover of the areas for unrestricted use.
- (7) The point of contact for NAVSEADET RASO is Mr. Eric Lieberman.

c. JMC shall:

- (1) Monitor site work by performing on-site visits, tracking on daily site reports and/or participating in conference calls.
- (2) Work with the contractor, NAVSEADET RASO, and NRLCBD to contractually address any unexpected contamination issues.
- (3) Point of contact for JMC is Mr. Frank Whitaker.

4. Jurisdictional Issues and Changes. Jurisdictional issues or specific situations not covered under this agreement will be discussed between, NAVSEADET RASO, JMC, and AWS for resolution and documented by amendment of this memorandum of understanding.

5. Effective Period: This MOU is effective upon signatures by all parties and will expire in 6 months. Either party may terminate this agreement by giving 90 days advance written notice of the effective date of termination, or upon the written agreement of both parties at a mutually agreeable date.

6. Approval:

Eric Lieberman, NAVSEADET RASO Representative

Date



Dan Spicuzza, AWS Project Manager

3/23/18

Date

Mr. Frank Whitaker, JMC COR

Date

Appendix B
Radiation Work Permit (RWP)

RADIATION WORK PERMIT (RWP)

RWP #: NRL-2018-01

Regular Extended

SECTION I

Contract # USN-2017-012

Date: 4-3-18

Time: 0800

Location/Project: NRL Chesapeake Bay Detachment Building 218

Exposure Category: FSS D&D Source Transfer Waste Processing Characterization

Job Description: Perform finl status surveys and sampling in Building 218.

Estimated Start Date: 4-3-18

Estimated End Date: 4-27-18

SECTION II

Existing Radiological Conditions:

Radiation Survey No. N/A Airborne Survey No. N/A Contamination Survey No. N/A

Existing General Area Radiation Level(s): <u>.006.010</u> mR/hr/γ <u>N/A</u> mrad/hr/corrected β <u>N/A</u> mrem/hr/η	Existing General Contamination Levels: <u>< 20</u> dpm/100cm ² α Loose <u>< 500</u> dpm/100cm ² βγ Loose <u>< 1,150</u> dpm/100cm ² α Fixed <u>< 1,192</u> dpm/100cm ² βγ Fixed	Airborne DAC Level(s): <u>< 10</u> % P <u>< 10</u> % P <u>N/A</u> % H ₃
Existing Maximum Radiation Level(s): <u>.01</u> mR/hr/γ <u>N/A</u> mrad/hr/corrected β <u>N/A</u> mrem/hr/η	Existing Maximum Contamination Level(s): <u>< 70</u> dpm/100cm ² α Loose <u>< 1,000</u> dpm/100cm ² βγ Loose <u>< 1,150</u> dpm/100cm ² α Fixed <u>< 1,192</u> dpm/100cm ² βγ Fixed	Hot Particle? Yes No

Remarks: None.

SECTION III

Radiological Limits:

Maximum Allowed WB Exposure Rate : 4 mr/hr γ or mrem/hr η

Corrected : N/A mrad/hr Maximum Extremity Exposure Rate: 4 mr/hr

Maximum Allowed Contamination Level : 100 dpm/100cm² α Loose : 1,000 dpm/100cm² βγ Loose

Maximum Allowed Contamination Level : 5,000 dpm/100cm² α Fixed : 100,000 dpm/100cm² βγ Fixed

Maximum Allowed Airborne Concentration Level: 10 % DAC

Remarks: _____

Industrial Hygiene/Safety Concerns: Potential fall hazard on ladders, scissor lift.

RADIATION WORK PERMIT (RWP)

RWP #: NRL-2018-01

Regular Extended

SECTION IV

WORKER REQUIREMENTS

<u>CLOTHING:</u>	<u>DOSIMETRY:</u>	<u>INSTRUCTIONS:</u>	<u>RESPIRATORY:</u>
<input type="checkbox"/> Coveralls <input type="checkbox"/> Lab Coat <input type="checkbox"/> Cloth Hood <input checked="" type="checkbox"/> Paper Coveralls ¹ <input type="checkbox"/> Plastic Suit <input checked="" type="checkbox"/> Plastic Booties ¹ <input type="checkbox"/> Rubber Shoe Covers <input type="checkbox"/> Canvas Shoe Covers <input type="checkbox"/> Cotton Gloves <input checked="" type="checkbox"/> Rubber Gloves ^{1 2} <input checked="" type="checkbox"/> Leather Gloves ¹ <input type="checkbox"/> Beta Goggles/Face Shield <input type="checkbox"/> Extra <input type="checkbox"/> Other Clothing Stay Time (Heat Stress, Radiation, Exposure Limits, etc.): <u>6</u> hrs.	<input checked="" type="checkbox"/> TLD <input type="checkbox"/> Film Badge <input type="checkbox"/> SRD <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Elbows <input type="checkbox"/> Gonad Pack <input type="checkbox"/> Hot Cell Entry <input type="checkbox"/> Extremity <input type="checkbox"/> Head Pack <input type="checkbox"/> Special <input type="checkbox"/> Knees <input type="checkbox"/> Varying Field <input type="checkbox"/> Upper Field <input type="checkbox"/> Ground Field <input type="checkbox"/> Alarming Dosimetry <input type="checkbox"/> None	<input checked="" type="checkbox"/> Contact HP for Line Breaks <input checked="" type="checkbox"/> Protect Cuts <input checked="" type="checkbox"/> Pre-Job Briefing <input checked="" type="checkbox"/> Post-Job Briefing <input checked="" type="checkbox"/> Contact HP Prior to Work In New Areas <input type="checkbox"/> Modesty Required <input checked="" type="checkbox"/> Site Specific Instructions <input checked="" type="checkbox"/> Equipment Monitor at Job End <input checked="" type="checkbox"/> Clean Up Work Area During and After Job <input checked="" type="checkbox"/> Eating, Drinking, Smoking, Chewing Prohibited <input checked="" type="checkbox"/> Frisk Upon Exiting Contaminated Area <input checked="" type="checkbox"/> Have Prescribed HP Coverage or Stop Work <input checked="" type="checkbox"/> Exit Area Immediately Upon Emergency or Injury. Notify HP Immediately	<input type="checkbox"/> FFNP <input type="checkbox"/> FFAL <input type="checkbox"/> SCBA <input type="checkbox"/> PAPR <input checked="" type="checkbox"/> Dust Mask ¹ <input type="checkbox"/> Half Face <input type="checkbox"/> Bubble Hood <u>Cartridges:</u> <input type="checkbox"/> Particulate <input type="checkbox"/> Vapor <input type="checkbox"/> Combination <input type="checkbox"/> Other

Special Instructions: ¹ Per HP supervision instructions. ² When collecting swipe samples and handling potentially contaminated items.

SECTION V

Health Physics Requirements

1. Job Coverage: Continuous Intermittent Start End of Job
2. Air Sampling: General Area Breathing Zone Lapel AgZ
 Tritium/C-14 Particulate Charcoal LoVol HiVol
3. Exposure Rate Surveys: Start of Job Continuous Monitoring Area Monitoring
 Intermittent Monitoring End of Job
4. Contamination Surveys: Start of Job Continuous Monitoring
 Intermittent Monitoring End of Job
5. Is the ALARA Consideration Complete and Attached? Yes No Why? _____
6. Other: _____

SECTION VI

Personnel Authorized to Perform Work & Acceptance of Responsibility

*My signature verifies that I have read and fully understand the RWP Requirements

Date	Name (Print)	Signature*	Last Four Digits SSN	HPS Init	Year Dose to Date (Rem)				
					TEDE	TODE	LDE	SDE WB	SDE EX
4/3/18	JOSEFINA L. Matus	<i>Josefina L. Matus</i>	3078	Q	0	0	0	0	0
4/3/18	Juan Cosgrove	<i>Juan Cosgrove</i>	8450	U	0	0	0	0	0
4/3/18	RICHARD THATCHER	<i>Richard Thatcher</i>	7692	V	0	0	0	0	0
4/3/18	Thomas Hogan	<i>Thomas Hogan</i>	3996	W	0	0	0	0	0
4/3/18	Don Spence	<i>Don Spence</i>	4551	X	0	0	0	0	0
4-3-18	Adolfo Matus	<i>Adolfo Matus</i>	6731	Q	0	0	0	0	0
<i>MA</i>									

H	Approvals/Reviews	I	Termination
Technician Generating RWP: <i>Adolfo Matus</i> Date/Time: 04-03-2018 / 0800		Date: 04/26/2018 Time: 1450	
Industrial Hygiene Approval: Date/Time: N/A		Health Physics Rep: <i>Adolfo Matus / Adolfo Matus</i>	
HP Supervisor Approval: Date/Time: N/A		Reason: <u>Job Complete</u> RWP Revision	
RSO Manager Approval: <i>Don Spence</i> Date/Time: 4/18/18 0800		HP Supervisor Review: <i>Don Spence</i> 4/26/18 1500	

Appendix C
Background Reference Area Data

Walls

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		184949
Last Calibration Date:		3/6/2018			
Detector Model:		43-93	Detector Serial No.:		268605
Today's Date:		4/4/2018	Data Collected by:		Joan Cosgrove
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.423					
Type of Surface:	Cinder Block	Count Time:	2	Minutes	4 π Instrument Efficiency: 0.213
Count Number	CPM	$(x - \bar{x})$		$(x - \bar{x})^2$	
1	16	8	3.09		9.57
2	8	4	-0.91		0.82
3	12	6	1.09		1.20
4	12	6	1.09		1.20
5	12	6	1.09		1.20
6	10	5	0.09		0.01
7	10	5	0.09		0.01
8	14	7	2.09		4.38
9	7	3.5	-1.41		1.98
10	7	3.5	-1.41		1.98
11	9	4.5	-0.41		0.17
12	6	3	-1.91		3.63
13	8	4	-0.91		0.82
14	7	3.5	-1.41		1.98
15	9	4.5	-0.41		0.17
16	10	5	0.09		0.01
Mean Count: \bar{x}	4.91		SUM	29.11	
Standard Deviation (σ)	1.39		Variance:	1.00	
Background Count Rate:	4.91	CPM + -	2.79	CPM	
Calculations Completed by:		Joan Cosgrove		Date:	4/4/2018
Reviewed by:		Daniel Spicuzza		Date:	4/4/2018

Background in dpm/100cm²	
46	
Scan Probability %	Static MDC in dpm/100cm²
100	83
Action Level in CPM	Release Limit in CPM
114	123

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.		184949	
Last Calibration Date:		3/6/2018				
Detector Model:		43-93	Detector Serial No.:		268605	
Today's Date:		4/4/2018	Data Collected by:		Joan Cosgrove	
Alpha		X	Beta-Gamma		Gamma	
Remarks:		Instrument Ambient Background 2 π Instrument Efficiency: 0.268				
Type of Surface:		Cinder Block	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.147	
Count Number		CPM	$(x - \bar{x})$		$(x - \bar{x})^2$	
1	739	370	16.59		275.35	
2	716	358	5.09		25.95	
3	743	372	18.59		345.73	
4	698	349	-3.91		15.26	
5	657	329	-24.41		595.67	
6	728	364	11.09		123.07	
7	680	340	-12.91		166.57	
8	695	348	-5.41		29.23	
9	698	349	-3.91		15.26	
10	708	354	1.09		1.20	
11	704	352	-0.91		0.82	
12	680	340	-12.91		166.57	
13	738	369	16.09		259.01	
14	679	340	-13.41		179.73	
15	724	362	9.09		82.70	
16	706	353	0.09		0.01	
Mean Count: \bar{x}		352.91		SUM	2282.11	
Standard Deviation (σ)		12.33		Variance:	78.69	
Background Count Rate:		352.91	CPM + -	24.67	CPM	
Calculations Completed by:		Joan Cosgrove			Date:	4/4/2018
Reviewed by:		Daniel Spicuzza			Date:	4/4/2018

Background in dpm/100cm²	
3512	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
1264	630
Action Level in CPM	Release Limit in CPM
496	513

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		193668
Last Calibration Date:		8/15/2017			
Detector Model:		43-93	Detector Serial No.:		326725
Today's Date:		4/5/2018	Data Collected by:		Thomas Hogan
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.497					
Type of Surface:	Cinder Block	Count Time:	2	Minutes	4 π Instrument Efficiency: 0.251
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	8	4	0.88	0.77	
2	4	2	-1.13	1.27	
3	6	3	-0.13	0.02	
4	4	2	-1.13	1.27	
5	8	4	0.88	0.77	
6	8	4	0.88	0.77	
7	4	2	-1.13	1.27	
8	6	3	-0.13	0.02	
9	7	3.5	0.38	0.14	
10	5	2.5	-0.63	0.39	
11	10	5	1.88	3.52	
12	2	1	-2.13	4.52	
13	4	2	-1.13	1.27	
14	8	4	0.88	0.77	
15	9	4.5	1.38	1.89	
16	7	3.5	0.38	0.14	
Mean Count: \bar{x}	3.13	SUM	18.75		
Standard Deviation (σ)	1.12	Variance:	0.65		
Background Count Rate:	3.13	CPM + -	2.24	CPM	
Calculations Completed by:		Thomas Hogan		Date:	4/5/2018
Reviewed by:		Daniel Spicuzza		Date:	4/5/2018

Background in dpm/100cm²	
25	
Scan Probability %	Static MDC in dpm/100cm²
100	59
Action Level in CPM	Release Limit in CPM
132	144

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.		193668
Last Calibration Date:		8/15/2017			
Detector Model:		43-93	Detector Serial No.:		326725
Today's Date:		4/5/2018	Data Collected by:		Thomas Hogan
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background					2 π Instrument Efficiency: 0.327
Type of Surface:		Cinder Block	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.18
Count Number		CPM	(x - \bar{x})	(x - \bar{x}) ²	
1	799	400	1.91	3.63	
2	765	383	-15.09	227.82	
3	769	385	-13.09	171.45	
4	803	402	3.91	15.26	
5	729	365	-33.09	1095.20	
6	749	375	-23.09	533.32	
7	851	426	27.91	778.76	
8	746	373	-24.59	604.85	
9	862	431	33.41	1115.98	
10	880	440	42.41	1798.29	
11	783	392	-6.09	37.13	
12	817	409	10.91	118.95	
13	797	399	0.91	0.82	
14	837	419	20.91	437.07	
15	747	374	-24.09	580.51	
16	789	395	-3.09	9.57	
Mean Count: \bar{x}		397.59	SUM	7528.61	
Standard Deviation (σ)		22.40	Variance:	259.61	
Background Count Rate:		397.59	CPM + -	44.81	CPM
Calculations Completed by:		Thomas Hogan			Date: 4/5/2018
Reviewed by:		Daniel Spicuzza			Date: 4/5/2018

Background in dpm/100cm²	
3242	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
1099	547
Action Level in CPM	Release Limit in CPM
573	592

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		268488
Last Calibration Date:		10/27/2017			
Detector Model:		43-37	Detector Serial No.:		190672
Today's Date:		4/10/2018	Data Collected by:		Adolfo Matus Jr.
X	Alpha		Beta-Gamma		Gamma
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.302					
Type of Surface:		Cinder Block	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.153
Count Number			(x - \bar{x})	(x - \bar{x}) ²	
1	15	7.5	1.88	3.52	
2	7	3.5	-2.13	4.52	
3	9	4.5	-1.13	1.27	
4	10	5	-0.63	0.39	
5	12	6	0.38	0.14	
6	12	6	0.38	0.14	
7	10	5	-0.63	0.39	
8	10	5	-0.63	0.39	
9	19	9.5	3.88	15.02	
10	11	5.5	-0.13	0.02	
11	7	3.5	-2.13	4.52	
12	9	4.5	-1.13	1.27	
13	18	9	3.38	11.39	
14	12	6	0.38	0.14	
15	10	5	-0.63	0.39	
16	9	4.5	-1.13	1.27	
Mean Count: \bar{x}		5.63	SUM	44.75	
Standard Deviation (σ)		1.73	Variance:	1.54	
Background Count Rate:		5.63	CPM + -	3.45	CPM
Calculations Completed by:		Adolfo Matus Jr.			Date: 4/10/2018
Reviewed by:		Daniel Spicuzza			Date: 4/10/2018

Background in dpm/100cm²	
13	
Scan Probability %	Static MDC in dpm/100cm²
100	21
Action Level in CPM	Release Limit in CPM
460	511

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.		268488
Last Calibration Date:		10/27/2017			
Detector Model:		43-37	Detector Serial No.:		190672
Today's Date:		4/10/2018	Data Collected by:		Adolfo Matus Jr.
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.37					
Type of Surface:		Cinder Block	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.182
Count Number		CPM	$(x - \bar{x})$		$(x - \bar{x})^2$
1	2256	1128	-50.19		2518.79
2	2218	1109	-69.19		4786.91
3	2198	1099	-79.19		6270.66
4	2148	1074	-104.19		10855.04
5	2204	1102	-76.19		5804.54
6	2308	1154	-24.19		585.04
7	2394	1197	18.81		353.91
8	2502	1251	72.81		5301.66
9	2424	1212	33.81		1143.29
10	2507	1254	75.31		5671.97
11	2548	1274	95.81		9180.04
12	2529	1265	86.31		7449.85
13	2297	1149	-29.69		881.35
14	2371	1186	7.31		53.47
15	2412	1206	27.81		773.54
16	2386	1193	14.81		219.41
Mean Count: \bar{x}		1178.19		SUM	61849.44
Standard Deviation (σ)		64.21		Variance:	2132.74
Background Count Rate:		1178.19	CPM + -	128.43	CPM
Calculations Completed by:		Adolfo Matus Jr.			Date: 4/10/2018
Reviewed by:		Daniel Spicuzza			Date: 4/10/2018

Background in dpm/100cm²	
1459	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
1256	142
Action Level in CPM	Release Limit in CPM
2330	2462

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.:		268497	
Last Calibration Date:		10/10/2017				
Detector Model:		43-37	Detector Serial No.:		O93965	
Today's Date:		4/3/2018	Data Collected by:		Josefina Matus	
X	Alpha	Beta-Gamma		Gamma		
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.31						
Type of Surface:		Cinder Block	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.157	
Count Number			(x - \bar{x})	(x - \bar{x}) ²		
1	9	4.5	-0.31	0.10		
2	9	4.5	-0.31	0.10		
3	15	7.5	2.69	7.22		
4	10	5	0.19	0.04		
5	10	5	0.19	0.04		
6	7	3.5	-1.31	1.72		
7	6	3	-1.81	3.29		
8	11	5.5	0.69	0.47		
9	5	2.5	-2.31	5.35		
10	13	6.5	1.69	2.85		
11	13	6.5	1.69	2.85		
12	9	4.5	-0.31	0.10		
13	7	3.5	-1.31	1.72		
14	12	6	1.19	1.41		
15	9	4.5	-0.31	0.10		
16	9	4.5	-0.31	0.10		
Mean Count: \bar{x}		4.81	SUM	27.44		
Standard Deviation (σ)		1.35	Variance:	0.95		
Background Count Rate:		4.81	CPM +-:	2.70	CPM	
Calculations Completed by:		Josefina Matus			Date:	2/7/2018
Reviewed by:		Daniel Spicuzza			Date:	2/7/2018

Background in dpm/100cm²	
11	
Scan Probability %	Static MDC in dpm/100cm²
100	19
Action Level in CPM	Release Limit in CPM
472	524

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.		268497	
Last Calibration Date:		10/10/2017				
Detector Model:		43-37	Detector Serial No.:		O93965	
Today's Date:		4/4/2018	Data Collected by:		Josefina Matus	
Alpha		X	Beta-Gamma		Gamma	
Remarks:		Instrument Ambient Background 2 π Instrument Efficiency: 0.352				
Type of Surface:		Cinder Block	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.173	
Count Number		CPM	$(x - \bar{x})$		$(x - \bar{x})^2$	
1	2710	1355	33.75		1139.06	
2	2617	1309	-12.75		162.56	
3	2534	1267	-54.25		2943.06	
4	2518	1259	-62.25		3875.06	
5	2560	1280	-41.25		1701.56	
6	2617	1309	-12.75		162.56	
7	2580	1290	-31.25		976.56	
8	2522	1261	-60.25		3630.06	
9	2760	1380	58.75		3451.56	
10	2644	1322	0.75		0.56	
11	2633	1317	-4.75		22.56	
12	2739	1370	48.25		2328.06	
13	2690	1345	23.75		564.06	
14	2738	1369	47.75		2280.06	
15	2682	1341	19.75		390.06	
16	2736	1368	46.75		2185.56	
Mean Count: \bar{x}		1321.25		SUM	25813.00	
Standard Deviation (σ)		41.48		Variance:	890.10	
Background Count Rate:		1321.25	CPM + -	82.97	CPM	
Calculations Completed by:		Josefina Matus			Date:	4/3/2018
Reviewed by:		Daniel Spicuzza			Date:	4/3/2018

Background in dpm/100cm²	
1720	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
1398	158
Action Level in CPM	Release Limit in CPM
2417	2542

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		297743
Last Calibration Date:		10/10/2017			
Detector Model:		43-37	Detector Serial No.:		302111
Today's Date:		4/4/2018	Data Collected by:		Adolfo Matus
X	Alpha	Beta-Gamma	Gamma		
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.319					
Type of Surface:		Cinder Block	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.161
Count Number			$(x - \bar{x})$	$(x - \bar{x})^2$	
1	14	7	-1.38	1.89	
2	16	8	-0.38	0.14	
3	18	9	0.63	0.39	
4	20	10	1.63	2.64	
5	18	9	0.63	0.39	
6	12	6	-2.38	5.64	
7	22	11	2.63	6.89	
8	16	8	-0.38	0.14	
9	20	10	1.63	2.64	
10	11	5.5	-2.88	8.27	
11	16	8	-0.38	0.14	
12	19	9.5	1.13	1.27	
13	19	9.5	1.13	1.27	
14	16	8	-0.38	0.14	
15	13	6.5	-1.88	3.52	
16	18	9	0.63	0.39	
Mean Count: \bar{x}	8.38		SUM	35.75	
Standard Deviation (σ)	1.54		Variance:	1.23	
Background Count Rate:	8.38	CPM +-:	3.09	CPM	
Calculations Completed by:		Adolfo Matus		Date:	4/4/2018
Reviewed by:		Daniel Spicuzza		Date:	4/4/2018

Background in dpm/100cm²	
18	
Scan Probability %	Static MDC in dpm/100cm²
100	32
Action Level in CPM	Release Limit in CPM
489	542

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.		297743
Last Calibration Date:		10/10/2017			
Detector Model:		43-37	Detector Serial No.:		302111
Today's Date:		4/4/2018	Data Collected by:		Adolfo Matus
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background			2 π Instrument Efficiency: 0.384		
Type of Surface:		Cinder Block	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.189
Count Number		CPM	(x - \bar{x})	(x - \bar{x}) ²	
1	2974	1487	-24.72	611.02	
2	3102	1551	39.28	1543.02	
3	3022	1511	-0.72	0.52	
4	3055	1528	15.78	249.05	
5	3079	1540	27.78	771.80	
6	3012	1506	-5.72	32.70	
7	2997	1499	-13.22	174.74	
8	3018	1509	-2.72	7.39	
9	2990	1495	-16.72	279.52	
10	3023	1512	-0.22	0.05	
11	2935	1468	-44.22	1955.30	
12	3064	1532	20.28	411.33	
13	3109	1555	42.78	1830.24	
14	3047	1524	11.78	138.80	
15	2922	1461	-50.72	2572.39	
16	3026	1513	1.28	1.64	
Mean Count: \bar{x}		1511.72	SUM	10579.48	
Standard Deviation (σ)		26.56	Variance:	364.81	
Background Count Rate:		1511.72	CPM + -	53.11	CPM
Calculations Completed by:		Adolfo Matus			Date:
Reviewed by:		Daniel Spicuzza			Date:

Background in dpm/100cm²	
1804	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
1187	116
Action Level in CPM	Release Limit in CPM
2707	2844

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		297758
Last Calibration Date:		2/14/2018			
Detector Model:		43-93	Detector Serial No.:		299597
Today's Date:		4/4/2018	Data Collected by:		Thomas Hogan
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.444					
Type of Surface:	Cinder Block	Count Time:	2	Minutes	4 π Instrument Efficiency: 0.225
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	18	9	2.28	5.20	
2	17	8.5	1.78	3.17	
3	19	9.5	2.78	7.74	
4	15	7.5	0.78	0.61	
5	12	6	-0.72	0.52	
6	16	8	1.28	1.64	
7	13	6.5	-0.22	0.05	
8	8	4	-2.72	7.39	
9	15	7.5	0.78	0.61	
10	6	3	-3.72	13.83	
11	13	6.5	-0.22	0.05	
12	12	6	-0.72	0.52	
13	15	7.5	0.78	0.61	
14	15	7.5	0.78	0.61	
15	12	6	-0.72	0.52	
16	9	4.5	-2.22	4.92	
Mean Count: \bar{x}	6.72	SUM	47.98		
Standard Deviation (σ)	1.79	Variance:	1.65		
Background Count Rate:	6.72	CPM + -	3.58	CPM	
Calculations Completed by:	Thomas Hogan			Date:	4/4/2018
Reviewed by:	Daniel Spicuzza			Date:	4/4/2018

Background in dpm/100cm²	
61	
Scan Probability %	Static MDC in dpm/100cm²
100	90
Action Level in CPM	Release Limit in CPM
122	129

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.		297758	
Last Calibration Date:		2/14/2018				
Detector Model:		43-93	Detector Serial No.:		299597	
Today's Date:		4/4/2018	Data Collected by:		Thomas Hogan	
Alpha		X	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.313						
Type of Surface:		Cinder Block	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.172	
Count Number		CPM	$(x - \bar{x})$		$(x - \bar{x})^2$	
1	1036	518	44.63		1991.39	
2	1015	508	34.13		1164.52	
3	968	484	10.63		112.89	
4	906	453	-20.38		415.14	
5	949	475	1.13		1.27	
6	940	470	-3.38		11.39	
7	925	463	-10.88		118.27	
8	892	446	-27.38		749.39	
9	919	460	-13.88		192.52	
10	871	436	-37.88		1434.52	
11	1011	506	32.13		1032.02	
12	1033	517	43.13		1859.77	
13	977	489	15.13		228.77	
14	897	449	-24.88		618.77	
15	913	457	-16.88		284.77	
16	896	448	-25.38		643.89	
Mean Count: \bar{x}		473.38		SUM	10859.25	
Standard Deviation (σ)		26.91		Variance:	374.46	
Background Count Rate:		473.38	CPM + -	53.81	CPM	
Calculations Completed by:		Thomas Hogan			Date:	4/4/2018
Reviewed by:		Daniel Spicuzza			Date:	4/4/2018

Background in dpm/100cm²	
4033	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
1253	623
Action Level in CPM	Release Limit in CPM
641	660

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		297766
Last Calibration Date:		12/20/2017			
Detector Model:		43-93	Detector Serial No.:		323074
Today's Date:		4/4/2018	Data Collected by:		Josefina Matus
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.404					
Type of Surface:	Cinder Block	Count Time:	2	Minutes	4 π Instrument Efficiency: 0.204
Count Number	CPM	($x - \bar{x}$)		($x - \bar{x}$) ²	
1	9	4.5	-0.47	0.22	
2	9	4.5	-0.47	0.22	
3	14	7	2.03	4.13	
4	6	3	-1.97	3.88	
5	12	6	1.03	1.06	
6	9	4.5	-0.47	0.22	
7	9	4.5	-0.47	0.22	
8	12	6	1.03	1.06	
9	9	4.5	-0.47	0.22	
10	13	6.5	1.53	2.34	
11	8	4	-0.97	0.94	
12	10	5	0.03	0.00	
13	9	4.5	-0.47	0.22	
14	15	7.5	2.53	6.41	
15	5	2.5	-2.47	6.09	
16	10	5	0.03	0.00	
Mean Count: \bar{x}	4.97	SUM	27.23		
Standard Deviation (σ)	1.35	Variance:	0.94		
Background Count Rate:	4.97	CPM ±	2.69	CPM	
Calculations Completed by:		Josefina Matus		Date:	4/4/2018
Reviewed by:		Daniel Spicuzza		Date:	4/4/2018

Background in dpm/100cm²	
49	
Scan Probability %	Static MDC in dpm/100cm²
100	87
Action Level in CPM	Release Limit in CPM
110	117

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		297766
Last Calibration Date:		12/20/2017			
Detector Model:		43-93	Detector Serial No.:		323074
Today's Date:		4/4/2018	Data Collected by:		Josefina Matus
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.254					
Type of Surface:		Cinder Block	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.14
Count Number		CPM	$(x - \bar{x})$	$(x - \bar{x})^2$	
1	870	435	34.38	1181.64	
2	796	398	-2.63	6.89	
3	840	420	19.38	375.39	
4	888	444	43.38	1881.39	
5	785	393	-8.13	66.02	
6	800	400	-0.63	0.39	
7	835	418	16.88	284.77	
8	870	435	34.38	1181.64	
9	815	408	6.88	47.27	
10	851	426	24.88	618.77	
11	832	416	15.38	236.39	
12	788	394	-6.63	43.89	
13	760	380	-20.63	425.39	
14	714	357	-43.63	1903.14	
15	606	303	-97.63	9530.64	
16	770	385	-15.63	244.14	
Mean Count: \bar{x}		400.63	SUM	18027.75	
Standard Deviation (σ)		34.67	Variance:	621.65	
Background Count Rate:		400.63	CPM + -	69.34	CPM
Calculations Completed by:		Josefina Matus			Date: 4/4/2018
Reviewed by:		Daniel Spicuzza			Date: 4/4/2018

Background in dpm/100cm²	
4206	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
1421	707
Action Level in CPM	Release Limit in CPM
537	552

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		184949
Last Calibration Date:		3/6/2018			
Detector Model:		43-93	Detector Serial No.:		268605
Today's Date:		4/3/2018	Data Collected by:		Joan Cosgrove
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.423					
Type of Surface:	Concrete Wall	Count Time:	2	Minutes	4 π Instrument Efficiency: 0.213
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	2	1	-0.16	0.02	
2	3	1.5	0.34	0.12	
3	2	1	-0.16	0.02	
4	2	1	-0.16	0.02	
5	3	1.5	0.34	0.12	
6	1	0.5	-0.66	0.43	
7	2	1	-0.16	0.02	
8	2	1	-0.16	0.02	
9	3	1.5	0.34	0.12	
10	3	1.5	0.34	0.12	
11	3	1.5	0.34	0.12	
12	1	0.5	-0.66	0.43	
13	2	1	-0.16	0.02	
14	2	1	-0.16	0.02	
15	1	0.5	-0.66	0.43	
16	5	2.5	1.34	1.81	
Mean Count: \bar{x}	1.16		SUM	3.86	
Standard Deviation (σ)	0.51		Variance:	0.13	
Background Count Rate:	1.16	CPM + -	1.01	CPM	
Calculations Completed by:		Joan Cosgrove		Date:	4/3/2018
Reviewed by:		Daniel Spicuzza		Date:	4/3/2018

Background in dpm/100cm²	
11	
Scan Probability %	Static MDC in dpm/100cm²
100	48
Action Level in CPM	Release Limit in CPM
111	123

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.		184949	
Last Calibration Date:		3/6/2018				
Detector Model:		43-93	Detector Serial No.:		268605	
Today's Date:		4/3/2018	Data Collected by:		Joan Cosgrove	
Alpha		X	Beta-Gamma		Gamma	
Remarks:		Instrument Ambient Background 2 π Instrument Efficiency: 0.268				
Type of Surface:		Concrete Wall	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.147	
Count Number	CPM	$(x - \bar{x})$		$(x - \bar{x})^2$		
1	328	164	-5.75	33.06		
2	320	160	-9.75	95.06		
3	349	175	4.75	22.56		
4	322	161	-8.75	76.56		
5	348	174	4.25	18.06		
6	355	178	7.75	60.06		
7	343	172	1.75	3.06		
8	360	180	10.25	105.06		
9	380	190	20.25	410.06		
10	331	166	-4.25	18.06		
11	356	178	8.25	68.06		
12	306	153	-16.75	280.56		
13	336	168	-1.75	3.06		
14	349	175	4.75	22.56		
15	331	166	-4.25	18.06		
16	318	159	-10.75	115.56		
Mean Count: \bar{x}	169.75		SUM	1349.50		
Standard Deviation (σ)	9.49		Variance:	46.53		
Background Count Rate:	169.75	CPM + -	18.97	CPM		
Calculations Completed by:		Joan Cosgrove			Date:	4/3/2018
Reviewed by:		Daniel Spicuzza			Date:	4/3/2018

Background in dpm/100cm²	
1689	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
876	441
Action Level in CPM	Release Limit in CPM
313	329

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		193668
Last Calibration Date:		8/15/2017			
Detector Model:		43-93	Detector Serial No.:		326725
Today's Date:		4/3/2018	Data Collected by:		Joan Cosgrove
X	Alpha		Beta-Gamma		Gamma
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.497					
Type of Surface:		Concrete Wall	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.251
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	8	4	2.34	5.49	
2	2	1	-0.66	0.43	
3	2	1	-0.66	0.43	
4	1	0.5	-1.16	1.34	
5	4	2	0.34	0.12	
6	1	0.5	-1.16	1.34	
7	7	3.5	1.84	3.40	
8	2	1	-0.66	0.43	
9	0	0	-1.66	2.74	
10	6	3	1.34	1.81	
11	1	0.5	-1.16	1.34	
12	4	2	0.34	0.12	
13	5	2.5	0.84	0.71	
14	2	1	-0.66	0.43	
15	3	1.5	-0.16	0.02	
16	5	2.5	0.84	0.71	
Mean Count: \bar{x}	1.66		SUM	20.86	
Standard Deviation (σ)	1.18		Variance:	0.72	
Background Count Rate:	1.66	CPM + -	2.36	CPM	
Calculations Completed by:		Joan Cosgrove		Date:	4/3/2018
Reviewed by:		Daniel Spicuzza		Date:	4/3/2018

Background in dpm/100cm²	
13	
Scan Probability %	Static MDC in dpm/100cm²
100	46
Action Level in CPM	Release Limit in CPM
130	144

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		193668
Last Calibration Date:		8/15/2017			
Detector Model:		43-93	Detector Serial No.:		326725
Today's Date:		4/3/2018	Data Collected by:		Joan Cosgrove
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.327					
Type of Surface:		Concrete Wall	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.18
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	304	152		-19.88	395.02
2	314	157		-14.88	221.27
3	360	180		8.13	66.02
4	357	179		6.63	43.89
5	368	184		12.13	147.02
6	346	173		1.13	1.27
7	358	179		7.13	50.77
8	314	157		-14.88	221.27
9	327	164		-8.38	70.14
10	309	155		-17.38	301.89
11	363	182		9.63	92.64
12	358	179		7.13	50.77
13	354	177		5.13	26.27
14	362	181		9.13	83.27
15	342	171		-0.88	0.77
16	364	182		10.13	102.52
Mean Count: \bar{x}	171.88		SUM	1874.75	
Standard Deviation (σ)	11.18		Variance:	64.65	
Background Count Rate:		171.88	CPM + -	22.36	CPM
Calculations Completed by:		Joan Cosgrove			Date: 4/3/2018
Reviewed by:		Daniel Spicuzza			Date: 4/3/2018

Background in dpm/100cm²	
1402	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
723	364
Action Level in CPM	Release Limit in CPM
347	367

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		268488
Last Calibration Date:		10/27/2017			
Detector Model:		43-37	Detector Serial No.:		190672
Today's Date:		4/10/2018	Data Collected by:		Adolfo Matus Jr.
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.302					
Type of Surface:		Concrete Wall	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.153
Count Number			(x - \bar{x})	(x - \bar{x}) ²	
1	8	4	-1.59	2.54	
2	12	6	0.41	0.17	
3	12	6	0.41	0.17	
4	17	8.5	2.91	8.45	
5	12	6	0.41	0.17	
6	12	6	0.41	0.17	
7	12	6	0.41	0.17	
8	14	7	1.41	1.98	
9	11	5.5	-0.09	0.01	
10	7	3.5	-2.09	4.38	
11	6	3	-2.59	6.73	
12	10	5	-0.59	0.35	
13	15	7.5	1.91	3.63	
14	11	5.5	-0.09	0.01	
15	13	6.5	0.91	0.82	
16	7	3.5	-2.09	4.38	
Mean Count: \bar{x}		5.59	SUM	34.11	
Standard Deviation (σ)		1.51	Variance:	1.18	
Background Count Rate:		5.59	CPM + -	3.02	CPM
Calculations Completed by:		Adolfo Matus Jr.			Date: 4/10/2018
Reviewed by:		Daniel Spicuzza			Date: 4/10/2018

Background in dpm/100cm²	
13	
Scan Probability %	Static MDC in dpm/100cm²
100	21
Action Level in CPM	Release Limit in CPM
460	511

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.		268488
Last Calibration Date:		10/27/2017			
Detector Model:		43-37	Detector Serial No.:		190672
Today's Date:		4/10/2018	Data Collected by:		Adolfo Matus Jr.
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.37					
Type of Surface:		Concrete Wall	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.182
Count Number		CPM	(x - \bar{x})		(x - \bar{x}) ²
1	984	492	12.34		152.37
2	933	467	-13.16		173.09
3	939	470	-10.16		103.15
4	979	490	9.84		96.90
5	920	460	-19.66		386.37
6	927	464	-16.16		261.02
7	938	469	-10.66		113.56
8	970	485	5.34		28.56
9	939	470	-10.16		103.15
10	972	486	6.34		40.24
11	960	480	0.34		0.12
12	956	478	-1.66		2.74
13	949	475	-5.16		26.59
14	1003	502	21.84		477.15
15	957	479	-1.16		1.34
16	1023	512	31.84		1014.02
Mean Count: \bar{x}		479.66		SUM	2980.36
Standard Deviation (σ)		14.10		Variance:	102.77
Background Count Rate:		479.66	CPM + -	28.19	CPM
Calculations Completed by:		Adolfo Matus Jr.		Date:	4/10/2018
Reviewed by:		Daniel Spicuzza		Date:	4/10/2018

Background in dpm/100cm²	
594	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
801	91
Action Level in CPM	Release Limit in CPM
1632	1763

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.:		268497	
Last Calibration Date:		10/10/2017				
Detector Model:		43-37	Detector Serial No.:		O93965	
Today's Date:		4/12/2018	Data Collected by:		Josefina Matus	
X	Alpha	Beta-Gamma		Gamma		
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.31						
Type of Surface:		Concrete Wall	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.157	
Count Number			(x - \bar{x})		(x - \bar{x}) ²	
1	13	6.5	2.28		5.20	
2	3	1.5	-2.72		7.39	
3	10	5	0.78		0.61	
4	12	6	1.78		3.17	
5	9	4.5	0.28		0.08	
6	9	4.5	0.28		0.08	
7	7	3.5	-0.72		0.52	
8	6	3	-1.22		1.49	
9	13	6.5	2.28		5.20	
10	11	5.5	1.28		1.64	
11	4	2	-2.22		4.92	
12	5	2.5	-1.72		2.95	
13	11	5.5	1.28		1.64	
14	7	3.5	-0.72		0.52	
15	11	5.5	1.28		1.64	
16	4	2	-2.22		4.92	
Mean Count: \bar{x}		4.22	SUM	41.98		
Standard Deviation (σ)		1.67	Variance:	1.45		
Background Count Rate:		4.22	CPM +-:	3.35	CPM	
Calculations Completed by:		Josefina Matus			Date:	4/12/2018
Reviewed by:		Daniel Spicuzza			Date:	4/12/2018

Background in dpm/100cm²	
9	
Scan Probability %	Static MDC in dpm/100cm²
100	18
Action Level in CPM	Release Limit in CPM
471	523

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.		268497
Last Calibration Date:		10/10/2017			
Detector Model:		43-37	Detector Serial No.:		O93965
Today's Date:		4/12/2018	Data Collected by:		Josefina Matus
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background					2 π Instrument Efficiency: 0.352
Type of Surface:		Concrete Wall	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.173
Count Number		CPM	$(x - \bar{x})$		$(x - \bar{x})^2$
1	1122	561	9.88		97.52
2	1083	542	-9.63		92.64
3	1080	540	-11.13		123.77
4	1130	565	13.88		192.52
5	1131	566	14.38		206.64
6	1121	561	9.38		87.89
7	1182	591	39.88		1590.02
8	1116	558	6.88		47.27
9	1093	547	-4.63		21.39
10	1187	594	42.38		1795.64
11	1203	602	50.38		2537.64
12	1007	504	-47.63		2268.14
13	1017	509	-42.63		1816.89
14	957	479	-72.63		5274.39
15	1020	510	-41.13		1691.27
16	1187	594	42.38		1795.64
Mean Count: \bar{x}		551.13		SUM	19639.25
Standard Deviation (σ)		36.18		Variance:	677.22
Background Count Rate:		551.13	CPM + -	72.37	CPM
Calculations Completed by:		Josefina Matus			Date: 4/12/2018
Reviewed by:		Daniel Spicuzza			Date: 4/12/2018

Background in dpm/100cm²	
717	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
903	102
Action Level in CPM	Release Limit in CPM
1647	1772

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.:		297743	
Last Calibration Date:		10/10/2017				
Detector Model:		43-37	Detector Serial No.:		302111	
Today's Date:		4/12/2018	Data Collected by:		Adolfo Matus	
X	Alpha	Beta-Gamma		Gamma		
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.319						
Type of Surface:		Concrete Wall	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.161	
Count Number			(x - \bar{x})		(x - \bar{x}) ²	
1	9	4.5	-0.50		0.25	
2	8	4	-1.00		1.00	
3	11	5.5	0.50		0.25	
4	11	5.5	0.50		0.25	
5	5	2.5	-2.50		6.25	
6	5	2.5	-2.50		6.25	
7	8	4	-1.00		1.00	
8	9	4.5	-0.50		0.25	
9	11	5.5	0.50		0.25	
10	9	4.5	-0.50		0.25	
11	7	3.5	-1.50		2.25	
12	18	9	4.00		16.00	
13	11	5.5	0.50		0.25	
14	14	7	2.00		4.00	
15	13	6.5	1.50		2.25	
16	11	5.5	0.50		0.25	
Mean Count: \bar{x}		5.00	SUM	41.00		
Standard Deviation (σ)		1.65	Variance:	1.41		
Background Count Rate:		5.00	CPM +-:	3.31	CPM	
Calculations Completed by:		Adolfo Matus			Date:	4/12/2018
Reviewed by:		Daniel Spicuzza			Date:	4/12/2018

Background in dpm/100cm²	
11	
Scan Probability %	Static MDC in dpm/100cm²
100	19
Action Level in CPM	Release Limit in CPM
485	539

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		297743
Last Calibration Date:		10/10/2017			
Detector Model:		43-37	Detector Serial No.:		302111
Today's Date:		4/12/2018	Data Collected by:		Adolfo Matus
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.384					
Type of Surface:		Concrete Wall	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.189
Count Number		CPM	$(x - \bar{x})$		$(x - \bar{x})^2$
1	1296	648	-21.25		451.56
2	1416	708	38.75		1501.56
3	1330	665	-4.25		18.06
4	1365	683	13.25		175.56
5	1379	690	20.25		410.06
6	1360	680	10.75		115.56
7	1356	678	8.75		76.56
8	1370	685	15.75		248.06
9	1402	701	31.75		1008.06
10	1361	681	11.25		126.56
11	1377	689	19.25		370.56
12	1371	686	16.25		264.06
13	1309	655	-14.75		217.56
14	1257	629	-40.75		1660.56
15	1237	619	-50.75		2575.56
16	1230	615	-54.25		2943.06
Mean Count: \bar{x}		669.25		SUM	12163.00
Standard Deviation (σ)		28.48		Variance:	419.41
Background Count Rate:		669.25	CPM + -	56.95	CPM
Calculations Completed by:		Adolfo Matus		Date:	4/12/2018
Reviewed by:		Daniel Spicuzza		Date:	4/12/2018

Background in dpm/100cm²	
799	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
790	78
Action Level in CPM	Release Limit in CPM
1865	2001

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		297758
Last Calibration Date:		2/14/2018			
Detector Model:		43-93	Detector Serial No.:		299597
Today's Date:		4/3/2018	Data Collected by:		Thomas Hogan
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.444					
Type of Surface:	Concrete Wall	Count Time:	2	Minutes	4 π Instrument Efficiency: 0.225
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	7	3.5	1.81	3.29	
2	2	1	-0.69	0.47	
3	4	2	0.31	0.10	
4	7	3.5	1.81	3.29	
5	1	0.5	-1.19	1.41	
6	2	1	-0.69	0.47	
7	5	2.5	0.81	0.66	
8	4	2	0.31	0.10	
9	4	2	0.31	0.10	
10	2	1	-0.69	0.47	
11	4	2	0.31	0.10	
12	2	1	-0.69	0.47	
13	3	1.5	-0.19	0.04	
14	4	2	0.31	0.10	
15	3	1.5	-0.19	0.04	
16	0	0	-1.69	2.85	
Mean Count: \bar{x}	1.69	SUM	13.94		
Standard Deviation (σ)	0.96	Variance:	0.48		
Background Count Rate:	1.69	CPM + -	1.93	CPM	
Calculations Completed by:		Thomas Hogan		Date:	4/3/2018
Reviewed by:		Daniel Spicuzza		Date:	4/3/2018

Background in dpm/100cm²	
15	
Scan Probability %	Static MDC in dpm/100cm²
100	52
Action Level in CPM	Release Limit in CPM
117	129

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		297758
Last Calibration Date:		2/14/2018			
Detector Model:		43-93	Detector Serial No.:		299597
Today's Date:		4/3/2018	Data Collected by:		Thomas Hogan
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.313					
Type of Surface:		Concrete Wall	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.172
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	387	194		-3.56	12.69
2	394	197		-0.06	0.00
3	417	209		11.44	130.82
4	410	205		7.94	63.00
5	412	206		8.94	79.88
6	403	202		4.44	19.69
7	378	189		-8.06	65.00
8	428	214		16.94	286.88
9	395	198		0.44	0.19
10	379	190		-7.56	57.19
11	394	197		-0.06	0.00
12	389	195		-2.56	6.57
13	396	198		0.94	0.88
14	375	188		-9.56	91.44
15	373	187		-10.56	111.57
16	376	188		-9.06	82.13
Mean Count: \bar{x}	197.06		SUM	1007.94	
Standard Deviation (σ)	8.20		Variance:	34.76	
Background Count Rate:	197.06	CPM + -	16.39	CPM	
Calculations Completed by:		Thomas Hogan		Date:	4/3/2018
Reviewed by:		Daniel Spicuzza		Date:	4/3/2018

Background in dpm/100cm²	
1679	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
809	406
Action Level in CPM	Release Limit in CPM
365	384

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		297766
Last Calibration Date:		12/20/2017			
Detector Model:		43-93	Detector Serial No.:		323074
Today's Date:		4/3/2018	Data Collected by:		Thomas Hogan
X	Alpha		Beta-Gamma		Gamma
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.404					
Type of Surface:	Concrete Wall	Count Time:	2	Minutes	4 π Instrument Efficiency: 0.204
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	2	1	-0.91	0.82	
2	9	4.5	2.59	6.73	
3	3	1.5	-0.41	0.17	
4	5	2.5	0.59	0.35	
5	4	2	0.09	0.01	
6	5	2.5	0.59	0.35	
7	5	2.5	0.59	0.35	
8	2	1	-0.91	0.82	
9	1	0.5	-1.41	1.98	
10	7	3.5	1.59	2.54	
11	2	1	-0.91	0.82	
12	4	2	0.09	0.01	
13	1	0.5	-1.41	1.98	
14	3	1.5	-0.41	0.17	
15	5	2.5	0.59	0.35	
16	3	1.5	-0.41	0.17	
Mean Count: \bar{x}	1.91	SUM	17.61		
Standard Deviation (σ)	1.08	Variance:	0.61		
Background Count Rate:	1.91	CPM + -	2.17	CPM	
Calculations Completed by:		Thomas Hogan		Date:	4/3/2018
Reviewed by:		Daniel Spicuzza		Date:	4/3/2018

Background in dpm/100cm²	
19	
Scan Probability %	Static MDC in dpm/100cm²
100	60
Action Level in CPM	Release Limit in CPM
106	117

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		297766
Last Calibration Date:		12/20/2017			
Detector Model:		43-93	Detector Serial No.:		323074
Today's Date:		4/3/2018	Data Collected by:		Thomas Hogan
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.254					
Type of Surface:		Concrete Wall	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.14
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	407	204		-3.72	13.83
2	397	199		-8.72	76.02
3	401	201		-6.72	45.14
4	388	194		-13.22	174.74
5	398	199		-8.22	67.55
6	403	202		-5.72	32.70
7	398	199		-8.22	67.55
8	393	197		-10.72	114.89
9	415	208		0.28	0.08
10	388	194		-13.22	174.74
11	379	190		-17.72	313.95
12	457	229		21.28	452.89
13	439	220		12.28	150.83
14	450	225		17.78	316.17
15	488	244		36.78	1352.86
16	430	215		7.78	60.55
Mean Count: \bar{x}	207.22		SUM	3414.48	
Standard Deviation (σ)	15.09		Variance:	117.74	
Background Count Rate:		207.22	CPM + -	30.17	CPM
Calculations Completed by:		Thomas Hogan			Date: 4/3/2018
Reviewed by:		Daniel Spicuzza			Date: 4/3/2018

Background in dpm/100cm²	
2176	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
1022	513
Action Level in CPM	Release Limit in CPM
343	359

Floor

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		184949
Last Calibration Date:		3/6/2018			
Detector Model:		43-93	Detector Serial No.:		268605
Today's Date:		4/3/2018	Data Collected by:		Joan Cosgrove
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.423					
Type of Surface:	Concrete Floor	Count Time:	2	Minutes	4 π Instrument Efficiency: 0.213
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	6	3	1.22	1.49	
2	4	2	0.22	0.05	
3	6	3	1.22	1.49	
4	1	0.5	-1.28	1.64	
5	2	1	-0.78	0.61	
6	1	0.5	-1.28	1.64	
7	2	1	-0.78	0.61	
8	7	3.5	1.72	2.95	
9	1	0.5	-1.28	1.64	
10	4	2	0.22	0.05	
11	3	1.5	-0.28	0.08	
12	5	2.5	0.72	0.52	
13	3	1.5	-0.28	0.08	
14	5	2.5	0.72	0.52	
15	5	2.5	0.72	0.52	
16	2	1	-0.78	0.61	
Mean Count: \bar{x}	1.78	SUM	14.48		
Standard Deviation (σ)	0.98	Variance:	0.50		
Background Count Rate:	1.78	CPM + -	1.97	CPM	
Calculations Completed by:		Joan Cosgrove		Date:	4/3/2018
Reviewed by:		Daniel Spicuzza		Date:	4/3/2018

Background in dpm/100cm²	
17	
Scan Probability %	Static MDC in dpm/100cm²
100	56
Action Level in CPM	Release Limit in CPM
111	123

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.		184949	
Last Calibration Date:		3/6/2018				
Detector Model:		43-93	Detector Serial No.:		268605	
Today's Date:		4/3/2018	Data Collected by:		Joan Cosgrove	
Alpha		X	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.268						
Type of Surface:		Concrete Floor	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.147	
Count Number		CPM	$(x - \bar{x})$		$(x - \bar{x})^2$	
1	515	258	18.47		341.09	
2	504	252	12.97		168.19	
3	501	251	11.47		131.53	
4	510	255	15.97		255.00	
5	437	219	-20.53		421.53	
6	433	217	-22.53		507.66	
7	449	225	-14.53		211.16	
8	484	242	2.97		8.81	
9	513	257	17.47		305.16	
10	487	244	4.47		19.97	
11	512	256	16.97		287.94	
12	448	224	-15.03		225.94	
13	475	238	-1.53		2.34	
14	516	258	18.97		359.81	
15	442	221	-18.03		325.13	
16	423	212	-27.53		757.97	
Mean Count: \bar{x}		239.03		SUM	4329.23	
Standard Deviation (σ)		16.99		Variance:	149.28	
Background Count Rate:		239.03	CPM + -	33.98	CPM	
Calculations Completed by:		Joan Cosgrove			Date:	4/3/2018
Reviewed by:		Daniel Spicuzza			Date:	4/3/2018

Background in dpm/100cm²
1784

Scan MDC in dpm/100cm ²	Static MDC in dpm/100cm ²
780	391
Action Level in CPM	Release Limit in CPM
382	399

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		193668
Last Calibration Date:		8/15/2017			
Detector Model:		43-93	Detector Serial No.:		326725
Today's Date:		4/3/2018	Data Collected by:		Joan Cosgrove
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.497					
Type of Surface:	Concrete Floor	Count Time:	2	Minutes	4 π Instrument Efficiency: 0.251
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	2	1	-1.28	1.64	
2	1	0.5	-1.78	3.17	
3	4	2	-0.28	0.08	
4	3	1.5	-0.78	0.61	
5	4	2	-0.28	0.08	
6	2	1	-1.28	1.64	
7	5	2.5	0.22	0.05	
8	5	2.5	0.22	0.05	
9	1	0.5	-1.78	3.17	
10	4	2	-0.28	0.08	
11	8	4	1.72	2.95	
12	5	2.5	0.22	0.05	
13	9	4.5	2.22	4.92	
14	6	3	0.72	0.52	
15	8	4	1.72	2.95	
16	6	3	0.72	0.52	
Mean Count: \bar{x}	2.28	SUM	22.48		
Standard Deviation (σ)	1.22	Variance:	0.78		
Background Count Rate:	2.28	CPM + -	2.45	CPM	
Calculations Completed by:		Joan Cosgrove		Date:	4/3/2018
Reviewed by:		Daniel Spicuzza		Date:	4/3/2018

Background in dpm/100cm²	
18	
Scan Probability %	Static MDC in dpm/100cm²
100	52
Action Level in CPM	Release Limit in CPM
131	144

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.		193668	
Last Calibration Date:		8/15/2017				
Detector Model:		43-93	Detector Serial No.:		326725	
Today's Date:		4/3/2018	Data Collected by:		Joan Cosgrove	
Alpha		X	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.327						
Type of Surface:		Concrete Floor	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.18	
Count Number		CPM	$(x - \bar{x})$		$(x - \bar{x})^2$	
1	509	255	-12.84		164.96	
2	539	270	2.16		4.65	
3	516	258	-9.34		87.31	
4	540	270	2.66		7.06	
5	564	282	14.66		214.81	
6	520	260	-7.34		53.93	
7	638	319	51.66		2668.37	
8	523	262	-5.84		34.15	
9	540	270	2.66		7.06	
10	535	268	0.16		0.02	
11	506	253	-14.34		205.74	
12	479	240	-27.84		775.27	
13	505	253	-14.84		220.34	
14	543	272	4.16		17.27	
15	570	285	17.66		311.74	
16	528	264	-3.34		11.18	
Mean Count: \bar{x}		267.34		SUM	4783.86	
Standard Deviation (σ)		17.86		Variance:	164.96	
Background Count Rate:		267.34	CPM + -	35.72	CPM	
Calculations Completed by:		Joan Cosgrove			Date:	4/3/2018
Reviewed by:		Daniel Spicuzza			Date:	4/3/2018

Background in dpm/100cm²	
2180	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
901	451
Action Level in CPM	Release Limit in CPM
442	462

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		268488
Last Calibration Date:		10/27/2017			
Detector Model:		43-37	Detector Serial No.:		190672
Today's Date:		4/10/2018	Data Collected by:		Adolfo Matus Jr.
X	Alpha		Beta-Gamma		Gamma
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.302					
Type of Surface:		Concrete Floor	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.153
Count Number			(x - \bar{x})	(x - \bar{x}) ²	
1	12	6	0.16	0.02	
2	13	6.5	0.66	0.43	
3	14	7	1.16	1.34	
4	18	9	3.16	9.96	
5	10	5	-0.84	0.71	
6	12	6	0.16	0.02	
7	16	8	2.16	4.65	
8	8	4	-1.84	3.40	
9	8	4	-1.84	3.40	
10	15	7.5	1.66	2.74	
11	8	4	-1.84	3.40	
12	13	6.5	0.66	0.43	
13	12	6	0.16	0.02	
14	8	4	-1.84	3.40	
15	5	2.5	-3.34	11.18	
16	15	7.5	1.66	2.74	
Mean Count: \bar{x}		5.84	SUM	47.86	
Standard Deviation (σ)		1.79	Variance:	1.65	
Background Count Rate:		5.84	CPM +-	3.57	CPM
Calculations Completed by:		Adolfo Matus Jr.			Date: 4/10/2018
Reviewed by:		Daniel Spicuzza			Date: 4/10/2018

Background in dpm/100cm²	
13	
Scan Probability %	Static MDC in dpm/100cm²
100	22
Action Level in CPM	Release Limit in CPM
461	511

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.		268488
Last Calibration Date:		10/27/2017			
Detector Model:		43-37	Detector Serial No.:		190672
Today's Date:		4/10/2018	Data Collected by:		Adolfo Matus Jr.
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background					2 π Instrument Efficiency: 0.37
Type of Surface:		Concrete Floor	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.182
Count Number		CPM	(x - \bar{x})	(x - \bar{x}) ²	
1	1708	854	-27.38	749.39	
2	1791	896	14.13	199.52	
3	1830	915	33.63	1130.64	
4	1695	848	-33.88	1147.52	
5	1729	865	-16.88	284.77	
6	1787	894	12.13	147.02	
7	1729	865	-16.88	284.77	
8	1766	883	1.63	2.64	
9	1772	886	4.63	21.39	
10	1761	881	-0.88	0.77	
11	1806	903	21.63	467.64	
12	1809	905	23.13	534.77	
13	1793	897	15.13	228.77	
14	1708	854	-27.38	749.39	
15	1742	871	-10.38	107.64	
16	1778	889	7.63	58.14	
Mean Count: \bar{x}		881.38	SUM	6114.75	
Standard Deviation (σ)		20.19	Variance:	210.85	
Background Count Rate:		881.38	CPM + -	40.38	CPM
Calculations Completed by:		Adolfo Matus Jr.			Date: 4/10/2018
Reviewed by:		Daniel Spicuzza			Date: 4/10/2018

Background in dpm/100cm²	
1091	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
1086	123
Action Level in CPM	Release Limit in CPM
2033	2165

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.:		268497	
Last Calibration Date:		10/10/2017				
Detector Model:		43-37	Detector Serial No.:		O93965	
Today's Date:		4/3/2018	Data Collected by:		Josefina Matus	
X	Alpha	Beta-Gamma		Gamma		
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.31						
Type of Surface:		Concrete Floor	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.157	
Count Number			(x - \bar{x})		(x - \bar{x}) ²	
1	17	8.5	3.59		12.92	
2	7	3.5	-1.41		1.98	
3	11	5.5	0.59		0.35	
4	9	4.5	-0.41		0.17	
5	4	2	-2.91		8.45	
6	9	4.5	-0.41		0.17	
7	18	9	4.09		16.76	
8	8	4	-0.91		0.82	
9	10	5	0.09		0.01	
10	12	6	1.09		1.20	
11	9	4.5	-0.41		0.17	
12	6	3	-1.91		3.63	
13	7	3.5	-1.41		1.98	
14	9	4.5	-0.41		0.17	
15	9	4.5	-0.41		0.17	
16	12	6	1.09		1.20	
Mean Count: \bar{x}		4.91	SUM	50.11		
Standard Deviation (σ)		1.83	Variance:	1.73		
Background Count Rate:		4.91	CPM +-:	3.66	CPM	
Calculations Completed by:		Josefina Matus			Date:	4/3/2018
Reviewed by:		Daniel Spicuzza			Date:	4/3/2018

Background in dpm/100cm²	
11	
Scan Probability %	Static MDC in dpm/100cm²
100	19
Action Level in CPM	Release Limit in CPM
472	524

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.		268497	
Last Calibration Date:		10/10/2017				
Detector Model:		43-37	Detector Serial No.:		O93965	
Today's Date:		4/3/2018	Data Collected by:		Josefina Matus	
Alpha		X	Beta-Gamma		Gamma	
Remarks:		Instrument Ambient Background 2 π Instrument Efficiency: 0.352				
Type of Surface:		Concrete Floor	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.173	
Count Number		CPM	$(x - \bar{x})$		$(x - \bar{x})^2$	
1	1854	927	37.34		1394.56	
2	1739	870	-20.16		406.27	
3	1687	844	-46.16		2130.40	
4	1742	871	-18.66		348.06	
5	1754	877	-12.66		160.18	
6	1779	890	-0.16		0.02	
7	1756	878	-11.66		135.87	
8	1833	917	26.84		720.59	
9	1755	878	-12.16		147.77	
10	1824	912	22.34		499.24	
11	1673	837	-53.16		2825.59	
12	1789	895	4.84		23.46	
13	1829	915	24.84		617.21	
14	1809	905	14.84		220.34	
15	1808	904	14.34		205.74	
16	1838	919	29.34		861.06	
Mean Count: \bar{x}		889.66		SUM	10696.36	
Standard Deviation (σ)		26.70		Variance:	368.84	
Background Count Rate:		889.66	CPM + -	53.41	CPM	
Calculations Completed by:		Josefina Matus			Date:	4/3/2018
Reviewed by:		Daniel Spicuzza			Date:	4/3/2018

Background in dpm/100cm²	
1158	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
1147	130
Action Level in CPM	Release Limit in CPM
1986	2111

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218				
Instrument Model:		2360	Instrument Serial No.:		276990	
Last Calibration Date:		3/20/2018				
Detector Model:		43-37	Detector Serial No.:		190620	
Today's Date:		4/3/2018	Data Collected by:		Richard Thatcher	
X	Alpha	Beta-Gamma		Gamma		
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.287						
Type of Surface:		Concrete Floor	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.145	
Count Number			(x - \bar{x})		(x - \bar{x}) ²	
1	14	7	3.59		12.92	
2	7	3.5	0.09		0.01	
3	3	1.5	-1.91		3.63	
4	4	2	-1.41		1.98	
5	8	4	0.59		0.35	
6	9	4.5	1.09		1.20	
7	7	3.5	0.09		0.01	
8	5	2.5	-0.91		0.82	
9	9	4.5	1.09		1.20	
10	5	2.5	-0.91		0.82	
11	7	3.5	0.09		0.01	
12	9	4.5	1.09		1.20	
13	7	3.5	0.09		0.01	
14	7	3.5	0.09		0.01	
15	3	1.5	-1.91		3.63	
16	5	2.5	-0.91		0.82	
Mean Count: \bar{x}		3.41	SUM	28.61		
Standard Deviation (σ)		1.38	Variance:	0.99		
Background Count Rate:		3.41	CPM +-:	2.76	CPM	
Calculations Completed by:		Richard Thatcher			Date:	4/3/2018
Reviewed by:		Daniel Spicuzza			Date:	4/3/2018

Background in dpm/100cm²	
8	
Scan Probability %	Static MDC in dpm/100cm²
100	25
Action Level in CPM	Release Limit in CPM
436	484

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360	Instrument Serial No.		276935
Last Calibration Date:		3/20/2018			
Detector Model:		43-37	Detector Serial No.:		190620
Today's Date:		4/3/2018	Data Collected by:		Richard Thatcher
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background			2 π Instrument Efficiency: 0.395		
Type of Surface:		Concrete Floor	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.195
Count Number		CPM	(x - \bar{x})	(x - \bar{x}) ²	
1	1804	902	91.44	8360.82	
2	1706	853	42.44	1800.94	
3	1764	882	71.44	5103.32	
4	1726	863	52.44	2749.69	
5	1783	892	80.94	6550.88	
6	1637	819	7.94	63.00	
7	1627	814	2.94	8.63	
8	1569	785	-26.06	679.25	
9	1566	783	-27.56	759.69	
10	1499	750	-61.06	3728.63	
11	1523	762	-49.06	2407.13	
12	1521	761	-50.06	2506.25	
13	1483	742	-69.06	4769.63	
14	1534	767	-43.56	1897.69	
15	1541	771	-40.06	1605.00	
16	1655	828	16.94	286.88	
Mean Count: \bar{x}		810.56	SUM	43277.44	
Standard Deviation (σ)		53.71	Variance:	1492.33	
Background Count Rate:		810.56	CPM + -	107.43	CPM
Calculations Completed by:		Richard Thatcher			Date: 4/3/2018
Reviewed by:		Daniel Spicuzza			Date: 4/3/2018

Background in dpm/100cm²	
940	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
976	110
Action Level in CPM	Release Limit in CPM
2040	2181

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		297743
Last Calibration Date:		10/10/2017			
Detector Model:		43-37	Detector Serial No.:		302111
Today's Date:		4/3/2018	Data Collected by:		Adolfo Matus
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.319					
Type of Surface:		Concrete Floor	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.161
Count Number			(x - \bar{x})		(x - \bar{x}) ²
1	6	3	-3.63		13.14
2	11	5.5	-1.13		1.27
3	20	10	3.38		11.39
4	9	4.5	-2.13		4.52
5	10	5	-1.63		2.64
6	18	9	2.38		5.64
7	12	6	-0.63		0.39
8	16	8	1.38		1.89
9	10	5	-1.63		2.64
10	14	7	0.38		0.14
11	15	7.5	0.88		0.77
12	15	7.5	0.88		0.77
13	14	7	0.38		0.14
14	17	8.5	1.88		3.52
15	8	4	-2.63		6.89
16	17	8.5	1.88		3.52
Mean Count: \bar{x}	6.63		SUM	59.25	
Standard Deviation (σ)	1.99		Variance:	2.04	
Background Count Rate:		6.63	CPM +-:	3.97	CPM
Calculations Completed by:		Adolfo Matus			Date: 4/3/2018
Reviewed by:		Daniel Spicuzza			Date: 4/3/2018

Background in dpm/100cm²	
14	
Scan Probability %	Static MDC in dpm/100cm²
100	29
Action Level in CPM	Release Limit in CPM
487	540

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.		297743	
Last Calibration Date:		10/10/2017				
Detector Model:		43-37	Detector Serial No.:		302111	
Today's Date:		4/3/2018	Data Collected by:		Adolfo Matus	
Alpha		X	Beta-Gamma		Gamma	
Remarks:		Instrument Ambient Background 2 π Instrument Efficiency: 0.384				
Type of Surface:		Concrete Floor	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.189	
Count Number		CPM	$(x - \bar{x})$		$(x - \bar{x})^2$	
1	2289	1145	10.88		118.27	
2	2300	1150	16.38		268.14	
3	2331	1166	31.88		1016.02	
4	2353	1177	42.88		1838.27	
5	2283	1142	7.88		62.02	
6	2397	1199	64.88		4208.77	
7	2317	1159	24.88		618.77	
8	2367	1184	49.88		2487.52	
9	2238	1119	-14.63		213.89	
10	2203	1102	-32.13		1032.02	
11	2214	1107	-26.63		708.89	
12	2189	1095	-39.13		1530.77	
13	2206	1103	-30.63		937.89	
14	2182	1091	-42.63		1816.89	
15	2191	1096	-38.13		1453.52	
16	2216	1108	-25.63		656.64	
Mean Count: \bar{x}		1133.63		SUM	18968.25	
Standard Deviation (σ)		35.56		Variance:	654.08	
Background Count Rate:		1133.63	CPM + -	71.12	CPM	
Calculations Completed by:		Adolfo Matus			Date:	4/3/2018
Reviewed by:		Daniel Spicuzza			Date:	4/3/2018

Background in dpm/100cm²	
1353	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
1187	134
Action Level in CPM	Release Limit in CPM
2329	2466

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		297758
Last Calibration Date:		2/14/2018			
Detector Model:		43-93	Detector Serial No.:		299597
Today's Date:		4/3/2018	Data Collected by:		Thomas Hogan
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.444					
Type of Surface:	Concrete Floor	Count Time:	2	Minutes	4 π Instrument Efficiency: 0.225
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	1	0.5	-1.31	1.72	
2	2	1	-0.81	0.66	
3	4	2	0.19	0.04	
4	4	2	0.19	0.04	
5	5	2.5	0.69	0.47	
6	4	2	0.19	0.04	
7	7	3.5	1.69	2.85	
8	1	0.5	-1.31	1.72	
9	2	1	-0.81	0.66	
10	1	0.5	-1.31	1.72	
11	8	4	2.19	4.79	
12	4	2	0.19	0.04	
13	6	3	1.19	1.41	
14	4	2	0.19	0.04	
15	2	1	-0.81	0.66	
16	3	1.5	-0.31	0.10	
Mean Count: \bar{x}	1.81	SUM	16.94		
Standard Deviation (σ)	1.06	Variance:	0.58		
Background Count Rate:	1.81	CPM + -	2.13	CPM	
Calculations Completed by:		Thomas Hogan		Date:	4/3/2018
Reviewed by:		Daniel Spicuzza		Date:	4/3/2018

Background in dpm/100cm²	
16	
Scan Probability %	Static MDC in dpm/100cm²
83	76
Action Level in CPM	Release Limit in CPM
117	129

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.		297758
Last Calibration Date:		2/14/2018			
Detector Model:		43-93	Detector Serial No.:		299597
Today's Date:		4/3/2018	Data Collected by:		Thomas Hogan
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background					2 π Instrument Efficiency: 0.313
Type of Surface:		Concrete Floor	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.172
Count Number		CPM	(x - \bar{x})	(x - \bar{x}) ²	
1	549	275	-4.75	22.56	
2	595	298	18.25	333.06	
3	616	308	28.75	826.56	
4	526	263	-16.25	264.06	
5	631	316	36.25	1314.06	
6	544	272	-7.25	52.56	
7	542	271	-8.25	68.06	
8	522	261	-18.25	333.06	
9	557	279	-0.75	0.56	
10	580	290	10.75	115.56	
11	510	255	-24.25	588.06	
12	597	299	19.25	370.56	
13	616	308	28.75	826.56	
14	529	265	-14.75	217.56	
15	532	266	-13.25	175.56	
16	490	245	-34.25	1173.06	
Mean Count: \bar{x}		279.25	SUM	6681.50	
Standard Deviation (σ)		21.11	Variance:	230.40	
Background Count Rate:		279.25	CPM + -	42.21	CPM
Calculations Completed by:		Thomas Hogan			Date: 4/3/2018
Reviewed by:		Daniel Spicuzza			Date: 4/3/2018

Background in dpm/100cm²	
2379	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
963	481
Action Level in CPM	Release Limit in CPM
447	466

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		297766
Last Calibration Date:		12/20/2017			
Detector Model:		43-93	Detector Serial No.:		323074
Today's Date:		4/3/2018	Data Collected by:		Thomas Hogan
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.404					
Type of Surface:	Concrete Floor	Count Time:	2	Minutes	4 π Instrument Efficiency: 0.204
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	2	1	-1.13	1.27	
2	7	3.5	1.38	1.89	
3	3	1.5	-0.63	0.39	
4	5	2.5	0.38	0.14	
5	6	3	0.88	0.77	
6	7	3.5	1.38	1.89	
7	4	2	-0.13	0.02	
8	4	2	-0.13	0.02	
9	5	2.5	0.38	0.14	
10	2	1	-1.13	1.27	
11	2	1	-1.13	1.27	
12	3	1.5	-0.63	0.39	
13	3	1.5	-0.63	0.39	
14	5	2.5	0.38	0.14	
15	6	3	0.88	0.77	
16	4	2	-0.13	0.02	
Mean Count: \bar{x}	2.13	SUM	10.75		
Standard Deviation (σ)	0.85	Variance:	0.37		
Background Count Rate:	2.13	CPM + -	1.69	CPM	
Calculations Completed by:	Thomas Hogan			Date:	4/3/2018
Reviewed by:	Daniel Spicuzza			Date:	4/3/2018

Background in dpm/100cm²	
21	
Scan Probability %	Static MDC in dpm/100cm²
100	62
Action Level in CPM	Release Limit in CPM
107	117

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.		297766
Last Calibration Date:		12/20/2017			
Detector Model:		43-93	Detector Serial No.:		323074
Today's Date:		4/3/2018	Data Collected by:		Thomas Hogan
Alpha		X	Beta-Gamma		Gamma
Remarks:		Instrument Ambient Background 2 π Instrument Efficiency: 0.254			
Type of Surface:		Concrete Floor	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.14
Count Number		CPM	$(x - \bar{x})$		$(x - \bar{x})^2$
1	519	260	-12.22		149.30
2	545	273	0.78		0.61
3	526	263	-8.72		76.02
4	503	252	-20.22		408.80
5	620	310	38.28		1465.45
6	556	278	6.28		39.45
7	535	268	-4.22		17.80
8	548	274	2.28		5.20
9	593	297	24.78		614.11
10	559	280	7.78		60.55
11	548	274	2.28		5.20
12	508	254	-17.72		313.95
13	581	291	18.78		352.74
14	541	271	-1.22		1.49
15	499	250	-22.22		493.67
16	514	257	-14.72		216.64
Mean Count: \bar{x}		271.72		SUM	4220.98
Standard Deviation (σ)		16.77		Variance:	145.55
Background Count Rate:		271.72	CPM + -	33.55	CPM
Calculations Completed by:		Thomas Hogan			
Reviewed by:		Daniel Spicuzza			

Background in dpm/100cm²	
2853	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
1170	585
Action Level in CPM	Release Limit in CPM
408	423

Date:	4/3/2018
Date:	4/3/2018

Metal

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		184949
Last Calibration Date:		3/6/2018			
Detector Model:		43-93	Detector Serial No.:		268605
Today's Date:		4/5/2018	Data Collected by:		Joan Cosgrove
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.423					
Type of Surface:	Metal	Count Time:	2	Minutes	4 π Instrument Efficiency: 0.213
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	1	0.5	-0.22	0.05	
2	2	1	0.28	0.08	
3	3	1.5	0.78	0.61	
4	1	0.5	-0.22	0.05	
5	2	1	0.28	0.08	
6	0	0	-0.72	0.52	
7	0	0	-0.72	0.52	
8	3	1.5	0.78	0.61	
9	2	1	0.28	0.08	
10	3	1.5	0.78	0.61	
11	0	0	-0.72	0.52	
12	1	0.5	-0.22	0.05	
13	2	1	0.28	0.08	
14	1	0.5	-0.22	0.05	
15	1	0.5	-0.22	0.05	
16	1	0.5	-0.22	0.05	
Mean Count: \bar{x}	0.72	SUM	3.98		
Standard Deviation (σ)	0.52	Variance:	0.14		
Background Count Rate:	0.72	CPM + -	1.03	CPM	
Calculations Completed by:		Joan Cosgrove		Date:	4/5/2018
Reviewed by:		Daniel Spicuzza		Date:	4/5/2018

Background in dpm/100cm²	
7	
Scan Probability %	Static MDC in dpm/100cm²
100	41
Action Level in CPM	Release Limit in CPM
110	123

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.		184949
Last Calibration Date:		3/6/2018			
Detector Model:		43-93	Detector Serial No.:		268605
Today's Date:		4/5/2018	Data Collected by:		Joan Cosgrove
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background					2 π Instrument Efficiency: 0.268
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.147
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	324	162	-4.75	22.56	
2	327	164	-3.25	10.56	
3	292	146	-20.75	430.56	
4	345	173	5.75	33.06	
5	341	171	3.75	14.06	
6	360	180	13.25	175.56	
7	337	169	1.75	3.06	
8	329	165	-2.25	5.06	
9	367	184	16.75	280.56	
10	314	157	-9.75	95.06	
11	329	165	-2.25	5.06	
12	323	162	-5.25	27.56	
13	345	173	5.75	33.06	
14	341	171	3.75	14.06	
15	324	162	-4.75	22.56	
16	338	169	2.25	5.06	
Mean Count: \bar{x}	166.75		SUM	1177.50	
Standard Deviation (σ)	8.86		Variance:	40.60	
Background Count Rate:	166.75	CPM + -	17.72	CPM	
Calculations Completed by:		Joan Cosgrove			Date: 4/5/2018
Reviewed by:		Daniel Spicuzza			Date: 4/5/2018

Background in dpm/100cm²	
1659	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
869	438
Action Level in CPM	Release Limit in CPM
310	326

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		193668
Last Calibration Date:		8/15/2017			
Detector Model:		43-93	Detector Serial No.:		326725
Today's Date:		4/5/2018	Data Collected by:		Joan Cosgrove
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.497					
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.251
Count Number		CPM	(x - \bar{x})	(x - \bar{x}) ²	
1	2	1	-0.28	0.08	
2	8	4	2.72	7.39	
3	3	1.5	0.22	0.05	
4	1	0.5	-0.78	0.61	
5	1	0.5	-0.78	0.61	
6	3	1.5	0.22	0.05	
7	0	0	-1.28	1.64	
8	2	1	-0.28	0.08	
9	4	2	0.72	0.52	
10	5	2.5	1.22	1.49	
11	4	2	0.72	0.52	
12	1	0.5	-0.78	0.61	
13	2	1	-0.28	0.08	
14	2	1	-0.28	0.08	
15	1	0.5	-0.78	0.61	
16	2	1	-0.28	0.08	
Mean Count: \bar{x}		1.28	SUM	14.48	
Standard Deviation (σ)		0.98	Variance:	0.50	
Background Count Rate:		1.28	CPM + -	1.97	CPM
Calculations Completed by:		Joan Cosgrove			Date: 4/5/2018
Reviewed by:		Daniel Spicuzza			Date: 4/5/2018

Background in dpm/100cm²	
10	
Scan Probability %	Static MDC in dpm/100cm²
100	42
Action Level in CPM	Release Limit in CPM
130	144

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.		193668
Last Calibration Date:		8/15/2017			
Detector Model:		43-93	Detector Serial No.:		326725
Today's Date:		4/5/2018	Data Collected by:		Joan Cosgrove
Alpha		X		Beta-Gamma	
Gamma					
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.327					
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.18
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	311	156	-4.16	17.27	
2	349	175	14.84	220.34	
3	298	149	-10.66	113.56	
4	297	149	-11.16	124.46	
5	338	169	9.34	87.31	
6	329	165	4.84	23.46	
7	311	156	-4.16	17.27	
8	330	165	5.34	28.56	
9	295	148	-12.16	147.77	
10	317	159	-1.16	1.34	
11	320	160	0.34	0.12	
12	331	166	5.84	34.15	
13	327	164	3.84	14.77	
14	323	162	1.84	3.40	
15	298	149	-10.66	113.56	
16	335	168	7.84	61.52	
Mean Count: \bar{x}	159.66		SUM	1008.86	
Standard Deviation (σ)	8.20		Variance:	34.79	
Background Count Rate:	159.66	CPM + -	16.40	CPM	
Calculations Completed by:		Joan Cosgrove		Date:	4/5/2018
Reviewed by:		Daniel Spicuzza		Date:	4/5/2018

Background in dpm/100cm²	
1302	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
697	351
Action Level in CPM	Release Limit in CPM
335	355

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		297758
Last Calibration Date:		2/14/2018			
Detector Model:		43-93	Detector Serial No.:		299597
Today's Date:		4/5/2018	Data Collected by:		Thomas Hogan
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.444					
Type of Surface:	Metal	Count Time:	2	Minutes	4 π Instrument Efficiency: 0.225
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	2	1	0.06	0.00	
2	1	0.5	-0.44	0.19	
3	5	2.5	1.56	2.44	
4	0	0	-0.94	0.88	
5	0	0	-0.94	0.88	
6	2	1	0.06	0.00	
7	1	0.5	-0.44	0.19	
8	2	1	0.06	0.00	
9	1	0.5	-0.44	0.19	
10	3	1.5	0.56	0.32	
11	2	1	0.06	0.00	
12	5	2.5	1.56	2.44	
13	1	0.5	-0.44	0.19	
14	3	1.5	0.56	0.32	
15	2	1	0.06	0.00	
16	0	0	-0.94	0.88	
Mean Count: \bar{x}	0.94	SUM	8.94		
Standard Deviation (σ)	0.77	Variance:	0.31		
Background Count Rate:	0.94	CPM + -	1.54	CPM	
Calculations Completed by:		Thomas Hogan		Date:	4/5/2018
Reviewed by:		Daniel Spicuzza		Date:	4/5/2018

Background in dpm/100cm²	
8	
Scan Probability %	Static MDC in dpm/100cm²
100	42
Action Level in CPM	Release Limit in CPM
116	129

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.		297758	
Last Calibration Date:		2/14/2018				
Detector Model:		43-93	Detector Serial No.:		299597	
Today's Date:		4/5/2018	Data Collected by:		Thomas Hogan	
Alpha		X	Beta-Gamma		Gamma	
Remarks:		Instrument Ambient Background 2 π Instrument Efficiency: 0.313				
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.172	
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²		
1	346	173		-2.03	4.13	
2	365	183		7.47	55.78	
3	357	179		3.47	12.03	
4	325	163		-12.53	157.03	
5	359	180		4.47	19.97	
6	343	172		-3.53	12.47	
7	352	176		0.97	0.94	
8	336	168		-7.03	49.44	
9	353	177		1.47	2.16	
10	344	172		-3.03	9.19	
11	347	174		-1.53	2.34	
12	299	150		-25.53	651.84	
13	374	187		11.97	143.25	
14	357	179		3.47	12.03	
15	378	189		13.97	195.13	
16	366	183		7.97	63.50	
Mean Count: \bar{x}	175.03		SUM	1391.23		
Standard Deviation (σ)	9.63		Variance:	47.97		
Background Count Rate:	175.03	CPM + -	19.26	CPM		
Calculations Completed by:		Thomas Hogan			Date:	4/5/2018
Reviewed by:		Daniel Spicuzza			Date:	4/5/2018

Background in dpm/100cm²	
1491	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
762	384
Action Level in CPM	Release Limit in CPM
342	362

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		297766
Last Calibration Date:		12/20/2017			
Detector Model:		43-93	Detector Serial No.:		323074
Today's Date:		4/5/2018	Data Collected by:		Thomas Hogan
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.404					
Type of Surface:	Metal	Count Time:	2	Minutes	4 π Instrument Efficiency: 0.204
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	2	1	0.06	0.00	
2	1	0.5	-0.44	0.19	
3	5	2.5	1.56	2.44	
4	0	0	-0.94	0.88	
5	0	0	-0.94	0.88	
6	2	1	0.06	0.00	
7	1	0.5	-0.44	0.19	
8	2	1	0.06	0.00	
9	1	0.5	-0.44	0.19	
10	3	1.5	0.56	0.32	
11	2	1	0.06	0.00	
12	5	2.5	1.56	2.44	
13	1	0.5	-0.44	0.19	
14	3	1.5	0.56	0.32	
15	2	1	0.06	0.00	
16	0	0	-0.94	0.88	
Mean Count: \bar{x}	0.94	SUM	8.94		
Standard Deviation (σ)	0.77	Variance:	0.31		
Background Count Rate:	0.94	CPM +- CPM	1.54	CPM	
Calculations Completed by:		Thomas Hogan		Date:	4/5/2018
Reviewed by:		Daniel Spicuzza		Date:	4/5/2018

Background in dpm/100cm²	
9	
Scan Probability %	Static MDC in dpm/100cm²
100	46
Action Level in CPM	Release Limit in CPM
105	117

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.		297766
Last Calibration Date:		12/20/2017			
Detector Model:		43-93	Detector Serial No.:		323074
Today's Date:		4/5/2018	Data Collected by:		Thomas Hogan
Alpha		X	Beta-Gamma		Gamma
Remarks:		Instrument Ambient Background		2 π Instrument Efficiency: 0.254	
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.14
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	350	175		-17.69	312.85
2	403	202		8.81	77.66
3	366	183		-9.69	93.85
4	394	197		4.31	18.60
5	374	187		-5.69	32.35
6	335	168		-25.19	634.41
7	353	177		-16.19	262.04
8	388	194		1.31	1.72
9	397	199		5.81	33.79
10	363	182		-11.19	125.16
11	397	199		5.81	33.79
12	370	185		-7.69	59.10
13	450	225		32.31	1044.10
14	413	207		13.81	190.79
15	407	204		10.81	116.91
16	406	203		10.31	106.35
Mean Count: \bar{x}	192.69		SUM	3143.44	
Standard Deviation (σ)	14.48		Variance:	108.39	
Background Count Rate:	192.69	CPM + -	28.95	CPM	
Calculations Completed by:		Thomas Hogan		Date:	4/5/2018
Reviewed by:		Daniel Spicuzza		Date:	4/5/2018

Background in dpm/100cm²	
2023	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
985	495
Action Level in CPM	Release Limit in CPM
329	344

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		184949
Last Calibration Date:		3/6/2018			
Detector Model:		43-93	Detector Serial No.:		268605
Today's Date:		4/3/2018	Data Collected by:		Joan Cosgrove
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.423					
Type of Surface:	Metal	Count Time:	2	Minutes	4 π Instrument Efficiency: 0.213
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	1	0.5		-0.25	0.06
2	0	0		-0.75	0.56
3	0	0		-0.75	0.56
4	4	2		1.25	1.56
5	3	1.5		0.75	0.56
6	3	1.5		0.75	0.56
7	1	0.5		-0.25	0.06
8	2	1		0.25	0.06
9	0	0		-0.75	0.56
10	2	1		0.25	0.06
11	5	2.5		1.75	3.06
12	0	0		-0.75	0.56
13	2	1		0.25	0.06
14	0	0		-0.75	0.56
15	0	0		-0.75	0.56
16	1	0.5		-0.25	0.06
Mean Count: \bar{x}	0.75	SUM	9.50		
Standard Deviation (σ)	0.80	Variance:	0.33		
Background Count Rate:	0.75	CPM + -	1.59	CPM	
Calculations Completed by:		Joan Cosgrove		Date:	4/3/2018
Reviewed by:		Daniel Spicuzza		Date:	4/3/2018

Background in dpm/100cm²	
7	
Scan Probability %	Static MDC in dpm/100cm²
100	61
Action Level in CPM	Release Limit in CPM
110	123

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.		184949	
Last Calibration Date:		3/6/2018				
Detector Model:		43-93	Detector Serial No.:		268605	
Today's Date:		4/3/2018	Data Collected by:		Joan Cosgrove	
Alpha		X	Beta-Gamma		Gamma	
Remarks:		Instrument Ambient Background		2 π Instrument Efficiency: 0.268		
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.147	
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²		
1	295	148		10.59	112.23	
2	270	135		-1.91	3.63	
3	285	143		5.59	31.29	
4	279	140		2.59	6.73	
5	273	137		-0.41	0.17	
6	250	125		-11.91	141.76	
7	254	127		-9.91	98.13	
8	263	132		-5.41	29.23	
9	284	142		5.09	25.95	
10	272	136		-0.91	0.82	
11	261	131		-6.41	41.04	
12	279	140		2.59	6.73	
13	275	138		0.59	0.35	
14	273	137		-0.41	0.17	
15	293	147		9.59	92.04	
16	275	138		0.59	0.35	
Mean Count: \bar{x}	136.91		SUM	590.61		
Standard Deviation (σ)	6.27		Variance:	20.37		
Background Count Rate:	136.91	CPM + -	12.55	CPM		
Calculations Completed by:		Joan Cosgrove			Date:	4/3/2018
Reviewed by:		Daniel Spicuzza			Date:	4/3/2018

Background in dpm/100cm²	
1362	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
787	398
Action Level in CPM	Release Limit in CPM
280	297

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		193668
Last Calibration Date:		8/15/2017			
Detector Model:		43-93	Detector Serial No.:		326725
Today's Date:		4/3/2018	Data Collected by:		Joan Cosgrove
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.497					
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.251
Count Number		CPM	(x - \bar{x})	(x - \bar{x}) ²	
1	0	0	-0.91	0.82	
2	3	1.5	0.59	0.35	
3	0	0	-0.91	0.82	
4	0	0	-0.91	0.82	
5	3	1.5	0.59	0.35	
6	0	0	-0.91	0.82	
7	0	0	-0.91	0.82	
8	3	1.5	0.59	0.35	
9	2	1	0.09	0.01	
10	4	2	1.09	1.20	
11	1	0.5	-0.41	0.17	
12	2	1	0.09	0.01	
13	4	2	1.09	1.20	
14	3	1.5	0.59	0.35	
15	0	0	-0.91	0.82	
16	4	2	1.09	1.20	
Mean Count: \bar{x}		0.91	SUM	10.11	
Standard Deviation (σ)		0.82	Variance:	0.35	
Background Count Rate:		0.91	CPM + -	1.64	CPM
Calculations Completed by:		Joan Cosgrove			Date: 4/3/2018
Reviewed by:		Daniel Spicuzza			Date: 4/3/2018

Background in dpm/100cm²	
7	
Scan Probability %	Static MDC in dpm/100cm²
100	37
Action Level in CPM	Release Limit in CPM
130	144

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.		193668
Last Calibration Date:		8/15/2017			
Detector Model:		43-93	Detector Serial No.:		326725
Today's Date:		4/3/2018	Data Collected by:		Joan Cosgrove
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.327					
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.18
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	333	167		26.41	697.29
2	267	134		-6.59	43.48
3	268	134		-6.09	37.13
4	266	133		-7.09	50.32
5	279	140		-0.59	0.35
6	309	155		14.41	207.54
7	278	139		-1.09	1.20
8	274	137		-3.09	9.57
9	282	141		0.91	0.82
10	299	150		9.41	88.48
11	260	130		-10.09	101.88
12	309	155		14.41	207.54
13	272	136		-4.09	16.76
14	256	128		-12.09	146.26
15	271	136		-4.59	21.10
16	260	130		-10.09	101.88
Mean Count: \bar{x}	140.09		SUM	1731.61	
Standard Deviation (σ)	10.74		Variance:	59.71	
Background Count Rate:	140.09	CPM + -	21.49	CPM	
Calculations Completed by:		Joan Cosgrove		Date:	4/3/2018
Reviewed by:		Daniel Spicuzza		Date:	4/3/2018

Background in dpm/100cm²	
1142	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
653	330
Action Level in CPM	Release Limit in CPM
315	335

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		268488
Last Calibration Date:		10/27/2017			
Detector Model:		43-37	Detector Serial No.:		190672
Today's Date:		4/10/2018	Data Collected by:		Adolfo Matus Jr.
X	Alpha	Beta-Gamma	Gamma		
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.302					
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.153
Count Number			(x - \bar{x})	(x - \bar{x}) ²	
1	6	3	0.06	0.00	
2	6	3	0.06	0.00	
3	1	0.5	-2.44	5.94	
4	5	2.5	-0.44	0.19	
5	5	2.5	-0.44	0.19	
6	12	6	3.06	9.38	
7	5	2.5	-0.44	0.19	
8	3	1.5	-1.44	2.07	
9	4	2	-0.94	0.88	
10	5	2.5	-0.44	0.19	
11	9	4.5	1.56	2.44	
12	8	4	1.06	1.13	
13	5	2.5	-0.44	0.19	
14	4	2	-0.94	0.88	
15	4	2	-0.94	0.88	
16	12	6	3.06	9.38	
Mean Count: \bar{x}	2.94		SUM	33.94	
Standard Deviation (σ)	1.50		Variance:	1.17	
Background Count Rate:	2.94		CPM + -	3.01	CPM
Calculations Completed by:		Adolfo Matus Jr.			Date: 4/10/2018
Reviewed by:		Daniel Spicuzza			Date: 4/10/2018

Background in dpm/100cm²	
7	
Scan Probability %	Static MDC in dpm/100cm²
100	16
Action Level in CPM	Release Limit in CPM
458	508

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.		268488	
Last Calibration Date:		10/27/2017				
Detector Model:		43-37	Detector Serial No.:		190672	
Today's Date:		4/10/2018	Data Collected by:		Adolfo Matus Jr.	
Alpha		X	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.37						
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.182	
Count Number		CPM	$(x - \bar{x})$		$(x - \bar{x})^2$	
1	936	468	17.16		294.34	
2	1013	507	55.66		3097.62	
3	933	467	15.66		245.12	
4	920	460	9.16		83.84	
5	966	483	32.16		1034.02	
6	976	488	37.16		1380.59	
7	835	418	-33.34		1111.81	
8	904	452	1.16		1.34	
9	899	450	-1.34		1.81	
10	812	406	-44.84		2010.96	
11	874	437	-13.84		191.65	
12	850	425	-25.84		667.90	
13	848	424	-26.84		720.59	
14	889	445	-6.34		40.24	
15	901	451	-0.34		0.12	
16	871	436	-15.34		235.43	
Mean Count: \bar{x}		450.84		SUM	11117.36	
Standard Deviation (σ)		27.22		Variance:	383.36	
Background Count Rate:		450.84	CPM + -	54.45	CPM	
Calculations Completed by:		Adolfo Matus Jr.			Date:	4/10/2018
Reviewed by:		Daniel Spicuzza			Date:	4/10/2018

Background in dpm/100cm²	
558	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
777	88
Action Level in CPM	Release Limit in CPM
1603	1734

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.:		268497	
Last Calibration Date:		10/10/2017				
Detector Model:		43-37	Detector Serial No.:		O93965	
Today's Date:		4/3/2018	Data Collected by:		Josefina Matus	
X	Alpha		Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.31						
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.157	
Count Number			(x - \bar{x})	(x - \bar{x}) ²		
1	7	3.5	0.13	0.02		
2	8	4	0.63	0.39		
3	7	3.5	0.13	0.02		
4	5	2.5	-0.88	0.77		
5	10	5	1.63	2.64		
6	4	2	-1.38	1.89		
7	7	3.5	0.13	0.02		
8	9	4.5	1.13	1.27		
9	7	3.5	0.13	0.02		
10	8	4	0.63	0.39		
11	10	5	1.63	2.64		
12	7	3.5	0.13	0.02		
13	4	2	-1.38	1.89		
14	6	3	-0.38	0.14		
15	5	2.5	-0.88	0.77		
16	4	2	-1.38	1.89		
Mean Count: \bar{x}		3.38	SUM	14.75		
Standard Deviation (σ)		0.99	Variance:	0.51		
Background Count Rate:		3.38	CPM +-:	1.98	CPM	
Calculations Completed by:		Josefina Matus			Date:	2/7/2018
Reviewed by:		Daniel Spicuzza			Date:	2/7/2018

Background in dpm/100cm²	
7	
Scan Probability %	Static MDC in dpm/100cm²
100	17
Action Level in CPM	Release Limit in CPM
470	522

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.		268497
Last Calibration Date:		10/10/2017			
Detector Model:		43-37	Detector Serial No.:		O93965
Today's Date:		4/3/2018	Data Collected by:		Josefina Matus
Alpha		X	Beta-Gamma		Gamma
Remarks:		Instrument Ambient Background		2 π Instrument Efficiency: 0.352	
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.173
Count Number		CPM	(x - \bar{x})	(x - \bar{x}) ²	
1	933	467	-17.34	300.81	
2	1004	502	18.16	329.65	
3	1000	500	16.16	261.02	
4	971	486	1.66	2.74	
5	964	482	-1.84	3.40	
6	908	454	-29.84	890.65	
7	984	492	8.16	66.52	
8	1006	503	19.16	366.96	
9	991	496	11.66	135.87	
10	910	455	-28.84	831.96	
11	972	486	2.16	4.65	
12	977	489	4.66	21.68	
13	973	487	2.66	7.06	
14	931	466	-18.34	336.49	
15	1001	501	16.66	277.43	
16	958	479	-4.84	23.46	
Mean Count: \bar{x}		483.84	SUM	3860.36	
Standard Deviation (σ)		16.04	Variance:	133.12	
Background Count Rate:		483.84	CPM + -	32.08	CPM
Calculations Completed by:		Josefina Matus		Date:	4/3/2018
Reviewed by:		Daniel Spicuzza		Date:	4/3/2018

Background in dpm/100cm²	
630	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
846	96
Action Level in CPM	Release Limit in CPM
1580	1705

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218				
Instrument Model:		2360	Instrument Serial No.:		276990	
Last Calibration Date:		3/20/2018				
Detector Model:		43-37	Detector Serial No.:		190620	
Today's Date:		4/3/2018	Data Collected by:		Richard Thatcher	
X	Alpha		Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.287						
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.145	
Count Number		CPM	(x - \bar{x})	(x - \bar{x}) ²		
1	3	1.5	-0.78	0.61		
2	4	2	-0.28	0.08		
3	6	3	0.72	0.52		
4	9	4.5	2.22	4.92		
5	6	3	0.72	0.52		
6	5	2.5	0.22	0.05		
7	4	2	-0.28	0.08		
8	3	1.5	-0.78	0.61		
9	5	2.5	0.22	0.05		
10	4	2	-0.28	0.08		
11	4	2	-0.28	0.08		
12	5	2.5	0.22	0.05		
13	5	2.5	0.22	0.05		
14	4	2	-0.28	0.08		
15	2	1	-1.28	1.64		
16	4	2	-0.28	0.08		
Mean Count: \bar{x}		2.28	SUM	9.48		
Standard Deviation (σ)		0.80	Variance:	0.33		
Background Count Rate:		2.28	CPM +-:	1.59	CPM	
Calculations Completed by:		Richard Thatcher			Date:	4/3/2018
Reviewed by:		Daniel Spicuzza			Date:	4/3/2018

Background in dpm/100cm²	
5	
Scan Probability %	Static MDC in dpm/100cm²
100	15
Action Level in CPM	Release Limit in CPM
434	483

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360	Instrument Serial No.		276935
Last Calibration Date:		3/20/2018			
Detector Model:		43-37	Detector Serial No.:		190620
Today's Date:		4/3/2018	Data Collected by:		Richard Thatcher
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background			2 π Instrument Efficiency: 0.395		
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.195
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	867	434		-55.03	3028.44
2	836	418		-70.53	4974.66
3	921	461		-28.03	785.75
4	923	462		-27.03	730.69
5	915	458		-31.03	962.94
6	918	459		-29.53	872.09
7	942	471		-17.53	307.34
8	931	466		-23.03	530.44
9	948	474		-14.53	211.16
10	932	466		-22.53	507.66
11	931	466		-23.03	530.44
12	940	470		-18.53	343.41
13	1001	501		11.97	143.25
14	968	484		-4.53	20.53
15	1005	503		13.97	195.13
16	1655	828		338.97	114899.81
Mean Count: \bar{x}	488.53		SUM	129043.73	
Standard Deviation (σ)	92.75		Variance:	4449.78	
Background Count Rate:	488.53	CPM + -	185.50	CPM	
Calculations Completed by:		Richard Thatcher		Date:	4/3/2018
Reviewed by:		Daniel Spicuzza		Date:	4/3/2018

Background in dpm/100cm²	
567	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
758	501
Action Level in CPM	Release Limit in CPM
1718	1859

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		297743
Last Calibration Date:		10/10/2017			
Detector Model:		43-37	Detector Serial No.:		302111
Today's Date:		4/3/2018	Data Collected by:		Adolfo Matus
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.319					
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.161
Count Number			(x - \bar{x})	(x - \bar{x}) ²	
1	15	7.5	3.41	11.60	
2	6	3	-1.09	1.20	
3	11	5.5	1.41	1.98	
4	7	3.5	-0.59	0.35	
5	10	5	0.91	0.82	
6	11	5.5	1.41	1.98	
7	10	5	0.91	0.82	
8	3	1.5	-2.59	6.73	
9	8	4	-0.09	0.01	
10	7	3.5	-0.59	0.35	
11	4	2	-2.09	4.38	
12	9	4.5	0.41	0.17	
13	11	5.5	1.41	1.98	
14	3	1.5	-2.59	6.73	
15	6	3	-1.09	1.20	
16	10	5	0.91	0.82	
Mean Count: \bar{x}	4.09		SUM	41.11	
Standard Deviation (σ)	1.66		Variance:	1.42	
Background Count Rate:	4.09		CPM +-	3.31	CPM
Calculations Completed by:		Adolfo Matus			Date: 4/3/2018
Reviewed by:		Daniel Spicuzza			Date: 4/3/2018

Background in dpm/100cm²	
9	
Scan Probability %	Static MDC in dpm/100cm²
100	18
Action Level in CPM	Release Limit in CPM
484	538

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.		297743	
Last Calibration Date:		10/10/2017				
Detector Model:		43-37	Detector Serial No.:		302111	
Today's Date:		4/3/2018	Data Collected by:		Adolfo Matus	
Alpha		X	Beta-Gamma		Gamma	
Remarks:		Instrument Ambient Background		2 π Instrument Efficiency: 0.384		
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.189	
Count Number		CPM	(x - \bar{x})	(x - \bar{x}) ²		
1	1090	545	5.56	30.94		
2	1024	512	-27.44	752.82		
3	1093	547	7.06	49.88		
4	1105	553	13.06	170.63		
5	1109	555	15.06	226.88		
6	1114	557	17.56	308.44		
7	1086	543	3.56	12.69		
8	1118	559	19.56	382.69		
9	1058	529	-10.44	108.94		
10	1033	517	-22.94	526.13		
11	1054	527	-12.44	154.69		
12	1106	553	13.56	183.94		
13	1030	515	-24.44	597.19		
14	1054	527	-12.44	154.69		
15	1096	548	8.56	73.32		
16	1092	546	6.56	43.07		
Mean Count: \bar{x}		539.44	SUM	3776.94		
Standard Deviation (σ)		15.87	Variance:	130.24		
Background Count Rate:		539.44	CPM + -	31.74	CPM	
Calculations Completed by:		Adolfo Matus			Date:	4/3/2018
Reviewed by:		Daniel Spicuzza			Date:	4/3/2018

Background in dpm/100cm²	
644	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
819	541
Action Level in CPM	Release Limit in CPM
1735	1871

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.:		297758	
Last Calibration Date:		2/14/2018				
Detector Model:		43-93	Detector Serial No.:		299597	
Today's Date:		4/3/2018	Data Collected by:		Thomas Hogan	
X	Alpha	Beta-Gamma		Gamma		
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.444						
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.225	
Count Number		CPM	($x - \bar{x}$)	($x - \bar{x}$) ²		
1	2	1	-0.19	0.04		
2	3	1.5	0.31	0.10		
3	1	0.5	-0.69	0.47		
4	3	1.5	0.31	0.10		
5	5	2.5	1.31	1.72		
6	2	1	-0.19	0.04		
7	2	1	-0.19	0.04		
8	3	1.5	0.31	0.10		
9	2	1	-0.19	0.04		
10	0	0	-1.19	1.41		
11	2	1	-0.19	0.04		
12	2	1	-0.19	0.04		
13	2	1	-0.19	0.04		
14	1	0.5	-0.69	0.47		
15	4	2	0.81	0.66		
16	4	2	0.81	0.66		
Mean Count: \bar{x}		1.19	SUM	5.94		
Standard Deviation (σ)		0.63	Variance:	0.20		
Background Count Rate:		1.19	CPM + -	1.26	CPM	
Calculations Completed by:		Thomas Hogan			Date:	4/3/2018
Reviewed by:		Daniel Spicuzza			Date:	4/3/2018

Background in dpm/100cm²	
11	
Scan Probability %	Static MDC in dpm/100cm²
100	46
Action Level in CPM	Release Limit in CPM
116	128

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.		297758
Last Calibration Date:		2/14/2018			
Detector Model:		43-93	Detector Serial No.:		299597
Today's Date:		4/3/2018	Data Collected by:		Thomas Hogan
Alpha		X	Beta-Gamma		Gamma
Remarks: Instrument Ambient Background					2 π Instrument Efficiency: 0.313
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.172
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	293	147		-5.63	31.64
2	333	167		14.38	206.64
3	312	156		3.88	15.02
4	302	151		-1.13	1.27
5	311	156		3.38	11.39
6	288	144		-8.13	66.02
7	311	156		3.38	11.39
8	302	151		-1.13	1.27
9	304	152		-0.13	0.02
10	262	131		-21.13	446.27
11	264	132		-20.13	405.02
12	300	150		-2.13	4.52
13	329	165		12.38	153.14
14	333	167		14.38	206.64
15	311	156		3.38	11.39
16	313	157		4.38	19.14
Mean Count: \bar{x}	152.13		SUM	1590.75	
Standard Deviation (σ)	10.30		Variance:	54.85	
Background Count Rate:	152.13	CPM + -	20.60	CPM	
Calculations Completed by:		Thomas Hogan			Date: 4/3/2018
Reviewed by:		Daniel Spicuzza			Date: 4/3/2018

Background in dpm/100cm²	
1296	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
710	358
Action Level in CPM	Release Limit in CPM
320	339

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218			
Instrument Model:		2360	Instrument Serial No.:		297766
Last Calibration Date:		12/20/2017			
Detector Model:		43-93	Detector Serial No.:		323074
Today's Date:		4/3/2018	Data Collected by:		Thomas Hogan
X	Alpha	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background 2 π Instrument Efficiency: 0.404					
Type of Surface:	Metal	Count Time:	2	Minutes	4 π Instrument Efficiency: 0.204
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²	
1	2	1	-0.09	0.01	
2	3	1.5	0.41	0.17	
3	3	1.5	0.41	0.17	
4	1	0.5	-0.59	0.35	
5	4	2	0.91	0.82	
6	0	0	-1.09	1.20	
7	3	1.5	0.41	0.17	
8	2	1	-0.09	0.01	
9	7	3.5	2.41	5.79	
10	1	0.5	-0.59	0.35	
11	2	1	-0.09	0.01	
12	0	0	-1.09	1.20	
13	2	1	-0.09	0.01	
14	2	1	-0.09	0.01	
15	1	0.5	-0.59	0.35	
16	2	1	-0.09	0.01	
Mean Count: \bar{x}	1.09	SUM	10.61		
Standard Deviation (σ)	0.84	Variance:	0.37		
Background Count Rate:	1.09	CPM + -	1.68	CPM	
Calculations Completed by:		Thomas Hogan		Date:	4/3/2018
Reviewed by:		Daniel Spicuzza		Date:	4/3/2018

Background in dpm/100cm²	
11	
Scan Probability %	Static MDC in dpm/100cm²
100	49
Action Level in CPM	Release Limit in CPM
106	117

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Bldg. 218				
Instrument Model:		2360	Instrument Serial No.:		297766	
Last Calibration Date:		12/20/2017				
Detector Model:		43-93	Detector Serial No.:		323074	
Today's Date:		4/3/2018	Data Collected by:		Thomas Hogan	
Alpha		X	Beta-Gamma		Gamma	
Remarks:		Instrument Ambient Background 2 π Instrument Efficiency: 0.254				
Type of Surface:		Metal	Count Time:	2	Minutes 4 π Instrument Efficiency: 0.14	
Count Number	CPM	(x - \bar{x})		(x - \bar{x}) ²		
1	328	164		-1.09	1.20	
2	316	158		-7.09	50.32	
3	325	163		-2.59	6.73	
4	323	162		-3.59	12.92	
5	351	176		10.41	108.29	
6	343	172		6.41	41.04	
7	338	169		3.91	15.26	
8	320	160		-5.09	25.95	
9	371	186		20.41	416.42	
10	311	156		-9.59	92.04	
11	313	157		-8.59	73.85	
12	342	171		5.91	34.88	
13	305	153		-12.59	158.60	
14	299	150		-15.59	243.17	
15	326	163		-2.09	4.38	
16	372	186		20.91	437.07	
Mean Count: \bar{x}	165.09		SUM	1722.11		
Standard Deviation (σ)	10.71		Variance:	59.38		
Background Count Rate:	165.09	CPM + -	21.43	CPM		
Calculations Completed by:		Thomas Hogan			Date:	4/3/2018
Reviewed by:		Daniel Spicuzza			Date:	4/3/2018

Background in dpm/100cm²	
1733	
Scan MDC in dpm/100cm²	Static MDC in dpm/100cm²
912	460
Action Level in CPM	Release Limit in CPM
301	316

Appendix D
Instrument Calibration Data

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: 3	Serial Number: 294756	
Contact Name: Mike Pauli			Calibration Method: Electronic and Source		
Contract/Task Number: N/A		Work Order Number: 2017-15322			
INSTRUMENT CALIBRATION INFORMATION					
Instrument Range	Calibration Standard Value (cpm)	Instrument Response ($\pm 10\%$)		Comments	
		Before Calibration	After Calibration	Calibrated in accordance with CP-IN-WI-219	
X0.1	100	100	100	Pulser: 151067	Cal Due: 02/28/2018
X0.1	250	250	250	DVM: 88020324	Cal Due: 06/02/2017
X0.1	400	400	400	Temp/Press: 3590	Cal Due: 11/30/2017
X 1	1,000	1,000	1,000	Humidity: 958670	Cal Due: 12/06/2017
X 1	2,500	2,500	2,500	Temp: 24.8 ° C Humidity: 41% Pressure: 739 mmHg	
X 1	4,000	4,000	4,000		
X 10	10,000	10,000	10,000		
X 10	25,000	25,000	25,000	Reset: SAT	Sensitivity: SAT
X 10	40,000	40,000	40,000	Audio: SAT	Geotropism: SAT
X 100	100,000	100,000	100,000	F/S Resp: SAT	BAT: SAT
X 100	250,000	250,000	250,000	Limited Use: X100 scale for info only. Use with GM Detector.	
X 100	400,000	400,000	400,000		
Mech. Zero	0	0	0		
HV Verification					
HV Adjustable from 400 to 1,500		<input checked="" type="checkbox"/> SAT <input type="checkbox"/> UNSAT		HV Set at 900 volts to be used with GM detectors.	
				Precision Test Reading 1 = 2,350 Reading 2 = 2,350 Reading 3 = 2,300 Mean = 2,333 <input checked="" type="checkbox"/> SAT <input type="checkbox"/> UNSAT	
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: <i>M. Pauli</i>		Reviewed By: <i>J. J. Johnson</i>		Date: 4/25/17	
Certification Date: 04/21/2017			*Certification Due (6 mo.): 10/21/2017		
			*Certification Due (12 mo.): 04/21/2018		

* Calibration due date is dependant on users regulatory requirements.

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: 3	Serial Number: 94347	
Contact Name: John Barncord			Calibration Method: Electronic and Source		
Contract/Task Number: N/A		Work Order Number: 2017-15513			
INSTRUMENT CALIBRATION INFORMATION					
Instrument Range	Calibration Standard Value (cpm)	Instrument Response ($\pm 10\%$)		Comments	
		Before Calibration	After Calibration	Calibrated in accordance with CP-IN-WI-219	
X0.1	100	100	100	Pulser: 130364	Cal Due: 8/29/17
X0.1	250	245	245	DVM: 94710023	Cal Due: 3/7/18
X0.1	400	395	395	Temp/Press: 3590	Cal Due: 11/30/17
X 1	1,000	1.05K	1.05K	Humidity: 958670	Cal Due: 12/6/17
X 1	2,500	2.45K	2.45K	Temp: 24.8 ° C Humidity: 38.6 % Pressure: 737 mmHg	
X 1	4,000	3.9K	3.9K		
X 10	10,000	10K	10K		
X 10	25,000	25K	25K	Reset: SAT	Sensitivity: SAT
X 10	40,000	39.5K	39.5K	Audio: SAT	Geotropism: SAT
X 100	100,000	100K	100K	F/S Resp: SAT	BAT: SAT
X 100	250,000	260K	260K	Limited Use: X100 scale for info only. Use with GM Detector.	
X 100	400,000	395K	395K		
Mech. Zero	0	0	0		
HV Verification					
HV Adjustable from 400 to 1,500		<input checked="" type="checkbox"/> SAT <input type="checkbox"/> UNSAT		HV Set at 900 volts to be used with GM detectors.	
				Precision Test Reading 1 = 260K Reading 2 = 260K Reading 3 = 260K Mean = 255K <input checked="" type="checkbox"/> SAT <input type="checkbox"/> UNSAT	
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		Reviewed By: <i>SEP Dickerson</i>		Date: 8/15/17	
Calibrated By: <i>[Signature]</i>				*Certification Due (6 mo.): 2/14/18	
Certification Date: 8/14/17				*Certification Due (12 mo.): 8/14/18	

* Calibration due date is dependent on users regulatory requirements.



**DETECTOR
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				DETECTOR INFORMATION			
Customer Name: EnergySolutions Services, Inc.				Manufacturer: Ludlum			
Address: 1570 Bear Creek Road, Oak Ridge, TN 37830				Detector Model: 44-9			
Contact Name: Mike Pauli				Serial Number: 210879			
Customer Purchase Order Number: N/A		Work Order Number: 2017-15322		Evaluation Method: Source			
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION							
1) Source Nuclide: Tc-99	Serial Number: 119720	Original Activity (dpm): 2,562		Certification Date: 10/14/97			
2) Source Nuclide: Tc-99	Serial Number: 119718	Original Activity (dpm): 20,520		Certification Date: 10/14/97			
3) Source Nuclide: Tc-99	Serial Number: 069507	Original Activity (dpm): 237,960		Certification Date: 04/01/95			
Efficiency determined using 180-2 jig @ 1/8" geometry							
Source #	Gross CPM	Net CPM	Efficiency				
Source 1	330	300	11.7%				
Source 2	2,350	2,320	11.3%				
Source 3	33,500	33,470	14.1%				
Geometry set to approx. 1/8" from detector face using 180-2 jig							
INSTRUMENT INFORMATION				DETECTOR INFORMATION			
<u>Model</u>	<u>Serial Number</u>	<u>Due Date</u>	<u>Background</u>	<u>Operating Voltage</u>	<u>Threshold</u>		
3	294756	04/21/2018	30	900Volts	27mV		
COMMENTS							
Detectors calibrated with a Model 3 or 12 and may be used with any Model 3 or 12 provided that the instrument is in calibration and the Instrument was previously set up to be used with a GM detector (operating voltage 900Volts)							
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: <i>M. Pauli</i>		Reviewed By: <i>[Signature]</i>		Date: 4/25/17			
Certification Date: 04/21/2017				Certification Due (6 mo.): 10/21/2017 Certification Due (12 mo.): 04/21/2018			

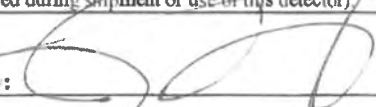
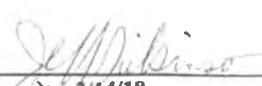
* Calibration due date is dependant on users regulatory requirements.



**DETECTOR
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				DETECTOR INFORMATION			
Customer Name: EnergySolutions Services, Inc.				Manufacturer: Ludlum			
Address: 1570 Bear Creek Road, Oak Ridge, TN 37830				Detector Model: 44-9			
Contact Name: John barncord				Serial Number: 115746			
Customer Purchase Order Number: N/A		Work Order Number: 2017-15513		Evaluation Method: Source			
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION							
1) Source Nuclide: Tc-99	Serial Number: 119720	Original Activity (dpm): 2,562		Certification Date: 10/14/97			
2) Source Nuclide: Tc-99	Serial Number: 119718	Original Activity (dpm): 20,520		Certification Date: 10/14/97			
3) Source Nuclide: Tc-99	Serial Number: 069507	Original Activity (dpm): 237,960		Certification Date: 04/01/95			
Efficiency determined using 180-2 jig @ 1/8" geometry							
Source #	Gross CPM	Net CPM	Efficiency				
Source 1	355	315	12.3%				
Source 2	2.4K	2360	11.5%				
Source 3	33K	32960	13.9%				
Geometry set to approx. 1/8" from detector face using 180-2 jig							
INSTRUMENT INFORMATION				DETECTOR INFORMATION			
<u>Model</u>	<u>Serial Number</u>	<u>Due Date</u>	<u>Background</u>	<u>Operating Voltage</u>	<u>Threshold</u>		
3	94347	8/14/18	40	900Volts	28mV		
COMMENTS							
Detectors calibrated with a Model 3 or 12 and may be used with any Model 3 or 12 provided that the instrument is in calibration and the Instrument was previously set up to be used with a GM detector (operating voltage 900Volts)							
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: 8/15/17			
Certification Date: 8/14/17				Certification Due (6 mo.): 2/14/18 Certification Due (12 mo.): 8/14/18			

* Calibration due date is dependant on users regulatory requirements.



**CALIBRATION
CERTIFICATE**

EnergySolutions Services, Inc.
1570 Bear Creek Road
Oak Ridge, TN 37830
Phone: (877) 462-4873
Fax: (865) 220-1346

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

CUSTOMER INFORMATION				INSTRUMENT INFORMATION				
Customer Name: EnergySolutions Services, Inc.				Manufacturer: Ludlum				
Address: 1570 Bear Creek Road, Oak Ridge, TN 37830				Model: 2360	Serial Number: 297766			
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 (CPM) Response ($\pm 10\%$ of Standard Values)		Calibration Standard Value	Time Base (minutes)	Tolerances (counts) $\pm 2\%$	Scaler Response (counts)	
		As Found	As Left				As Found	As Left
X 1	100	100	100	40,000 CPM	0.1	3,920 - 4,080	3,999	3,999
X 1	250	250	250	40,000 CPM	0.5	19.6K - 20.4K	19,996	19,996
X 1	400	400	400	40,000 CPM	1	39.2K - 40.8K	39,993	39,993
X 10	1,000	1,000	1,000	40,000 CPM	2	78.4K - 81.6K	79,984	79,984
X 10	2,500	2,500	2,500					
X 10	4,000	4,000	4,000					
X 100	10,000	10,000	10,000					
X 100	25,000	25,000	25,000					
X 100	40,000	40,000	40,000					
X 1000	100,000	100,000	100,000	Calibrated in accordance with OEM Technical Manual				
X 1000	250,000	250,000	250,000					
X 1000	400,000	400,000	400,000					
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: <i>Mike Yone</i> Reviewed By: <i>Jeff Dupriso</i> Date: 12/21/17 * Calibration Due (6 mo.): 06/20/2018 * Calibration Due (12 mo.): 12/20/2018				
Calibration Date: 12/20/2017								

* Calibration due date is dependent on users regulatory requirements.

Model: 2360

Serial Number: 297766

M&TE				Environmental Conditions		
Volt Meter	ID#	97960214	Cal Due:	08/15/18	Barometer	ID# 3314 Cal Due: 02/01/18
Pulser	ID#	101500	Cal Due:	04/19/18	Thermometer	ID# 3314 Cal Due: 02/01/18
Humidity	ID#	992290	Cal Due:	03/13/18	Temp: 22.9°C	Pressure: 740 mmHg Humidity: 42.7 %
Special Test						
Mechanical Zero		Sat (√) Unsat ()		Geotropism		Sat (√) Unsat ()
LCD Display Check		Sat (√) Unsat ()		Audio Check		Sat (√) Unsat ()
BAT Check		Sat (√) Unsat ()		Low BAT Set		Sat (√) Unsat ()
Reset		Sat (√) Unsat ()				
HV Analog Display		Sat (√) Unsat ()		As Found		As Left
High Voltage Calibration (± 10%)				Alpha Sensitivity = 126 mV		Alpha Sensitivity = 120 mV
Voltage	Tolerance	As Found	As Left	Beta Sensitivity = 4.1 mV		Beta Sensitivity = 3.5 mV
500	450 - 550	529	529	Beta Window = 30.5 mV		Beta Window = 30.0 mV
1,000	900 - 1,100	1,012	1,012	Beta Setpoints--Pulser counts detected at 3.5 mV ± 1 mV and shut off at 30 mV for beta. For Alpha channel counts detected at 120 mV and above.		
1,500	1,350 - 1,650	1,512	1,512			
H.V. Set With Detector Not Connected				Overload to be set with detector to be used		
COMMENTS						
<p>Calibrated in accordance with OEM Technical Manual</p> <p>See detector certificate for High Voltage setting</p> <p>**Calibrated with 5 ft. cable**</p>						
Instrument				Date: 12/21/17		
Calibrated By: <i>Mike Yonce</i>		Reviewed By: <i>J. Robinson</i>				
Calibration Date: 12/20/2017		* Calibration Due (6 mo.): 06/20/2018				
		* Calibration Due (12 mo.): 12/20/2018				

* Calibration due date is dependent on users regulatory requirements.



**CALIBRATION
CERTIFICATE**

EnergySolutions 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: EnergySolutions Services, Inc.			Manufacturer: Ludlum			
Address: 1570 Bear Creek Road, Oak Ridge, TN 37830			Detector Model: 43-93			
Contact Name: Mike Pauli			Serial Number: 323074			
Customer Purchase: Order Number: N/A		Work Order Number: N/A	Evaluation Method: Source			
DETECTOR EVALUATION INFORMATION (Efficiencies determined with source on contact)						
Source Nuclide	Serial Number	Activity (dpm)	2 Pi Emissions	Net Response (cpm)	4pi Eff (%)	2pi Eff (%)
Th-230	051301	20,694	10,450 / min	4,219	20.4	40.4
Tc-99	051304	24,330	13,380 / min	3,398	14.0	25.4
Pu-239	071601	23,887	12,060 / min	5,380	22.5	44.6
SrY-90	101502	42,503	24,300 / min	13,044	30.7	53.7
SCALER INFORMATION			DETECTOR INFORMATION			
Model	Serial Number	Due Date	Background	Operating Voltage	Threshold	
2360	297766	12/20/18	3	650V	Alpha (120 mV)	
2360	297766	12/20/18	235	650V	Beta (3.5 - 30 mV)	
ATTACHMENTS						
Voltage Plateau: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Cross Talk Evaluation: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				
COMMENTS			LINEARITY TEST (Gross Counts)			
Calibrated with 5 ft. cable Linearity test performed with Tc-99, #051304. Calibrated in accordance with original equipment technical manual. Background counts were performed using a 5 minute count.			Count 1 (Toe)	3,534		
			Count 2 (Mid)	3,628		
			Count 3 (Heel)	3,737		
			Average	3,633		
			Pass/Fail	PASS (+/-10% Tolerance)		
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: <i>Mike Yon</i>		Reviewed By: <i>Jeff Dickman</i>		Date: 12/21/17
Certification Date: 12/20/2017			* Certification Due (6 mo.): 06/20/2018			
			* Certification Due (12 mo.): 12/20/2018			

* Calibration due date is dependent on users regulatory requirements.

EnergySolutions Services, Inc
1570 Bear Creek Road
Oak Ridge, TN 37830

Phone: (877) 462-4873
Fax: (865) 220-1346
Email: Isfstaff@energysolutions.com

http://www.energysolutions.com/

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

CUSTOMER INFORMATION				INSTRUMENT INFORMATION			
Customer Name:		EnergySolutions		Manufacturer:			
Address:		1570 Bear Creek Rd. Oak Ridge, TN 37830		Model:		2360	S.N. 297766
Contact Name:		Mike Pauli		Probe:		43-93	S.N. 323074
Customer PO No.:	N/A	Work Order Number:	N/A	Calibration Method:		Source	

Source Information

	Isotope	Source ID	Certification Date	Activity (dpm)
α Source	Pu-239	071601	7/25/16	23,887
β Source	Tc-99	051304	5/15/13	24,330

Ludlum Model 43-93 High Voltage Plateau with crosstalk

Operating Voltage	High Voltage	Background		Alpha Source		Beta Source		Crosstalk		Efficiency	
		Alpha	Beta	Alpha	Beta	Alpha	Beta	α to β	β to α	α	β
	600	1	107	4,810	275	2	1,998	3.49%	0.05%	20.13%	7.77%
	625	3	171	5,204	295	3	2,883	2.38%	0.00%	21.77%	11.15%
SET	650	2	233	5,348	392	3	3,633	2.97%	0.03%	22.38%	13.97%
	675	3	267	5,472	544	2	4,312	5.06%	0.00	22.90%	16.63%

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).

Comments:

Calibrated By: Mike Youce Reviewed By: J.P. DeLino Date: 12/21/17
 Calibration Date: 12/20/17 Calibration Due: 12/20/18



**CALIBRATION
CERTIFICATE**

EnergySolutions Services, Inc.
1570 Bear Creek Road
Oak Ridge, TN 37830
Phone: (877) 462-4873
Fax: (865) 220-1346

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

CUSTOMER INFORMATION					INSTRUMENT INFORMATION				
Customer Name: EnergySolutions Services, Inc.					Manufacturer: Ludlum				
Address: 1570 Bear Creek Road Oak Ridge, TN 37830					Model: 2360		Serial Number: 193668		
Contact Name: Mike Pauli					Probe: 43-93		Serial Number: 326725		
Customer Purchase Order Number: N/A			Work Order Number: 2017-15513		Calibration Method: Electronic				
INSTRUMENT CALIBRATION INFORMATION									
Instrument Range	Calibration Standard Value	Tolerance (cpm) ($\pm 10\%$)	Ratemeter Response		Calibration Standard Value (CPM)	Time Base (minutes)	Tolerances (cpm) $\pm 2\%$	Scaler Response	
			As Found	As Left				As Found	As Left
X 1	100	90 - 110	100	100	40,000 CPM	0.1	3,920-4,080	3,988	3,988
X 1	250	225 - 275	250	250	40,000 CPM	0.5	19.6K-20.4K	19,941	19,941
X 1	400	360 - 440	400	400	40,000 CPM	1	39.2K-40.8K	39,881	39,881
X 10	1,000	900 - 1,100	1,000	1,000	40,000 CPM	2	78.4K-81.6K	79,762	79,762
X 10	2,500	2,250 - 2,750	2,500	2,500					
X 10	4,000	3,600 - 4,400	4,000	4,000					
X 100	10,000	9,000 - 11,000	10,000	10,000					
X 100	25,000	22,500 - 27,500	25,000	25,000					
X 100	40,000	36,000 - 44,000	40,000	40,000					
X 1000	100,000	90,000 - 110,000	100,000	100,000	Calibrated in accordance with OEM Technical Manual				
X 1000	250,000	225,000 - 275,000	250,000	250,000					
X 1000	400,000	360,000 - 440,000	400,000	400,000					
X 1000	400,000	360,000 - 440,000	400,000	400,000					
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: <i>M. Pauli</i>					Reviewed By: <i>J. M. Robinson</i> Date: 8/16/17				
Calibration Date: 08/15/2017					*Calibration Due (6mo): 02/15/2018				
					*Calibration Due (12mo): 08/15/2018				

* Calibration due date is dependant on users regulatory requirements.

Model: 2360

Serial Number: 193668

M&TE				Environmental Conditions		
Volt Meter	ID#	92260808	Cal Due: 07/17/2018	Barometer	ID# 3590	Cal Due: 11/30/17
Pulser	ID#	151067	Cal Due: 02/28/2018	Thermometer	ID# 3590	Cal Due: 11/30/17
Humidity	ID#	958670	Cal Due: 12/06/2017	Temp: 22.4 °C	Pressure: 740 mmHg	Humidity: 32.9%
Special Test						
Mechanical Zero			Sat (✓) Unsat ()	Geotropism		Sat (✓) Unsat ()
LCD Display Check			Sat (✓) Unsat ()	Audio Check		Sat (✓) Unsat ()
BAT Check			Sat (✓) Unsat ()	Low BAT Set		Sat (✓) Unsat ()
Reset			Sat (✓) Unsat ()	Physical Condition		Sat (✓) Unsat ()
HV Analog Display			Sat (✓) Unsat ()	As Found		As Left
High Voltage Calibration (± 10%)				Alpha Sensitivity = 108 mv	Alpha Sensitivity = 120 mv	
Voltage	Tolerance	As Found	As Left	Beta Sensitivity = 3.3 mv	Beta Sensitivity = 3.5 mv	
500	450-550	467	478	Beta Window = 28.1 mv	Beta Window = 30 mv	
1000	900-1100	981	1,000	Beta Setpoints--Pulser counts detected at 3.5mv ± 1mv and shut off at 30mv for beta. For Alpha channel counts detected at 120mv and above.		
1500	1350-1650	1,491	1,543			
H.V. Set With Detector Not Connected				Overload to be set with detector to be used		
COMMENTS						
<p>Calibrated in accordance with OEM Technical Manual</p> <p>See detector certificate for High Voltage setting</p> <p>**Calibrated with 5ft cable**</p>						
Instrument				Reviewed By: <i>S. J. D'Amico</i> Date: 8/16/17		
Calibrated By: <i>M. Pauli</i>				*Calibration Due (6mo): 02/15/2018		
Calibration Date: 08/15/2017				*Calibration Due (12mo): 08/15/2018		

* Calibration due date is dependant on users regulatory requirements.



**CALIBRATION
CERTIFICATE**

EnergySolutions 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: EnergySolutions Services, Inc.			Manufacturer: Ludlum			
Address: 1570 Bear Creek Road, Oak Ridge, TN 37830			Detector Model: 43-93			
Contact Name: Mike Pauli			Serial Number: 326725			
Customer Purchase: Order Number: N/A		Work Order Number: 2017-15513	Evaluation Method: Source			
DETECTOR EVALUATION INFORMATION						
Source Nuclide	Serial Number	Activity (dpm)	2 Pi Emissions	Net Response (cpm)	4pi Eff (%) **	2pi Eff (%) **
Th-230	051301	20,694	10,450 / min	5,192	25.1	49.7
Tc-99	051304	24,330	13,380 / min	4,372	18.0	32.7
Pu ²³⁹	101501	24,222	12,230 / min	6,441	26.6	52.7
SrY-90	101502	42,953	24,557 / min	15,328	35.7	62.4
SCALER INFORMATION			DETECTOR INFORMATION			
Model	Serial Number	Due Date	Background	Operating Voltage	Threshold	
2360	193668	08/15/2018	2.1	675 V	Alpha (120 mV)	
2360	193668	08/15/2018	198.8	675 V	Beta (3.5 - 30 mV)	
ATTACHMENTS						
Voltage Plateau: ✓ YES NO		MDA/Cross Talk Evaluation: ✓ YES NO				
COMMENTS			LINEARITY TEST (Gross Counts)			
Calibrated with 5 ft. cable Linearity test performed with Tc-99 #051304. Calibrated in accordance with original equipment technical manual. ** Efficiencies done on contact with detector screen.			Count 1 (Toe)	4,369		
			Count 2 (Mid)	4,765		
			Count 3 (Heel)	4,579		
			Average	4,571		
			Pass/Fail	PASS (+/-10% Tolerance)		
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: <i>M. Pauli</i>		Reviewed By: <i>J. Robinson</i>		Date: 8/16/17
Certification Date: 08/15/2017		* Certification Due (6 mo.): 02/15/2018		* Certification Due (12 mo.): 08/15/2018		

* Calibration due date is dependent on users regulatory requirements.



**CALIBRATION
CERTIFICATE**

EnergySolutions Services, Inc.
1570 Bear Creek Road
Oak Ridge, TN 37830
Phone: (877) 462-4873
Fax: (865) 220-1346

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

CUSTOMER INFORMATION				INSTRUMENT INFORMATION				
Customer Name: EnergySolutions Services, Inc.				Manufacturer: Ludlum				
Address: 1570 Bear Creek Road, Oak Ridge, TN 37830				Model: 2360	Serial Number: 297743			
Contact Name: Mike Pauli				Probe: N/A	Serial Number: N/A			
Customer Purchase Order Number: N/A		Work Order Number: 2017-15616		Calibration Method: Electronic				
INSTRUMENT CALIBRATION INFORMATION								
Instrument Range	Calibration Standard Value (CPM)	Ratemeter (CPM) Response ($\pm 10\%$ of Standard Values)		Calibration Standard Value	Time Base (minutes)	Tolerances (counts) $\pm 2\%$	Scaler Response (counts)	
		As Found	As Left				As Found	As Left
X 1	100	100	100	40,000 CPM	0.1	3,920 - 4,080	3,981	3,981
X 1	250	250	250	40,000 CPM	0.5	19.6K - 20.4K	19,903	19,903
X 1	400	400	400	40,000 CPM	1	39.2K - 40.8K	39,803	39,803
X 10	1,000	1,000	1,000	40,000 CPM	2	78.4K - 81.6K	79,606	79,606
X 10	2,500	2,500	2,500					
X 10	4,000	4,000	4,000					
X 100	10,000	10,000	10,000					
X 100	25,000	25,000	25,000					
X 100	40,000	40,000	40,000					
X 1000	100,000	100,000	100,000	Calibrated in accordance with OEM Technical Manual				
X 1000	250,000	250,000	250,000					
X 1000	400,000	400,000	400,000					
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				Reviewed By: <i>J. Pulcinella</i> Date: 10/12/17				
Calibrated By: <i>M. Pauli</i>				* Calibration Due (6 mo.): 04/10/2018				
Calibration Date: 10/10/2017				* Calibration Due (12 mo.): 10/10/2018				

* Calibration due date is dependent on users regulatory requirements.

M&TE				Environmental Conditions			
Volt Meter	ID#	94710023	Cal Due: 03/07/2018	Barometer	ID#	3590	Cal Due: 11/30/17
Pulser	ID#	151067	Cal Due: 02/28/2018	Thermometer	ID#	3590	Cal Due: 11/30/17
Humidity	ID#	958670	Cal Due: 12/06/2017	Temp: 25.2 °C	Pressure: 740 mmHg	Humidity: 42.8 %	
Special Test							
Mechanical Zero			Sat (✓) Unsat ()	Geotropism		Sat (✓) Unsat ()	
LCD Display Check			Sat (✓) Unsat ()	Audio Check		Sat (✓) Unsat ()	
BAT Check			Sat (✓) Unsat ()	Low BAT Set		Sat (✓) Unsat ()	
Reset			Sat (✓) Unsat ()				
HV Analog Display			Sat (✓) Unsat ()	As Found		As Left	
High Voltage Calibration (± 10%)				Alpha Sensitivity = 123 mV		Alpha Sensitivity = 120 mV	
Voltage	Tolerance	As Found	As Left	Beta Sensitivity = 3.6 mV		Beta Sensitivity = 3.5 mV	
500	450 - 550	501	501	Beta Window = 32 mV		Beta Window = 30 mV	
1,000	900 - 1,100	996	996	Beta Setpoints—Pulser counts detected at 3.5 mV ± 1 mV and shut off at 30 mV for beta. For Alpha channel counts detected at 120 mV and above.			
1,500	1,350 - 1,650	1,504	1,504				
H.V. Set With Detector Not Connected				Overload to be set with detector to be used			
COMMENTS							
<p>Calibrated in accordance with OEM Technical Manual</p> <p>See detector certificate for High Voltage setting</p> <p>**Calibrated with 8ft cable**</p>							
Instrument							
Calibrated By: <i>M. Pauli</i>			Reviewed By: <i>J. Paterson</i>		Date: 10/12/17		
Calibration Date: 10/10/2017			* Calibration Due (6 mo.): 04/10/2018				
			* Calibration Due (12 mo.): 10/10/2018				

* Calibration due date is dependent on users regulatory requirements.



**CALIBRATION
CERTIFICATE**

EnergySolutions 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: EnergySolutions Instrument Services				Manufacturer: Ludlum			
Address: 1570 Bear Creek Road Oak Ridge, TN 37830				Detector Model: 43-37A			
Contact Name: Mike Pauli				Serial Number: 302111			
Customer Purchase Order Number: N/A		Work Order Number: 2017-15616		Evaluation Method: Source			
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION							
Source Nuclide: Th ²³⁰		Serial Number: 051301		Activity: 20,694 dpm		2 Pi Emissions: 10,450 /min	Certification Date: 05/15/2013
Parameter	As Found	As Left	Precision Test			CPM	
Count 1	3,500	3,500	Count 1 (Heel)			2,933	
Count 2	3,297	3,297	Count 2 (Center)			2,882	
Count 3	3,246	3,246	Count 3 (Toe)			2,889	
Count 4	3,270	3,270	Average			2,898	
Count 5	3,418	3,418	Tolerance			±10%	
Count 6	3,326	3,326	Pass/Fail			Pass	
Average	3,343	3,343					
Background (CPM)	4.8	4.8					
Net Counts	3,338	3,338					
2pi Efficiency	31.9%	31.9%					
4pi Efficiency	16.1%	16.1%					
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				
<u>Model</u>	<u>Serial Number</u>	<u>Due Date</u>	<u>Background (cpm)</u>	<u>Operating Voltage</u>		<u>Threshold</u>	
2360	297743	10/10/2018	4.8	1775V		Alpha (120mV) Beta (3.5-30mV)	
Detector Setup Report	YES	NO ✓	Barcode Report	YES	NO ✓	Voltage Plateau YES ✓ NO	
COMMENTS							
5 minute background performed		Efficiency performed on contact with 8ft cable			2 layer mylar (0.8mg/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: <i>M. Pauli</i>			Reviewed By: <i>J. DePinto</i>		Date: 10/13/17
Certification Date: 10/11/2017				*Certification Due (6mo): 04/11/2018			
				* Certification Due (12mo): 10/11/2018			

* Calibration due date is dependant on users regulatory requirements.



**CALIBRATION
CERTIFICATE**

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 1570 Bear Creek Road
 Oak Ridge, TN 37830
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 Email: ISFstaff@energysolutions.com

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

CUSTOMER INFORMATION				DETECTOR INFORMATION		
Customer Name: EnergySolutions Instrument Services				Manufacturer: Ludlum		
Address: 1570 Bear Creek Road Oak Ridge, TN 37830				Detector Model: 43-37B		
Contact Name: Mike Pauli				Serial Number: 302111		
Customer Purchase Order Number: N/A		Work Order Number: 2017-15616		Evaluation Method: Source		
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION						
Source Nuclide: Tc ⁹⁹	Serial Number: 099608		Activity: 21,311 dpm	2 Pi Emissions: 10,499/min	Certification Date: 08/08/1996	
Parameter	As Found	As Left	Precision Test		CPM	
Count 1	4,780	4,780	Count 1 (Heel)		4,824	
Count 2	4,947	4,947	Count 2 (Center)		4,646	
Count 3	4,744	4,744	Count 3 (Toe)		4,499	
Count 4	4,950	4,950	Average		4,656	
Count 5	4,285	4,285	Tolerance		±10%	
Count 6	4,545	4,545	Pass/Fail		Pass	
Average	4,709	4,709				
Background (CPM)	679.6	679.6				
Net Counts	4,029	4,029				
2pi Efficiency	38.4%	38.4%				
4pi Efficiency	18.9%	18.9%				
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			
<u>Model</u>	<u>Serial Number</u>	<u>Due Date</u>	<u>Background (cpm)</u>	<u>Operating Voltage</u>	<u>Threshold</u>	
2360	297743	10/10/2018	679.6	1775V	Alpha (120mV) Beta (3.5-30mV)	
Detector Setup Report	YES	NO ✓	Barcode Report	YES	NO ✓	Voltage Plateau YES ✓ NO
COMMENTS						
5 minute background performed		Efficiency performed on contact with 8ft cable		2 layer mylar (0.8mg/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: <i>M Pauli</i>		Reviewed By: <i>J. D. Kemiso</i>		Date: 10/13/17
Certification Date: 10/11/2017				*Certification Due (6mo): 04/11/2018		
				* Certification Due (12mo): 10/11/2018		

* Calibration due date is dependant on users regulatory requirements.



CALIBRATION
CERTIFICATE

EnergySolutions Services, Inc
1570 Bear Creek Road
Oak Ridge, TN 37830

Phone: (877) 462-4873
Fax: (865) 220-1346
Email: lsfstaff@energysolutions.com

<http://www.energysolutions.com/>

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

CUSTOMER INFORMATION				INSTRUMENT INFORMATION			
Customer Name:		EnergySolutions		Manufacturer:			
Address:		1570 Bear Creek Rd Oak Ridge, TN 37830		Model:		2360	S.N. 297743
Contact Name:		Mike Pauli		Probe:		43-37	S.N. 302111
Customer PO No.:	N/A	Work Order Number:	2017-15616	Calibration Method:		Source	

Source Information

	Isotope	Source ID	Certification Date	Activity (dpm)
α Source	Pu-239	071601	7/25/16	23,887
β Source	Tc-99	099608	8/8/96	21,311

Ludlum Model 43-37 High Voltage Plateau with crosstalk

Operating Voltage	High Voltage	Background		Alpha Source		Beta Source		Crosstalk		Efficiency	
		Alpha	Beta	Alpha	Beta	Alpha	Beta	α to β	β to α	α	β
	1,700	4.0	277.0	2,294.0	537.0	6.0	3,702.0	11.35%	0.06%	9.59%	16.07%
	1,725	5.0	361.0	2,720.0	665.0	9.0	4,171.0	11.20%	0.10%	11.37%	17.88%
	1,750	3.0	497.0	2,992.0	819.0	3.0	4,383.0	10.77%	0.00%	12.51%	18.23%
SET	1,775	6.0	721.0	3,250.0	958.0	6.0	4,379.0	7.31%	0.00%	13.58%	17.16%
	1,800	6.0	800.0	3,840.0	1,074.0	9.0	4,480.0	9.01%	0.08%	16.05%	17.27%
	1,825	12.0	864.0	3,714.0	1,119.0	21.0	4,096.0	8.95%	0.28%	15.50%	15.17%

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).

Comments:

Calibrated using 8ft C cable assembly

Calibrated By: M. Pauli Reviewed By: J. M. Dukens Date: 10/17/17
 Calibration Date: 10/17/17 Calibration Due: 10/17/18



**CALIBRATION
CERTIFICATE**

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1570 Bear Creek Road
Oak Ridge, TN 37830
Phone: (877) 462-4873
Fax: (865) 220-1346

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

CUSTOMER INFORMATION				INSTRUMENT INFORMATION				
Customer Name: EnergySolutions Services, Inc.				Manufacturer: Ludlum				
Address: 1570 Bear Creek Road, Oak Ridge, TN 37830				Model: 2360	Serial Number: 268497			
Contact Name: Mike Pauli				Probe: N/A	Serial Number: N/A			
Customer Purchase Order Number: N/A		Work Order Number: 2017-15616		Calibration Method: Electronic				
INSTRUMENT CALIBRATION INFORMATION								
Instrument Range	Calibration Standard Value (CPM)	Ratemeter (CPM) Response ($\pm 10\%$ of Standard Values)		Calibration Standard Value	Time Base (minutes)	Tolerances (counts) $\pm 2\%$	Scaler Response (counts)	
		As Found	As Left				As Found	As Left
X 1	100	100	100	40,000 CPM	0.1	3,920 - 4,080	3,995	3,995
X 1	250	250	250	40,000 CPM	0.5	19.6K - 20.4K	19,972	19,972
X 1	400	400	400	40,000 CPM	1	39.2K - 40.8K	39,942	39,942
X 10	1,000	1,000	1,000	40,000 CPM	2	78.4K - 81.6K	79,884	79,884
X 10	2,500	2,500	2,500					
X 10	4,000	4,000	4,000					
X 100	10,000	10,000	10,000					
X 100	25,000	25,000	25,000					
X 100	40,000	40,000	40,000					
X 1000	100,000	100,000	100,000	Calibrated in accordance with OEM Technical Manual				
X 1000	250,000	250,000	250,000					
X 1000	400,000	400,000	400,000					
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				Reviewed By: <i>J. Dukerino</i> Date: 10/12/17				
Calibrated By: <i>M. Pauli</i>				* Calibration Due (6 mo.): 04/10/2018				
Calibration Date: 10/10/2017				* Calibration Due (12 mo.): 10/10/2018				

* Calibration due date is dependent on users regulatory requirements.

M&TE				Environmental Conditions			
Volt Meter	ID#	94710023	Cal Due: 03/07/2018	Barometer	ID#	3590	Cal Due: 11/30/17
Pulser	ID#	151067	Cal Due: 02/28/2018	Thermometer	ID#	3590	Cal Due: 11/30/17
Humidity	ID#	958670	Cal Due: 12/06/2017	Temp: 25.2 °C	Pressure: 740 mmHg	Humidity: 42.8 %	
Special Test							
Mechanical Zero			Sat (<input checked="" type="checkbox"/>) Unsat ()	Geotropism		Sat (<input checked="" type="checkbox"/>) Unsat ()	
LCD Display Check			Sat (<input checked="" type="checkbox"/>) Unsat ()	Audio Check		Sat (<input checked="" type="checkbox"/>) Unsat ()	
BAT Check			Sat (<input checked="" type="checkbox"/>) Unsat ()	Low BAT Set		Sat (<input checked="" type="checkbox"/>) Unsat ()	
Reset			Sat (<input checked="" type="checkbox"/>) Unsat ()				
HV Analog Display			Sat (<input checked="" type="checkbox"/>) Unsat ()	As Found		As Left	
High Voltage Calibration (± 10%)				Alpha Sensitivity = 115 mV		Alpha Sensitivity = 120 mV	
Voltage	Tolerance	As Found	As Left	Beta Sensitivity = 3.6 mV		Beta Sensitivity = 3.5 mV	
500	450 - 550	514	514	Beta Window = 31.6 mV		Beta Window = 30 mV	
1,000	900 - 1,100	1,014	1,014	Beta Setpoints--Pulser counts detected at 3.5 mV ± 1 mV and shut off at 30 mV for beta. For Alpha channel counts detected at 120 mV and above.			
1,500	1,350 - 1,650	1,527	1,527				
H.V. Set With Detector Not Connected				Overload to be set with detector to be used			
COMMENTS							
<p>Calibrated in accordance with OEM Technical Manual</p> <p>See detector certificate for High Voltage setting</p> <p>**Calibrated with 8ft cable**</p>							
Instrument				Reviewed By: <i>[Signature]</i> Date: 10/12/17			
Calibrated By: <i>M Paul</i>				* Calibration Due (6 mo.): 04/10/2018			
Calibration Date: 10/10/2017				* Calibration Due (12 mo.): 10/10/2018			

* Calibration due date is dependent on users regulatory requirements.



**CALIBRATION
CERTIFICATE**

EnergySolutions 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: EnergySolutions Instrument Services				Manufacturer: Ludlum		
Address: 1570 Bear Creek Road Oak Ridge, TN 37830				Detector Model: 43-37A		
Contact Name: Mike Pauli				Serial Number: 093965		
Customer Purchase Order Number: N/A		Work Order Number: 2017-15616		Evaluation Method: Source		
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION						
Source Nuclide: Th ²³⁰	Serial Number: 051301		Activity: 20,694 dpm	2 Pi Emissions: 10,450 /min		Certification Date: 05/15/2013
Parameter	As Found	As Left	Precision Test		CPM	
Count 1	3,295	3,295	Count 1 (Heel)		3,303	
Count 2	3,174	3,174	Count 2 (Center)		3,242	
Count 3	3,309	3,309	Count 3 (Toe)		3,291	
Count 4	3,191	3,191	Average		3,279	
Count 5	3,342	3,342	Tolerance		±10%	
Count 6	3,180	3,180	Pass/Fail		Pass	
Average	3,249	3,249				
Background (CPM)	8.6	8.6				
Net Counts	3,240	3,240				
2pi Efficiency	31.0%	31.0%				
4pi Efficiency	15.7%	15.7%				
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			
<u>Model</u>	<u>Serial Number</u>	<u>Due Date</u>	<u>Background (cpm)</u>	<u>Operating Voltage</u>		<u>Threshold</u>
2360	268497	10/10/2018	8.6	1750V		Alpha (120mV) Beta (3.5-30mV)
Detector Setup Report		YES NO ✓	Barcode Report		YES NO ✓	Voltage Plateau YES ✓ NO
COMMENTS						
5 minute background performed Efficiency performed on contact with 8ft cable 2 layer mylar (0.8mg/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: <i>M Pauli</i>		Reviewed By: <i>JM Dickenson</i>		Date: 10/12/17
Certification Date: 10/12/2017			*Certification Due (6mo): 04/12/2018		* Certification Due (12mo): 10/12/2018	

* Calibration due date is dependant on users regulatory requirements.



**CALIBRATION
CERTIFICATE**

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 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: EnergySolutions Instrument Services				Manufacturer: Ludlum	
Address: 1570 Bear Creek Road Oak Ridge, TN 37830				Detector Model: 43-37B	
Contact Name: Mike Pauli				Serial Number: 093965	
Customer Purchase Order Number: N/A		Work Order Number: 2017-15616		Evaluation Method: Source	
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION					
Source Nuclide: Tc ⁹⁹	Serial Number: 099608		Activity: 21,311 dpm	2 Pi Emissions: 10,499/min	Certification Date: 08/08/1996
Parameter	As Found	As Left	Precision Test		CPM
Count 1	4,692	4,692	Count 1 (Heel)		4,765
Count 2	4,540	4,540	Count 2 (Center)		4,331
Count 3	4,580	4,580	Count 3 (Toe)		4,522
Count 4	4,352	4,352	Average		4,539
Count 5	4,547	4,547	Tolerance		±10%
Count 6	4,472	4,472	Pass/Fail		Pass
Average	4,531	4,531			
Background (CPM)	838.2	838.2			
Net Counts	3,692	3,692			
2pi Efficiency	35.2%	35.2%			
4pi Efficiency	17.3%	17.3%			
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		
<u>Model</u>	<u>Serial Number</u>	<u>Due Date</u>	<u>Background (cpm)</u>	<u>Operating Voltage</u>	<u>Threshold</u>
2360	268497	10/10/2018	838.2	1750V	Alpha (120mV) Beta (3.5-30mV)
Detector Setup Report	YES	NO ✓	Barcode Report	YES	NO ✓
Voltage Plateau YES ✓ NO					
COMMENTS					
5 minute background performed Efficiency performed on contact with 8ft cable 2 layer mylar (0.8mg/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: <i>M. Pauli</i>		Reviewed By: <i>J. Parkinson</i>		Date: 10/12/17	
Certification Date: 10/12/2017		*Certification Due (6mo): 04/12/2018			
		* Certification Due (12mo): 10/12/2018			

* Calibration due date is dependant on users regulatory requirements.



CALIBRATION
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Email: Isfstaff@energysolutions.com

http://www.energysolutions.com/

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

CUSTOMER INFORMATION				INSTRUMENT INFORMATION			
Customer Name:	EnergySolutions			Manufacturer:			
Address:	1570 Bear Creek Rd Oak Ridge, TN 37830			Model:	2360	S.N.	268497
Contact Name:	Mike Pauli			Probe:	43-37	S.N.	093965
Customer PO No.:	N/A	Work Order Number:	2017-15616	Calibration Method:	Source		

Source Information

	Isotope	Source ID	Certification Date	Activity (dpm)
α Source	Pu-239	071601	7/25/16	23,887
β Source	Tc-99	099608	8/8/96	21,311

Ludlum Model 43-37 High Voltage Plateau with crosstalk

Operating Voltage	High Voltage	Background		Alpha Source		Beta Source		Crosstalk		Efficiency	
		Alpha	Beta	Alpha	Beta	Alpha	Beta	α to β	β to α	α	β
	1,700	4.0	551.0	3,484.0	811.0	6.0	4,587.0	7.47%	0.05%	14.57%	18.94%
	1,725	7.0	655.0	3,785.0	1,006.0	7.0	4,638.0	9.29%	0.00%	15.82%	18.69%
SET	1,750	9.0	831.0	4,217.0	1,124.0	7.0	4,348.0	6.96%	0.00	17.62%	16.50%
	1,775	7.0	887.0	4,306.0	1,232.0	25.0	3,967.0	8.03%	0.58%	18.00%	14.45%
	1,800	8.0	849.0	4,640.0	1,154.0	111.0	3,276.0	8.05%	4.24%	19.39%	11.39%
	1,825	25.0	769.0	4,745.0	1,083.0	300.0	2,539.0	7.90%	15.54%	19.76%	8.31%

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).

Comments:

Calibrated using 8ft C cable assembly

Calibrated By: M. Pauli Reviewed By: Jeff Mutenso Date: 10/17/17
 Calibration Date: 10/17/17 Calibration Due: 10/17/18



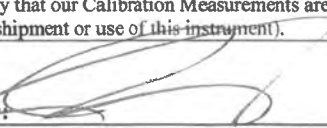
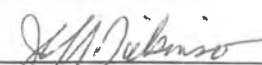
**CALIBRATION
CERTIFICATE**

EnergySolutions Services, Inc.
1570 Bear Creek Road
Oak Ridge, TN 37830
Phone: (877) 462-4873
Fax: (865) 220-1346



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: 2360	Serial Number: 276990
Contact Name: John Barncord		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 (CPM) Response ($\pm 10\%$ of Standard Values)		Calibration Standard Value	Time Base (minutes)	Tolerances (counts) $\pm 2\%$	Scaler Response (counts)	
		As Found	As Left				As Found	As Left
X 1	100	97.5	97.5	40,000 CPM	0.1	3,920 - 4,080	4010	4010
X 1	250	245	245	40,000 CPM	0.5	19.6K - 20.4K	20054	20054
X 1	400	390	390	40,000 CPM	1	39.2K - 40.8K	40107	40107
X 10	1,000	950	950	40,000 CPM	2	78.4K - 81.6K	80216	80216
X 10	2,500	2.5K	2.5K					
X 10	4,000	3.9K	3.9K					
X 100	10,000	9.75K	9.75K					
X 100	25,000	24.5K	24.5K					
X 100	40,000	40K	40K					
X 1000	100,000	95K	95K	Calibrated in accordance with OEM Technical Manual				
X 1000	250,000	245K	245K					
X 1000	400,000	390K	390K					

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: 	Reviewed By:  Date: 3/20/18
Calibration Date: 3/20/18	* Calibration Due (6 mo.): 9/20/18 * Calibration Due (12 mo.): 3/20/19

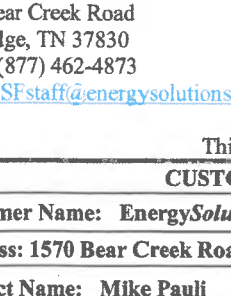
* Calibration due date is dependent on users regulatory requirements.

M&TE				Environmental Conditions		
Volt Meter	ID#: 92260808	Cal Due: 7/17/18		Barometer	ID#: 3063	Cal Due: 02/07/19
Pulser	ID#: 120935	Cal Due: 7/12/18		Thermometer	ID#: 3063	Cal Due: 02/07/19
Humidity	ID#: 958670	Cal Due: 12/15/18		Temp: 23.4 °C	Pressure: 727 mmHg	Humidity: 49.7 %
Special Test						
Mechanical Zero		Sat (✓) Unsat ()		Geotropism		Sat (✓) Unsat ()
LCD Display Check		Sat (✓) Unsat ()		Audio Check		Sat (✓) Unsat ()
BAT Check		Sat (✓) Unsat ()		Low BAT Set		Sat (✓) Unsat ()
Reset		Sat (✓) Unsat ()				
HV Analog Display		Sat (✓) Unsat ()		As Found		As Left
High Voltage Calibration (± 10%)				Alpha Sensitivity = 127 mV		Alpha Sensitivity = 120 mV
Voltage	Tolerance	As Found	As Left	Beta Sensitivity = 4.1 mV		Beta Sensitivity = 3.5 mV
500	450 - 550	518	518	Beta Window = 29.8 mV		Beta Window = 30.0 mV
1,000	900 - 1,100	1006	1006	Beta Setpoints--Pulser counts detected at 3.5 mV ± 1 mV and shut off at 30 mV for beta. For Alpha channel counts detected at 120 mV and above.		
1,500	1,350 - 1,650	1503	1503			
H.V. Set With Detector Not Connected				Overload to be set with detector to be used		
COMMENTS						
<p>Calibrated in accordance with OEM Technical Manual</p> <p>See detector certificate for High Voltage setting</p> <p>**Calibrated with 5 ft. cable**</p>						
Instrument				Reviewed By: 		
Calibrated By: 				Date: 3/20/18		
Calibration Date: 3/20/18				* Calibration Due (6 mo.): 9/20/18		
				* Calibration Due (12 mo.): 3/20/19		

* Calibration due date is dependent on users regulatory requirements.

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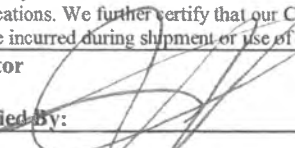
This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION				DETECTOR INFORMATION	
Customer Name: EnergySolutions Instrument Services				Manufacturer: Ludlum	
Address: 1570 Bear Creek Road Oak Ridge, TN 37830				Detector Model: 43-37A	
Contact Name: Mike Pauli				Serial Number: 190620	
Customer Purchase Order Number: N/A		Work Order Number: N/A		Evaluation Method: Source	
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION					
Source Nuclide: Th ²³⁰	Serial Number: 051301		Activity: 20,694 dpm	2 Pi Emissions: 10,450 /min	Certification Date: 05/15/2013
Parameter	As Found	As Left	Precision Test		CPM
Count 1	2,818	2,818	Count 1 (Heel)		2,786
Count 2	3,042	3,042	Count 2 (Center)		2,967
Count 3	3,130	3,130	Count 3 (Toe)		3,083
Count 4	3,012	3,012	Average		2,945
Count 5	2,994	2,994	Tolerance		±10%
Count 6	3,043	3,043	Pass/Fail		Pass
Average	3,007	3,007			
Background (CPM)	3.4	3.4			
Net Counts	3,003	3,003			
2pi Efficiency	28.7%	28.7%			
4pi Efficiency	14.5%	14.5%			
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		
<u>Model</u>	<u>Serial Number</u>	<u>Due Date</u>	<u>Background (cpm)</u>	<u>Operating Voltage</u>	<u>Threshold</u>
2360	276990	03/20/2019	3.4	1750V	Alpha (120mV) Beta (3.5-30mV)
Detector Setup Report		YES NO <input checked="" type="checkbox"/>	Barcode Report		YES NO <input checked="" type="checkbox"/>
			Voltage Plateau		YES <input checked="" type="checkbox"/> NO
COMMENTS					
5 minute background performed		Efficiency performed on contact with 8ft cable		2 layer mylar (0.8mg/cm ²)	
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: M. Pauli	
				Date: 3/22/2018	
Certification Date: 03/22/2018			*Certification Due (6mo): 09/22/2018		
			* Certification Due (12mo): 03/22/2019		

* Calibration due date is dependant on users regulatory requirements.

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Email: ISFstaff@energysolutions.com

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

CUSTOMER INFORMATION				DETECTOR INFORMATION	
Customer Name: EnergySolutions Instrument Services				Manufacturer: Ludlum	
Address: 1570 Bear Creek Road Oak Ridge, TN 37830				Detector Model: 43-37B	
Contact Name: Mike Pauli				Serial Number: 190620	
Customer Purchase Order Number: N/A		Work Order Number: N/A		Evaluation Method: Source	
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION					
Source Nuclide: Tc ⁹⁹	Serial Number: 099608		Activity: 21,311 dpm	2 Pi Emissions: 10,499/min	Certification Date: 08/08/1996
Parameter	As Found	As Left	Precision Test		CPM
Count 1	4,849	4,849	Count 1 (Heel)		4,827
Count 2	4,744	4,744	Count 2 (Center)		4,668
Count 3	4,705	4,705	Count 3 (Toe)		4,788
Count 4	4,831	4,831	Average		4,761
Count 5	4,707	4,707	Tolerance		±10%
Count 6	4,997	4,997	Pass/Fail		Pass
Average	4,806	4,806			
Background (CPM)	645.8	645.8			
Net Counts	4,160	4,160			
2pi Efficiency	39.6%	39.6%			
4pi Efficiency	19.5%	19.5%			
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		
<u>Model</u>	<u>Serial Number</u>	<u>Due Date</u>	<u>Background (cpm)</u>	<u>Operating Voltage</u>	<u>Threshold</u>
2360	276990	03/20/2019	645.8	1750V	Alpha (120mV) Beta (3.5-30mV)
Detector Setup Report		YES NO ✓	Barcode Report		YES NO ✓
			Voltage Plateau		YES ✓ NO
COMMENTS					
5 minute background performed		Efficiency performed on contact with 8ft cable		2 layer mylar (0.8mg/cm ²)	
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: M. Pauli		Date: 3/22/2018	
Certification Date: 03/22/2018			*Certification Due (6mo): 09/22/2018		
			* Certification Due (12mo): 03/22/2019		

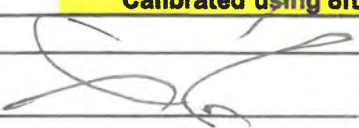
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EnergySolutions Services, Inc
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Email: Isfstaff@energysolutions.com

<http://www.energysolutions.com/>

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

CUSTOMER INFORMATION					INSTRUMENT INFORMATION						
Customer Name:		EnergySolutions			Manufacturer:						
Address:		1570 Bear Creek Rd Oak Ridge, TN 37830			Model:		2360	S.N.	276990		
Contact Name:		Mike Pauli			Probe:		43-37	S.N.	190620		
Customer PO No.:	N/A	Work Order Number:	N/A		Calibration Method:		Source				
Source Information											
		Isotope	Source ID	Certification Date	Activity (dpm)						
α Source		Pu-239	071601	7/25/16	23,887						
β Source		Tc-99	099608	8/8/96	21,311						
Ludlum Model 43-37 High Voltage Plateau with crosstalk											
Operating Voltage	High Voltage	Background		Alpha Source		Beta Source		Crosstalk		Efficiency	
		Alpha	Beta	Alpha	Beta	Alpha	Beta	α to β	β to α	α	β
	1,700	7.0	441.0	3,302.0	728.0	6.0	4,821.0	8.71%	0.00	13.79%	20.55%
	1,725	2.0	617.0	3,551.0	914.0	6.0	5,026.0	8.37%	0.09%	14.86%	20.69%
SET	1,750	5.0	799.0	3,859.0	1,052.0	7.0	4,537.0	6.56%	0.05%	16.13%	17.54%
	1,775	6.0	912.0	4,191.0	1,181.0	18.0	4,193.0	6.43%	0.37%	17.52%	15.40%
	1,800	15.0	938.0	4,451.0	1,225.0	44.0	3,681.0	8.17%	1.06%	18.57%	12.87%
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).											
Comments:											
Calibrated using 8ft C cable assembly											
Calibrated By: 				Reviewed By: <u>M. Pauli</u>				Date: <u>3/22/2018</u>			
Calibration Date: 3/22/18				Calibration Due: 3/22/19							



**CALIBRATION
CERTIFICATE**

EnergySolutions Services, Inc.
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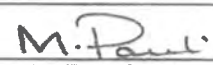
This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION			INSTRUMENT INFORMATION		
Customer Name: EnergySolutions Services, Inc.			Manufacturer: Ludlum		
Address: 1570 Bear Creek Road, Oak Ridge, TN 37830			Model: 19	Serial Number: 109899	
Contact Name: Mike Pauli			Probe: N/A	Serial Number: N/A	
Customer Purchase Order Number: N/A		Work Order Number: 2017-15513	Calibration Method: Electronic And Source		
INSTRUMENT CALIBRATION INFORMATION					
Range (µR/hr)	Calibration Standard Value	Tolerances (µR/hr)	Instrument Response		Comments
			As Found (µR/hr)	As Left (µR/hr)	
5000 Black	4,000 µR/hr	3,600 - 4,400	3,750	3,850	Pulser: 151067 Cal Due: 02/28/2018
	2,500 µR/hr	2,250 - 2,750	2,400	2,500	DVM: 92260808 Cal Due: 07/17/2018
	1,000 µR/hr	900 - 1,100	950	1,000	Temp/Press: 3590 Cal Due: 11/30/2017
500 Black	400 µR/hr	360 - 440	365	380	Humidity: 958670 Cal Due: 12/06/2017
	250 µR/hr	225 - 275	235	250	Temp: 24.8 °C Humidity: 39% Pressure: 737 mmHg
	Input cpm = 16,700	90 - 110	90	100	
250 Red	Input cpm = 32,000	180 - 220	185	200	
	Input cpm = 19,200	108 - 132	110	120	Geotropism: SAT Over Range: SAT
	Input cpm = 8,000	45 - 55	45	50	Batteries: SAT Mech. Zero: SAT
50 Black	Input cpm = 6,400	36 - 44	37	39	F/S Response: SAT Audio: SAT
	Input cpm = 4,000	22.5 - 27.5	22	25	Light: SAT
	Input cpm = 1,660	9 - 11	9.5	10	
25 Red	Input cpm = 3,200	18 - 22	18	20	Source: Due Date:
	Input cpm = 1,920	10.8 - 13.2	11	12	High Voltage As Found: 650V As Left: 650V
	Input cpm = 800	4.5 - 5.5	4.5	5	cpm/µR/hr: As Found: 176 As Left: 160
Precision Test --- Reading 1: 250µR/hr 2: 248µR/hr 3: 245 µR/hr Mean: 248µR/hr			Precision Test: SAT		
COMMENTS					
Special Remarks: High Voltage: 650Volts cpm/µR/hr: 160					
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			Date: 8/16/17		
Calibrated By: <i>M. Pauli</i>		Reviewed By: <i>J. M. Duferino</i>		Date: 8/16/17	
Certification Date: 08/15/2017			* Certification Due (6 mo.): 02/15/2018		
			* Certification Due (12 mo.): 08/15/2018		

* Calibration due date is dependent on users regulatory requirements.

EnergySolutions Services, Inc.
1570 Bear Creek Road
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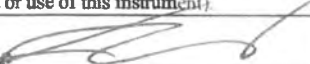

This Certificate will be accompanied by Calibration Charts or Readings where applicable

Customer Information			Instrument Information		
Customer Name: EnergySolutions Instrument Services			Manufacturer: Ludlum		
Address: 1570 Bear Creek Road, Oak Ridge, TN 37830			Model: 2929	Serial Number: 146780	
Contact Name: John Barncord			Probe: 43-10-1	Serial Number: 151113	
Customer Purchase Order Number: N/A		Work Order Number: 2017-XXXX	Calibration Method: Electronic And Source		
Instrument Calibration Information					
M&TE	ID Number	Calibration Due Date	Environmental Conditions		
Thermometer	3590	11/30/17	Temperature (°C)	24.7	
Barometer	3590	11/30/17	Pressure (mmHg)	737	
Hygrometer	958670	12/6/17	Humidity (%)	37.1	
Pulse Generator	130364	8/29/17	Calibrated in accordance with CP-IN-WI-235		
DVM	94710023	3/7/18			
Isotope	Source ID Number	Decayed Activity (dpm)	2Pi Emissions (EPM)	Source Cert. Date	
Pu ²³⁹	101501	24,222	12,230/ min	11/10/2015	
Tc ⁹⁹	099608	21,311	10,500/ min	08/08/1996	
Th ²³⁰	119738	18,600	8,638/ min	10/27/1997	
Sr ⁹⁰	129676	11,320	7,974/min	05/12/2003	
Frequency Calibration					
Desired (cpm)	Tolerances (cpm)	Alpha As Found (cpm)	Alpha As Left (cpm)	Beta As Found (cpm)	Beta As Left (cpm)
40	40	40	40	40	40
400	(392 - 408)	398	398	399	399
4,000	(3,920 - 4,080)	3,983	3,983	3,983	3,983
40,000	(39.2K - 40.8K)	39,829	39,829	39,836	39,836
400,000	(392K - 408K)	398,270	398,270	398,246	398,246
Background Determination		Alpha As Found	Alpha As Left	Beta As Found	Beta As Left
Counts, C _b		18	6	917	864
Time, T _b	(min)	20	20	20	20
Rate, R _b	(cpm)	.9	.3	45.85	43.2
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).					
Calibrated By: 		Reviewed By: 		Date: 6/20/2017	
Calibration Date: 06/17/2017		* Calibration Due (6 mo.): 12/17/2017		* Calibration Due (12 mo.): 06/17/2018	

* Calibration due date is dependent on users regulatory requirements.

CROSS TALK & EFFICIENCY SHEET

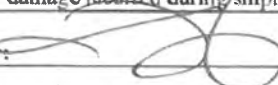
Instrument ID: 146780

As Found Alpha Threshold (mV)		As Left Alpha Threshold (mV)			
172.5		172.5			
Alpha Source: Cross Talk – Performed using Pu ²³⁹ #101501					
Parameter and Tolerance	Alpha As Found	Alpha As Left	Beta As Found	Beta As Left	
Source Count, C _s	39,186	39,505	1,584	1,476	
Time, T _s (min)	5	5	5	5	
Rate, R _s (cpm)	R _{s[α]} = 7,837.2	R _{s[α]} = 7,901	R _{s[β]} = 316.8	R _{s[β]} = 295.2	
4π EFF (% Net cpm/dpm) (>25%)	32.35%	32.6%	N/A	N/A	
2π EFF (% Net cpm/emissions)	64.1%	64.6%	N/A	N/A	
%Crosstalk [α to β] (< 10%)	$\frac{R_{s[\beta]} - R_{b[\beta]}}{R_{s[\alpha]} - R_{b[\alpha]}} = \frac{295.2 - 43.2}{7903 - 0.3} = 3.19\%$				
As Found Beta Low Threshold	As Left Beta Low Threshold	As Found Beta High Threshold	As Left Beta High Threshold		
4.0 mV	4.0 mV	50.0 mV	50.0 mV		
Beta Source: Cross Talk Performed Using Tc ⁹⁹ #099608					
Parameter and Tolerance	Alpha As Found	Alpha As Left	Beta As Found	Beta As Left	
Source Count, C _s	14	6	27,977	27,829	
Time, T _s (min)	5	5	5	5	
Rate, R _s (cpm)	R _{s[α]} = 2.8	R _{s[α]} = 1.2	R _{s[β]} = 5,595.4	R _{s[β]} = 5,565.8	
4π EFF (% Net cpm/dpm) (>10%)	N/A	N/A	26.26%	26.1%	
2π EFF (% Net cpm/emissions)	N/A	N/A	53.29%	53.0%	
%Crosstalk [β to α] (< 1%)	$\frac{R_{s[\alpha]} - R_{b[\alpha]}}{R_{s[\beta]} - R_{b[\beta]}} = \frac{1.2 - 0.3}{5565.8 - 43.2} = 0.016\%$				
High Voltage Power Supply Calibration					
Desired Voltage	Tolerance	DVM As Found	DVM As Left	2929 Meter As Found	2929 Meter As Left
600	540 - 660	570	570	600	600
800	720 - 880	789	789	800	800
1,000	900 - 1,100	1,006	1,006	1,000	1,000
1,200	1,080 - 1,320	1,221	1,221	1,200	1,200
1,300	1,170 - 1,430	1,336	1,336	1,300	1,300
High Voltage		As Found	Vern Dial Reading	As Left	Vern Dial Reading
		850V	3.40	850V	3.40
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).					
Calibrated By: 	Reviewed By: 	Date: 6/20/2017			
Calibration Date: 06/17/2017			* Calibration Due (6 mo.): 12/17/2017		
			* Calibration Due (12 mo.): 06/17/2018		

* Calibration due date is dependent on users regulatory requirements.

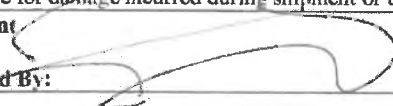
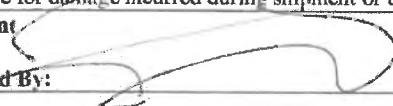
EFFICIENCY SHEET

Instrument ID: 146780

As Found Alpha Threshold (mV)		As Left Alpha Threshold (mV)		
172.5		172.5		
Alpha Source: Efficiency determined using Th²³⁰ #119738				
Parameter and Tolerance	Alpha As Found	Alpha As Left	Beta As Found	Beta As Left
Source Count, C _s	30,561	30,681	3,688	3,607
Time, T _s (min)	5	5	5	5
Rate, R _s (cpm)	R _{s[α]} = 6,113.2	R _{s[α]} = 6,136.2	R _{s[β]} = 737	R _{s[β]} = 721.4
4π EFF (% Net cpm/dpm) (>25%)	32.86%	32.99%	N/A	N/A
2π EFF (% Net cpm/emissions)	70.75%	71.04%	N/A	N/A
Beta Source: Efficiency determined using Sry⁹⁰ #129676				
Parameter and Tolerance	Alpha As Found	Alpha As Left	Beta As Found	Beta As Left
Source Count, C _s	18	29	18,728	18,884
Time, T _s (min)	5	5	5	5
Rate, R _s (cpm)	R _{s[α]} = 3.6	R _{s[α]} = 5.8	R _{s[β]} = 3,745.6	R _{s[β]} = 3,776.8
4π EFF (% Net cpm/dpm) (>10%)	N/A	N/A	30.09%	33.3%
2π EFF (% Net cpm/emissions)	N/A	N/A	46.97%	47.4%
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).				
Calibrated By: 	Reviewed By: <u>M. Paul</u>	Date: <u>6/20/2017</u>		
Calibration Date: 06/17/2017		* Calibration Due (6 mo.): 12/17/2017		
		* Calibration Due (12 mo.): 06/17/2018		

* Calibration due date is dependent on users regulatory requirements.

Instrument ID: 146780

Source and Background Plateau Worksheet								
High Voltage	Background		Alpha Source		Beta Source		Cross Talk	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	α to β	β to α
600								
650								
700								
750								
800								
850	Plateau not required—All As Found within tolerance							
900								
950	As Found HV = As Left HV							
1000								
1050								
1100								
1150								
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: 			Reviewed By: <i>M. Paul</i>			Date: <i>06/20/2017</i>		
Calibrated By: 			Calibration Date: <i>06/17/2017</i>			* Calibration Due (6 mo.): <i>12/17/2017</i>		
						* Calibration Due (12 mo.): <i>06/17/2018</i>		

* Calibration due date is dependent on users regulatory requirements.

Ludlum Model 2929 Serial Number: 146780
Beta Background (cpm): 43.2 **Alpha Background (cpm):** 0.3
Beta Source Nuclide: Tc99 **Alpha Source Nuclide:** Th230
Beta Source ID Number: 99608 **Alpha Source ID Number:** 119738

Spreadsheet Modified and V&V by Jeff Dickinson on 3/30/04

Chi-Square and Control Chart Data:

Print Macros:

Beta Source		Alpha Source	
Count Number	Source Count	Count Number	Source Count
(N)	(x)	(N)	(x)
1	5529	1	6,126
2	5457	2	6087
3	5580	3	5977
4	5560	4	6061
5	5602	5	6040
6	5485	6	5995
7	5491	7	6059
8	5612	8	6145
9	5644	9	5922
10	5744	10	6239
11	5503	11	6086
12	5503	12	6181
13	5523	13	6217
14	5412	14	5995
15	5545	15	6139
16	5712	16	6098
17	5588	17	6257
18	5557	18	6088
19	5655	19	6062
20	5637	20	6145

Beta Source Data/Chart

Alpha Source Data/Chart

High Voltage	Background		Alpha Source		Beta Source		Cross Talk	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	α to β	β to α
600	N/A	N/A	N/A	N/A	N/A	N/A	#VALUE!	#VALUE!
650							0.00%	0.00%
700							0.00%	0.00%
750							0.00%	0.00%
800							0.00%	0.00%
850							0.00%	0.00%
900							0.00%	0.00%
950							0.00%	0.00%
1000							0.00%	0.00%
1050							0.00%	0.00%
1100							0.00%	0.00%
1150							0.00%	0.00%
1200							0.00%	0.00%
1250							0.00%	0.00%
1300							0.00%	0.00%

Beta Source Chi-Square Test

Ludlum Model 2929 Serial Number: 146780 Tc99 99608

<u>Count Number (N)</u>	<u>Source Count (x)</u>	<u>x-Mean</u>	<u>(x-Mean)²</u>
1	5529	-37.95	1440.20
2	5457	-109.95	12089.00
3	5580	13.05	170.30
4	5560	-6.95	48.30
5	5602	35.05	1228.50
6	5485	-81.95	6715.80
7	5491	-75.95	5768.40
8	5612	45.05	2029.50
9	5644	77.05	5936.70
10	5744	177.05	31346.70
11	5503	-63.95	4089.60
12	5503	-63.95	4089.60
13	5523	-43.95	1931.60
14	5412	-154.95	24009.50
15	5545	-21.95	481.80
16	5712	145.05	21039.50
17	5588	21.05	443.10
18	5557	-9.95	99.00
19	5655	88.05	7752.80
20	5637	70.05	4907.00
	<u>Σ=</u> 111339	<u>(x-Mean)² =</u>	<u>135616.95</u>

Mean = 5566.95

Chi² = 24.36

σ = 84.49

2σ = 168.9702

Reduce Chi Square = 1.282162

3σ = 253.46

Reduced Chi Pass/Fail = PASS

Performed By/Date  / 6/17/17

Reviewed By/Date M. Paul / 6/20/2017

Alpha Source Chi-Square Test

Ludlum Model 2929	Serial Number: 146780	Source Nuclide Th230	Source ID 119738
<u>Count Number (N)</u>	<u>Source Count (x)</u>	<u>x-Mean</u>	<u>(x-Mean)²</u>
1	6126	30.05	903.00
2	6087	-8.95	80.10
3	5977	-118.95	14149.10
4	6061	-34.95	1221.50
5	6040	-55.95	3130.40
6	5995	-100.95	10190.90
7	6059	-36.95	1365.30
8	6145	49.05	2405.90
9	5922	-173.95	30258.60
10	6239	143.05	20463.30
11	6086	-9.95	99.00
12	6181	85.05	7233.50
13	6217	121.05	14653.10
14	5995	-100.95	10190.90
15	6139	43.05	1853.30
16	6098	2.05	4.20
17	6257	161.05	25937.10
18	6088	-7.95	63.20
19	6062	-33.95	1152.60
20	6145	49.05	2405.90
	Σ= 121919	(x-Mean) ² =	147760.95

Mean = 6095.95

Chi² = 24.24

σ = 88.19

2σ = 176.3733779

Reduce Chi-Square = 1.275747

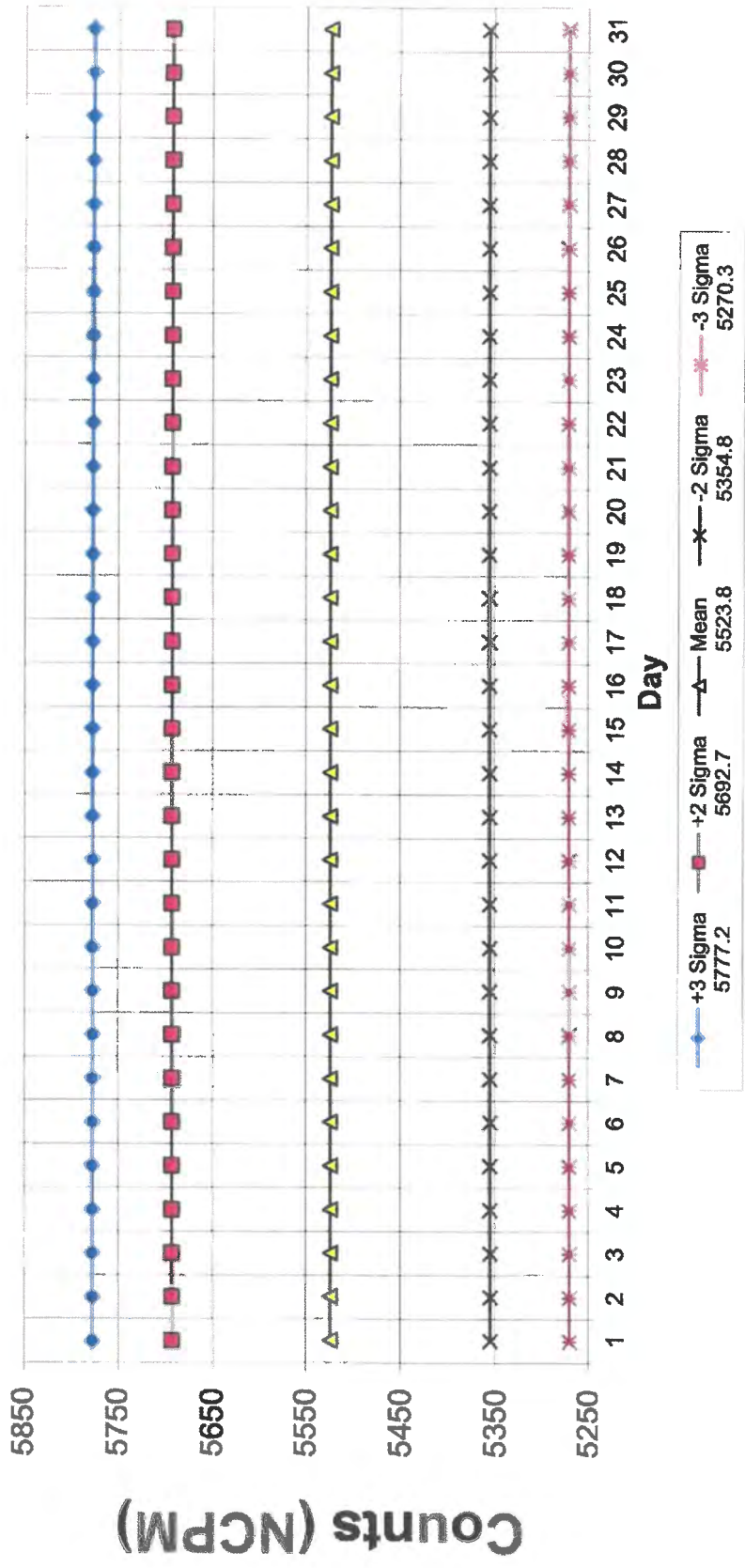
3σ = 264.56

Reduced Chi Pass/Fail = PASS

Performed By/Date  / 6/17/17

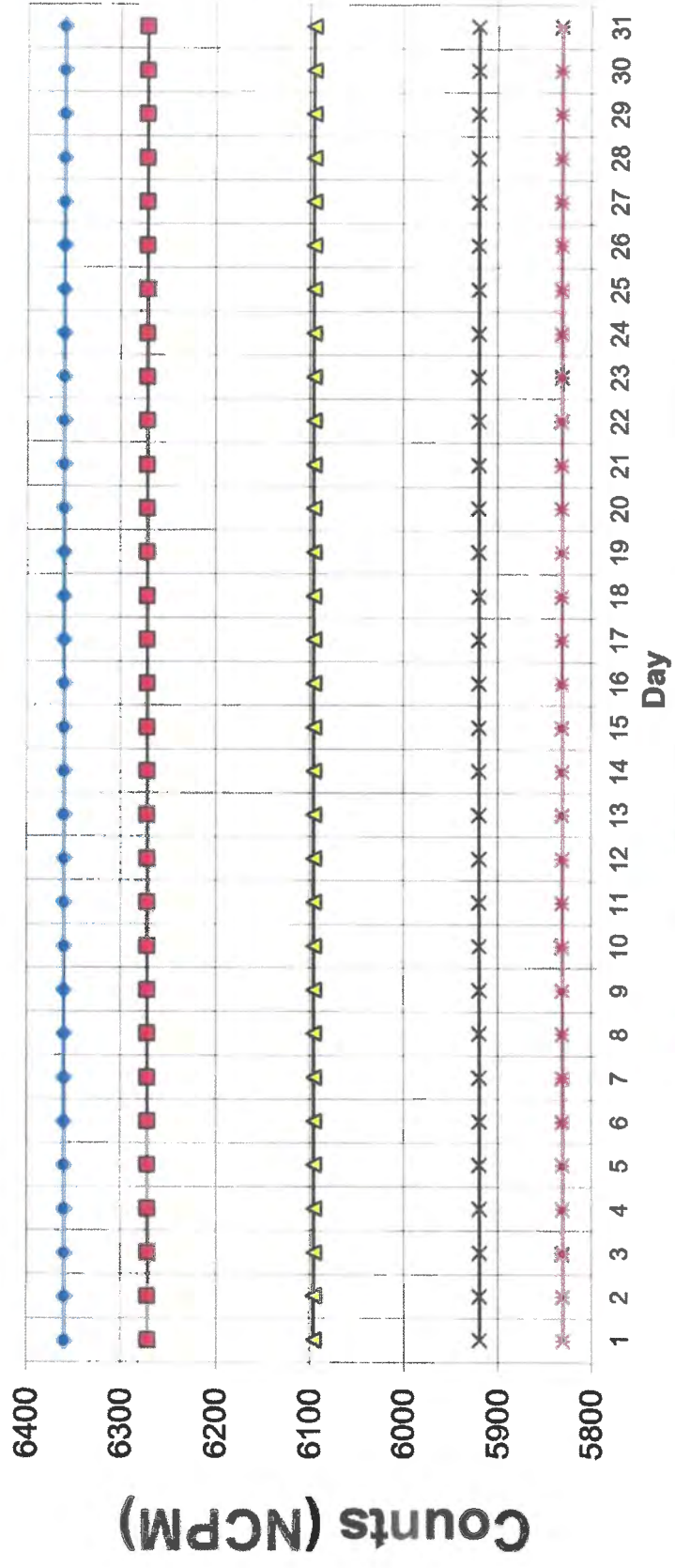
Reviewed By/Date M. Pauli / 6/20/2017

Control Chart Month Of 20
 Instrument _____, Source# _____, Isotope _____



Reviewed By _____ Date _____

Control Chart Month Of 20
 Instrument _____, Source# _____, Isotope _____



Reviewed By _____ Date _____



**CALIBRATION
CERTIFICATE**

EnergySolutions Services, Inc.
 1570 Bear Creek Rd
 Oak Ridge, TN 37830
 Phone: (877) 462-4873
 Fax: (865) 220-1346
 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: 2350-1	Serial Number: 203475
Contact Name: Mike Pauli		Probe: N/A	Serial Number: N/A
Customer Purchase Order Number: N/A	Work Order Number: 2018-15781	Calibration Method: Electronic	

INSTRUMENT CALIBRATION INFORMATION

Instrument Range (CPM)	Calibration Standard Value (CPM)	Instrument Response ($\pm 10\%$)		Comments
		Before Calibration	After Calibration	
400	400	399	399	Pulser: 151067 Cal Due: 02/28/2018
4,000	4,000	3,989	3,989	DVM: 94710023 Cal Due: 03/07/2018
40,000	40,000	39,886	39,886	Temp / Press: 3314 Cal Due: 02/01/2018
400,000	400,000	398,868	398,868	Humidity: 992290 Cal Due: 03/13/2018
HV Cal Values (M2350 HV Entry)	Desired HV Tolerance (Voltmeter) (VDC)	As Found (VDC)	As Left (VDC)	CP Firmware Version: 37122N28 I/O Firmware Version: 37123N05 Temp: 18.7 °C Pressure: 752 mmHg Humidity: 12.1 %
500	(490 - 510)	498	498	
1,500	(1,498 - 1,502)	1,499	1,499	
2,000	(1,940 - 2,060)	1,997	1,997	
Parameter	Tolerance ($\pm 10\%$)	As Found	As Left	
Threshold T = 100	10 \pm (9 to 11) mVDC	10.5	10.5	BAT > 4.5: SAT
Threshold T = 500	50 \pm (45 to 55) mVDC	51.3	51.3	Volume: SAT ACK / Scroll: SAT
Threshold T = 1000	100 \pm (90 to 110) mVDC	102	102	Audio Divide: SAT Count: SAT
Window Width W = 100	10 \pm (9 to 11) mVDC	9.6	9.6	Backlight: SAT Alarms: SAT
Display-to-mV ratio:	100 to 10 mV			Overload Test: SAT Physical Cond: SAT

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 Wilson*

Date: 1/19/18

Calibration Date: 01/18/2018

* Certification Due (6 mo.): 07/18/2018

* Certification Due (12 mo.): 01/18/2019

* Calibration due date is dependent on users regulatory requirements.

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			DETECTOR INFORMATION			
Customer Name: EnergySolutions Instrument Services			Manufacturer: Ludlum			
Address: 1570 Bear Creek Road Oak Ridge, TN 37830			Detector Model: 44-10			
Contact Name: Mike Pauli			Serial Number: 185844			
Customer Purchase Order Number: N/A		Work Order Number: 2017-15322		Evaluation Method: Source		
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION						
1) Source Nuclide: Cs ¹³⁷	Serial Number: 019454	Activity: 5µCi nominal		Certification Date: N/A (Used for Plateau Only)		
2) Source Nuclide: Cs ¹³⁷	Serial Number: 049711	Activity: Variable		Due Date: 09/16/2017		
Scaler Information		Precision Test		mR/Hr (Source #2)		
2350-1	#95352	Count 1		2.00		
Due Date	10/17/2017	Count 2		2.01		
Threshold	T=100 (10mV)	Count 3		1.99		
Cable Length	5ft	Average		2.00		
Temp/Press: 3590	Cal Due: 11/30/2017	Tolerance ±10%		All counts within ±10% of Average		
Humidity Pen: 958670	Cal Due: 12/06/2017	Pass/Fail				
Temp: 24.8 °C		Humidity: 41%		Press: 739 mmHg		
Low Sample Activity (400uR/hr): Using Source #2 = 70,500		High Sample Activity (2mR/hr) Using Source #2 = 264,384		Dead Time (DT): 1.418247E-05	Calibration Constant (CC): 5.768112E+10	
ATTACHMENTS			DETECTOR DATA: DOSE RATE PROBES (mR/Hr)			
Detector Setup Report	√YES NO		Desired Exposure	Tolerance ±10%	As Found	As Left
Barcode Report	√YES NO		0.400	0.360-0.440	0.406	0.406
Voltage Plateau:	√YES NO		0.900	0.810 – 0.990	0.874	0.874
High Voltage: 950V			2	1.8-2.2	2.00	2.00
COMMENTS						
Detectors set up with a 2350-1 may be used with any 2350-1 provided that the 2350-1 to be used is in calibration and the setup parameters are scanned into the 2350-1 prior to use with that specific detector						
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: <i>M. Pauli</i>		Reviewed By: <i>J. J. [Signature]</i>		Date: 4/25/17	
Certification Date: 04/21/2017			*Certification Due (6mo): 10/21/2017			
			*certification Due (12mo): 04/21/2018			

* Calibration due date is dependant on users regulatory requirements.

background plateau 44-10#185844 2/22/2017

750	1139
800	1212
850	1131
900	1237
950	1186
1000	1145
1050	1089
1100	1132
1150	1128
1200	1234
1250	1453
1300	2171
1350	3582

source plateau Cs-137#1296117 5uCi

700	4254
750	4537
800	4609
850	4854
900	4933
950	4844
1000	4835
1050	4978
1100	4804
1150	4923
1200	4978
1250	5465
1300	7204
1350	9903

DETECTOR SETUP CHECK LIST REPORT

The following list is stored as detector setup D1 in the Model 2350.
Today's date is 04/21/2017.
The current time of day is: 14:14:20.

I have verified the list below
has NO discrepancies with the DETECTOR SETTINGS TABLE: 4

Comments:

Model 2350 Serial # =	95352.
User I.D. =	
High Voltage =	950 volts.
Threshold =	100.
Window =	1000,Off.
Overload Current =	40.0 micro amperes.
Scaler Count Time =	12 seconds.
Readout Units =	R.
Readout Time Base =	hr.
Readout Range Multiplier =	auto.
Detector Dead Time =	1.418247E-05.
Detector Calibration Constant =	5.768112E+10.
Detector Model =	44-10DOSE.
Detector Serial # =	185844.
Ratemeter Alarm Setting =	1.000000E+09.
Scaler Alarm Setting =	1000000.
Integrated Dose Alarm Setting =	1.000000E+09.
Low Count Alarm Setting =	X.
Operating Battery Voltage =	5.8 volts.

det1

Generated: 04/21/2017 14:13:02.

Model 2350 Serial #95352



H950\$R

Set High Voltage: 950



T100\$Q

Set Threshold: 100



W1000\$WOFF\$P

Set Window: 1000,OFF



O400\$OOFF\$C

Set Overload: 400,OFF



F12\$E

Set Scaler Count Time: 12



SU4\$F

Set Readout Units = R



SB2\$.

Set Readout Time Base = hr



SM0\$3

Set Readout Range Multiplier = auto



SL1.418247E-05\$Z

Set Dead Time: 1.418247E-05



SC5.768112E+10\$U

Set Calibration Constant: 5.768112E+10



M44-10DOSE\$D

Set Detector Model: 44-10DOSE



N185844\$6

Set Detector Serial #: 185844



J1.000000E+09\$V

Set Ratemeter Alarm: 1.000000E+09



K1000000\$H

Set Scaler Alarm: 1000000



P1.000000E+09\$.

Set Dose Alarm: 1.000000E+09



SP1\$7

SAVE PARAMETERS AS D1

DETECTOR SETUP CHECK LIST REPORT

The following list is stored as detector setup D2 in the Model 2350.
Today's date is 04/21/2017.
The current time of day is: 14:14:42.

I have verified the list below
has NO discrepancies with the DETECTOR SETTINGS TABLE:

Comments:

Model 2350 Serial # =	95352.
User I.D. =	.
High Voltage =	950 volts.
Threshold =	100.
Window =	1000,Off.
Overload Current =	40.0 micro amperes.
Scaler Count Time =	60 seconds.
Readout Units =	counts.
Readout Time Base =	min.
Readout Range Multiplier =	auto.
Detector Dead Time =	1.420000E-05.
Detector Calibration Constant =	1.000000E+00.
Detector Model =	44-10CPM.
Detector Serial # =	185844.
Ratemeter Alarm Setting =	1.000000E+09.
Scaler Alarm Setting =	1000000.
Integrated Dose Alarm Setting =	1.000000E+09.
Low Count Alarm Setting =	X.
Operating Battery Voltage =	5.8 volts.

Model 2350 Serial #95352



H950\$R

Set High Voltage: 950



T100\$Q

Set Threshold: 100



W1000\$W\$OFF\$P

Set Window: 1000,OFF



O400\$O\$OFF\$C

Set Overload: 400,OFF



F60\$H

Set Scaler Count Time: 60



SU7\$I

Set Readout Units = counts



SB1\$-

Set Readout Time Base = min



SM0\$3

Set Readout Range Multiplier = auto



SL1.420000E-05\$F

Set Dead Time: 1.420000E-05



SC1.000000E+00\$0

Set Calibration Constant: 1.000000E+00



M44-10CPM\$-

Set Detector Model: 44-10CPM



N185844\$6

Set Detector Serial #: 185844



J1.000000E+09\$V

Set Ratemeter Alarm: 1.000000E+09



K1000000\$H

Set Scaler Alarm: 1000000



P1.000000E+09\$.

Set Dose Alarm: 1.000000E+09



SP2\$8

SAVE PARAMETERS AS D2



**CALIBRATION
CERTIFICATE**

EnergySolutions Services, Inc.
1570 Bear Creek Road
Oak Ridge, TN 37830
Phone: (877) 462-4873
Fax: (865) 220-1346

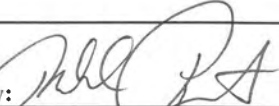

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION					INSTRUMENT INFORMATION				
Customer Name: EnergySolutions Services, Inc.					Manufacturer: Ludlum				
Address: 1570 Bear Creek Road Oak Ridge, TN 37830					Model: 2360		Serial Number: 297758		
Contact Name: Mike Pauli					Probe: 43-93		Serial Number: 299597		
Customer Purchase Order Number: N/A		Work Order Number: 2018-15832			Calibration Method: Electronic				
INSTRUMENT CALIBRATION INFORMATION									
Instrument Range	Calibration Standard Value	Tolerance (cpm) (± 10%)	Ratemeter Response		Calibration Standard Value (CPM)	Time Base (minutes)	Tolerances (cpm) ± 2%	Scaler Response	
			As Found	As Left				As Found	As Left
X 1	100	90 - 110	100	100	40,000 CPM	0.1	3,920-4,080	3,987	3,987
X 1	250	225 - 275	250	250	40,000 CPM	0.5	19.6K-20.4K	19,935	19,935
X 1	400	360 - 440	400	400	40,000 CPM	1	39.2K-40.8K	39,863	39,863
X 10	1,000	900 - 1,100	1,000	1,000	40,000 CPM	2	78.4K-81.6K	79,726	79,726
X 10	2,500	2,250 - 2,750	2,500	2,500					
X 10	4,000	3,600 - 4,400	4,000	4,000					
X 100	10,000	9,000 - 11,000	10,000	10,000					
X 100	25,000	22,500 - 27,500	25,000	25,000					
X 100	40,000	36,000 - 44,000	40,000	40,000					
X 1000	100,000	90,000 - 110,000	100,000	100,000	Calibrated in accordance with OEM Technical Manual				
X 1000	250,000	225,000 - 275,000	250,000	250,000					
X 1000	400,000	360,000 - 440,000	400,000	400,000					
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			Reviewed By: <i>[Signature]</i>			Date: 2/15/18			
Calibrated By: <i>M. Pauli</i>			*Calibration Due (6mo): 08/14/2018						
Calibration Date: 02/14/2018			*Calibration Due (12mo): 02/14/2019						

* Calibration due date is dependant on users regulatory requirements.

Model: 2360

Serial Number: 297758

M&TE				Environmental Conditions			
Volt Meter	ID# 94710023	Cal Due: 03/07/2018	Barometer	ID# A070146	Cal Due: 03/13/18		
Pulser	ID# 151067	Cal Due: 02/28/2018	Thermometer	ID# A070146	Cal Due: 03/13/18		
Humidity	ID# 992290	Cal Due: 03/13/2018	Temp: 21.4 °C	Pressure: 751 mmHg	Humidity: 44 %		
Special Test							
Mechanical Zero		Sat (√) Unsat ()	Geotropism		Sat (√) Unsat ()		
LCD Display Check		Sat (√) Unsat ()	Audio Check		Sat (√) Unsat ()		
BAT Check		Sat (√) Unsat ()	Low BAT Set		Sat (√) Unsat ()		
Reset		Sat (√) Unsat ()	Physical Condition		Sat (√) Unsat ()		
HV Analog Display		Sat (√) Unsat ()	As Found		As Left		
High Voltage Calibration (± 10%)				Alpha Sensitivity =	124 mv	Alpha Sensitivity =	120 mv
Voltage	Tolerance	As Found	As Left	Beta Sensitivity =	3.8 mv	Beta Sensitivity =	3.5 mv
500	450-550	502	502	Beta Window =	31.4 mv	Beta Window =	30 mv
1000	900-1100	990	990	Beta Setpoints--Pulser counts detected at 3.5mv ± 1mv and shut off at 30mv for beta. For Alpha channel counts detected at 120mv and above.			
1500	1350-1650	1,476	1,476				
H.V. Set With Detector Not Connected				Overload to be set with detector to be used			
COMMENTS							
<p>Calibrated in accordance with OEM Technical Manual</p> <p>See detector certificate for High Voltage setting</p> <p>**Calibrated with 5ft cable**</p>							
Instrument				Reviewed By: 			
Calibrated By: 				Date: 2/15/18			
Calibration Date: 02/14/2018				*Calibration Due (6mo): 08/14/2018			
				*Calibration Due (12mo): 02/14/2019			

* Calibration due date is dependant on users regulatory requirements.

EnergySolutions 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: EnergySolutions Services, Inc.			Manufacturer: Ludlum			
Address: 1570 Bear Creek Road, Oak Ridge, TN 37830			Detector Model: 43-93			
Contact Name: Mike Pauli			Serial Number: 299597			
Customer Purchase: Order Number: N/A		Work Order Number: 2018-15837	Evaluation Method: Source			
DETECTOR EVALUATION INFORMATION						
Source Nuclide	Serial Number	Activity (dpm)	2 Pi Emissions	Net Response (cpm)	4pi Eff (%) **	2pi Eff (%) **
Th-230	051301	20,694	10,450 / min	4,649	22.5	44.4
Tc-99	051304	24,330	13,380 / min	4,191	17.2	31.3
Pu ²³⁹	101501	24,222	12,230 / min	5,341	22.1	43.7
SrY-90	101502	42,348	24,211 / min	14,373	33.9	59.4
SCALER INFORMATION			DETECTOR INFORMATION			
Model	Serial Number	Due Date	Background	Operating Voltage	Threshold	
2360	297758	02/14/2019	0.8	900 V	Alpha (120 mV)	
2360	297758	02/14/2019	201.8	900 V	Beta (3.5 - 30 mV)	
ATTACHMENTS						
Voltage Plateau: √ YES NO		MDA/Cross Talk Evaluation: √ YES NO				
COMMENTS			LINEARITY TEST (Gross Counts)			
Calibrated with 5ft. cable Linearity test performed with Tc-99, #051304. Calibrated in accordance with original equipment technical manual. ** Efficiencies done on contact with detector screen.			Count 1 (Toe)	4,248		
			Count 2 (Mid)	4,362		
			Count 3 (Heel)	4,568		
			Average	4,393		
			Pass/Fail	PASS (+/-10% Tolerance)		
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: <i>M. Pauli</i>			Reviewed By: <i>John R. A.</i>	
Certification Date: 02/14/2018		* Certification Due (6 mo.): 08/14/2018			Date: <i>2-15-18</i>	
		* Certification Due (12 mo.): 02/14/2019				

* Calibration due date is dependent on users regulatory requirements.

EnergySolutions Services, Inc
1570 Bear Creek Road
Oak Ridge, TN 37830

Phone: (877) 462-4873
Fax: (865) 220-1346
Email: Isfstaff@energysolutions.com

<http://www.energysolutions.com/>

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

CUSTOMER INFORMATION				INSTRUMENT INFORMATION			
Customer Name:	EnergySolutions Services, Inc.			Manufacturer:			
Address:	1570 Bear Creek Rd., Oak Ridge, TN 37830			Model:	2360	S.N.	297758
Contact Name:	Mike Pauli			Probe:	43-93	S.N.	299597
Customer PO No.:	N/A	Work Order Number:	2018-15837	Calibration Method:	Source		

Source Information

	Isotope	Source ID	Certification Date	Activity (dpm)
α Source	Pu-239	101501	11/1/15	24,222
β Source	Tc-99	051304	5/15/13	24,330

Ludlum Model 43-93 High Voltage Plateau with crosstalk

Operating Voltage	High Voltage	Background		Alpha Source		Beta Source		Crosstalk		Efficiency	
		Alpha	Beta	Alpha	Beta	Alpha	Beta	α to β	β to α	α	β
	850	4	134	5,119	273	1	3,351	2.72%	0.00	21.12%	13.22%
	875	1	173	5,168	343	1	3,844	3.29%	0.00%	21.33%	15.09%
SET	900	2	200	5,297	494	1	4,444	5.55%	0.00	21.86%	17.44%
	925	1	213	5,371	697	1	4,827	9.38%	0.00%	22.17%	18.96%
	950	2	277	5,453	932	2	5,185	12.65%	0.00%	22.50%	20.17%

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).

Comments:

Calibrated By: M. Pauli Reviewed By: [Signature] Date: 2-15-18

Calibration Date: 2/14/18 Calibration Due: 2/14/19



**CALIBRATION
CERTIFICATE**

EnergySolutions Services, Inc.
1570 Bear Creek Road
Oak Ridge, TN 37830
Phone: (877) 462-4873
Fax: (865) 220-1346

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

CUSTOMER INFORMATION		INSTRUMENT INFORMATION	
Customer Name: EnergySolutions Services, Inc.		Manufacturer: Ludlum	
Address: 1570 Bear Creek Road, Oak Ridge, TN 37830		Model: 2360	Serial Number: 268488
Contact Name: Mike Pauli		Probe: N/A	Serial Number: N/A
Customer Purchase Order Number: N/A	Work Order Number: 2017-15616	Calibration Method: Electronic	

INSTRUMENT CALIBRATION INFORMATION

Instrument Range	Calibration Standard Value (CPM)	Ratemeter (CPM) Response ($\pm 10\%$ of Standard Values)		Calibration Standard Value	Time Base (minutes)	Tolerances (counts) $\pm 2\%$	Scaler Response (counts)	
		As Found	As Left				As Found	As Left
X 1	100	100	100	40,000 CPM	0.1	3,920 - 4,080	3,978	3,978
X 1	250	250	250	40,000 CPM	0.5	19.6K - 20.4K	19,891	19,891
X 1	400	400	400	40,000 CPM	1	39.2K - 40.8K	39,788	39,788
X 10	1,000	1,000	1,000	40,000 CPM	2	78.4K - 81.6K	79,587	79,587
X 10	2,500	2,500	2,500					
X 10	4,000	4,000	4,000					
X 100	10,000	10,000	10,000					
X 100	25,000	25,000	25,000					
X 100	40,000	40,000	40,000					
X 1000	100,000	100,000	100,000	Calibrated in accordance with OEM Technical Manual				
X 1000	250,000	250,000	250,000					
X 1000	400,000	400,000	400,000					

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: <i>M. Pauli</i>	Reviewed By: <i>J. D. Dierksen</i> Date: 10/30/17
Calibration Date: 10/27/2017	* Calibration Due (6 mo.): 04/27/2018
	* Calibration Due (12 mo.): 10/27/2018

* Calibration due date is dependent on users regulatory requirements.

Model: 2360

Serial Number: 268488

M&TE				Environmental Conditions			
Volt Meter	ID#	958670 94710023	Cal Due: 12/06/2017 3/7/2018	Barometer	ID#	3590 Cal Due: 11/30/17	
Pulser	ID#	151067	Cal Due: 02/28/2018	Thermometer	ID#	3590 Cal Due: 11/30/17	
Humidity	ID#	958670	Cal Due: 12/06/2017	Temp: 23.2 °C	Pressure: 738 mmHg	Humidity: 38.5 %	
Special Test							
Mechanical Zero			Sat (<input checked="" type="checkbox"/>) Unsat ()	Geotropism			Sat (<input checked="" type="checkbox"/>) Unsat ()
LCD Display Check			Sat (<input checked="" type="checkbox"/>) Unsat ()	Audio Check			Sat (<input checked="" type="checkbox"/>) Unsat ()
BAT Check			Sat (<input checked="" type="checkbox"/>) Unsat ()	Low BAT Set			Sat (<input checked="" type="checkbox"/>) Unsat ()
Reset			Sat (<input checked="" type="checkbox"/>) Unsat ()				
HV Analog Display			Sat (<input checked="" type="checkbox"/>) Unsat ()	As Found			As Left
High Voltage Calibration (± 10%)				Alpha Sensitivity = 125 mV		Alpha Sensitivity = 120 mV	
Voltage	Tolerance	As Found	As Left	Beta Sensitivity = 3.8 mV		Beta Sensitivity = 3.5 mV	
500	450 - 550	545	503	Beta Window = 35.6 mV		Beta Window = 30 mV	
1,000	900 - 1,100	1,036	993	Beta Setpoints—Pulser counts detected at 3.5 mV ± 1 mV and shut off at 30 mV for beta. For Alpha channel counts detected at 120 mV and above.			
1,500	1,350 - 1,650	1,548	1,499				
H.V. Set With Detector Not Connected				Overload to be set with detector to be used			
COMMENTS							
<p>Calibrated in accordance with OEM Technical Manual</p> <p>See detector certificate for High Voltage setting</p> <p>**Calibrated with 8ft cable**</p>							
Instrument				Reviewed By: <i>J. Dukens</i> Date: 10/30/17			
Calibrated By: <i>M. Paul</i>				* Calibration Due (6 mo.): 04/27/2018			
Calibration Date: 10/27/2017				* Calibration Due (12 mo.): 10/27/2018			

* Calibration due date is dependent on users regulatory requirements.

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

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

CUSTOMER INFORMATION			DETECTOR INFORMATION		
Customer Name: EnergySolutions Instrument Services			Manufacturer: Ludlum		
Address: 1570 Bear Creek Road Oak Ridge, TN 37830			Detector Model: 43-37B		
Contact Name: Mike Pauli			Serial Number: 190672		
Customer Purchase Order Number: N/A		Work Order Number: 2017-15616	Evaluation Method: Source		
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION					
Source Nuclide: Tc ⁹⁹	Serial Number: 099608		Activity: 21,311 dpm	2 Pi Emissions: 10,499/min	Certification Date: 08/08/1996
Parameter	As Found	As Left	Precision Test		CPM
Count 1	4,862	4,862	Count 1 (Heel)		4,866
Count 2	4,774	4,774	Count 2 (Center)		4,648
Count 3	4,543	4,543	Count 3 (Toe)		4,307
Count 4	4,662	4,662	Average		4,607
Count 5	4,547	4,547	Tolerance		±10%
Count 6	4,584	4,584	Pass/Fail		Pass
Average	4,662	4,662			
Background (CPM)	772.8	772.8			
Net Counts	3,889	3,889			
2pi Efficiency	37.0%	37.0%			
4pi Efficiency	18.2%	18.2%			
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		
<u>Model</u>	<u>Serial Number</u>	<u>Due Date</u>	<u>Background (cpm)</u>	<u>Operating Voltage</u>	<u>Threshold</u>
2360	268488	10/27/2018	772.8	1750V	Alpha (120mV) Beta (3.5-30mV)
Detector Setup Report		YES NO ✓	Barcode Report		YES NO ✓
					Voltage Plateau YES ✓ NO
COMMENTS					
5 minute background performed		Efficiency performed on contact with 8ft cable		2 layer mylar (0.8mg/cm ²)	
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: <i>M. Pauli</i>		Reviewed By: <i>J.P. Robinson</i>		Date: 10/30/17	
Certification Date: 10/30/2017			*Certification Due (6mo): 04/30/2018		
			* Certification Due (12mo): 10/30/2018		

* Calibration due date is dependant on users regulatory requirements.

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

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

CUSTOMER INFORMATION				DETECTOR INFORMATION			
Customer Name: EnergySolutions Instrument Services				Manufacturer: Ludlum			
Address: 1570 Bear Creek Road Oak Ridge, TN 37830				Detector Model: 43-37A			
Contact Name: Mike Pauli				Serial Number: 190672			
Customer Purchase Order Number: N/A		Work Order Number: 2017-15616		Evaluation Method: Source			
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION							
Source Nuclide: Th ²³⁰	Serial Number: 051301		Activity: 20,694 dpm		2 Pi Emissions: 10,450 /min		Certification Date: 05/15/2013
Parameter	As Found	As Left	Precision Test			CPM	
Count 1	2,865	2,865	Count 1 (Heel)			3,012	
Count 2	2,986	2,986	Count 2 (Center)			3,169	
Count 3	3,145	3,145	Count 3 (Toe)			3,329	
Count 4	3,270	3,270	Average			3,170	
Count 5	3,338	3,338	Tolerance			±10%	
Count 6	3,354	3,354	Pass/Fail			Pass	
Average	3,160	3,160					
Background (CPM)	3.8	3.8					
Net Counts	3,156	3,156					
2pi Efficiency	30.2%	30.2%					
4pi Efficiency	15.3%	15.3%					
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				
<u>Model</u>	<u>Serial Number</u>	<u>Due Date</u>	<u>Background (cpm)</u>	<u>Operating Voltage</u>		<u>Threshold</u>	
2360	268488	10/27/2018	3.8	1750V		Alpha (120mV) Beta (3.5-30mV)	
<u>Detector Setup Report</u>		YES NO ✓	<u>Barcode Report</u>		YES NO ✓	<u>Voltage Plateau</u> YES ✓ NO	
COMMENTS							
5 minute background performed Efficiency performed on contact with 8ft cable 2 layer mylar (0.8mg/cm ²)							
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).							
<u>Detector</u>		<u>Certified By:</u> <i>M. Pauli</i>					
<u>Certification Date:</u> 10/30/2017		<u>Reviewed By:</u> <i>J. Dubois</i>		<u>Date:</u> 10/30/17			
				*Certification Due (6mo): 04/30/2018			
				* Certification Due (12mo): 10/30/2018			

* Calibration due date is dependant on users regulatory requirements.

EnergySolutions Services, Inc
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<http://www.energysolutions.com/>

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

CUSTOMER INFORMATION				INSTRUMENT INFORMATION			
Customer Name:		EnergySolutions		Manufacturer:			
Address:		1570 Bear Creek Rd Oak Ridge, TN 37830		Model:		2360	S.N. 268488
Contact Name:		Mike Pauli		Probe:		43-37	S.N. 190672
Customer PO No.:	N/A	Work Order Number:	2017-15616	Calibration Method:		Source	

Source Information

	Isotope	Source ID	Certification Date	Activity (dpm)
α Source	Pu-239	071601	7/25/16	23,887
β Source	Tc-99	099608	8/8/96	21,311

Ludlum Model 43-37 High Voltage Plateau with crosstalk

Operating Voltage	High Voltage	Background		Alpha Source		Beta Source		Crosstalk		Efficiency	
		Alpha	Beta	Alpha	Beta	Alpha	Beta	α to β	β to α	α	β
	1,700	0.0	446.0	3,491.0	760.0	4.0	4,440.0	8.99%	0.10%	14.61%	18.74%
	1,725	0.0	662.0	3,800.0	866.0	8.0	4,675.0	5.37%	0.20%	15.91%	18.83%
SET	1,750	3.0	784.0	4,104.0	1,094.0	4.0	4,539.0	7.56%	0.03%	17.17%	17.62%
	1,775	6.0	838.0	4,397.0	1,197.0	13.0	4,075.0	8.18%	0.22%	18.38%	15.19%
	1,800	7.0	928.0	4,523.0	1,189.0	37.0	3,632.0	7.26%	1.11%	18.91%	12.69%

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).

Comments:

Calibrated using 8ft C cable assembly

Calibrated By: M. Pauli Reviewed By: J. D. Dinkins Date: 10/30/17
 Calibration Date: 10/30/17 Calibration Due: 10/30/18

SEG# 049410

CERTIFICATE OF CALIBRATION

CUSTOM BETA STANDARD⁽¹⁾

Radionuclide Tc-99 Activity 9.504 nCi Serial Number B399

Reference Date April 1, 1994 Half-Life⁽²⁾ (2.13 ± 0.05) x 10⁵ years

Beta Flux Rate (2 pi emission rate) 12131.9 particles/minute

PRINCIPAL EMISSIONS⁽²⁾

Type	Energy (keV)	Intensity (%)
beta	E _{max} = 294 E _{avg} = 85	100

SOURCE DESCRIPTION

The activity is homogeneously incorporated into the anodized layer of an aluminum plate. The active dimensions are 150 mm by 67 mm and the overall dimensions are 159 mm by 69 mm by 6.35 mm thick.

METHOD OF CALIBRATION

This is a provisional assay. Final assay results will be reported for this source upon completion of intercomparison with the National Institute of Standards and Technology.

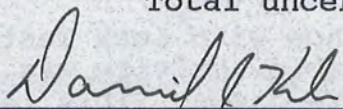
The total activity and beta flux rate were calibrated on a wide-area gas-flow proportional counter using an efficiency determined through intercomparison with the National Institute of Standards and Technology.

North American Scientific, Inc. actively participates in the Radioactivity Measurements Assurance Program conducted by the National Institute of Standards and Technology in cooperation with the U.S. Council for Energy Awareness.

TOTAL UNCERTAINTY (99% Confidence Level)

Systematic uncertainty	± 3.08%
Weighing uncertainty	± 0.72%
Total uncertainty	± 3.80%

ORIGINAL



Calibration Laboratory

4-8-94

Date

Notes

- (1) A provisional assay is provided as specified in the Method of Calibration.
- (2) Table of Radioactive Isotopes, 7th edition, 1986.

•LEAK TEST CERTIFICATION ON REVERSE•

CERTIFICATE OF CALIBRATION ALPHA STANDARD SOURCE

Radionuclide: Th-230	Customer: ENERGYSOLUTIONS (ENVIROCARE)
Half-life: (7.54 ± 0.03)E+04 years	P.O. No.: 639313
Catalog No.: EAB-230-47U	Reference Date: 15-Feb-14 12:00 PST
Source No.: L1-640	Contained Radioactivity: 7.383 nCi 273.2 Bq

Physical Description:

A. Capsule type:	Disk (47 mm OD x 0.76 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxide
C. Active diameter/volume:	45 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities:

None detected

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 0.5 %
B. Type B (systematic) uncertainty:	± 3.0 %
C. Uncertainty in aliquot weighing:	± 0.0 %
D. Total uncertainty at the 99% confidence level:	± 3.0 %

Notes:

- See reverse side for leak test(s) performed on this source.
- EZIP participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a surface emission rate of 8278 α/min in 2π on 15-Jan-14.



Quality Control

17-Jan-14

Date

EZIP Ref. No.: 1703-75

THE LEAK TEST(S) INDICATED BY THE CHECKED BOX(ES) WAS(WERE) APPLIED TO DETERMINE THE INTEGRITY OF THE SOURCE DESCRIBED ON THE FRONT SIDE. THE LEAK TESTS INDICATED BELOW WERE EITHER TAKEN DIRECTLY FROM ISO 9978:1992 OR DERIVED FROM THE LEAK TEST METHODS LISTED IN ISO 9978:1992. THE REGULATORY LIMIT FOR LEAK TEST RESULTS IS $<5 \text{ nCi (185 Bq)}$ FOR BOTH ALPHA AND BETA-GAMMA ACTIVITY. LEAK TEST RESULTS MARKED BELOW CONTAINED $<5 \text{ nCi (185 Bq)}$ OF REMOVABLE ACTIVITY UNLESS OTHERWISE STATED ON THIS CERTIFICATE.



Standard Wipe Test

The source was wiped over its entire surface with a moistened filter paper disk. After drying, the disk was checked for activity using a scintillation detector.



Special Wipe Test

The source was wiped over its entire surface with moistened polystyrene. The polystyrene was then dissolved in a liquid scintillation cocktail and counted in a liquid scintillation counter.



Distilled Water Soak Test

The source was immersed in distilled water and maintained at $(50 \pm 5)^\circ\text{C}$ for a minimum of four hours or room temperature $(20 \pm 5)^\circ\text{C}$ for 24 hours. After removal of the source, the liquid was a) checked for activity using a liquid scintillation counter, or b) evaporated in a planchet and the residue checked for activity using a windowless proportional counter or end-window G.M. tube.



Liquid Scintillation Soak Test

The source was immersed for a minimum of 3 hours at room temperature $(20 \pm 5)^\circ\text{C}$ in a liquid scintillation cocktail, which does not attack the source's outer surface material. The source was stored away from light to avoid photoluminescence. The sealed source was then removed and the activity of the liquid scintillation cocktail was measured.



Gas Source Test

The source was placed in a vacuum desiccator and maintained at a pressure of $<10 \text{ mm Hg}$ for not less than 12 hours. The activity was checked by introducing air into the desiccator and monitoring the air with an end-window G.M. tube.



Ampoule Leak Test

The ampoule was kept in an inverted position on a filter paper disk or polystyrene wipe for a minimum of 16 hours. The wipe was then checked for activity using a scintillation detector or liquid scintillation counter.



Bubble Leak Test

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



Wipe Test for Industrial Ni-63 Sources

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



Pressure Test for Triotech Kr-85 Sources

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



Leak Test Not Applicable

The active area of the source is uncovered or is protected by a very thin coating. Although the deposit is adherent, it is not designed or certified to pass a standard leak test. The inactive portions of the source have been checked using the standard wipe test or special wipe test depending on the nuclide.



Other Leak Test

CERTIFICATE OF CALIBRATION BETA STANDARD SOURCE

Radionuclide: Tc-99	Customer: ENERGYSOLUTIONS (ENVIROCARE)
Half-life: (2.13 ± 0.05)E+05 years	P.O. No.: 639313
Catalog No.: EAB-099-47U	Reference Date: 15-Feb-14 12:00 PST
Source No.: L1-618	Contained Radioactivity: 9.862 nCi 364.9 Bq

Physical Description:

A. Capsule type:	Disk (47 mm OD x 0.76 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded Technetium metal
C. Active diameter/volume:	45 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities:

None detected

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 0.3 %
B. Type B (systematic) uncertainty:	± 3.0 %
C. Uncertainty in aliquot weighing:	± 0.0 %
D. Total uncertainty at the 99% confidence level:	± 3.0 %

Notes:

- See reverse side for leak test(s) performed on this source.
- EZIP participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a surface emission rate of 12040 β/min in 2π on 15-Jan-14.


Quality Control

17-Jan-14
Date

EZIP Ref. No.: 1703-75

THE LEAK TEST(S) INDICATED BY THE CHECKED BOX(ES) WAS(WERE) APPLIED TO DETERMINE THE INTEGRITY OF THE SOURCE DESCRIBED ON THE FRONT SIDE. THE LEAK TESTS INDICATED BELOW WERE EITHER TAKEN DIRECTLY FROM ISO 9978:1992 OR DERIVED FROM THE LEAK TEST METHODS LISTED IN ISO 9978:1992. THE REGULATORY LIMIT FOR LEAK TEST RESULTS IS <5 nCi (185 Bq) FOR BOTH ALPHA AND BETA-GAMMA ACTIVITY. LEAK TEST RESULTS MARKED BELOW CONTAINED <5 nCi (185 Bq) OF REMOVABLE ACTIVITY UNLESS OTHERWISE STATED ON THIS CERTIFICATE.



Standard Wipe Test

The source was wiped over its entire surface with a moistened filter paper disk. After drying, the disk was checked for activity using a scintillation detector.



Special Wipe Test

The source was wiped over its entire surface with moistened polystyrene. The polystyrene was then dissolved in a liquid scintillation cocktail and counted in a liquid scintillation counter.



Distilled Water Soak Test

The source was immersed in distilled water and maintained at $(50 \pm 5)^\circ\text{C}$ for a minimum of four hours or room temperature $(20 \pm 5)^\circ\text{C}$ for 24 hours. After removal of the source, the liquid was a) checked for activity using a liquid scintillation counter, or b) evaporated in a planchet and the residue checked for activity using a windowless proportional counter or end-window G.M. tube.



Liquid Scintillation Soak Test

The source was immersed for a minimum of 3 hours at room temperature $(20 \pm 5)^\circ\text{C}$ in a liquid scintillation cocktail, which does not attack the source's outer surface material. The source was stored away from light to avoid photoluminescence. The sealed source was then removed and the activity of the liquid scintillation cocktail was measured.



Gas Source Test

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



Ampoule Leak Test

The ampoule was kept in an inverted position on a filter paper disk or polystyrene wipe for a minimum of 16 hours. The wipe was then checked for activity using a scintillation detector or liquid scintillation counter.



Bubble Leak Test

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



Wipe Test for Industrial Ni-63 Sources

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



Pressure Test for Triotech Kr-85 Sources

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



Leak Test Not Applicable

The active area of the source is uncovered or is protected by a very thin coating. Although the deposit is adherent, it is not designed or certified to pass a standard leak test. The inactive portions of the source have been checked using the standard wipe test or special wipe test depending on the nuclide.



Other Leak Test

5186 # 039404

CERTIFICATE OF CALIBRATION

CUSTOM ALPHA STANDARD⁽¹⁾

Radionuclide Th-230 Activity 2.585 nCi Serial Number B403

Reference Date Feb. 1, 1994 Half-Life⁽²⁾ (7.54 ± 0.03) x 10⁴ years

Alpha Flux Rate (2 pi emission rate) 2869.4 particles/minute

PRINCIPAL EMISSIONS⁽²⁾

Type	Energy (keV)	Intensity (%)
alpha	4621.1	23.4
	4687.6	76.3

SOURCE DESCRIPTION

The activity is homogenously incorporated into the anodized layer of an aluminum plate. The active dimensions are 150 mm by 67 mm and the overall dimensions are 159 mm by 69 mm by 6.35 mm thick.

METHOD OF CALIBRATION

This is a provisional assay. Final assay results will be reported for this source upon completion of intercomparison with the National Institute of Standards and Technology.

The total activity and alpha flux rate were calibrated on a wide-area gas-flow proportional counter using an efficiency determined through intercomparison with the National Institute of Standards and Technology.

North American Scientific, Inc. actively participates in the Radioactivity Measurements Assurance Program conducted by the National Institute of Standards and Technology in cooperation with the U.S. Council for Energy Awareness.

TOTAL UNCERTAINTY (99% Confidence Level)

Systematic uncertainty	± 1.56%
Random uncertainty	± 0.97%
Total uncertainty	± 2.53%

ORIGINAL

Daniel J. Kelly

Calibration Laboratory

2-24-94

Date

Notes

- (1) A provisional assay is provided as specified in the Method of Calibration.
- (2) Table of Radioactive Isotopes, 7th edition, 1986.

•LEAK TEST CERTIFICATION ON REVERSE•

ENVIRO-EQUIPMENT, INC.

RAE SYSTEMS QRAE 3 CALIBRATION DATA SHEET

Serial Number: M02A008687 Date: 04/03/18 Inspector: CSF
 Battery Voltage: 4.1 VDC Date & Time: ✓ Alarm Mode = Auto Reset: ✓
 Automatic Datalog: ✓ Datalog Cleared: ✓ Datalog Period = 60 Seconds: ✓
 Sample Pump Flow: 354 cc/min Low Flow Alarm: ✓

Calibration Check (Performed at Room Temperature)

Calibration Gas	Calibration Gas Concentration	Reading	Tolerance
Methane	<u>50</u> %LEL	<u>50</u> % LEL	± 10%
Carbon Monoxide	<u>50</u> PPM	<u>50</u> PPM	± 10%
Hydrogen Sulfide	<u>10</u> PPM	<u>10.0</u> PPM	± 10%
Ambient Oxygen	<u>20.9</u> %	<u>20.9</u> %	± 0.2%
Low Oxygen	<u>18</u> %	<u>18</u> %	± 0.2%

Fresh Air Zero: Done Span Cal: Done

Factory Alarm Setpoints					
	Low	High	STEL	TWA	
TOX 1 (CO)	35 ppm ✓	200 ppm ✓	100 ppm ✓	35 ppm ✓	
TOX 2 (H2S)	10 ppm ✓	20 ppm ✓	15 ppm ✓	10 ppm ✓	
Oxygen	19.5% ✓	23.5% ✓	N/A	N/A	
LEL	10% ✓	20% ✓	N/A	N/A	

INSPECTOR'S MAINTENANCE NOTES

Appendix E
Daily Instrument Response Check Data

Ambient Background Data

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218				
Instrument Model:		2360	Instrument Serial No. 268488			
Last Calibration Date:		10/27/2017				
Detector Model:		43-37	Detector Serial No.: 190672			
Today's Date:		4/9/2018	Data Collected by: Adolfo Matus Jr.			
X	Alpha	Beta-Gamma	Gamma			
Remarks:		Instrument Ambient Background Instrument Efficiency: 0.302				
Type of Surface:	Ambient	Count Time:	1	Minutes		
Count Number	CPM	$(x - \bar{x})$	$(x - \bar{x})^2$			
1	4	-2.40	5.76			
2	6	-0.40	0.16			
3	5	-1.40	1.96			
4	11	4.60	21.16			
5	5	-1.40	1.96			
6	2	-4.40	19.36			
7	4	-2.40	5.76			
8	4	-2.40	5.76			
9	9	2.60	6.76			
10	3	-3.40	11.56			
11	7	0.60	0.36			
12	8	1.60	2.56			
13	7	0.60	0.36			
14	4	-2.40	5.76			
15	4	-2.40	5.76			
16	6	-0.40	0.16			
17	4	-2.40	5.76			
18	8	1.60	2.56			
19	3	-3.40	11.56			
20	6	-0.40	0.16			
21	10	3.60	12.96			
22	9	2.60	6.76			
23	7	0.60	0.36			
24	8	1.60	2.56			
25	6	-0.40	0.16			
26	10	3.60	12.96			
27	11	4.60	21.16			
28	9	2.60	6.76			
29	4	-2.40	5.76			
30	8	1.60	2.56			
Mean Count: \bar{x}	6.40	SUM	187.20	Background in dpm/100cm ² 14.56		
Standard Deviation (σ)	2.54	Variance:	6.46			
Background Count Rate:	6.40	CPM + -	5.08	CPM	CPM Low 1.32	CPM High 11.48
Calculations Completed by:	Adolfo Matus Jr.			Date:	4/9/2018	
Reviewed by:	Daniel Spicuzza			Date:	4/9/2018	

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360	Instrument Serial No. 268488		
Last Calibration Date:		10/27/2017			
Detector Model:		43-37	Detector Serial No.: 190672		
Today's Date:		4/9/2018	Data Collected by: Adolfo Matus Jr.		
Alpha		X	Beta-Gamma		
Gamma					
Remarks:		Instrument Ambient Background			
		Instrument Efficiency: 0.37			
Type of Surface:	Ambient		Count Time:	1 Minutes	
Count Number	CPM	$(x - \bar{x})$		$(x - \bar{x})^2$	
1	751	-14.87		221.02	
2	803	37.13		1378.88	
3	760	-5.87		34.42	
4	765	-0.87		0.75	
5	769	3.13		9.82	
6	740	-25.87		669.08	
7	718	-47.87		2291.22	
8	731	-34.87		1215.68	
9	758	-7.87		61.88	
10	775	9.13		83.42	
11	756	-9.87		97.35	
12	742	-23.87		569.62	
13	771	5.13		26.35	
14	783	17.13		293.55	
15	819	53.13		2823.15	
16	737	-28.87		833.28	
17	755	-10.87		118.08	
18	769	3.13		9.82	
19	745	-20.87		435.42	
20	783	17.13		293.55	
21	754	-11.87		140.82	
22	759	-6.87		47.15	
23	821	55.13		3039.68	
24	778	12.13		147.22	
25	812	46.13		2128.28	
26	736	-29.87		892.02	
27	791	25.13		631.68	
28	766	0.13		0.02	
29	790	24.13		582.42	
30	739	-26.87		721.82	
Mean Count: \bar{x}	765.87		SUM	19797.47	
Standard Deviation (σ)	26.13		Variance:	682.67	
Background Count Rate:	765.87	CPM + -	52.26	CPM	
Calculations Completed by:		Adolfo Matus Jr.		Date:	4/9/2018
Reviewed by:		Daniel Spicuzza		Date:	4/9/2018

Background in dpm/100cm ²	
1422.62	
CPM Low	CPM High
714	818

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218				
Instrument Model:		2360	Instrument Serial No. 268497			
Last Calibration Date:		10/10/2017				
Detector Model:		43-37	Detector Serial No.: 93965			
Today's Date:		4/3/2018	Data Collected by: Josefina Matus			
X	Alpha	Beta-Gamma	Gamma			
Remarks:		Instrument Ambient Background Instrument Efficiency: 0.31				
Type of Surface:	Ambient	Count Time:	1	Minutes		
Count Number	CPM	$(x - \bar{x})$	$(x - \bar{x})^2$			
1	6	1.40	1.96			
2	4	-0.60	0.36			
3	9	4.40	19.36			
4	5	0.40	0.16			
5	4	-0.60	0.36			
6	6	1.40	1.96			
7	3	-1.60	2.56			
8	4	-0.60	0.36			
9	3	-1.60	2.56			
10	3	-1.60	2.56			
11	3	-1.60	2.56			
12	3	-1.60	2.56			
13	8	3.40	11.56			
14	8	3.40	11.56			
15	5	0.40	0.16			
16	5	0.40	0.16			
17	4	-0.60	0.36			
18	4	-0.60	0.36			
19	4	-0.60	0.36			
20	1	-3.60	12.96			
21	2	-2.60	6.76			
22	10	5.40	29.16			
23	5	0.40	0.16			
24	3	-1.60	2.56			
25	8	3.40	11.56			
26	2	-2.60	6.76			
27	1	-3.60	12.96			
28	5	0.40	0.16			
29	5	0.40	0.16			
30	5	0.40	0.16			
Mean Count: \bar{x}	4.60	SUM	145.20	Background in dpm/100cm ² 10.20		
Standard Deviation (σ)	2.24	Variance:	5.01			
Background Count Rate:	4.60	CPM + -	4.48	CPM	CPM Low 0.12	CPM High 9.08
Calculations Completed by:	Josefina Matus			Date:	4/3/2018	
Reviewed by:	Daniel Spicuzza			Date:	4/3/2018	

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218				
Instrument Model:		2360	Instrument Serial No.		268497	
Last Calibration Date:		10/10/2017				
Detector Model:		43-37	Detector Serial No.:		93965	
Today's Date:		4/3/2018	Data Collected by:		Josefina Matus	
	Alpha	X	Beta-Gamma		Gamma	
Remarks: Instrument Ambient Background			Instrument Efficiency: 0.352			
Type of Surface:	Ambient		Count Time:	1	Minutes	
Count Number	CPM	$(x - \bar{x})$		$(x - \bar{x})^2$		
1	733	-32.93		1084.60		
2	736	-29.93		896.00		
3	783	17.07		291.27		
4	777	11.07		122.47		
5	792	26.07		679.47		
6	742	-23.93		572.80		
7	756	-9.93		98.67		
8	749	-16.93		286.74		
9	738	-27.93		780.27		
10	773	7.07		49.94		
11	752	-13.93		194.14		
12	750	-15.93		253.87		
13	722	-43.93		1930.14		
14	783	17.07		291.27		
15	747	-18.93		358.47		
16	718	-47.93		2297.60		
17	791	25.07		628.34		
18	760	-5.93		35.20		
19	775	9.07		82.20		
20	763	-2.93		8.60		
21	774	8.07		65.07		
22	803	37.07		1373.94		
23	759	-6.93		48.07		
24	753	-12.93		167.27		
25	766	0.07		0.00		
26	778	12.07		145.60		
27	782	16.07		258.14		
28	820	54.07		2923.20		
29	821	55.07		3032.34		
30	782	16.07		258.14		
Mean Count: \bar{x}	765.93		SUM	19213.87	Background in dpm/100cm ² 1495.50	
Standard Deviation (σ)	25.74		Variance:	662.55		
Background Count Rate:	765.93	CPM + -	51.48	CPM	CPM Low 714	CPM High 817
Calculations Completed by:	Josefina Matus				Date:	4/3/2018
Reviewed by:	Daniel Spicuzza				Date:	4/3/2018

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218				
Instrument Model:		2360	Instrument Serial No. 276990			
Last Calibration Date:		3/20/2018				
Detector Model:		43-37	Detector Serial No.: 190620			
Today's Date:		4/3/2018	Data Collected by: Josefina Matus			
X	Alpha	Beta-Gamma	Gamma			
Remarks:		Instrument Ambient Background Instrument Efficiency: 0.287				
Type of Surface:	Ambient	Count Time:	1	Minutes		
Count Number	CPM	$(x - \bar{x})$	$(x - \bar{x})^2$			
1	7	-0.97	0.93			
2	7	-0.97	0.93			
3	13	5.03	25.33			
4	3	-4.97	24.67			
5	9	1.03	1.07			
6	10	2.03	4.13			
7	7	-0.97	0.93			
8	2	-5.97	35.60			
9	7	-0.97	0.93			
10	7	-0.97	0.93			
11	5	-2.97	8.80			
12	7	-0.97	0.93			
13	11	3.03	9.20			
14	7	-0.97	0.93			
15	8	0.03	0.00			
16	4	-3.97	15.73			
17	11	3.03	9.20			
18	10	2.03	4.13			
19	14	6.03	36.40			
20	9	1.03	1.07			
21	14	6.03	36.40			
22	10	2.03	4.13			
23	8	0.03	0.00			
24	8	0.03	0.00			
25	4	-3.97	15.73			
26	9	1.03	1.07			
27	9	1.03	1.07			
28	8	0.03	0.00			
29	5	-2.97	8.80			
30	6	-1.97	3.87			
Mean Count: \bar{x}	7.97	SUM	252.97	Background in dpm/100cm ² 19.08		
Standard Deviation (σ)	2.95	Variance:	8.72			
Background Count Rate:	7.97	CPM + -	5.91	CPM	CPM Low 2.06	CPM High 13.87
Calculations Completed by:	Josefina Matus			Date:	4/3/2018	
Reviewed by:	Daniel Spicuzza			Date:	4/3/2018	

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218		
Instrument Model:		2360	Instrument Serial No. 276990	
Last Calibration Date:		3/20/2018		
Detector Model:		43-37	Detector Serial No.: 190620	
Today's Date:		4/3/2018	Data Collected by: Josefina Matus	
Alpha		X	Beta-Gamma	
Gamma				
Remarks:		Instrument Ambient Background		
		Instrument Efficiency: 0.396		
Type of Surface:	Ambient		Count Time:	1 Minutes
Count Number	CPM	$(x - \bar{x})$		$(x - \bar{x})^2$
1	916	-9.47		89.62
2	944	18.53		343.48
3	944	18.53		343.48
4	920	-5.47		29.88
5	892	-33.47		1120.02
6	989	63.53		4036.48
7	888	-37.47		1403.75
8	897	-28.47		810.35
9	904	-21.47		460.82
10	857	-68.47		4687.68
11	927	1.53		2.35
12	973	47.53		2259.42
13	915	-10.47		109.55
14	907	-18.47		341.02
15	908	-17.47		305.08
16	966	40.53		1642.95
17	943	17.53		307.42
18	875	-50.47		2546.88
19	928	2.53		6.42
20	948	22.53		507.75
21	952	26.53		704.02
22	941	15.53		241.28
23	913	-12.47		155.42
24	915	-10.47		109.55
25	945	19.53		381.55
26	969	43.53		1895.15
27	902	-23.47		550.68
28	1007	81.53		6647.68
29	850	-75.47		5695.22
30	929	3.53		12.48
Mean Count: \bar{x}	925.47		SUM	37747.47
Standard Deviation (σ)	36.08		Variance:	1301.64
Background Count Rate:	925.47	CPM + -	72.16	CPM
Calculations Completed by: Josefina Matus		Date:		4/3/2018
Reviewed by: Daniel Spicuzza		Date:		4/3/2018

Background in dpm/100cm ²	
1606.21	
CPM Low	CPM High
853	998

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218				
Instrument Model:		2360	Instrument Serial No. 297743			
Last Calibration Date:		10/10/2017				
Detector Model:		43-37	Detector Serial No.: 302111			
Today's Date:		4/3/2018	Data Collected by: Richard Thatcher			
X	Alpha	Beta-Gamma	Gamma			
Remarks:		Instrument Ambient Background Instrument Efficiency: 0.319				
Type of Surface:	Ambient	Count Time:	1	Minutes		
Count Number	CPM	$(x - \bar{x})$	$(x - \bar{x})^2$			
1	9	2.17	4.69			
2	8	1.17	1.36			
3	8	1.17	1.36			
4	8	1.17	1.36			
5	6	-0.83	0.69			
6	10	3.17	10.03			
7	6	-0.83	0.69			
8	13	6.17	38.03			
9	7	0.17	0.03			
10	5	-1.83	3.36			
11	6	-0.83	0.69			
12	5	-1.83	3.36			
13	6	-0.83	0.69			
14	8	1.17	1.36			
15	7	0.17	0.03			
16	7	0.17	0.03			
17	4	-2.83	8.03			
18	6	-0.83	0.69			
19	11	4.17	17.36			
20	12	5.17	26.69			
21	9	2.17	4.69			
22	3	-3.83	14.69			
23	6	-0.83	0.69			
24	7	0.17	0.03			
25	2	-4.83	23.36			
26	5	-1.83	3.36			
27	4	-2.83	8.03			
28	7	0.17	0.03			
29	3	-3.83	14.69			
30	7	0.17	0.03			
Mean Count: \bar{x}	6.83	SUM	190.17	Background in dpm/100cm ² 14.72		
Standard Deviation (σ)	2.56	Variance:	6.56			
Background Count Rate:	6.83	CPM + -	5.12	CPM	CPM Low 1.71	CPM High 11.95
Calculations Completed by:	Richard Thatcher			Date:	4/3/2018	
Reviewed by:	Daniel Spicuzza			Date:	4/3/2018	

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218		
Instrument Model:		2360	Instrument Serial No. 297743	
Last Calibration Date:		10/10/2017		
Detector Model:		43-37	Detector Serial No.: 302111	
Today's Date:		4/3/2018	Data Collected by: Richard Thatcher	
Alpha		X	Beta-Gamma	
Gamma				
Remarks:		Instrument Ambient Background		
		Instrument Efficiency: 0.384		
Type of Surface:	Ambient		Count Time:	1 Minutes
Count Number	CPM	$(x - \bar{x})$		$(x - \bar{x})^2$
1	1076	-8.00		64.00
2	1053	-31.00		961.00
3	1074	-10.00		100.00
4	1036	-48.00		2304.00
5	1065	-19.00		361.00
6	1061	-23.00		529.00
7	1108	24.00		576.00
8	1057	-27.00		729.00
9	1067	-17.00		289.00
10	1132	48.00		2304.00
11	1064	-20.00		400.00
12	1111	27.00		729.00
13	1123	39.00		1521.00
14	1078	-6.00		36.00
15	1081	-3.00		9.00
16	1114	30.00		900.00
17	1050	-34.00		1156.00
18	1078	-6.00		36.00
19	1074	-10.00		100.00
20	1088	4.00		16.00
21	1119	35.00		1225.00
22	1143	59.00		3481.00
23	1063	-21.00		441.00
24	1103	19.00		361.00
25	1024	-60.00		3600.00
26	1078	-6.00		36.00
27	1120	36.00		1296.00
28	1071	-13.00		169.00
29	1110	26.00		676.00
30	1099	15.00		225.00
Mean Count: \bar{x}	1084.00		SUM	24630.00
Standard Deviation (σ)	29.14		Variance:	849.31
Background Count Rate:	1084.00	CPM + -	58.29	CPM
Calculations Completed by: Richard Thatcher		Date:		4/3/2018
Reviewed by: Daniel Spicuzza		Date:		4/3/2018

Background in dpm/100cm ²	
1940.15	
CPM Low	CPM High
1026	1142

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218		
Instrument Model:		2360	Instrument Serial No. 193668	
Last Calibration Date:		8/15/2017		
Detector Model:		43-93	Detector Serial No.: 326725	
Today's Date:		4/3/2018	Data Collected by: Joan Cosgrove	
X	Alpha	Beta-Gamma	Gamma	
Remarks:		Instrument Ambient Background		Instrument Efficiency: 0.497
Type of Surface:		Ambient	Count Time:	1 Minutes
Count Number	CPM	$(x - \bar{x})$		$(\bar{x} - \bar{x})^2$
1	1	-0.30		0.09
2	1	-0.30		0.09
3	2	0.70		0.49
4	0	-1.30		1.69
5	0	-1.30		1.69
6	0	-1.30		1.69
7	1	-0.30		0.09
8	0	-1.30		1.69
9	0	-1.30		1.69
10	1	-0.30		0.09
11	3	1.70		2.89
12	1	-0.30		0.09
13	0	-1.30		1.69
14	2	0.70		0.49
15	1	-0.30		0.09
16	0	-1.30		1.69
17	3	1.70		2.89
18	1	-0.30		0.09
19	0	-1.30		1.69
20	3	1.70		2.89
21	3	1.70		2.89
22	2	0.70		0.49
23	0	-1.30		1.69
24	1	-0.30		0.09
25	4	2.70		7.29
26	0	-1.30		1.69
27	5	3.70		13.69
28	3	1.70		2.89
29	0	-1.30		1.69
30	1	-0.30		0.09
Mean Count: \bar{x}	1.30		SUM	56.30
Standard Deviation (σ)	1.39		Variance:	1.94
Background Count Rate:		1.30	CPM + -	2.79
Calculations Completed by:	Joan Cosgrove			CPM
Reviewed by:	Daniel Spicuzza			CPM
		Background in dpm/100cm ²		
		10.46		
		CPM Low	CPM High	
		-1.49	4.09	
Date:		4/3/2018		
Date:		4/3/2018		

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218		
Instrument Model:		2360	Instrument Serial No. 193668	
Last Calibration Date:		8/15/2017		
Detector Model:		43-93	Detector Serial No.: 326725	
Today's Date:		4/3/2018	Data Collected by: Joan Cosgrove	
Alpha		X	Beta-Gamma	
Gamma				
Remarks:		Instrument Ambient Background		
		Instrument Efficiency: 0.327		
Type of Surface:	Ambient		Count Time: 1	Minutes
Count Number	CPM	$(x - \bar{x})$	$(\bar{x} - \bar{x})^2$	
1	144	-6.37	40.53	
2	138	-12.37	152.93	
3	142	-8.37	70.00	
4	132	-18.37	337.33	
5	127	-23.37	546.00	
6	153	2.63	6.93	
7	144	-6.37	40.53	
8	151	0.63	0.40	
9	160	9.63	92.80	
10	132	-18.37	337.33	
11	145	-5.37	28.80	
12	172	21.63	468.00	
13	153	2.63	6.93	
14	152	1.63	2.67	
15	150	-0.37	0.13	
16	157	6.63	44.00	
17	159	8.63	74.53	
18	162	11.63	135.33	
19	160	9.63	92.80	
20	157	6.63	44.00	
21	163	12.63	159.60	
22	153	2.63	6.93	
23	141	-9.37	87.73	
24	165	14.63	214.13	
25	154	3.63	13.20	
26	143	-7.37	54.27	
27	139	-11.37	129.20	
28	160	9.63	92.80	
29	158	7.63	58.27	
30	145	-5.37	28.80	
Mean Count: \bar{x}	150.37		SUM	3366.97
Standard Deviation (σ)	10.78		Variance:	116.10
Background Count Rate:	150.37		CPM + -	21.55
Calculations Completed by: Joan Cosgrove		Date:		4/3/2018
Reviewed by: Daniel Spicuzza		Date:		4/3/2018
			Background in dpm/100cm ² 1839.35	
			CPM Low	CPM High
			128.82	171.92

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218		
Instrument Model:		2360	Instrument Serial No. 297758	
Last Calibration Date:		2/14/2018		
Detector Model:		43-93	Detector Serial No.: 299597	
Today's Date:		4/3/2018	Data Collected by: Thomas Hogan	
X	Alpha	Beta-Gamma	Gamma	
Remarks:		Instrument Ambient Background		Instrument Efficiency: 0.444
Type of Surface:		Ambient	Count Time:	1 Minutes
Count Number	CPM	$(x - \bar{x})$		$(\bar{x} - \bar{x})^2$
1	0	-0.57		0.32
2	0	-0.57		0.32
3	1	0.43		0.19
4	0	-0.57		0.32
5	0	-0.57		0.32
6	0	-0.57		0.32
7	2	1.43		2.05
8	1	0.43		0.19
9	0	-0.57		0.32
10	0	-0.57		0.32
11	1	0.43		0.19
12	1	0.43		0.19
13	1	0.43		0.19
14	0	-0.57		0.32
15	0	-0.57		0.32
16	0	-0.57		0.32
17	0	-0.57		0.32
18	0	-0.57		0.32
19	0	-0.57		0.32
20	2	1.43		2.05
21	1	0.43		0.19
22	1	0.43		0.19
23	0	-0.57		0.32
24	0	-0.57		0.32
25	1	0.43		0.19
26	0	-0.57		0.32
27	0	-0.57		0.32
28	2	1.43		2.05
29	2	1.43		2.05
30	1	0.43		0.19
Mean Count: \bar{x}	0.57		SUM	15.37
Standard Deviation (σ)	0.73		Variance:	0.53
Background Count Rate:		0.57	CPM + -	1.46 CPM
Calculations Completed by:		Thomas Hogan		Date: 4/3/2018
Reviewed by:		Daniel Spicuzza		Date: 4/3/2018

Background in dpm/100cm ²	
5.11	
CPM Low	CPM High
-1	2

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218		
Instrument Model:		2360	Instrument Serial No. 297758	
Last Calibration Date:		2/14/2018		
Detector Model:		43-93	Detector Serial No.: 299597	
Today's Date:		4/3/2018	Data Collected by: Thomas Hogan	
Alpha		X	Beta-Gamma	
Gamma				
Remarks:		Instrument Ambient Background		
		Instrument Efficiency: 0.313		
Type of Surface:	Ambient		Count Time: 1	Minutes
Count Number	CPM	$(x - \bar{x})$	$(\bar{x} - \bar{x})^2$	
1	177	5.17	26.69	
2	197	25.17	633.36	
3	187	15.17	230.03	
4	177	5.17	26.69	
5	167	-4.83	23.36	
6	147	-24.83	616.69	
7	161	-10.83	117.36	
8	167	-4.83	23.36	
9	166	-5.83	34.03	
10	176	4.17	17.36	
11	188	16.17	261.36	
12	167	-4.83	23.36	
13	164	-7.83	61.36	
14	155	-16.83	283.36	
15	152	-19.83	393.36	
16	193	21.17	448.03	
17	163	-8.83	78.03	
18	170	-1.83	3.36	
19	169	-2.83	8.03	
20	179	7.17	51.36	
21	160	-11.83	140.03	
22	165	-6.83	46.69	
23	201	29.17	850.69	
24	172	0.17	0.03	
25	168	-3.83	14.69	
26	175	3.17	10.03	
27	156	-15.83	250.69	
28	174	2.17	4.69	
29	197	25.17	633.36	
30	165	-6.83	46.69	
Mean Count: \bar{x}	171.83		SUM	5358.17
Standard Deviation (σ)	13.59		Variance:	184.76
Background Count Rate:	171.83		CPM + -	27.19
Calculations Completed by: Thomas Hogan		Date:		4/3/2018
Reviewed by: Daniel Spicuzza		Date:		4/3/2018

Background in dpm/100cm ²	
2195.95	
CPM Low	CPM High
145	199

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218		
Instrument Model:		2360	Instrument Serial No. 297766	
Last Calibration Date:		12/20/2017		
Detector Model:		43-93	Detector Serial No.: 323074	
Today's Date:		4/3/2018	Data Collected by: Thomas Hogan	
X	Alpha	Beta-Gamma	Gamma	
Remarks:		Instrument Ambient Background		Instrument Efficiency: 0.404
Type of Surface:		Ambient	Count Time:	1 Minutes
Count Number	CPM	$(x - \bar{x})$		$(\bar{x} - \bar{x})^2$
1	2	1.10		1.21
2	3	2.10		4.41
3	0	-0.90		0.81
4	0	-0.90		0.81
5	1	0.10		0.01
6	0	-0.90		0.81
7	0	-0.90		0.81
8	0	-0.90		0.81
9	1	0.10		0.01
10	0	-0.90		0.81
11	0	-0.90		0.81
12	0	-0.90		0.81
13	0	-0.90		0.81
14	4	3.10		9.61
15	0	-0.90		0.81
16	1	0.10		0.01
17	1	0.10		0.01
18	0	-0.90		0.81
19	1	0.10		0.01
20	1	0.10		0.01
21	1	0.10		0.01
22	1	0.10		0.01
23	0	-0.90		0.81
24	1	0.10		0.01
25	1	0.10		0.01
26	3	2.10		4.41
27	2	1.10		1.21
28	1	0.10		0.01
29	2	1.10		1.21
30	0	-0.90		0.81
Mean Count: \bar{x}	0.90		SUM	32.70
Standard Deviation (σ)	1.06		Variance:	1.13
Background Count Rate:		0.90	CPM + -	2.12 CPM
Calculations Completed by:		Thomas Hogan		Date: 4/3/2018
Reviewed by:		Daniel Spicuzza		Date: 4/3/2018

Background in dpm/100cm ²	
8.91	
CPM Low	CPM High
-1.22	3.02

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218		
Instrument Model:		2360	Instrument Serial No. 297766	
Last Calibration Date:		12/20/2017		
Detector Model:		43-93	Detector Serial No.: 323074	
Today's Date:		4/3/2018	Data Collected by: Thomas Hogan	
Alpha		X	Beta-Gamma	
Gamma				
Remarks:		Instrument Ambient Background		
		Instrument Efficiency: 0.254		
Type of Surface:	Ambient		Count Time: 1	Minutes
Count Number	CPM	$(x - \bar{x})$	$(\bar{x} - \bar{x})^2$	
1	173	2.60	6.76	
2	190	19.60	384.16	
3	180	9.60	92.16	
4	180	9.60	92.16	
5	167	-3.40	11.56	
6	159	-11.40	129.96	
7	176	5.60	31.36	
8	202	31.60	998.56	
9	179	8.60	73.96	
10	158	-12.40	153.76	
11	130	-40.40	1632.16	
12	159	-11.40	129.96	
13	170	-0.40	0.16	
14	176	5.60	31.36	
15	164	-6.40	40.96	
16	178	7.60	57.76	
17	168	-2.40	5.76	
18	187	16.60	275.56	
19	179	8.60	73.96	
20	167	-3.40	11.56	
21	151	-19.40	376.36	
22	171	0.60	0.36	
23	169	-1.40	1.96	
24	174	3.60	12.96	
25	159	-11.40	129.96	
26	168	-2.40	5.76	
27	158	-12.40	153.76	
28	167	-3.40	11.56	
29	172	1.60	2.56	
30	181	10.60	112.36	
Mean Count: \bar{x}	170.40		SUM	5041.20
Standard Deviation (σ)	13.18		Variance:	173.83
Background Count Rate:	170.40		CPM + -	26.37
Calculations Completed by: Thomas Hogan		Date:		4/3/2018
Reviewed by: Daniel Spicuzza		Date:		4/3/2018

Background in dpm/100cm ²	
2683.46	
CPM Low	CPM High
144.03	196.77

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218		
Instrument Model:		2360	Instrument Serial No. 184949	
Last Calibration Date:		3/6/2018		
Detector Model:		43-93	Detector Serial No.: 268605	
Today's Date:		4/3/2018	Data Collected by: Joan Cosgrove	
X	Alpha		Beta-Gamma	Gamma
Remarks:		Instrument Ambient Background Instrument Efficiency: 0.423		
Type of Surface:		N/A	Count Time:	1 Minutes
Count Number	CPM	$(x - \bar{x})$		$(x - \bar{x})^2$
1	0	-1.23		1.52
2	0	-1.23		1.52
3	0	-1.23		1.52
4	0	-1.23		1.52
5	0	-1.23		1.52
6	0	-1.23		1.52
7	0	-1.23		1.52
8	0	-1.23		1.52
9	1	-0.23		0.05
10	0	-1.23		1.52
11	0	-1.23		1.52
12	1	-0.23		0.05
13	2	0.77		0.59
14	1	-0.23		0.05
15	2	0.77		0.59
16	3	1.77		3.12
17	2	0.77		0.59
18	2	0.77		0.59
19	2	0.77		0.59
20	0	-1.23		1.52
21	1	-0.23		0.05
22	2	0.77		0.59
23	2	0.77		0.59
24	1	-0.23		0.05
25	3	1.77		3.12
26	2	0.77		0.59
27	1	-0.23		0.05
28	3	1.77		3.12
29	2	0.77		0.59
30	4	2.77		7.65
Mean Count: \bar{x}	1.23		SUM	39.37
Standard Deviation (σ)	1.17		Variance:	1.36
Background Count Rate:	1.23	CPM + -	2.33	CPM
Calculations Completed by:		Joan Cosgrove		Date: 4/3/2018
Reviewed by:		Daniel Spicuzza		Date: 4/3/2018
				Instrument Background in DPM 11.66
				CPM Low -1.1 CPM High 3.6

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218	
Instrument Model:		2360	Instrument Serial No. 184949
Last Calibration Date:		3/6/2018	
Detector Model:		43-93	Detector Serial No.: 268605
Today's Date:		4/3/2018	Data Collected by: Joan Cosgrove
Alpha		X	Beta-Gamma
Gamma			
Remarks:		Instrument Ambient Background Instrument Efficiency: 0.268	
Type of Surface:		N/A	Count Time: 1 Minutes
Count Number	CPM	$(x - \bar{x})$	$(x - \bar{x})^2$
1	143	4.27	18.20
2	133	-5.73	32.87
3	142	3.27	10.67
4	141	2.27	5.14
5	117	-21.73	472.34
6	148	9.27	85.87
7	134	-4.73	22.40
8	137	-1.73	3.00
9	139	0.27	0.07
10	164	25.27	638.40
11	128	-10.73	115.20
12	146	7.27	52.80
13	131	-7.73	59.80
14	120	-18.73	350.94
15	167	28.27	799.00
16	156	17.27	298.14
17	148	9.27	85.87
18	140	1.27	1.60
19	128	-10.73	115.20
20	123	-15.73	247.54
21	127	-11.73	137.67
22	134	-4.73	22.40
23	142	3.27	10.67
24	140	1.27	1.60
25	153	14.27	203.54
26	145	6.27	39.27
27	138	-0.73	0.54
28	140	1.27	1.60
29	140	1.27	1.60
30	118	-20.73	429.87
Mean Count: \bar{x}	138.73	SUM	4263.87
Standard Deviation (σ)	12.13	Variance:	147.03
Background Count Rate:	138.73	CPM + -	24.25
Calculations Completed by:	Joan Cosgrove		CPM
Reviewed by:	Daniel Spicuzza		CPM
Instrument Background in DPM			2070.65
CPM Low		CPM High	
114.5		163.0	
Date:	4/3/2018		
Date:	4/3/2018		

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218				
Instrument Model:		2929	Instrument Serial No. 146870			
Last Calibration Date:		6/17/2017				
Detector Model:		43-10-1	Detector Serial No.: 151113			
Today's Date:		Data Collected by:				
X	Alpha	Beta-Gamma	Gamma			
Remarks:		Instrument Ambient Background Instrument Efficiency: 0.71				
Type of Surface:	N/A	Count Time:	1 Minutes			
Count Number	CPM	$(x - \bar{x})$	$(x - \bar{x})^2$			
1	0	0.00	0.00			
2	0	-0.33	0.11			
3	0	-0.33	0.11			
4	1	0.67	0.44			
5	0	-0.33	0.11			
6	0	-0.33	0.11			
7	1	0.67	0.44			
8	1	0.67	0.44			
9	0	-0.33	0.11			
10	1	0.67	0.44			
11	0	-0.33	0.11			
12	0	-0.33	0.11			
13	0	-0.33	0.11			
14	0	-0.33	0.11			
15	0	-0.33	0.11			
16	1	0.67	0.44			
17	0	-0.33	0.11			
18	0	-0.33	0.11			
19	0	-0.33	0.11			
20	1	0.67	0.44			
21	0	-0.33	0.11			
22	0	-0.33	0.11			
23	0	-0.33	0.11			
24	1	0.67	0.44			
25	0	-0.33	0.11			
26	1	0.67	0.44			
27	1	0.67	0.44			
28	0	-0.33	0.11			
29	0	-0.33	0.11			
30	1	0.67	0.44			
Mean Count: \bar{x}	0.33	SUM	6.56	Instrument Background in DPM 1.88		
Standard Deviation (σ)	0.48	Variance:	0.23			
Background Count Rate:	0.33	CPM + -	0.96	CPM	CPM Low -0.6	CPM High 1.3
Calculations Completed by:	Thomas Hogan			Date:	4/3/2018	
Reviewed by:	Daniel Spicuzza			Date:	4/3/2018	

Aleut World Solutions
Background Determination Data Sheet

Project/Location:		NRL Chesapeake Building 218	
Instrument Model:		2929	Instrument Serial No. 146780
Last Calibration Date:		6/17/2017	
Detector Model:		43-10-1	Detector Serial No.: 151113
Today's Date:		4/3/2018	Data Collected by: Thomas Hogan
Alpha		X	Beta-Gamma
Gamma			
Remarks:		Instrument Ambient Background Instrument Efficiency: 0.53	
Type of Surface:		N/A	Count Time: 1 Minutes
Count Number	CPM	$(x - \bar{x})$	$(x - \bar{x})^2$
1	41	1.63	2.67
2	46	6.63	44.00
3	40	0.63	0.40
4	36	-3.37	11.33
5	49	9.63	92.80
6	38	-1.37	1.87
7	43	3.63	13.20
8	44	4.63	21.47
9	36	-3.37	11.33
10	48	8.63	74.53
11	39	-0.37	0.13
12	30	-9.37	87.73
13	37	-2.37	5.60
14	31	-8.37	70.00
15	42	2.63	6.93
16	37	-2.37	5.60
17	41	1.63	2.67
18	34	-5.37	28.80
19	44	4.63	21.47
20	36	-3.37	11.33
21	30	-9.37	87.73
22	40	0.63	0.40
23	33	-6.37	40.53
24	38	-1.37	1.87
25	42	2.63	6.93
26	35	-4.37	19.07
27	40	0.63	0.40
28	46	6.63	44.00
29	40	0.63	0.40
30	45	5.63	31.73
Mean Count: \bar{x}	39.37	SUM	746.97
Standard Deviation (σ)	5.08	Variance:	25.76
Background Count Rate:	39.37	CPM + -	10.15 CPM
Calculations Completed by:	Thomas Hogan		Date: 4/3/2018
Reviewed by:	Daniel Spicuzza		Date: 4/3/2018

Instrument Background in DPM 297.11	
CPM Low 29.2	CPM High 49.5

Chi Square Tests

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360		Instrument Serial No.	268488
Last Calibration Date:		10/27/2017		Background Count Rate:	6.4 C_B
Detector Model:		43-37		Detector Serial No.:	190672
Today's Date:		4/9/2018		Data Collected by:	Adolfo Matus Jr.
Source ID:	039404	Activity	2,869	alphas/min	Efficiency: 30.2 %
Radionuclide:	Th-230	CPM (Gross) C_G	CPM (Net) C_1		
Count Number				$(C_1 - \bar{c})$	$(C_1 - \bar{c})^2$
1	521	514.6		0.95	0.90
2	497	490.6		-23.05	531.30
3	488	481.6		-32.05	1027.20
4	510	503.6		-10.05	101.00
5	523	516.6		2.95	8.70
6	526	519.6		5.95	35.40
7	532	525.6		11.95	142.80
8	569	562.6		48.95	2396.10
9	478	471.6		-42.05	1768.20
10	497	490.6		-23.05	531.30
11	479	472.6		-41.05	1685.10
12	579	572.6		58.95	3475.10
13	522	515.6		1.95	3.80
14	536	529.6		15.95	254.40
15	518	511.6		-2.05	4.20
16	532	525.6		11.95	142.80
17	521	514.6		0.95	0.90
18	532	525.6		11.95	142.80
19	546	539.6		25.95	673.40
20	495	488.6		-25.05	627.50
Total	10401	10273		SUM	13552.95 $\Sigma(C_1 - \bar{c})^2$
Mean Count: \bar{c}		514			
Chi Squared Value (C^2):		26.39	10.11 - 30.14	Standard Deviation:	27
+ 20% Value:	616	- 20% Value:	411	+ 3 σ Value:	594
				- 3 σ Value:	434
Calculations Completed by: Adolfo Matus Jr.				Date:	4/9/2018
Reviewed by: Daniel Spicuzza				Date:	4/9/2018

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360			Instrument Serial No. 268488
Last Calibration Date:		10/27/2017	Background Count Rate:		766 C_B
Detector Model:		43-37	Detector Serial No.:		190672
Today's Date:		4/9/2018	Data Collected by:		Adolfo Matus Jr.
Source ID:	049410	Activity	12,131	betas/min	Efficiency: 37.0 %
Radionuclide:	Tc-99	CPM (Gross) C_G	CPM (Net) C_1		
Count Number				$(C_1 - \bar{c})$	$(C_1 - \bar{c})^2$
1	4376	3610		-88.55	7841.10
2	4386	3620		-78.55	6170.10
3	4465	3699		0.45	0.20
4	4428	3662		-36.55	1335.90
5	4443	3677		-21.55	464.40
6	4411	3645		-53.55	2867.60
7	4393	3627		-71.55	5119.40
8	4538	3772		73.45	5394.90
9	4391	3625		-73.55	5409.60
10	4487	3721		22.45	504.00
11	4521	3755		56.45	3186.60
12	4522	3756		57.45	3300.50
13	4512	3746		47.45	2251.50
14	4578	3812		113.45	12870.90
15	4467	3701		2.45	6.00
16	4632	3866		167.45	28039.50
17	4338	3572		-126.55	16014.90
18	4495	3729		30.45	927.20
19	4476	3710		11.45	131.10
20	4432	3666		-32.55	1059.50
Total	89291	73971		SUM	102894.95 $\Sigma(C_1 - \bar{c})^2$
Mean Count: \bar{c}		3699			
Chi Squared Value (C^2):		27.82	10.11 - 30.14	Standard Deviation:	74
+ 20% Value:	4438	- 20% Value:	2959	+ 3 σ Value:	3919
				- 3 σ Value:	3478
Calculations Completed by: Adolfo Matus Jr.				Date:	4/9/2018
Reviewed by: Daniel Spicuzza				Date:	4/9/2018

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360			Instrument Serial No. 268497
Last Calibration Date:		10/10/2017	Background Count Rate:		4.6 C_B
Detector Model:		43-93	Detector Serial No.:		93965
Today's Date:	4/3/2018	Data Collected by:			Josefina Matus
Source ID:	039404	Activity	2,869	alphas/min	Efficiency: 31.0 %
Radionuclide:	Th-230	CPM (Gross) C_G	CPM (Net) C_1		
Count Number				$(C_1 - \bar{c})$	$(C_1 - \bar{c})^2$
1	448	443.4		13.85	191.82
2	467	462.4		32.85	1079.12
3	463	458.4		28.85	832.32
4	457	452.4		22.85	522.12
5	396	391.4		-38.15	1455.42
6	416	411.4		-18.15	329.42
7	421	416.4		-13.15	172.92
8	439	434.4		4.85	23.52
9	423	418.4		-11.15	124.32
10	448	443.4		13.85	191.82
11	456	451.4		21.85	477.42
12	419	414.4		-15.15	229.52
13	465	460.4		30.85	951.72
14	464	459.4		29.85	891.02
15	433	428.4		-1.15	1.32
16	403	398.4		-31.15	970.32
17	422	417.4		-12.15	147.62
18	425	420.4		-9.15	83.72
19	402	397.4		-32.15	1033.62
20	416	411.4		-18.15	329.42
Total	8683	8591		SUM	10038.55 $\Sigma(C_1 - \bar{c})^2$
Mean Count: \bar{c}		430			
Chi Squared Value (C^2):	23.37	10.11 - 30.14	Standard Deviation:	23	
+ 20% Value:	515	- 20% Value:	344	+ 3 σ Value:	499
				- 3 σ Value:	361
Calculations Completed by: Josefina Matus				Date:	4/3/2018
Reviewed by: Daniel Spicuzza				Date:	4/3/2018

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360			Instrument Serial No. 268497
Last Calibration Date:		10/10/2017	Background Count Rate:		766 C_B
Detector Model:		43-37	Detector Serial No.:		93965
Today's Date:		4/3/2018	Data Collected by:		Josefina Matus
Source ID:	049410	Activity	12,131	betas/min	Efficiency: 35.2 %
Radionuclide:	Tc-99	CPM (Gross) C_G	CPM (Net) C_1		
Count Number				$(C_1 - \bar{c})$	$(C_1 - \bar{c})^2$
1		4443	3677	34.15	1166.22
2		4421	3655	12.15	147.62
3		4413	3647	4.15	17.22
4		4255	3489	-153.85	23669.82
5		4433	3667	24.15	583.22
6		4309	3543	-99.85	9970.02
7		4409	3643	0.15	0.02
8		4471	3705	62.15	3862.62
9		4425	3659	16.15	260.82
10		4361	3595	-47.85	2289.62
11		4376	3610	-32.85	1079.12
12		4535	3769	126.15	15913.82
13		4403	3637	-5.85	34.22
14		4313	3547	-95.85	9187.22
15		4397	3631	-11.85	140.42
16		4450	3684	41.15	1693.32
17		4580	3814	171.15	29292.32
18		4363	3597	-45.85	2102.22
19		4375	3609	-33.85	1145.82
20		4445	3679	36.15	1306.82
Total		88177	72857	SUM	103862.55 $\Sigma(C_1 - \bar{c})^2$
Mean Count: \bar{c}			3643		
Chi Squared Value (C^2):	28.51		10.11 - 30.14	Standard Deviation:	74
+ 20% Value:	4371	- 20% Value:	2914	+ 3 σ Value:	3865
				- 3 σ Value:	3421
Calculations Completed by: Josefina Matus				Date:	4/3/2018
Reviewed by: Daniel Spicuzza				Date:	4/3/2018

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360			Instrument Serial No. 297743
Last Calibration Date:		10/10/2017	Background Count Rate:		6.8 C_B
Detector Model:		43-37	Detector Serial No.:		302111
Today's Date:		4/3/2018	Data Collected by:		Richard Thatcher
Source ID:	039404	Activity	2,869	alphas/min	Efficiency: 31.9 %
Radionuclide:	Th-230	CPM (Gross) C_G	CPM (Net) C_1		
Count Number				$(C_1 - \bar{c})$	$(C_1 - \bar{c})^2$
1	604	597.2		15.80	249.64
2	661	654.2		72.80	5299.84
3	622	615.2		33.80	1142.44
4	539	532.2		-49.20	2420.64
5	590	583.2		1.80	3.24
6	601	594.2		12.80	163.84
7	593	586.2		4.80	23.04
8	608	601.2		19.80	392.04
9	559	552.2		-29.20	852.64
10	579	572.2		-9.20	84.64
11	555	548.2		-33.20	1102.24
12	543	536.2		-45.20	2043.04
13	578	571.2		-10.20	104.04
14	586	579.2		-2.20	4.84
15	582	575.2		-6.20	38.44
16	573	566.2		-15.20	231.04
17	574	567.2		-14.20	201.64
18	590	583.2		1.80	3.24
19	626	619.2		37.80	1428.84
20	601	594.2		12.80	163.84
Total	11764	11628		SUM	15953.2 $\Sigma(C_1 - \bar{c})^2$
Mean Count: \bar{c}		581			
Chi Squared Value (C^2):		27.44	10.11 - 30.14	Standard Deviation:	29
+ 20% Value:	698	- 20% Value:	465	+ 3 σ Value:	668
				- 3 σ Value:	494
Calculations Completed by: Richard Thatcher				Date: 4/3/2018	
Reviewed by: Daniel Spicuzza				Date: 4/3/2018	

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360		Instrument Serial No.	297743
Last Calibration Date:		10/10/2017		Background Count Rate:	1084 C_B
Detector Model:		43-37		Detector Serial No.:	302111
Today's Date:		4/3/2018		Data Collected by:	Richard Thatcher
Source ID:	049410	Activity	12,131	betas/min	Efficiency: 38.4 %
Radionuclide:	Tc-99	CPM (Gross) C_G	CPM (Net) C_1		
Count Number				$(C_1 - \bar{c})$	$(C_1 - \bar{c})^2$
1	4224	3140		-42.55	1810.50
2	4142	3058		-124.55	15512.70
3	4163	3079		-103.55	10722.60
4	4225	3141		-41.55	1726.40
5	4294	3210		27.45	753.50
6	4331	3247		64.45	4153.80
7	4233	3149		-33.55	1125.60
8	4192	3108		-74.55	5557.70
9	4249	3165		-17.55	308.00
10	4212	3128		-54.55	2975.70
11	4266	3182		-0.55	0.30
12	4240	3156		-26.55	704.90
13	4368	3284		101.45	10292.10
14	4343	3259		76.45	5844.60
15	4387	3303		120.45	14508.20
16	4236	3152		-30.55	933.30
17	4332	3248		65.45	4283.70
18	4293	3209		26.45	699.60
19	4289	3205		22.45	504.00
20	4312	3228		45.45	2065.70
Total	85331	63651		SUM	84482.95 $\Sigma(C_1 - \bar{c})^2$
Mean Count: \bar{c}		3183			
Chi Squared Value (C^2):		26.55	10.11 - 30.14	Standard Deviation:	67
+ 20% Value:	3819	- 20% Value:	2546	+ 3 σ Value:	3383
				- 3 σ Value:	2983
Calculations Completed by:				Richard Thatcher	Date: 4/3/2018
Reviewed by:				Daniel Spicuzza	Date: 4/3/2018

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360			Instrument Serial No. 184949
Last Calibration Date:		3/6/2018	Background Count Rate:		1.2 C_B
Detector Model:		43-93	Detector Serial No.:		268605
Today's Date:		4/3/2018	Data Collected by:		Joan Cosgrove
Source ID:	039404	Activity	2,869	alphas/min	Efficiency: 42.3 %
Radionuclide:	Th-230	CPM (Gross) C_G	CPM (Net) C_1		
Count Number				$(C_1 - \bar{c})$	$(C_1 - \bar{c})^2$
1		701	699.8	7.70	59.29
2		639	637.8	-54.30	2948.49
3		683	681.8	-10.30	106.09
4		669	667.8	-24.30	590.49
5		724	722.8	30.70	942.49
6		719	717.8	25.70	660.49
7		694	692.8	0.70	0.49
8		706	704.8	12.70	161.29
9		700	698.8	6.70	44.89
10		722	720.8	28.70	823.69
11		681	679.8	-12.30	151.29
12		708	706.8	14.70	216.09
13		706	704.8	12.70	161.29
14		679	677.8	-14.30	204.49
15		660	658.8	-33.30	1108.89
16		671	669.8	-22.30	497.29
17		742	740.8	48.70	2371.69
18		705	703.8	11.70	136.89
19		704	702.8	10.70	114.49
20		653	651.8	-40.30	1624.09
Total		13866	13842	SUM	12924.2 $\Sigma(C_1 - \bar{c})^2$
Mean Count: \bar{c}		692			
Chi Squared Value (C^2):		18.67	10.11 - 30.14	Standard Deviation:	26
+ 20% Value:	831	- 20% Value:	554	770	- 3 σ Value: 614
Calculations Completed by: Joan Cosgrove					Date: 4/3/2018
Reviewed by: Daniel Spicuzza					Date: 4/3/2018

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360		Instrument Serial No.	184949
Last Calibration Date:		3/6/2018		Background Count Rate:	139 C_B
Detector Model:		43-93		Detector Serial No.:	268605
Today's Date:		4/3/2018		Data Collected by:	Joan Cosgrove
Source ID:	049410	Activity	12,131	betas/min	Efficiency: 26.8 %
Radionuclide:	Tc-99	CPM (Gross) C_G	CPM (Net) C_1		
Count Number				$(C_1 - \bar{c})$	$(C_1 - \bar{c})^2$
1		2652	2513	-112.80	12723.84
2		2722	2583	-42.80	1831.84
3		2853	2714	88.20	7779.24
4		2753	2614	-11.80	139.24
5		2688	2549	-76.80	5898.24
6		2772	2633	7.20	51.84
7		2743	2604	-21.80	475.24
8		2764	2625	-0.80	0.64
9		2899	2760	134.20	18009.64
10		2768	2629	3.20	10.24
11		2815	2676	50.20	2520.04
12		2698	2559	-66.80	4462.24
13		2781	2642	16.20	262.44
14		2769	2630	4.20	17.64
15		2705	2566	-59.80	3576.04
16		2760	2621	-4.80	23.04
17		2751	2612	-13.80	190.44
18		2742	2603	-22.80	519.84
19		2829	2690	64.20	4121.64
20		2832	2693	67.20	4515.84
Total		55296	52516	SUM	67129.2
Mean Count: \bar{c}			2626		$\Sigma(C_1 - \bar{c})^2$
Chi Squared Value (C^2):		25.57	10.11 - 30.14	Standard Deviation:	59
+ 20% Value:	3151	- 20% Value:	2101	+ 3 σ Value:	2804
				- 3 σ Value:	2447
Calculations Completed by:				Joan Cosgrove	Date: 4/3/2018
Reviewed by:				Daniel Spicuzza	Date: 4/3/2018

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360		Instrument Serial No.	193668
Last Calibration Date:		8/15/2017		Background Count Rate:	1.3 C_B
Detector Model:		43-93		Detector Serial No.:	326725
Today's Date:	4/3/2018			Data Collected by:	Joan Cosgrove
Source ID:	039404	Activity	2,869	alphas/min	Efficiency: 49.7 %
Radionuclide:	Th-230	CPM (Gross) C_G	CPM (Net) C_1		
Count Number				$(C_1 - \bar{c})$	$(C_1 - \bar{c})^2$
1	725	723.7		-2.70	7.29
2	694	692.7		-33.70	1135.69
3	738	736.7		10.30	106.09
4	692	690.7		-35.70	1274.49
5	700	698.7		-27.70	767.29
6	713	711.7		-14.70	216.09
7	663	661.7		-64.70	4186.09
8	718	716.7		-9.70	94.09
9	702	700.7		-25.70	660.49
10	754	752.7		26.30	691.69
11	742	740.7		14.30	204.49
12	716	714.7		-11.70	136.89
13	737	735.7		9.30	86.49
14	771	769.7		43.30	1874.89
15	765	763.7		37.30	1391.29
16	787	785.7		59.30	3516.49
17	755	753.7		27.30	745.29
18	707	705.7		-20.70	428.49
19	776	774.7		48.30	2332.89
20	699	697.7		-28.70	823.69
Total	14554	14528		SUM	20680.2 $\Sigma(C_1 - \bar{c})^2$
Mean Count: \bar{c}		726			
Chi Squared Value (C^2):	28.47	10.11 - 30.14	Standard Deviation:	33	
+ 20% Value:	872	- 20% Value:	581	+ 3 σ Value:	825
				- 3 σ Value:	627
Calculations Completed by:	Joan Cosgrove				Date: 4/3/2018
Reviewed by:	Daniel Spicuzza				Date: 4/3/2018

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360			Instrument Serial No. 193668
Last Calibration Date:		8/15/2017	Background Count Rate:		150 C_B
Detector Model:		43-93	Detector Serial No.:		326725
Today's Date:		4/3/2018	Data Collected by:		Joan Cosgrove
Source ID:	049410	Activity	12,131	betas/min	Efficiency: 32.7 %
Radionuclide:	Tc-99	CPM (Gross) C_G	CPM (Net) C_1		
Count Number				$(C_1 - \bar{c})$	$(C_1 - \bar{c})^2$
1	3131	2981		-34.90	1218.01
2	3208	3058		42.10	1772.41
3	3173	3023		7.10	50.41
4	3209	3059		43.10	1857.61
5	3099	2949		-66.90	4475.61
6	3052	2902		-113.90	12973.21
7	3147	2997		-18.90	357.21
8	3243	3093		77.10	5944.41
9	3168	3018		2.10	4.41
10	3208	3058		42.10	1772.41
11	3075	2925		-90.90	8262.81
12	3120	2970		-45.90	2106.81
13	3208	3058		42.10	1772.41
14	3160	3010		-5.90	34.81
15	3296	3146		130.10	16926.01
16	3098	2948		-67.90	4610.41
17	3223	3073		57.10	3260.41
18	3267	3117		101.10	10221.21
19	3134	2984		-31.90	1017.61
20	3099	2949		-66.90	4475.61
Total	63318	60318		SUM	83113.8 $\Sigma(C_1 - \bar{c})^2$
Mean Count: \bar{c}		3016			
Chi Squared Value (C^2):		27.56	10.11 - 30.14	Standard Deviation:	66
+ 20% Value:	3619	- 20% Value:	2413	+ 3 σ Value:	3214
				- 3 σ Value:	2817
Calculations Completed by: Joan Cosgrove				Date:	4/3/2018
Reviewed by: Daniel Spicuzza				Date:	4/3/2018

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360			Instrument Serial No. 276990
Last Calibration Date:		3/20/2018	Background Count Rate:		8 C_B
Detector Model:		43-37	Detector Serial No.:		190620
Today's Date:		4/3/2018	Data Collected by:		Josefina Matus
Source ID:	039404	Activity	2,869	alphas/min	Efficiency: 28.7 %
Radionuclide:	Th-230	CPM (Gross) C_G	CPM (Net) C_1		
Count Number				$(C_1 - \bar{c})$	$(C_1 - \bar{c})^2$
1	566	558		16.10	259.21
2	580	572		30.10	906.01
3	578	570		28.10	789.61
4	546	538		-3.90	15.21
5	560	552		10.10	102.01
6	544	536		-5.90	34.81
7	540	532		-9.90	98.01
8	533	525		-16.90	285.61
9	542	534		-7.90	62.41
10	551	543		1.10	1.21
11	577	569		27.10	734.41
12	548	540		-1.90	3.61
13	568	560		18.10	327.61
14	536	528		-13.90	193.21
15	572	564		22.10	488.41
16	542	534		-7.90	62.41
17	509	501		-40.90	1672.81
18	541	533		-8.90	79.21
19	536	528		-13.90	193.21
20	529	521		-20.90	436.81
Total	10998	10838		SUM	6745.8 $\Sigma(C_1 - \bar{c})^2$
Mean Count: \bar{c}		542			
Chi Squared Value (C^2):		12.45	10.11 - 30.14	Standard Deviation:	19
+ 20% Value:	650	- 20% Value:	434		598 - 3 σ Value: 485
Calculations Completed by: Josefina Matus				Date:	4/3/2018
Reviewed by: Daniel Spicuzza				Date:	4/3/2018

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360		Instrument Serial No.	276990
Last Calibration Date:		3/20/2018		Background Count Rate:	925 C_B
Detector Model:		43-37		Detector Serial No.:	190620
Today's Date:	4/3/2018			Data Collected by:	Josefina Matus
Source ID:	049410	Activity	12,131	betas/min	Efficiency: 39.6 %
Radionuclide:	Tc-99	CPM (Gross) C_G	CPM (Net) C_1		
Count Number				$(C_1 - \bar{c})$	$(C_1 - \bar{c})^2$
1		4271	3346	-41.45	1718.10
2		4291	3366	-21.45	460.10
3		4281	3356	-31.45	989.10
4		4192	3267	-120.45	14508.20
5		4413	3488	100.55	10110.30
6		4302	3377	-10.45	109.20
7		4336	3411	23.55	554.60
8		4310	3385	-2.45	6.00
9		4223	3298	-89.45	8001.30
10		4249	3324	-63.45	4025.90
11		4280	3355	-32.45	1053.00
12		4275	3350	-37.45	1402.50
13		4458	3533	145.55	21184.80
14		4370	3445	57.55	3312.00
15		4371	3446	58.55	3428.10
16		4304	3379	-8.45	71.40
17		4347	3422	34.55	1193.70
18		4372	3447	59.55	3546.20
19		4300	3375	-12.45	155.00
20		4304	3379	-8.45	71.40
Total		86249	67749	SUM	75900.95 $\Sigma(C_1 - \bar{c})^2$
Mean Count: \bar{c}			3387		
Chi Squared Value (C^2):	22.41		10.11 - 30.14	Standard Deviation:	63
+ 20% Value:	4065	- 20% Value:	2710	+ 3 σ Value:	3577
				- 3 σ Value:	3198
Calculations Completed by:				Josefina Matus	Date: 4/3/2018
Reviewed by:				Daniel Spicuzza	Date: 4/3/2018

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360			Instrument Serial No. 297758
Last Calibration Date:		2/14/2018	Background Count Rate:		0.5 C_B
Detector Model:		43-93	Detector Serial No.:		299597
Today's Date:		4/3/2018	Data Collected by:		Thomas Hogan
Source ID:	039404	Activity	2,869	alphas/min	Efficiency: 44.4 %
Radionuclide:	Th-230	CPM (Gross) C_G	CPM (Net) C_1		
Count Number				$(C_1 - \bar{c})$	$(C_1 - \bar{c})^2$
1		754	753.5	40.25	1620.06
2		729	728.5	15.25	232.56
3		761	760.5	47.25	2232.56
4		671	670.5	-42.75	1827.56
5		692	691.5	-21.75	473.06
6		719	718.5	5.25	27.56
7		715	714.5	1.25	1.56
8		716	715.5	2.25	5.06
9		752	751.5	38.25	1463.06
10		691	690.5	-22.75	517.56
11		709	708.5	-4.75	22.56
12		713	712.5	-0.75	0.56
13		683	682.5	-30.75	945.56
14		680	679.5	-33.75	1139.06
15		678	677.5	-35.75	1278.06
16		761	760.5	47.25	2232.56
17		725	724.5	11.25	126.56
18		685	684.5	-28.75	826.56
19		738	737.5	24.25	588.06
20		703	702.5	-10.75	115.56
Total		14275	14265	SUM	15675.75 $\Sigma(C_1 - \bar{c})^2$
Mean Count: \bar{c}		713			
Chi Squared Value (C^2):		21.98	10.11 - 30.14	Standard Deviation:	29
+ 20% Value:	856	- 20% Value:	571	+ 3 σ Value:	799
				- 3 σ Value:	627
Calculations Completed by: Thomas Hogan				Date:	4/3/2018
Reviewed by: Daniel Spicuzza				Date:	4/3/2018

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360			Instrument Serial No. 297758
Last Calibration Date:		2/14/2018	Background Count Rate:		172 C_B
Detector Model:		43-93	Detector Serial No.:		299597
Today's Date:		4/3/2018	Data Collected by:		Thomas Hogan
Source ID:	049410	Activity	12,131	betas/min	Efficiency: 31.3 %
Radionuclide:	Tc-99	CPM (Gross) C_G	CPM (Net) C_1		
Count Number				$(C_1 - \bar{c})$	$(C_1 - \bar{c})^2$
1		3223	3051	86.60	7499.56
2		3135	2963	-1.40	1.96
3		3198	3026	61.60	3794.56
4		3074	2902	-62.40	3893.76
5		3069	2897	-67.40	4542.76
6		3175	3003	38.60	1489.96
7		3121	2949	-15.40	237.16
8		3228	3056	91.60	8390.56
9		3133	2961	-3.40	11.56
10		3048	2876	-88.40	7814.56
11		3211	3039	74.60	5565.16
12		3194	3022	57.60	3317.76
13		3170	2998	33.60	1128.96
14		3171	2999	34.60	1197.16
15		3164	2992	27.60	761.76
16		3127	2955	-9.40	88.36
17		3134	2962	-2.40	5.76
18		3082	2910	-54.40	2959.36
19		3043	2871	-93.40	8723.56
20		3028	2856	-108.40	11750.56
Total		62728	59288	SUM	73174.8 $\Sigma(C_1 - \bar{c})^2$
Mean Count: \bar{c}		2964			
Chi Squared Value (C^2):		24.68	10.11 - 30.14	Standard Deviation:	62
+ 20% Value:	3557	- 20% Value:	2372	+ 3 σ Value:	3151
				- 3 σ Value:	2778
Calculations Completed by: Thomas Hogan				Date:	4/3/2018
Reviewed by: Daniel Spicuzza				Date:	4/3/2018

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360		Instrument Serial No.	297766
Last Calibration Date:		12/20/2017		Background Count Rate:	0.09 C_B
Detector Model:		43-93		Detector Serial No.:	323074
Today's Date:				Data Collected by:	
Source ID:	039404	Activity	2,869	alphas/min	Efficiency: 40.4 %
Radionuclide:	Th-230	CPM (Gross) C_G	CPM (Net) C_1		
Count Number				$(C_1 - \bar{c})$	$(C_1 - \bar{c})^2$
1		612	611.91	-26.60	707.56
2		592	591.91	-46.60	2171.56
3		651	650.91	12.40	153.76
4		647	646.91	8.40	70.56
5		595	594.91	-43.60	1900.96
6		644	643.91	5.40	29.16
7		662	661.91	23.40	547.56
8		638	637.91	-0.60	0.36
9		609	608.91	-29.60	876.16
10		620	619.91	-18.60	345.96
11		686	685.91	47.40	2246.76
12		596	595.91	-42.60	1814.76
13		646	645.91	7.40	54.76
14		679	678.91	40.40	1632.16
15		632	631.91	-6.60	43.56
16		637	636.91	-1.60	2.56
17		669	668.91	30.40	924.16
18		670	669.91	31.40	985.96
19		642	641.91	3.40	11.56
20		645	644.91	6.40	40.96
Total		12772	12770.2	SUM	14560.8 $\Sigma(C_1 - \bar{c})^2$
Mean Count: \bar{c}			639		
Chi Squared Value (C^2):		22.80	10.11 - 30.14	Standard Deviation:	28
+ 20% Value:	766	- 20% Value:	511		722 - 3 σ Value: 555
Calculations Completed by:				Thomas Hogan	Date: 4/3/2018
Reviewed by:				Daniel Spicuzza	Date: 4/3/2018

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2360		Instrument Serial No.:	297766
Last Calibration Date:		12/20/2017		Background Count Rate:	170 C_B
Detector Model:		43-93		Detector Serial No.:	323074
Today's Date:		4/3/2018		Data Collected by:	Thomas Hogan
Source ID:	049410	Activity	12,131	betas/min	Efficiency: 25.4 %
Radionuclide:	Tc-99	CPM (Gross) C_G	CPM (Net) C_1		
Count Number				$(C_1 - \bar{c})$	$(C_1 - \bar{c})^2$
1	2606	2436		44.55	1984.70
2	2580	2410		18.55	344.10
3	2692	2522		130.55	17043.30
4	2543	2373		-18.45	340.40
5	2597	2427		35.55	1263.80
6	2505	2335		-56.45	3186.60
7	2551	2381		-10.45	109.20
8	2601	2431		39.55	1564.20
9	2605	2435		43.55	1896.60
10	2514	2344		-47.45	2251.50
11	2569	2399		7.55	57.00
12	2611	2441		49.55	2455.20
13	2461	2291		-100.45	10090.20
14	2566	2396		4.55	20.70
15	2531	2361		-30.45	927.20
16	2520	2350		-41.45	1718.10
17	2561	2391		-0.45	0.20
18	2474	2304		-87.45	7647.50
19	2591	2421		29.55	873.20
20	2551	2381		-10.45	109.20
Total	51229	47829		SUM	53882.95 $\Sigma(C_1 - \bar{c})^2$
Mean Count: \bar{c}		2391			
Chi Squared Value (C^2):	22.53	10.11 - 30.14	Standard Deviation:	53	
+ 20% Value:	2870	- 20% Value:	1913	+ 3 σ Value:	2551
				- 3 σ Value:	2232
Calculations Completed by:				Thomas Hogan	Date: 4/3/2018
Reviewed by:				Daniel Spicuzza	Date: 4/3/2018

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2929	Instrument Serial No.		146780
Last Calibration Date:		6/17/2017	Background Count Rate:		0.3 C _B
Detector Model:		43-10-1	Detector Serial No.:		151113
Today's Date:		4/3/2018	Data Collected by:		Thomas Hogan
Source ID:		011404	Activity		8,278 alphas/min
Radionuclide:		Th-230	Efficiency:		71.0 %
Count Number		CPM (Gross) C _G	CPM (Net) C _I	$(C_I - \bar{c})$	$(C_I - \bar{c})^2$
1	5214	5213.7	78.90	6225.21	
2	5249	5248.7	113.90	12973.21	
3	5232	5231.7	96.90	9389.61	
4	5196	5195.7	60.90	3708.81	
5	5085	5084.7	-50.10	2510.01	
6	5182	5181.7	46.90	2199.61	
7	5125	5124.7	-10.10	102.01	
8	5127	5126.7	-8.10	65.61	
9	5060	5059.7	-75.10	5640.01	
10	5132	5131.7	-3.10	9.61	
11	5181	5180.7	45.90	2106.81	
12	5143	5142.7	7.90	62.41	
13	5051	5050.7	-84.10	7072.81	
14	5097	5096.7	-38.10	1451.61	
15	5050	5049.7	-85.10	7242.01	
16	5105	5104.7	-30.10	906.01	
17	5146	5145.7	10.90	118.81	
18	5108	5107.7	-27.10	734.41	
19	5165	5164.7	29.90	894.01	
20	5054	5053.7	-81.10	6577.21	
Total		102702	102696	SUM	69989.8 $\Sigma(C_I - \bar{c})^2$
Mean Count: \bar{c}		5135			
Chi Squared Value (C ²):		13.63	10.11 - 30.14	Standard Deviation: 61	
+ 20% Value:		6162	- 20% Value:		4108
				+ 3 σ Value: 5317	
				- 3 σ Value: 4953	
Calculations Completed by:				Thomas Hogan	
				Date: 4/3/2018	
Reviewed by:				Daniel Spicuzza	
				Date: 4/3/2018	

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

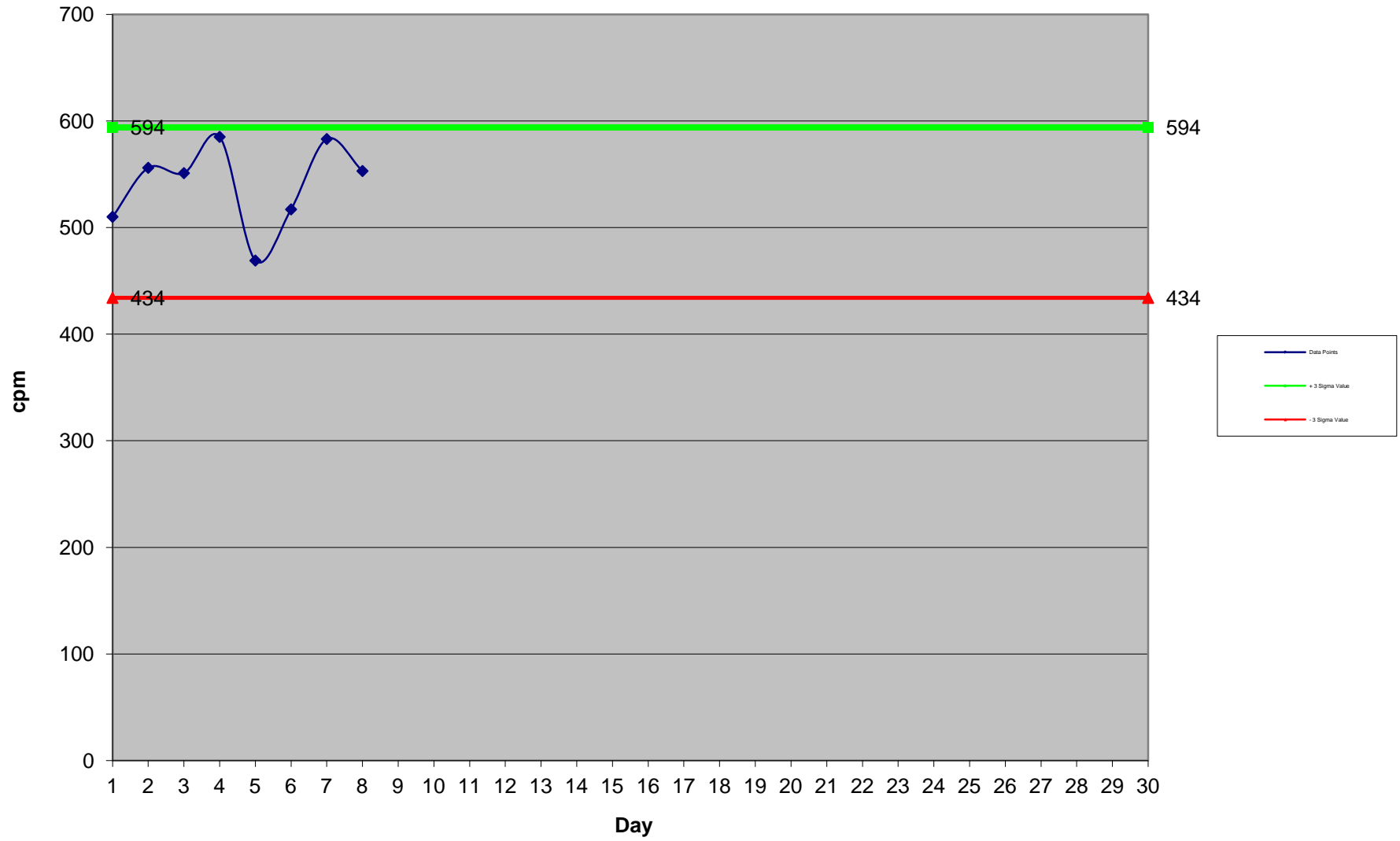
Project/Location:		NRL Chesapeake Building 218			
Instrument Model:		2929			Instrument Serial No. 146780
Last Calibration Date:		6/17/2017	Background Count Rate:		39.3 C_B
Detector Model:		43-10-1	Detector Serial No.:		151113
Today's Date:		4/3/2018	Data Collected by:		Thomas Hogan
Source ID:	011403	Activity	12,040	betas/min	Efficiency: 53.0 %
Radionuclide:	Tc-99	CPM	CPM		
Count Number	(Gross) C_G	(Net) C_I		$(C_I - \bar{c})$	$(C_I - \bar{c})^2$
1	5228	5188.7		90.35	8163.12
2	5210	5170.7		72.35	5234.52
3	5325	5285.7		187.35	35100.02
4	5103	5063.7		-34.65	1200.62
5	5165	5125.7		27.35	748.02
6	5075	5035.7		-62.65	3925.02
7	5078	5038.7		-59.65	3558.12
8	5105	5065.7		-32.65	1066.02
9	5102	5062.7		-35.65	1270.92
10	5158	5118.7		20.35	414.12
11	5139	5099.7		1.35	1.82
12	5013	4973.7		-124.65	15537.62
13	5118	5078.7		-19.65	386.12
14	5220	5180.7		82.35	6781.52
15	5108	5068.7		-29.65	879.12
16	5146	5106.7		8.35	69.72
17	5130	5090.7		-7.65	58.52
18	5117	5077.7		-20.65	426.42
19	5114	5074.7		-23.65	559.32
20	5099	5059.7		-38.65	1493.82
Total	102753	101967		SUM	86874.55 $\Sigma(C_I - c)^2$
Mean Count: \bar{c}			5098		
Chi Squared Value (C^2):	17.04	10.11 - 30.14	Standard Deviation:	68	
+ 20% Value:	6118	- 20% Value:	4079	+ 3 σ Value:	5301
				- 3 σ Value:	4895
Calculations Completed by:	Thomas Hogan				Date: 4/3/2018
Reviewed by:	Daniel Spicuzza				Date: 4/3/2018

Daily Instrument Response Checks

DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg. 218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Th-230	SOURCE ACTIVITY alphas/min	BACKGROUND CPM 1-11	READING CPM	Net CPM 434-594	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/10/2018	2360/43-37	268488/190672	N	10/27/2018	039404	2,869	6	516	510	30.2	P	AM
4/11/2018	2360/43-37	268488/190672	N	10/27/2018	039404	2,869	6	562	556	30.2	P	AM
4/12/2018	2360/43-37	268488/190672	N	10/27/2018	039404	2,869	8	559	551	30.2	P	AM
4/13/2018	2360/43-37	268488/190672	N	10/27/2018	039404	2,869	6	591	585	30.2	P	AM
4/16/2018	2360/43-37	268488/190672	N	10/27/2018	039404	2,869	11	480	469	30.2	P	AM
4/17/2018	2360/43-37	268488/190672	N	10/27/2018	039404	2,869	9	526	517	30.2	P	AM
4/18/2018	2360/43-37	268488/190672	N	10/27/2018	039404	2,869	5	588	583	30.2	P	TH
4/19/2018	2360/43-37	268488/190672	N	10/27/2018	039404	2,869	10	563	553	30.2	P	TH

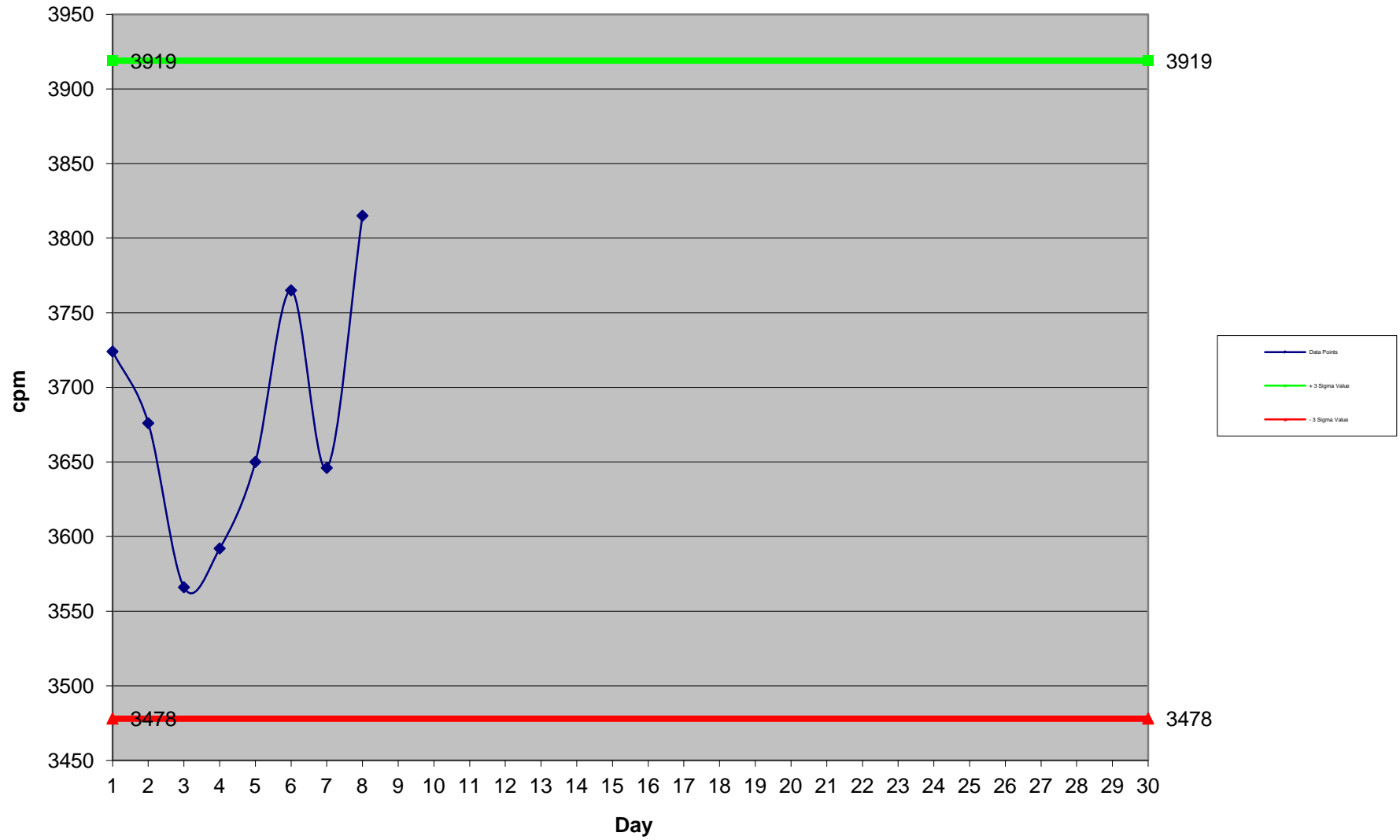
Model 2360Alpha Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg. 218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Tc-99	SOURCE ACTIVITY betas/min	BACKGROUND CPM 714-818	READING CPM	Net CPM 3478-3919	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/10/2018	2360/43-37	268488/190672	N	10/27/2018	049410	12,131	744	4468	3724	37.0	P	AM
4/11/2018	2360/43-37	268488/190672	N	10/27/2018	049410	12,131	808	4484	3676	37.0	P	AM
4/12/2018	2360/43-37	268488/190672	N	10/27/2018	049410	12,131	801	4367	3566	37.0	P	AM
4/13/2018	2360/43-37	268488/190672	N	10/27/2018	049410	12,131	817	4409	3592	37.0	P	AM
4/16/2018	2360/43-37	268488/190672	N	10/27/2018	049410	12,131	758	4408	3650	37.0	P	AM
4/17/2018	2360/43-37	268488/190672	N	10/27/2018	049410	12,131	815	4580	3765	37.0	P	AM
4/18/2018	2360/43-37	268488/190672	N	10/27/2018	049410	12,131	815	4461	3646	37.0	P	TH
4/19/2018	2360/43-37	268488/190672	N	10/27/2018	049410	12,131	751	4566	3815	37.0	P	TH

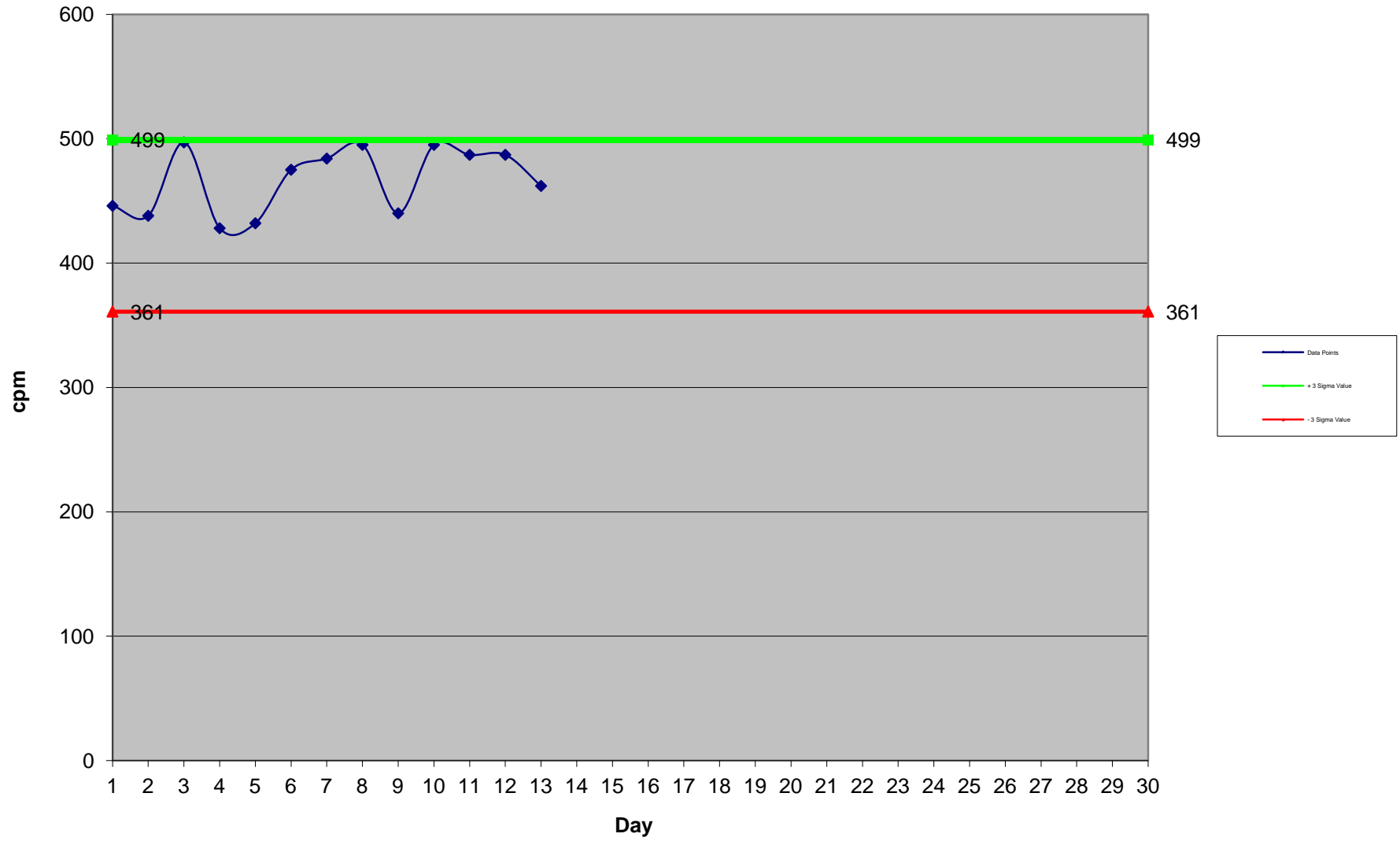
Model 2360 Beta Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg. 218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Th-230	SOURCE ACTIVITY alphas/min	BACKGROUND CPM 0-9	READING CPM	Net CPM 361-499	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/4/2018	2360/43-37	268497/093965	N	10/10/2018	039404	2,869	3	449	446	31.0	P	AM
4/5/2018	2360/43-37	268497/093965	N	10/10/2018	039404	2,869	4	442	438	31.0	P	AM
4/6/2018	2360/43-37	268497/093965	N	10/10/2018	039404	2,869	4	501	497	31.0	P	AM
4/9/2018	2360/43-37	268497/093965	N	10/10/2018	039404	2,869	1	429	428	31.0	P	AM
4/10/2018	2360/43-37	268497/093965	N	10/10/2018	039404	2,869	6	438	432	31.0	P	AM
4/11/2018	2360/43-37	268497/093965	N	10/10/2018	039404	2,869	4	479	475	31.0	P	AM
4/12/2018	2360/43-37	268497/093965	N	10/10/2018	039404	2,869	5	489	484	31.0	P	AM
4/13/2018	2360/43-37	268497/093965	N	10/10/2018	039404	2,869	8	503	495	31.0	P	AM
4/16/2018	2360/43-37	268497/093965	N	10/10/2018	039404	2,869	6	446	440	31.0	P	AM
4/17/2018	2360/43-37	268497/093965	N	10/10/2018	039404	2,869	2	497	495	31.0	P	AM
4/18/2018	2360/43-37	268497/093965	N	10/10/2018	039404	2,869	9	496	487	31.0	P	TH
4/19/2018	2360/43-37	268497/093965	N	10/10/2018	039404	2,869	5	492	487	31.0	P	TH
4/20/2018	2360/43-37	268497/093965	N	10/10/2018	039404	2,869	5	467	462	31.0	P	TH

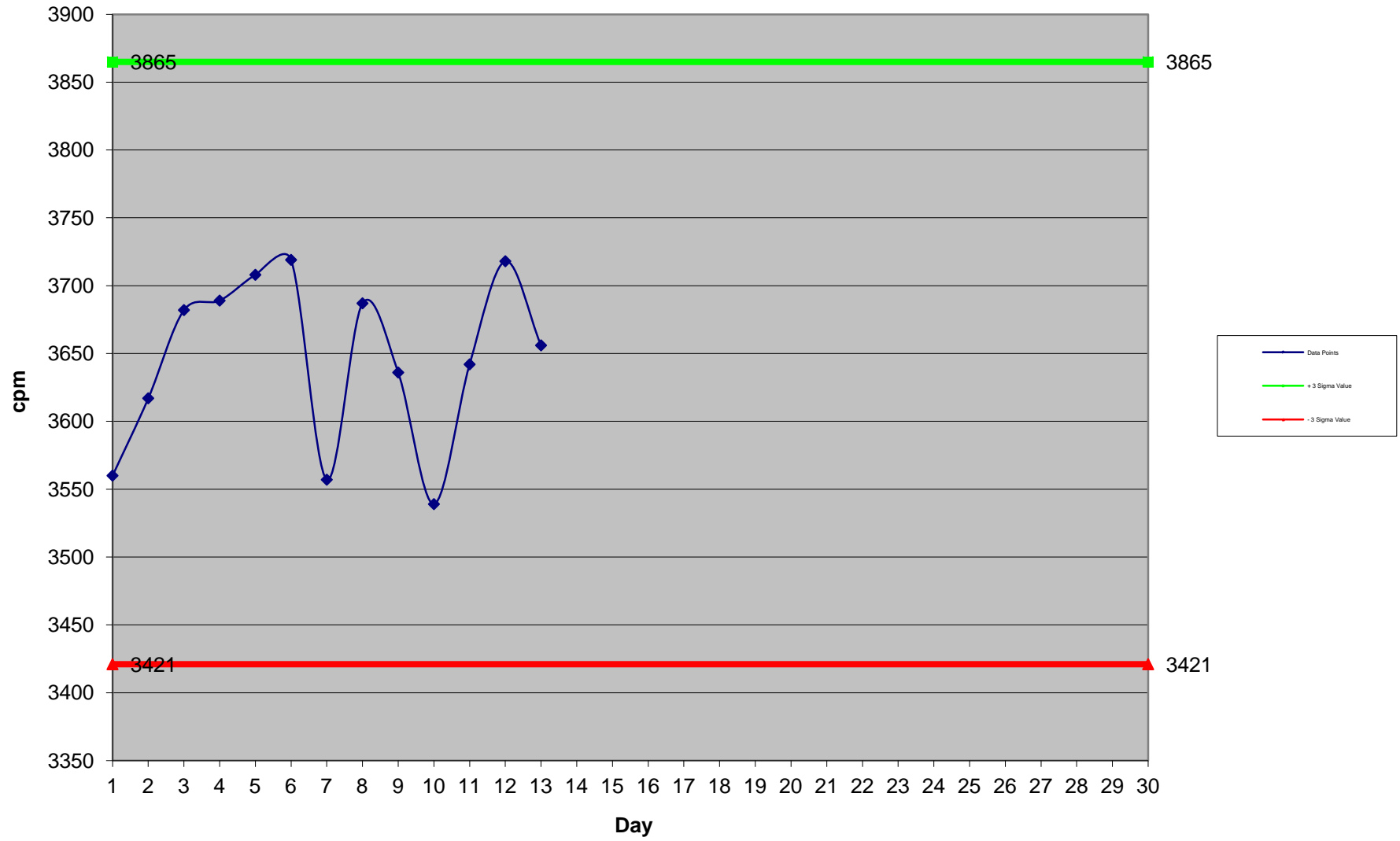
Model 2360Alpha Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg. 218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Tc-99	SOURCE ACTIVITY betas/min	BACKGROUND CPM 714-817	READING CPM	Net CPM 3421-3865	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/4/2018	2360/43-37	268497/093965	N	10/10/2018	049410	12,131	813	4373	3560	35.2	P	AM
4/5/2018	2360/43-37	268497/093965	N	10/10/2018	049410	12,131	738	4355	3617	35.2	P	AM
4/6/2018	2360/43-37	268497/093965	N	10/10/2018	049410	12,131	776	4458	3682	35.2	P	AM
4/9/2018	2360/43-37	268497/093965	N	10/10/2018	049410	12,131	758	4447	3689	35.2	P	AM
4/10/2018	2360/43-37	268497/093965	N	10/10/2018	049410	12,131	782	4490	3708	35.2	P	AM
4/11/2018	2360/43-37	268497/093965	N	10/10/2018	049410	12,131	741	4460	3719	35.2	P	AM
4/12/2018	2360/43-37	268497/093965	N	10/10/2018	049410	12,131	789	4346	3557	35.2	P	AM
4/13/2018	2360/43-37	268497/093965	N	10/10/2018	049410	12,131	771	4458	3687	35.2	P	AM
4/16/2018	2360/43-37	268497/093965	N	10/10/2018	049410	12,131	805	4441	3636	35.2	P	AM
4/17/2018	2360/43-37	268497/093965	N	10/10/2018	049410	12,131	809	4348	3539	35.2	P	AM
4/18/2018	2360/43-37	268497/093965	N	10/10/2018	049410	12,131	777	4419	3642	35.2	P	TH
4/19/2018	2360/43-37	268497/093965	N	10/10/2018	049410	12,131	785	4503	3718	35.2	P	TH
4/20/2018	2360/43-37	268497/093965	N	10/10/2018	049410	12,131	757	4413	3656	35.2	P	TH

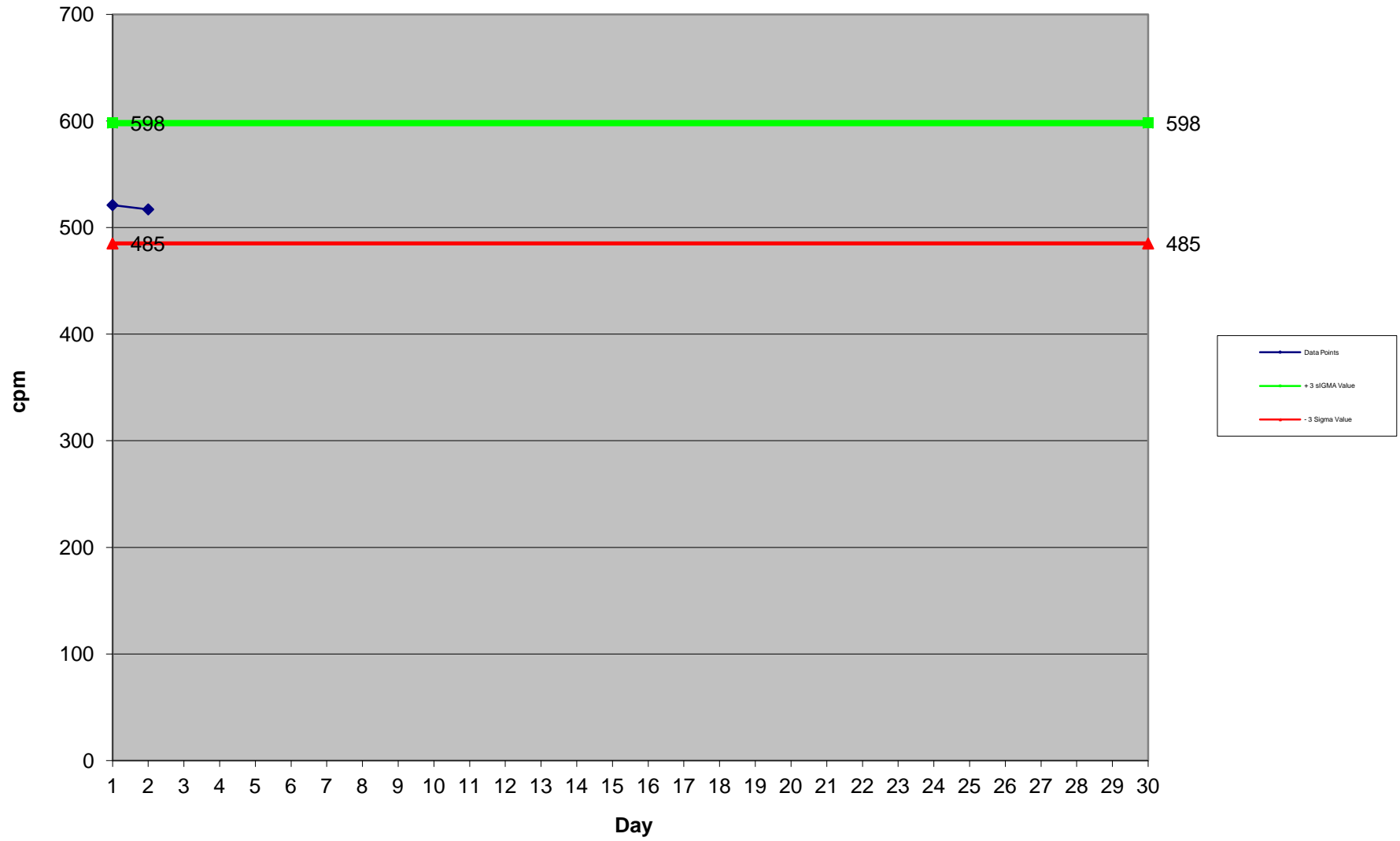
Model 2360 Beta Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg. 218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Th-230	SOURCE ACTIVITY alphas/min	BACKGROUND CPM 2-13	READING CPM	Net CPM 485-598	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/4/2018	2360/43-37	276990/190620	N	3/20/2018	039404	2,869	11	532	521	28.7	P	AM
4/5/2018	2360/43-37	276990/190620	N	3/20/2018	039404	2,869	7	524	517	28.7	P	AM

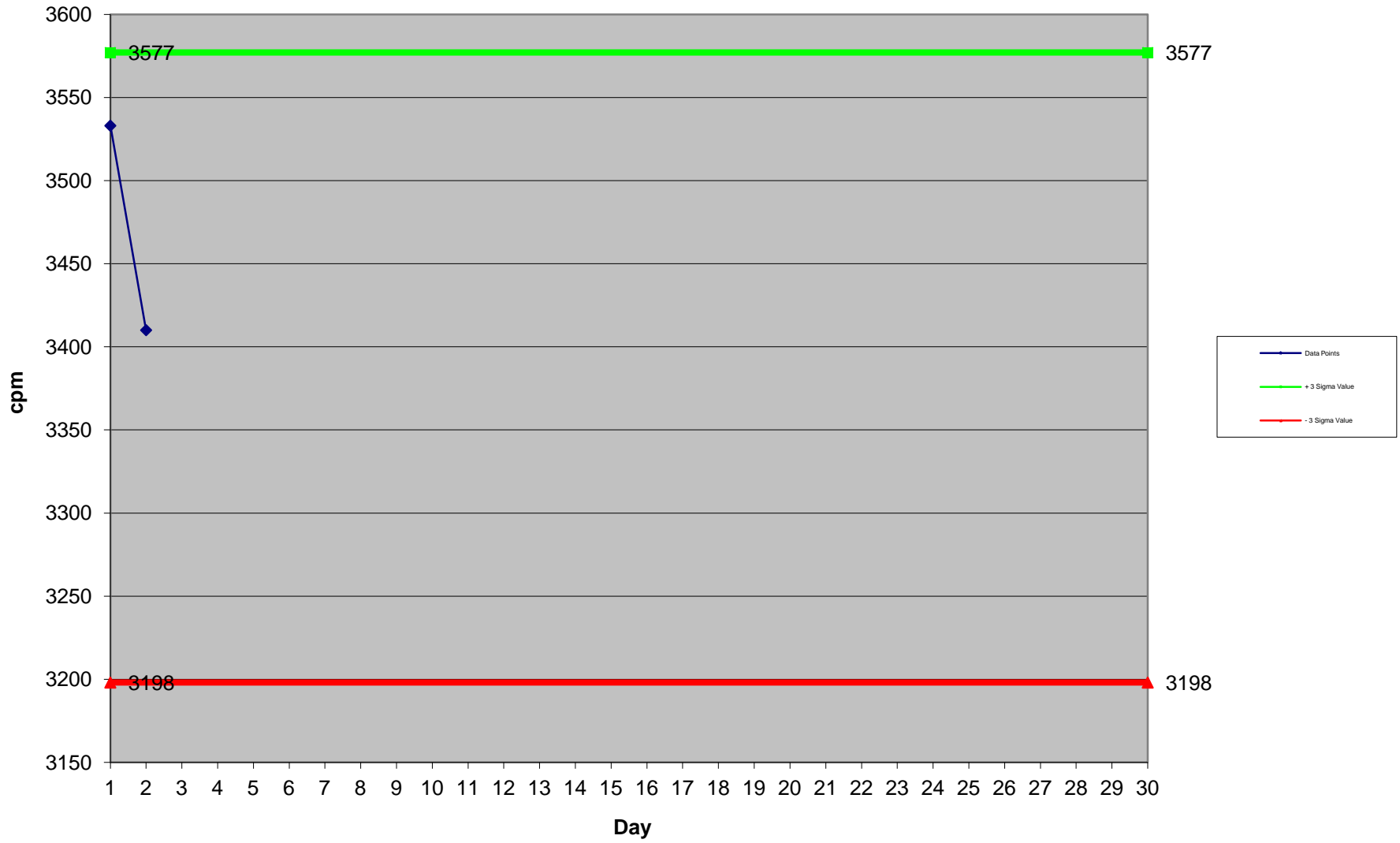
Model 2360 Alpha Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg. 218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Tc-99	SOURCE ACTIVITY betas/min	BACKGROUND CPM 853-998	READING CPM	Net CPM 3198-3577	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/4/2018	2360/43-37	276990/190620	N	3/20/2018	049410	12,131	868	4401	3533	39.6	P	AM
4/5/2018	2360/43-37	276990/190620	N	3/20/2018	049410	12,131	927	4337	3410	39.6	P	AM

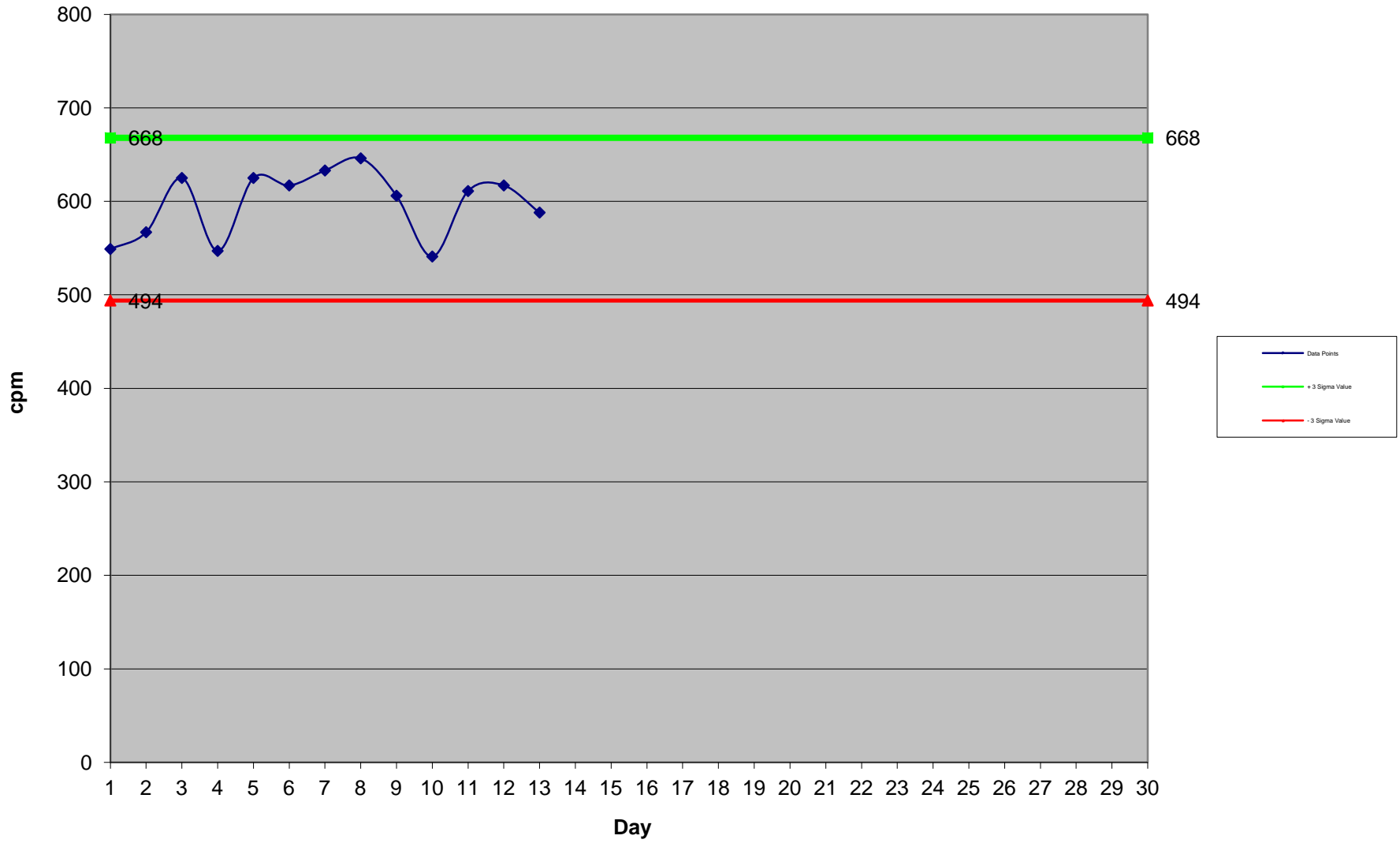
Model 2360 Beta Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg. 218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Th-230	SOURCE ACTIVITY alphas/min	BACKGROUND CPM 1-12	READING CPM	Net CPM 494-668	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/4/2018	2360/43-37	297743/302111	N	10/10/2018	039404	2,869	9	558	549	31.9	P	AM
4/5/2018	2360/43-37	297743/302111	N	10/10/2018	039404	2,869	11	578	567	31.9	P	AM
4/6/2018	2360/43-37	297743/302111	N	10/10/2018	039404	2,869	6	631	625	31.9	P	AM
4/9/2018	2360/43-37	297743/302111	N	10/10/2018	039404	2,869	8	555	547	31.9	P	AM
4/10/2018	2360/43-37	297743/302111	N	10/10/2018	039404	2,869	9	634	625	31.9	P	AM
4/11/2018	2360/43-37	297743/302111	N	10/10/2018	039404	2,869	7	624	617	31.9	P	AM
4/12/2018	2360/43-37	297743/302111	N	10/10/2018	039404	2,869	10	643	633	31.9	P	AM
4/13/2018	2360/43-37	297743/302111	N	10/10/2018	039404	2,869	11	657	646	31.9	P	AM
4/16/2018	2360/43-37	297743/302111	N	10/10/2018	039404	2,869	8	614	606	31.9	P	AM
4/17/2018	2360/43-37	297743/302111	N	10/10/2018	039404	2,869	6	547	541	31.9	P	AM
4/18/2018	2360/43-37	297743/302111	N	10/10/2018	039404	2,869	7	618	611	31.9	P	TH
4/19/2018	2360/43-37	297743/302111	N	10/10/2018	039404	2,869	1	618	617	31.9	P	TH
4/20/2018	2360/43-37	297743/302111	N	10/10/2018	039404	2,869	6	594	588	31.9	P	TH

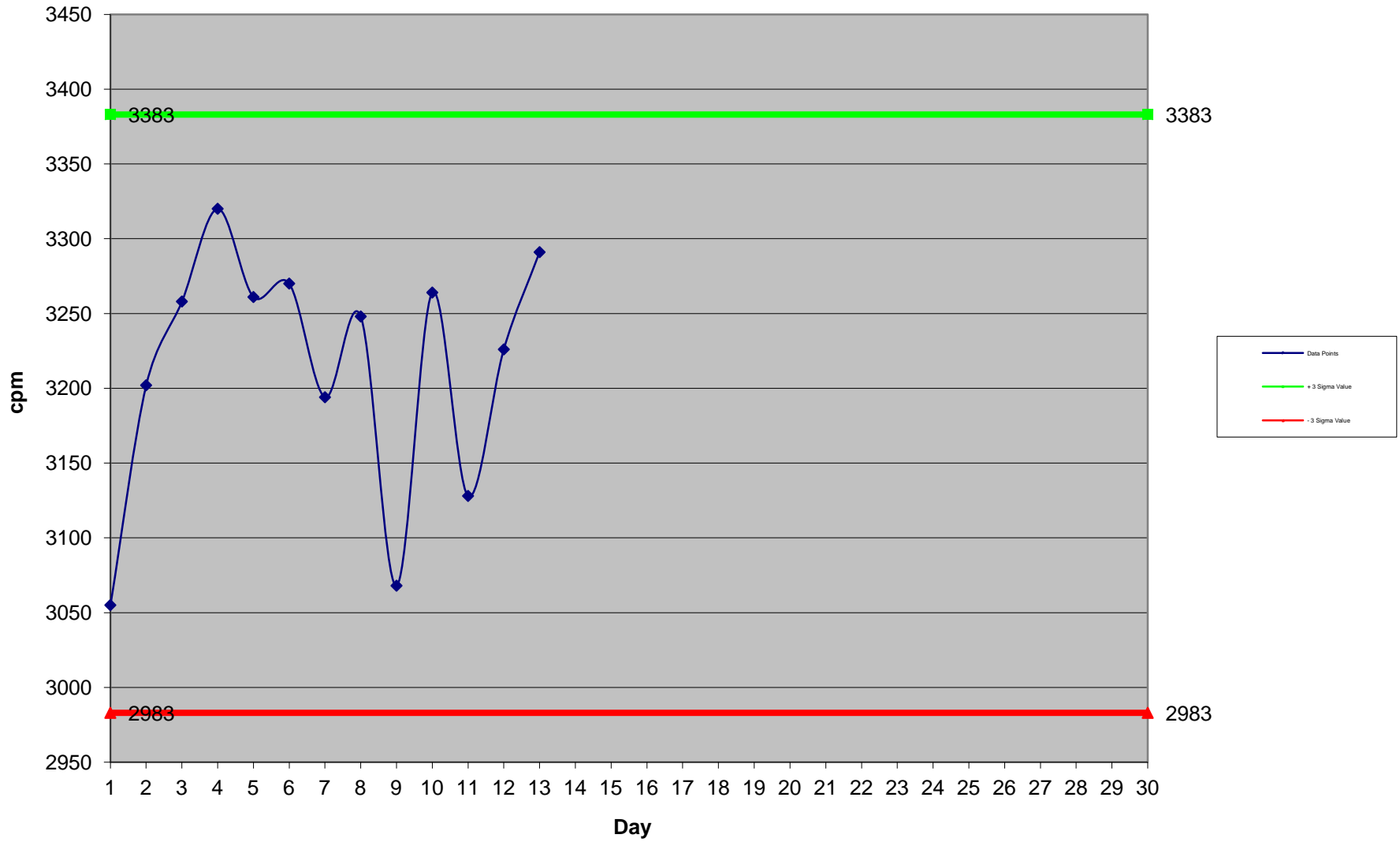
Model 2360Alpha Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg. 218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Tc-99	SOURCE ACTIVITY betas/min	BACKGROUND CPM 1026-1142	READING CPM	Net CPM 2983-3383	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/4/2018	2360/43-37	297743/302111	N	10/10/2018	049410	12,131	1132	4187	3055	38.4	P	AM
4/5/2018	2360/43-37	297743/302111	N	10/10/2018	049410	12,131	1073	4275	3202	38.4	P	AM
4/6/2018	2360/43-37	297743/302111	N	10/10/2018	049410	12,131	1124	4382	3258	38.4	P	AM
4/9/2018	2360/43-37	297743/302111	N	10/10/2018	049410	12,131	1056	4376	3320	38.4	P	AM
4/10/2018	2360/43-37	297743/302111	N	10/10/2018	049410	12,131	1061	4322	3261	38.4	P	AM
4/11/2018	2360/43-37	297743/302111	N	10/10/2018	049410	12,131	1058	4328	3270	38.4	P	AM
4/12/2018	2360/43-37	297743/302111	N	10/10/2018	049410	12,131	1085	4279	3194	38.4	P	AM
4/13/2018	2360/43-37	297743/302111	N	10/10/2018	049410	12,131	1071	4319	3248	38.4	P	AM
4/16/2018	2360/43-37	297743/302111	N	10/10/2018	049410	12,131	1038	4106	3068	38.4	P	AM
4/17/2018	2360/43-37	297743/302111	N	10/10/2018	049410	12,131	1100	4364	3264	38.4	P	AM
4/18/2018	2360/43-37	297743/302111	N	10/10/2018	049410	12,131	1106	4234	3128	38.4	P	TH
4/19/2018	2360/43-37	297743/302111	N	10/10/2018	049410	12,131	1029	4255	3226	38.4	P	TH
4/20/2018	2360/43-37	297743/302111	N	10/10/2018	049410	12,131	1009	4300	3291	38.4	P	TH

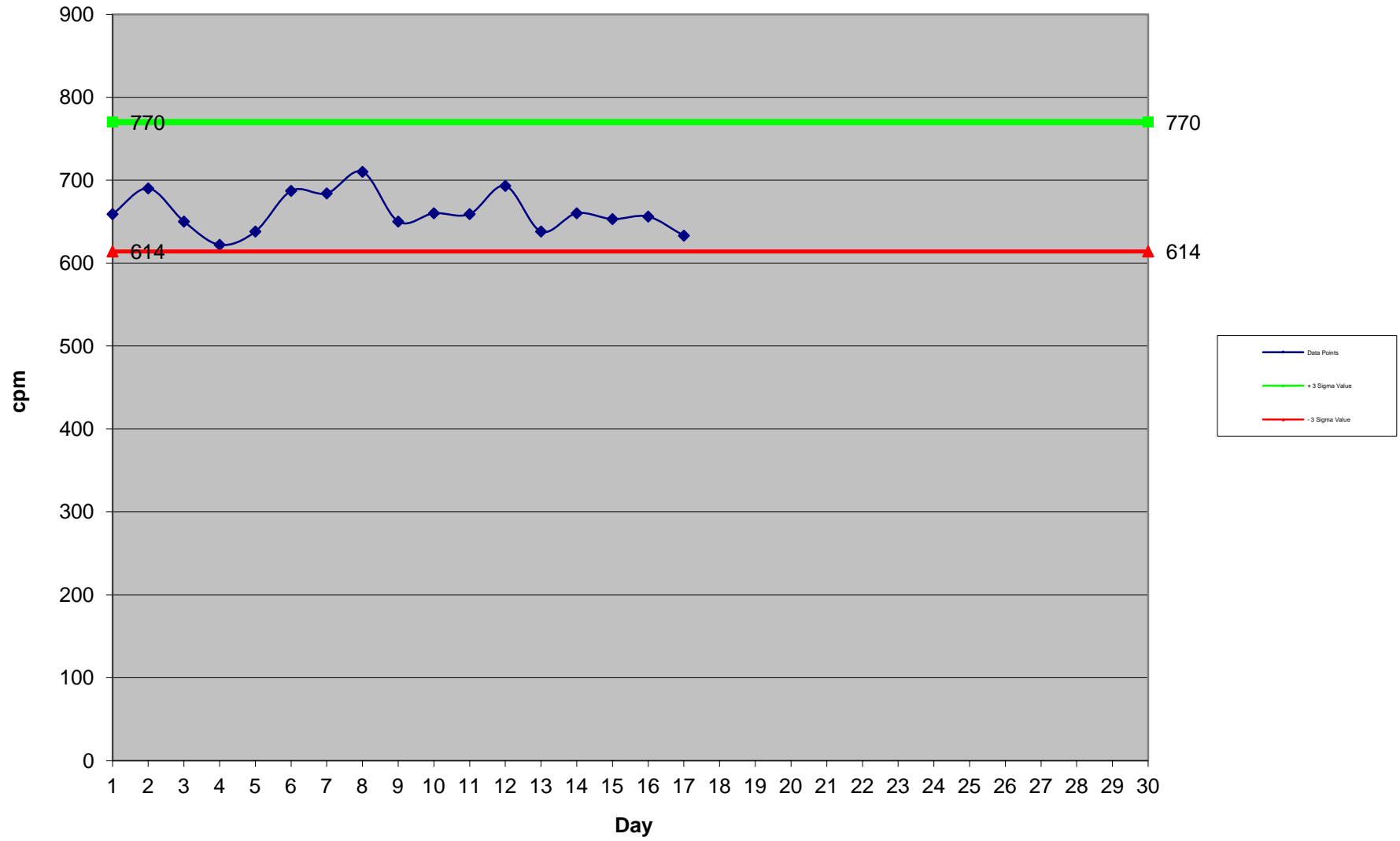
Model 2360 Beta Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg .218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Th-230	SOURCE ACTIVITY alphas/min	BACKGROUND CPM 0-3	READING CPM	Net CPM 614-770	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/4/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	2	661	659	42.3	P	TH
4/5/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	1	691	690	42.3	P	TH
4/6/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	1	651	650	42.3	P	TH
4/9/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	0	622	622	42.3	P	JC
4/10/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	0	638	638	42.3	P	TH
4/11/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	1	688	687	42.3	P	TH
4/12/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	1	685	684	42.3	P	TH
4/13/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	0	710	710	42.3	P	TH
4/16/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	0	650	650	42.3	P	JC
4/17/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	1	661	660	42.3	P	TH
4/18/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	0	659	659	42.3	P	TH
4/19/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	0	693	693	42.3	P	TH
4/20/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	2	640	638	42.3	P	TH
4/23/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	0	660	660	42.3	P	TH
4/24/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	0	653	653	42.3	P	TH
4/25/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	0	656	656	42.3	P	TH
4/26/2018	2360/43-93	184949/268605	N	3/6/2019	039404	2,869	0	633	633	42.3	P	TH

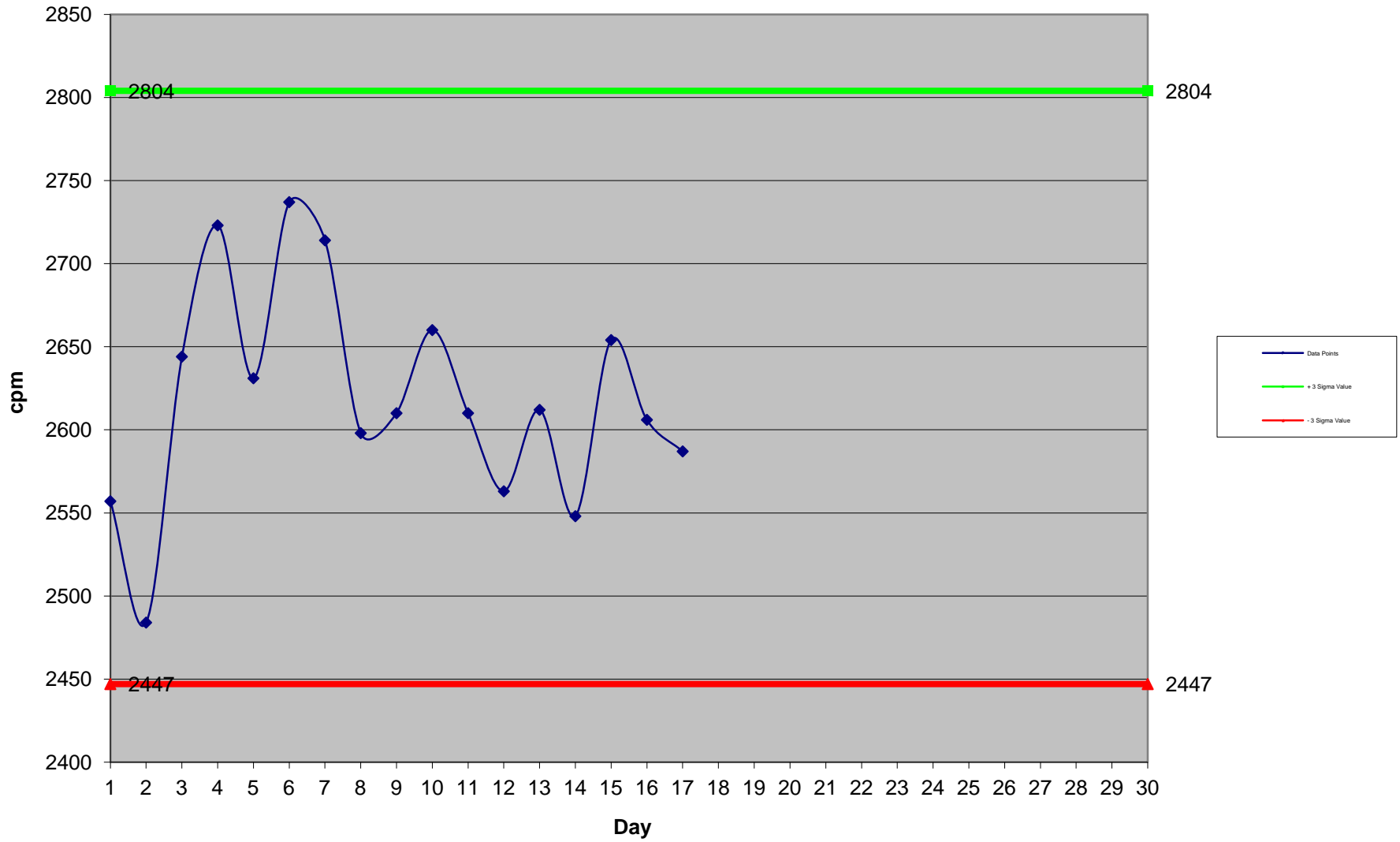
Model 2360 Alpha Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg .218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Tc-99	SOURCE ACTIVITY betas/min	BACKGROUND CPM 114-163	READING CPM	Net CPM 2447-2804	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/4/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	140	2697	2557	26.8	P	TH
4/5/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	160	2644	2484	26.8	P	TH
4/6/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	160	2804	2644	26.8	P	TH
4/9/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	162	2885	2723	26.8	P	JC
4/10/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	160	2791	2631	26.8	P	TH
4/11/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	154	2891	2737	26.8	P	TH
4/12/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	132	2846	2714	26.8	P	TH
4/13/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	160	2758	2598	26.8	P	TH
4/16/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	151	2761	2610	26.8	P	JC
4/17/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	160	2820	2660	26.8	P	TH
4/18/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	142	2752	2610	26.8	P	TH
4/19/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	162	2725	2563	26.8	P	TH
4/20/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	159	2771	2612	26.8	P	TH
4/23/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	150	2698	2548	26.8	P	TH
4/24/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	121	2775	2654	26.8	P	TH
4/25/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	150	2756	2606	26.8	P	TH
4/26/2018	2360/43-93	184949/268605	N	3/6/2019	049410	12,131	133	2720	2587	26.8	P	TH

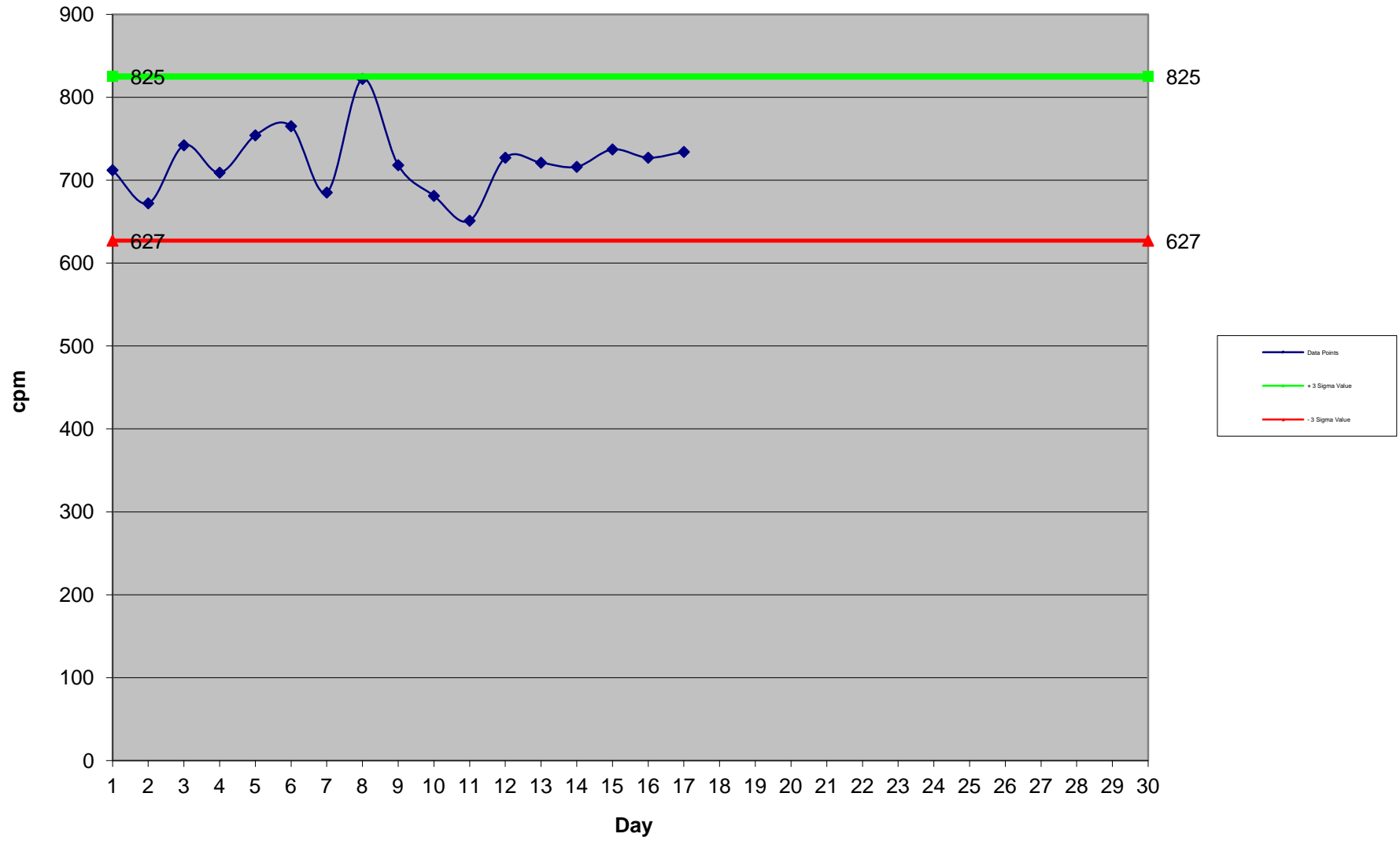
Model 2360 Beta Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg. 218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Th-230	SOURCE ACTIVITY alphas/min	BACKGROUND CPM 0-4	READING CPM	Net CPM 627-825	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/4/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	0	712	712	49.7	P	JC
4/5/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	1	673	672	49.7	P	JC
4/6/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	0	742	742	49.7	P	TH
4/9/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	1	710	709	49.7	P	JC
4/10/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	1	755	754	49.7	P	TH
4/11/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	1	766	765	49.7	P	TH
4/12/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	1	686	685	49.7	P	TH
4/13/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	1	823	822	49.7	P	TH
4/16/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	0	718	718	49.7	P	TH
4/17/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	0	681	681	49.7	P	JC
4/18/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	0	651	651	49.7	P	TH
4/19/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	1	728	727	49.7	P	TH
4/20/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	1	722	721	49.7	P	TH
4/23/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	0	716	716	49.7	P	TH
4/24/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	0	737	737	49.7	P	TH
4/25/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	0	727	727	49.7	P	TH
4/26/2018	2360/43-93	193668/326725	N	8/15/2018	039404	2,869	1	735	734	49.7	P	TH

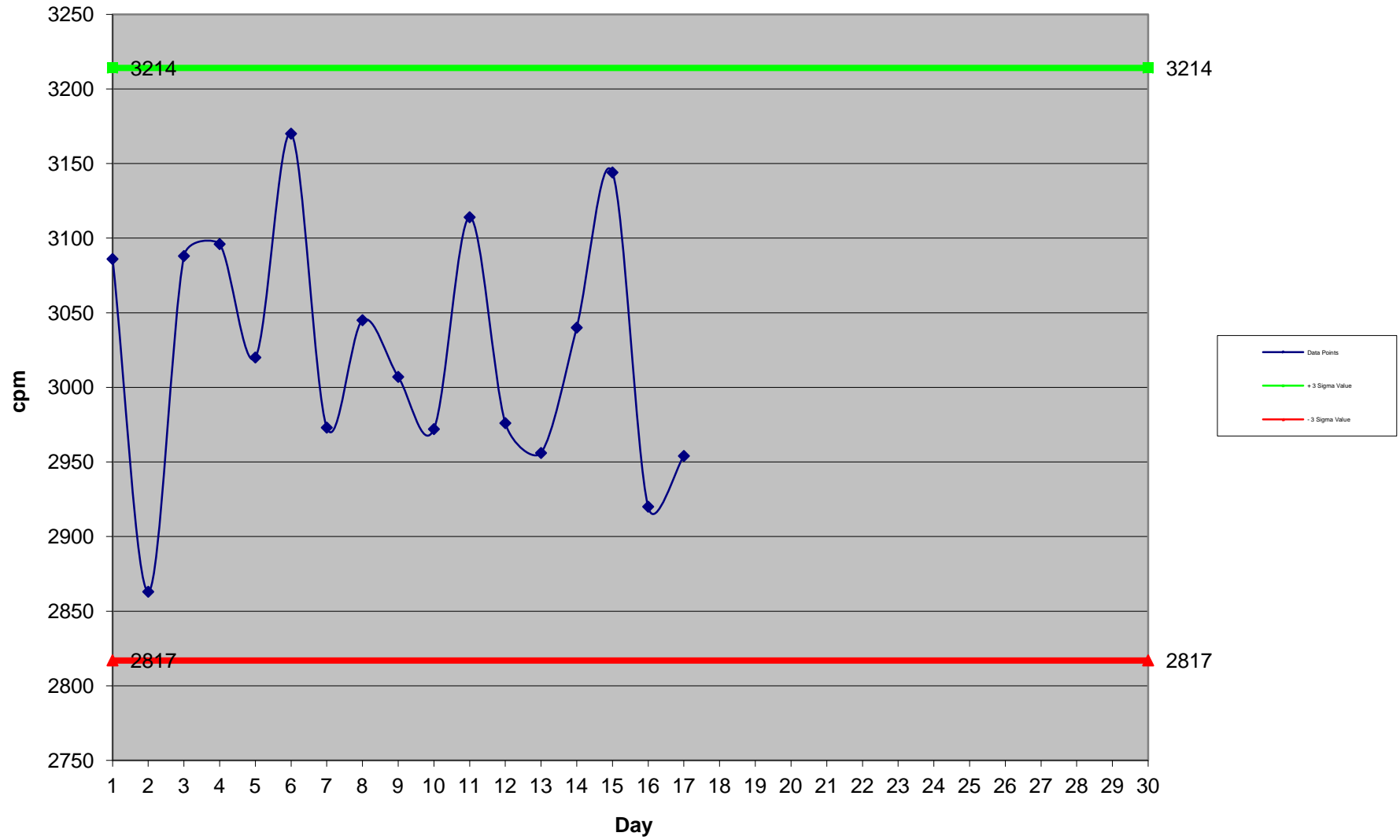
Model 2360 Alpha Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg. 218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Tc-99	SOURCE ACTIVITY betas/min	BACKGROUND CPM 128-172	READING CPM	Net CPM 2817-3214	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/4/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	156	3242	3086	32.7	P	JC
4/5/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	160	3023	2863	32.7	P	JC
4/6/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	163	3251	3088	32.7	P	TH
4/9/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	163	3259	3096	32.7	P	JC
4/10/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	168	3188	3020	32.7	P	TH
4/11/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	170	3340	3170	32.7	P	TH
4/12/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	167	3140	2973	32.7	P	TH
4/13/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	161	3206	3045	32.7	P	TH
4/16/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	148	3155	3007	32.7	P	TH
4/17/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	166	3138	2972	32.7	P	JC
4/18/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	170	3284	3114	32.7	P	TH
4/19/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	159	3135	2976	32.7	P	TH
4/20/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	168	3124	2956	32.7	P	TH
4/23/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	166	3206	3040	32.7	P	TH
4/24/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	143	3287	3144	32.7	P	TH
4/25/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	168	3088	2920	32.7	P	TH
4/26/2018	2360/43-93	193668/326725	N	8/15/2018	049410	12,131	169	3123	2954	32.7	P	TH

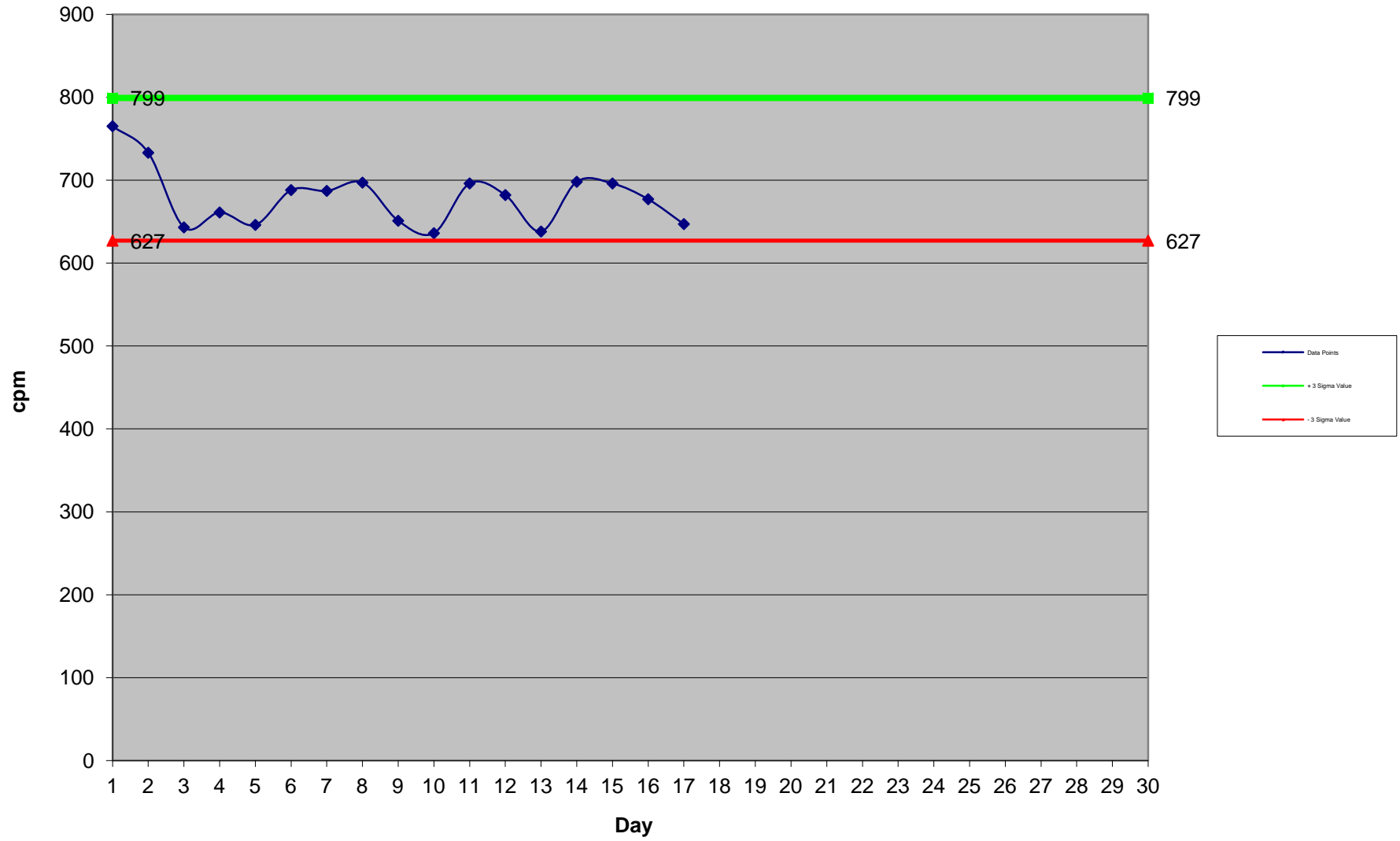
Model 2360 Beta Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg. 218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Th-230	SOURCE ACTIVITY alphas/min	BACKGROUND CPM 0-2	READING CPM	Net CPM 627-799	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/4/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	0	765	765	44.4	P	TH
4/5/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	0	733	733	44.4	P	TH
4/6/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	2	645	643	44.4	P	TH
4/9/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	1	662	661	44.4	P	TH
4/10/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	0	646	646	44.4	P	TH
4/11/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	1	689	688	44.4	P	TH
4/12/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	0	687	687	44.4	P	TH
4/13/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	0	697	697	44.4	P	TH
4/16/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	1	652	651	44.4	P	TH
4/17/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	0	636	636	44.4	P	TH
4/18/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	0	696	696	44.4	P	TH
4/19/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	1	683	682	44.4	P	TH
4/20/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	0	638	638	44.4	P	TH
4/23/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	0	698	698	44.4	P	TH
4/24/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	0	696	696	44.4	P	TH
4/25/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	0	677	677	44.4	P	TH
4/26/2018	2360/43-93	297758/299597	N	2/14/2019	039404	2,869	1	648	647	44.4	P	TH

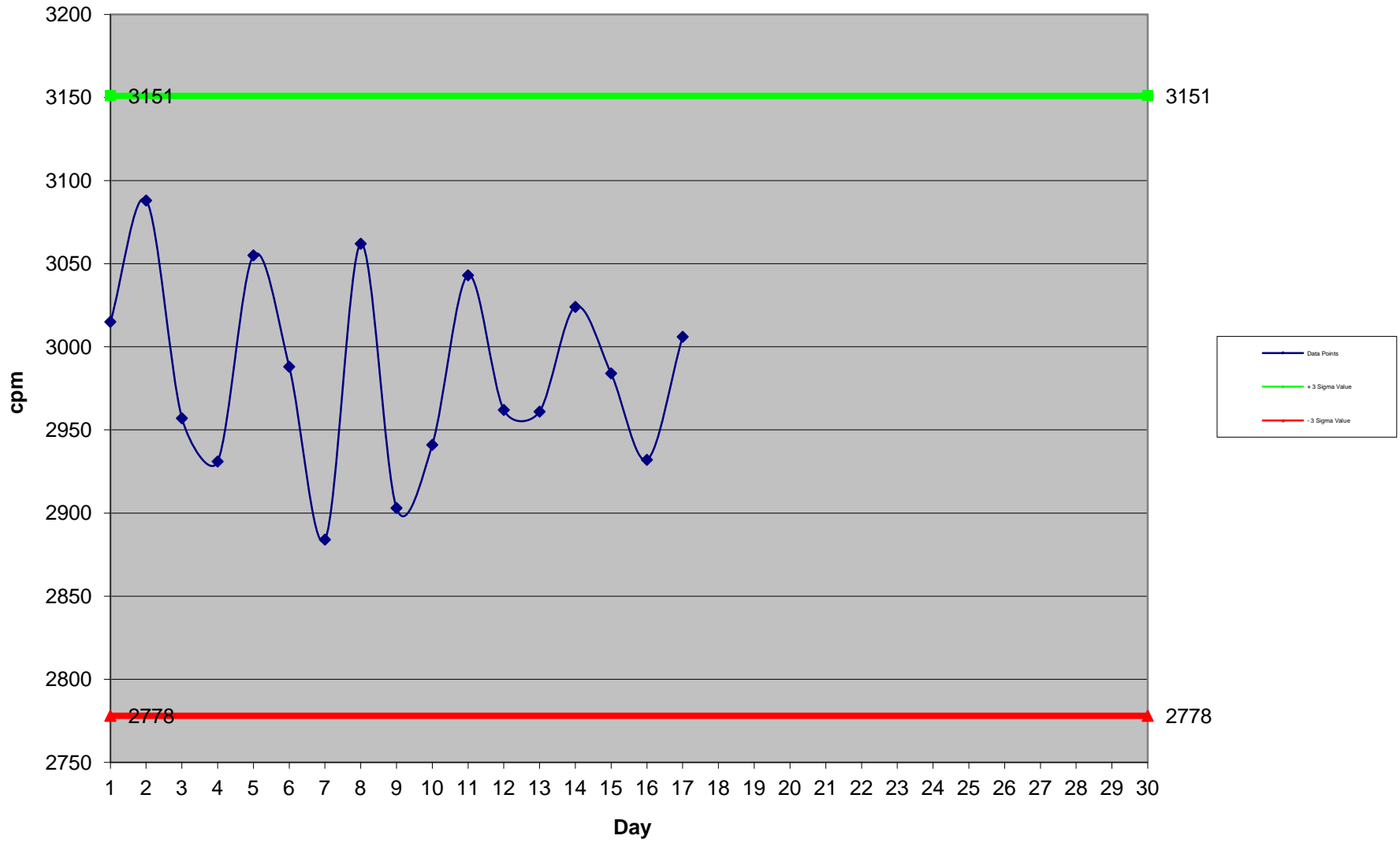
Model 2360 Alpha Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg. 218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Tc-99	SOURCE ACTIVITY betas/min	BACKGROUND CPM 144-199	READING CPM	Net CPM 2778-3151	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/4/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	197	3212	3015	31.3	P	TH
4/5/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	176	3264	3088	31.3	P	TH
4/6/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	191	3148	2957	31.3	P	TH
4/9/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	194	3125	2931	31.3	P	TH
4/10/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	178	3233	3055	31.3	P	TH
4/11/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	160	3148	2988	31.3	P	TH
4/12/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	194	3078	2884	31.3	P	TH
4/13/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	179	3241	3062	31.3	P	TH
4/16/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	167	3070	2903	31.3	P	TH
4/17/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	196	3137	2941	31.3	P	TH
4/18/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	174	3217	3043	31.3	P	TH
4/19/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	186	3148	2962	31.3	P	TH
4/20/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	197	3158	2961	31.3	P	TH
4/23/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	160	3184	3024	31.3	P	TH
4/24/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	194	3178	2984	31.3	P	TH
4/25/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	178	3110	2932	31.3	P	TH
4/26/2018	2360/43-93	297758/299597	N	2/14/2019	049410	12,131	170	3176	3006	31.3	P	TH

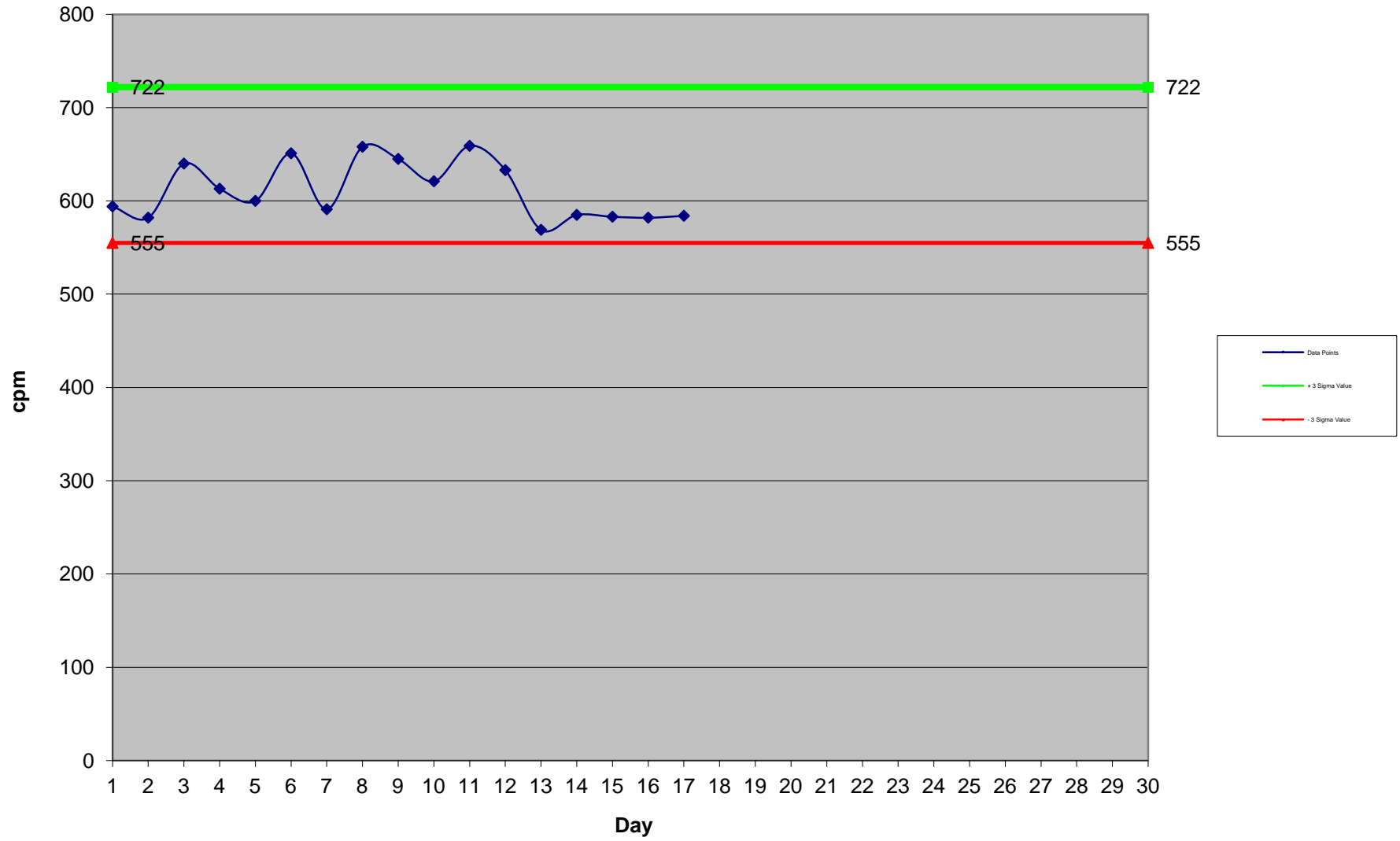
Model 2360 Beta Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg. 218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Th-230	SOURCE ACTIVITY alphas/min	BACKGROUND CPM 0-3	READING CPM	Net CPM 555-722	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/4/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	0	594	594	40.4	P	JC
4/5/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	1	583	582	40.4	P	JC
4/6/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	1	641	640	40.4	P	TH
4/9/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	0	613	613	40.4	P	TH
4/10/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	1	601	600	40.4	P	TH
4/11/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	1	652	651	40.4	P	TH
4/12/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	1	592	591	40.4	P	TH
4/13/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	0	658	658	40.4	P	TH
4/16/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	0	645	645	40.4	P	JC
4/17/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	0	621	621	40.4	P	TH
4/18/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	0	659	659	40.4	P	TH
4/19/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	0	633	633	40.4	P	TH
4/20/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	0	569	569	40.4	P	TH
4/23/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	2	587	585	40.4	P	TH
4/24/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	0	583	583	40.4	P	TH
4/25/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	0	582	582	40.4	P	TH
4/26/2018	2360/43-93	297766/323074	N	12/20/2018	039404	2,869	0	584	584	40.4	P	TH

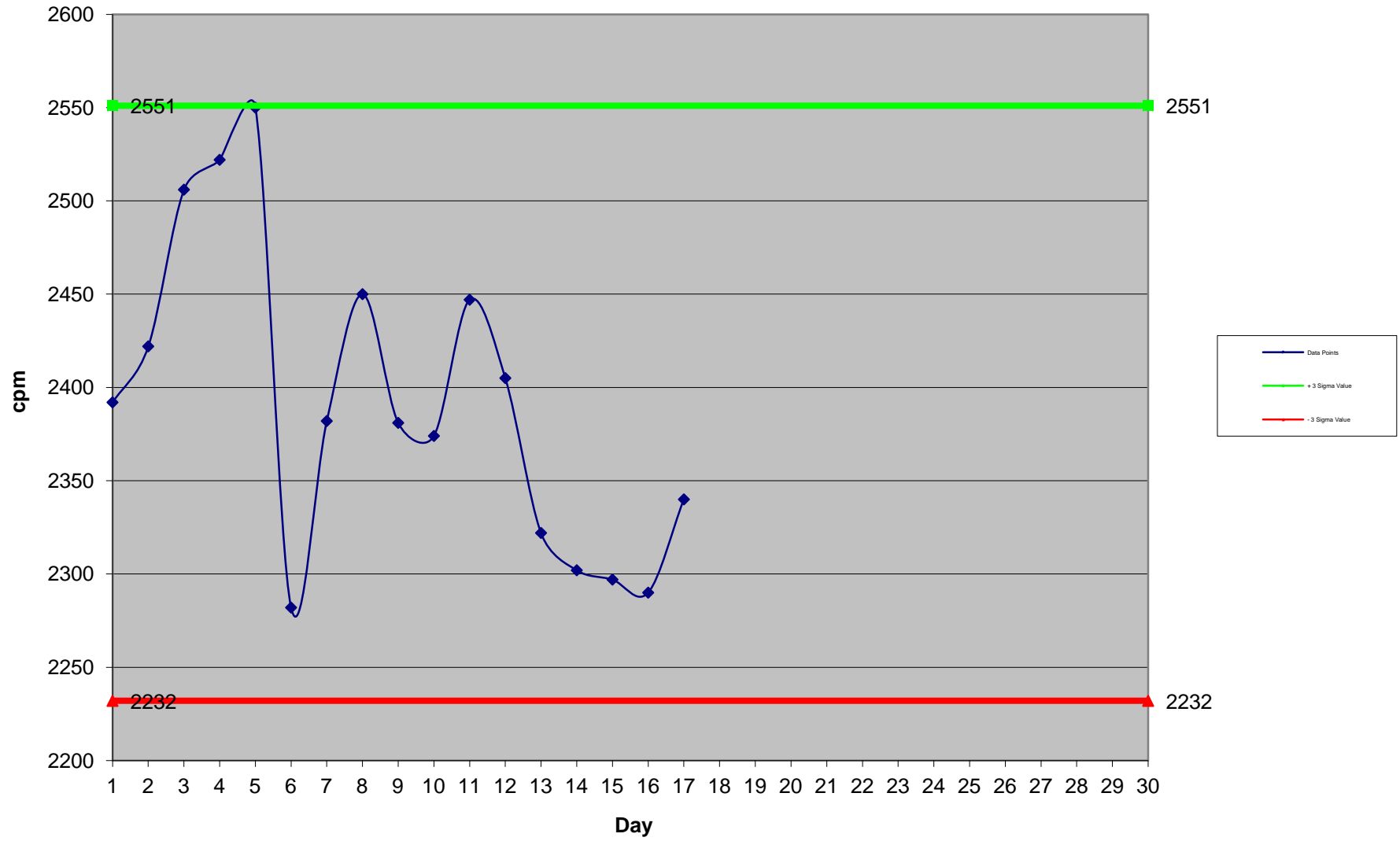
Model 2360 Alpha Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg. 218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Tc-99	SOURCE ACTIVITY betas/min	BACKGROUND CPM 144-196	READING CPM	Net CPM 2232-2551	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/4/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	166	2558	2392	25.4	P	JC
4/5/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	173	2595	2422	25.4	P	JC
4/6/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	178	2684	2506	25.4	P	TH
4/9/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	158	2680	2522	25.4	P	TH
4/10/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	172	2722	2550	25.4	P	TH
4/11/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	195	2477	2282	25.4	P	TH
4/12/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	175	2557	2382	25.4	P	TH
4/13/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	178	2628	2450	25.4	P	TH
4/16/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	173	2554	2381	25.4	P	JC
4/17/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	194	2568	2374	25.4	P	TH
4/18/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	187	2634	2447	25.4	P	TH
4/19/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	194	2599	2405	25.4	P	TH
4/20/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	176	2498	2322	25.4	P	TH
4/23/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	167	2469	2302	25.4	P	TH
4/24/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	171	2468	2297	25.4	P	TH
4/25/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	192	2482	2290	25.4	P	TH
4/26/2018	2360/43-93	297766/323074	N	12/20/2018	049410	12,131	178	2518	2340	25.4	P	TH

Model 2360 Beta Control Chart

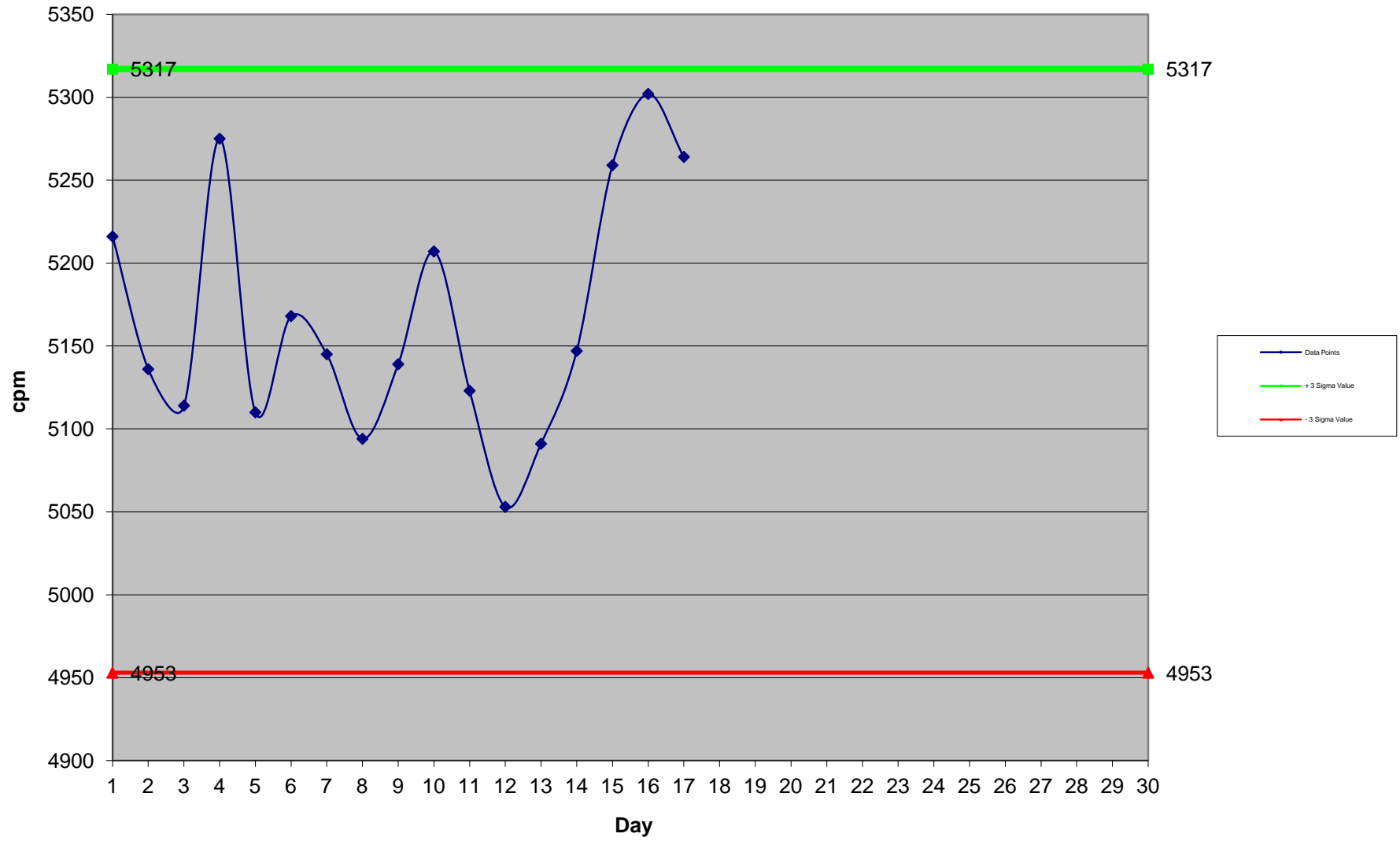


LUDLUM MODEL 2929
DAILY 30 MINUTE BACKGROUND AND EFFICIENCY

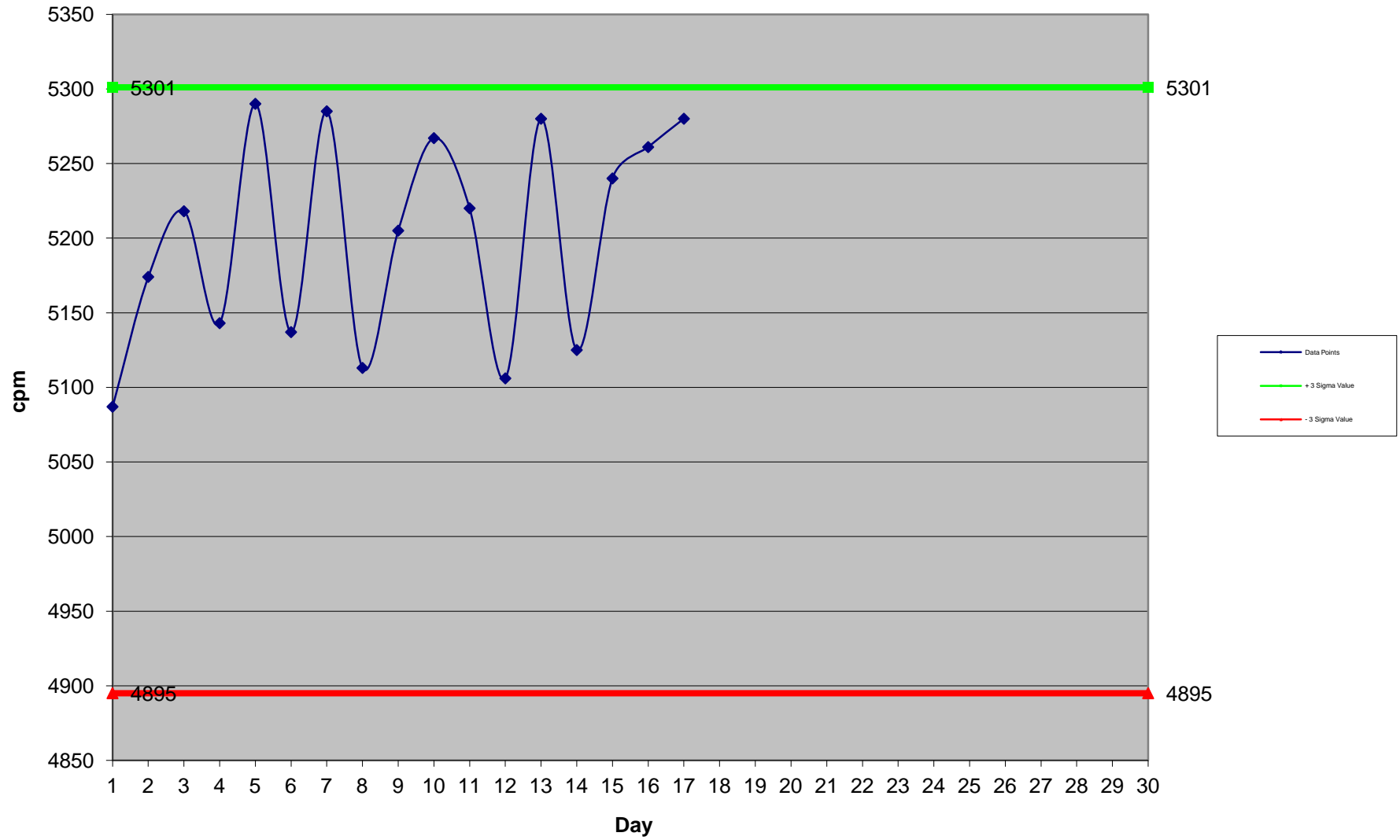
For: NRL Chesapeake Bldg. 218									
Instrument ID: 146780					Detector ID: 151113				
Cal Due Date: 6/17/2018									
Sources Used:			Alpha S/N: Th-230/011404		Activity: 8,278 alphas/min				
			Beta S/N: Tc-99/011403		Activity: 12,040 betas/min				
Background Count Time: 30 Minutes			Acceptable Range of Background: 0 CPM to 1 CPM α		29 CPM to 45 CPM $\beta\gamma$				
Date	Total Counts		30-Minute Background (CPM)		1-min α Source Counts	Eff.	1-min $\beta\gamma$ Source Counts	Eff.	Initials
	α	$\beta\gamma$	α 0-1	$\beta\gamma$ 29-45	4953-5317	α	4895-5301	$\beta\gamma$	
4/4/2018	1	1288	0.0	42.9	5216	71.0	5087	53.0	JM
4/5/2018	6	1269	0.2	42.3	5136	71.0	5174	53.0	JM
4/6/2018	2	1138	0.1	37.9	5114	71.0	5218	53.0	JM
4/9/2018	5	1147	0.2	38.2	5275	71.0	5143	53.0	JM
4/10/2018	3	1120	0.1	37.3	5110	71.0	5290	53.0	JM
4/11/2018	8	1192	0.3	39.7	5168	71.0	5137	53.0	JM
4/12/2018	4	1157	0.1	38.6	5145	71.0	5285	53.0	JM
4/13/2018	5	1155	0.2	38.5	5094	71.0	5113	53.0	JM
4/16/2018	4	1176	0.1	39.2	5139	71.0	5205	53.0	AM
4/17/2018	7	1153	0.2	38.4	5207	71.0	5267	53.0	AM
4/18/2018	5	1232	0.2	41.1	5123	71.0	5220	53.0	AM
4/19/2018	3	1185	0.1	39.5	5053	71.0	5106	53.0	AM
4/20/2018	3	1142	0.1	38.1	5091	71.0	5280	53.0	JM
4/23/2018	4	1065	0.1	35.5	5147	71.0	5125	53.0	JM
4/24/2018	3	1064	0.1	35.5	5259	71.0	5240	53.0	JM
4/25/2018	4	1187	0.1	39.6	5302	71.0	5261	53.0	JM
4/26/2018	2	1218	0.1	40.6	5264	71.0	5280	53.0	JM

Reviewed by: *Daniel Spicuzza* Date: 4/27/2018

Model 2929 Alpha Control Chart



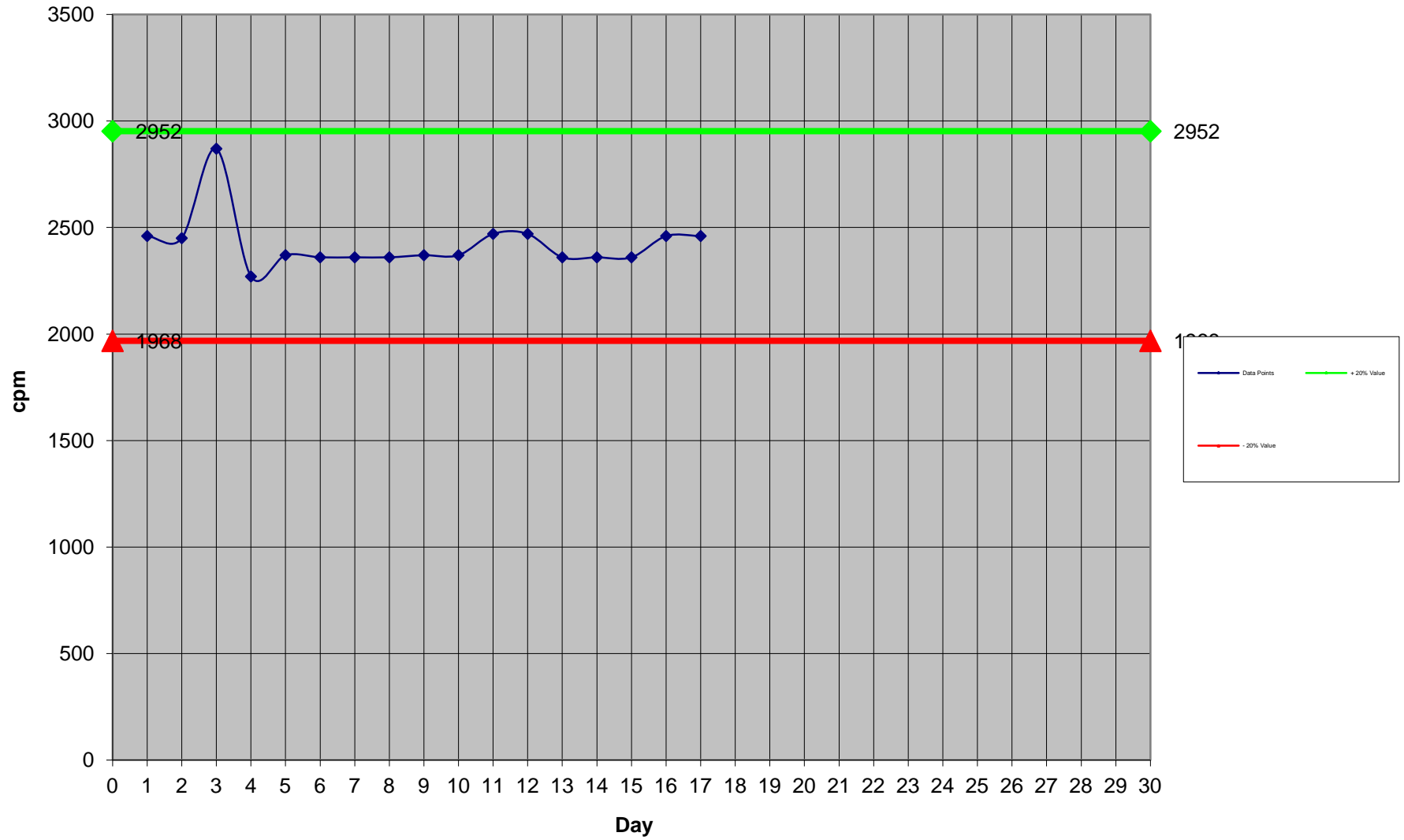
Model 2929 Beta Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg. 218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Tc-99	SOURCE ACTIVITY betas/min	BACKGROUND CPM	READING CPM	Net CPM 1968-2952	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/4/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	40	2500	2460	20	P	TH
4/5/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	50	2500	2450	20	P	JC
4/6/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	30	2900	2870	24	P	TH
4/9/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	30	2300	2270	19	P	TH
4/10/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	30	2400	2370	20	P	TH
4/11/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	40	2400	2360	20	P	TH
4/12/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	40	2400	2360	20	P	TH
4/13/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	40	2400	2360	20	P	TH
4/16/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	30	2400	2370	20	P	TH
4/17/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	30	2400	2370	20	P	TH
4/18/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	30	2500	2470	21	P	TH
4/19/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	30	2500	2470	21	P	TH
4/20/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	40	2400	2360	20	P	TH
4/23/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	40	2400	2360	20	P	TH
4/24/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	40	2400	2360	20	P	TH
4/25/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	40	2500	2460	20	P	JC
4/26/2018	3/44-9	94347/115746	N	8/14/2018	011403	12,040	40	2500	2460	20	P	JC

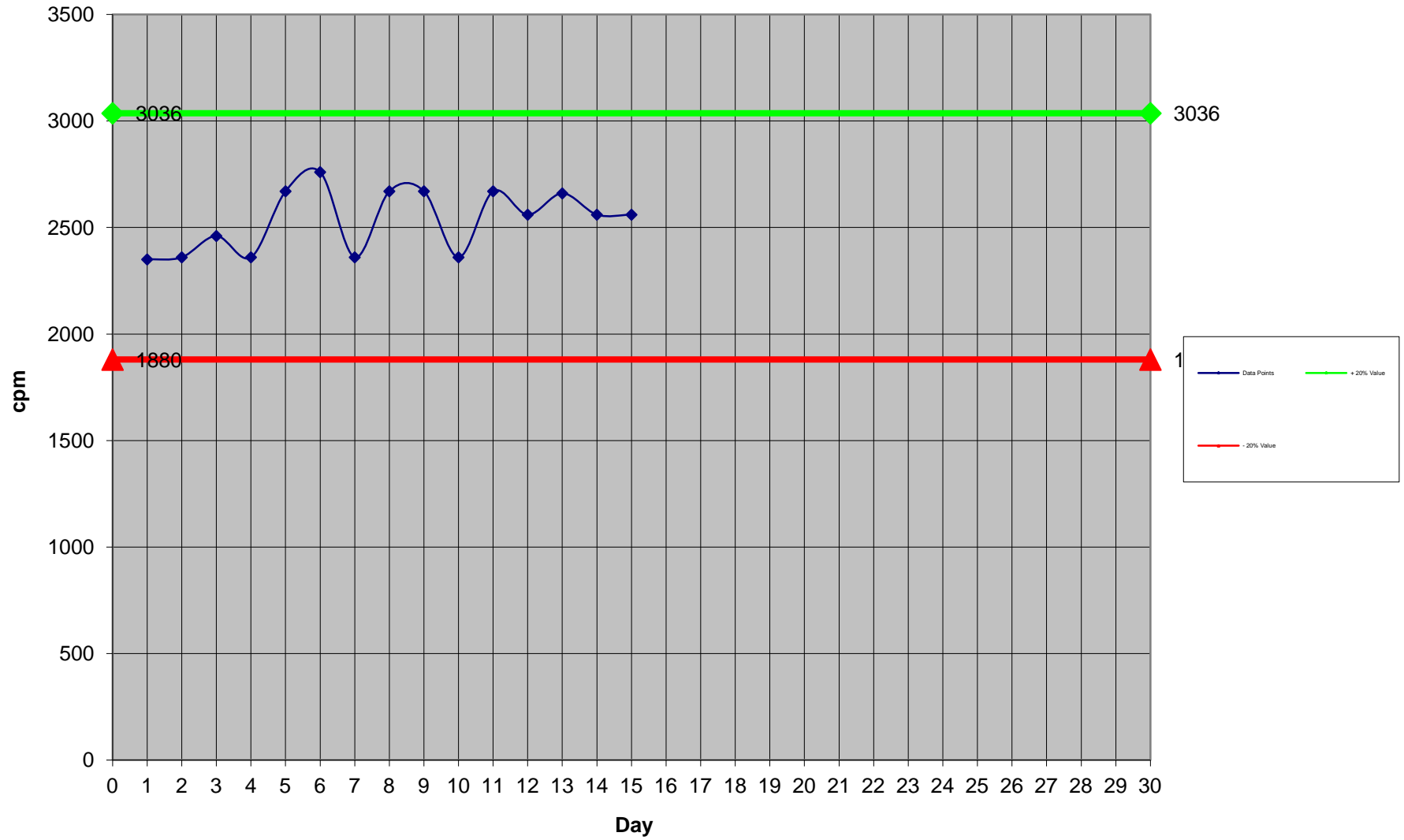
Beta Control Chart



DAILY INSTRUMENT PERFORMANCE TEST LOG SHEET

Project: NRL Chesapeake Bldg. 218												
DATE	MODEL/TYPE (Meter/Detector)	S/N (Meter/Detector)	PHYSICAL DAMAGE Y/N	CAL. DUE DATE	SOURCE I.D Tc-99	SOURCE ACTIVITY betas/min	BACKGROUND CPM	READING CPM	Net CPM 1880-3036	EFF. %	PASS/ FAIL (P/F)	TECH. INIT.
4/4/2018	3/44-9	294756/210879	N	4/21/2018	011403	12,040	50	2400	2350	20	P	TH
4/5/2018	3/44-9	294756/210879	N	4/21/2018	011403	12,040	40	2400	2360	20	P	JC
4/6/2018	3/44-9	294756/210879	N	4/21/2018	011403	12,040	40	2500	2460	20	P	TH
4/9/2018	3/44-9	294756/210879	N	4/21/2018	011403	12,040	40	2400	2360	20	P	TH
4/10/2018	3/44-9	294756/210879	N	4/21/2018	011403	12,040	30	2700	2670	22	P	TH
4/11/2018	3/44-9	294756/210879	N	4/21/2018	011403	12,040	40	2800	2760	23	P	TH
4/12/2018	3/44-9	294756/210879	N	4/21/2018	011403	12,040	40	2400	2360	20	P	TH
4/13/2018	3/44-9	294756/210879	N	4/21/2018	011403	12,040	30	2700	2670	22	P	TH
4/16/2018	3/44-9	294756/210879	N	4/21/2018	011403	12,040	30	2700	2670	22	P	TH
4/17/2018	3/44-9	294756/210879	N	4/21/2018	011403	12,040	40	2400	2360	20	P	TH
4/18/2018	3/44-9	294756/210879	N	4/21/2018	011403	12,040	30	2700	2670	22	P	TH
4/19/2018	3/44-9	294756/210879	N	4/21/2018	011403	12,040	40	2600	2560	21	P	TH
4/20/2018	3/44-9	294756/210879	N	4/21/2018	011403	12,040	40	2700	2660	22	P	TH
4/23/2018	3/44-9	294756/210879	N	4/21/2018	011403	12,040	40	2600	2560	21	P	TH
4/24/2018	3/44-9	294756/210879	N	4/21/2018	011403	12,040	40	2600	2560	21	P	TH

Beta Control Chart



Appendix F
QA Audit Report

Appendix G
Data Validation Report

Appendix H

Building 218/227 Rooms Scan Survey Data

Room 100 Floor

2360 SN:268497

43-37 SN:093965

Cal Due Date: 10/10/2018

Surveyor: Thomas Hogan

Bldg. 218

Room 100 Floor Grids 1 thru 12

Alpha Efficiency: 0.31

Beta/Gamma Efficiency: 0.352

Alpha Background: 4.9

Beta/Gamma Background: 889

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²	
									Alpha	Beta
1	4/6/2018	12:39:54 PM	0	897	R	0.1	Grid 1	-11	10	
2	4/6/2018	12:40:06 PM	0	889	R	0.1		-11	0	
3	4/6/2018	12:40:18 PM	3	967	R	0.1		-4	102	
4	4/6/2018	12:40:30 PM	0	812	R	0.1		-11	-100	
5	4/6/2018	12:40:41 PM	7	970	R	0.1		5	105	
6	4/6/2018	12:40:53 PM	1	947	R	0.1		-9	75	
7	4/6/2018	12:41:05 PM	18	880	R	0.1		29	-12	
8	4/6/2018	12:41:17 PM	4	864	R	0.1		-2	-33	
9	4/6/2018	12:41:28 PM	1	968	R	0.1		-9	103	
10	4/6/2018	12:43:34 PM	0	855	R	0.1	Grid 2	-11	-44	
11	4/6/2018	12:43:45 PM	0	792	R	0.1		-11	-126	
12	4/6/2018	12:43:57 PM	3	916	R	0.1		-4	35	
13	4/6/2018	12:44:09 PM	0	879	R	0.1		-11	-13	
14	4/6/2018	12:44:21 PM	3	880	R	0.1		-4	-12	
15	4/6/2018	12:44:32 PM	5	749	R	0.1		0	-182	
16	4/6/2018	12:44:44 PM	1	915	R	0.1		-9	34	
17	4/6/2018	12:44:56 PM	14	742	R	0.1		20	-191	
18	4/6/2018	12:45:08 PM	3	902	R	0.1		-4	17	
19	4/6/2018	12:45:19 PM	0	905	R	0.1		-11	21	
20	4/6/2018	12:47:05 PM	0	925	R	0.1	Grid 3	-11	47	
21	4/6/2018	12:47:16 PM	0	819	R	0.1		-11	-91	
22	4/6/2018	12:47:28 PM	9	844	R	0.1		9	-59	
23	4/6/2018	12:47:40 PM	2	908	R	0.1		-6	25	
24	4/6/2018	12:47:52 PM	12	916	R	0.1		16	35	
25	4/6/2018	12:48:03 PM	15	821	R	0.1		22	-89	
26	4/6/2018	12:48:15 PM	4	892	R	0.1		-2	4	
27	4/6/2018	12:48:27 PM	1	888	R	0.1		-9	-1	
28	4/6/2018	12:48:39 PM	0	845	R	0.1		-11	-57	
29	4/6/2018	12:48:50 PM	6	815	R	0.1		2	-96	
30	4/6/2018	12:50:26 PM	0	893	R	0.1	Grid 4	-11	5	
31	4/6/2018	12:50:37 PM	0	781	R	0.1		-11	-141	
32	4/6/2018	12:50:49 PM	9	696	R	0.1		9	-251	
33	4/6/2018	12:51:01 PM	7	870	R	0.1		5	-25	
34	4/6/2018	12:51:13 PM	1	868	R	0.1		-9	-27	
35	4/6/2018	12:51:24 PM	7	853	R	0.1		5	-47	
36	4/6/2018	12:51:36 PM	1	820	R	0.1		-9	-90	
37	4/6/2018	12:51:48 PM	0	847	R	0.1		-11	-55	
38	4/6/2018	12:52:00 PM	11	874	R	0.1		14	-20	
39	4/6/2018	12:52:11 PM	3	900	R	0.1		-4	14	
40	4/6/2018	12:55:03 PM	14	869	R	0.1	Grid 5	20	-26	

41	4/6/2018	12:55:15 PM	12	805 R	0.1	16	-109
42	4/6/2018	12:55:27 PM	2	875 R	0.1	-6	-18
43	4/6/2018	12:55:38 PM	0	823 R	0.1	-11	-86
44	4/6/2018	12:55:50 PM	13	888 R	0.1	18	-1
45	4/6/2018	12:56:02 PM	3	856 R	0.1	-4	-43
46	4/6/2018	12:56:14 PM	8	853 R	0.1	7	-47
47	4/6/2018	12:56:25 PM	13	868 R	0.1	18	-27
48	4/6/2018	12:56:37 PM	3	846 R	0.1	-4	-56
49	4/6/2018	12:56:49 PM	0	845 R	0.1	-11	-57
50	4/6/2018	12:57:55 PM	7	881 R	0.1 Grid 6	5	-10
51	4/6/2018	12:58:07 PM	1	880 R	0.1	-9	-12
52	4/6/2018	12:58:18 PM	0	1004 R	0.1	-11	150
53	4/6/2018	12:58:30 PM	5	882 R	0.1	0	-9
54	4/6/2018	12:58:42 PM	1	848 R	0.1	-9	-53
55	4/6/2018	12:58:54 PM	0	840 R	0.1	-11	-64
56	4/6/2018	12:59:06 PM	10	892 R	0.1	11	4
57	4/6/2018	12:59:17 PM	5	825 R	0.1	0	-83
58	4/6/2018	12:59:29 PM	5	908 R	0.1	0	25
59	4/6/2018	12:59:41 PM	7	815 R	0.1	5	-96
60	4/6/2018	1:01:33 PM	0	842 R	0.1 Grid 7	-11	-61
61	4/6/2018	1:01:45 PM	0	821 R	0.1	-11	-89
62	4/6/2018	1:01:57 PM	5	877 R	0.1	0	-16
63	4/6/2018	1:02:08 PM	1	806 R	0.1	-9	-108
64	4/6/2018	1:02:20 PM	4	858 R	0.1	-2	-40
65	4/6/2018	1:02:32 PM	0	812 R	0.1	-11	-100
66	4/6/2018	1:02:44 PM	0	818 R	0.1	-11	-92
67	4/6/2018	1:02:55 PM	5	887 R	0.1	0	-3
68	4/6/2018	1:03:07 PM	1	857 R	0.1	-9	-42
69	4/6/2018	1:03:19 PM	8	882 R	0.1	7	-9
70	4/6/2018	1:07:51 PM	0	920 R	0.1 Grid 8	-11	40
71	4/6/2018	1:08:03 PM	7	893 R	0.1	5	5
72	4/6/2018	1:08:14 PM	11	833 R	0.1	14	-73
73	4/6/2018	1:08:26 PM	2	857 R	0.1	-6	-42
74	4/6/2018	1:08:38 PM	4	832 R	0.1	-2	-74
75	4/6/2018	1:08:50 PM	0	913 R	0.1	-11	31
76	4/6/2018	1:09:01 PM	3	904 R	0.1	-4	20
77	4/6/2018	1:09:13 PM	0	897 R	0.1	-11	10
78	4/6/2018	1:09:25 PM	3	910 R	0.1	-4	27
79	4/6/2018	1:09:37 PM	7	836 R	0.1	5	-69
80	4/6/2018	1:11:03 PM	10	921 R	0.1 Grid 9	11	42
81	4/6/2018	1:11:14 PM	2	900 R	0.1	-6	14
82	4/6/2018	1:11:26 PM	0	841 R	0.1	-11	-62
83	4/6/2018	1:11:38 PM	4	823 R	0.1	-2	-86
84	4/6/2018	1:11:50 PM	0	866 R	0.1	-11	-30
85	4/6/2018	1:12:02 PM	11	851 R	0.1	14	-49
86	4/6/2018	1:12:13 PM	7	974 R	0.1	5	111
87	4/6/2018	1:12:25 PM	1	837 R	0.1	-9	-68
88	4/6/2018	1:12:37 PM	0	899 R	0.1	-11	13
89	4/6/2018	1:12:49 PM	3	881 R	0.1	-4	-10
90	4/6/2018	1:14:23 PM	14	900 R	0.1 Grid 10	20	14
91	4/6/2018	1:14:35 PM	15	910 R	0.1	22	27
92	4/6/2018	1:14:46 PM	3	834 R	0.1	-4	-72
93	4/6/2018	1:14:58 PM	0	831 R	0.1	-11	-75
94	4/6/2018	1:15:10 PM	6	857 R	0.1	2	-42
95	4/6/2018	1:15:22 PM	3	850 R	0.1	-4	-51

96	4/6/2018	1:15:33 PM	0	877 R	0.1	-11	-16
97	4/6/2018	1:15:45 PM	3	867 R	0.1	-4	-29
98	4/6/2018	1:15:57 PM	4	912 R	0.1	-2	30
99	4/6/2018	1:16:09 PM	0	882 R	0.1	-11	-9
100	4/6/2018	1:18:23 PM	0	856 R	0.1 Grid 11	-11	-43
101	4/6/2018	1:18:34 PM	5	836 R	0.1	0	-69
102	4/6/2018	1:18:46 PM	0	856 R	0.1	-11	-43
103	4/6/2018	1:18:58 PM	4	867 R	0.1	-2	-29
104	4/6/2018	1:19:10 PM	0	847 R	0.1	-11	-55
105	4/6/2018	1:19:21 PM	6	855 R	0.1	2	-44
106	4/6/2018	1:19:33 PM	1	862 R	0.1	-9	-35
107	4/6/2018	1:19:45 PM	7	886 R	0.1	5	-4
108	4/6/2018	1:19:57 PM	1	879 R	0.1	-9	-13
109	4/6/2018	1:20:08 PM	0	895 R	0.1	-11	8
110	4/6/2018	1:22:19 PM	3	885 R	0.1 Grid 12	-4	-5
111	4/6/2018	1:22:31 PM	0	913 R	0.1	-11	31
112	4/6/2018	1:22:43 PM	0	960 R	0.1	-11	92
113	4/6/2018	1:22:54 PM	5	826 R	0.1	0	-82
114	4/6/2018	1:23:06 PM	1	921 R	0.1	-9	42
115	4/6/2018	1:23:18 PM	28	902 R	0.1	51	17
116	4/6/2018	1:23:30 PM	12	950 R	0.1	16	79
117	4/6/2018	1:23:41 PM	3	1051 R	0.1	-4	211
118	4/6/2018	1:23:53 PM	11	1128 R	0.1	14	311
119	4/6/2018	1:24:05 PM	2	1003 R	0.1	-6	148
		Maximum:	28	1128		51	311
		Average:	4	874		-2	-19
		StDev:	5	56		11	73

Room 100 Lower Walls

2360 SN:268497

43-37# 093965

Cal Due Date: 10/10/2018

Surveyor: Thomas Hogan

Bldg. 218

Room 100 Lower Wall Grids All

Alpha Efficiency: 0.31

Beta/Gamma Efficiency: 0.352 Metal

Alpha Background: 4.8 3.3

Beta/Gamma Background: 1321 484

S=Scaler,

R=Ratemeter

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²		
									Alpha	Beta	
1	4/4/2018	9:58:56 AM	0	1310	R		0.1	Grid 1	-11	-14	
2	4/4/2018	9:59:07 AM	0	1301	R		0.1		-11	-26	
3	4/4/2018	9:59:19 AM	15	768	R		0.1		23	370	Metal
4	4/4/2018	9:59:31 AM	3	637	R		0.1		-4	199	Metal
5	4/4/2018	9:59:43 AM	0	695	R		0.1		-11	275	Metal
6	4/4/2018	9:59:54 AM	0	721	R		0.1		-11	308	Metal
7	4/4/2018	10:00:06 AM	0	593	R		0.1		-11	142	Metal
8	4/4/2018	10:00:18 AM	16	688	R		0.1		25	266	Metal
9	4/4/2018	10:00:30 AM	3	1319	R		0.1		-4	-3	
10	4/4/2018	10:04:27 AM	0	579	R		0.1	Grid 2	-11	124	Metal
11	4/4/2018	10:04:39 AM	0	604	R		0.1		-11	156	Metal
12	4/4/2018	10:04:51 AM	4	1318	R		0.1		-2	-4	
13	4/4/2018	10:05:02 AM	12	1547	R		0.1		16	294	
14	4/4/2018	10:05:14 AM	3	1437	R		0.1		-4	151	
15	4/4/2018	10:05:26 AM	4	1392	R		0.1		-2	92	
16	4/4/2018	10:05:38 AM	0	1410	R		0.1		-11	116	
17	4/4/2018	10:05:49 AM	3	1285	R		0.1		-4	-47	
18	4/4/2018	10:06:01 AM	0	1117	R		0.1		-11	-266	
19	4/4/2018	10:06:13 AM	4	755	R		0.1		-2	353	Metal
20	4/4/2018	10:09:37 AM	5	1330	R		0.1	Grid 3	0	12	
21	4/4/2018	10:09:49 AM	8	1388	R		0.1		7	87	
22	4/4/2018	10:10:01 AM	2	1285	R		0.1		-6	-47	
23	4/4/2018	10:10:12 AM	12	1547	R		0.1		16	294	
24	4/4/2018	10:10:24 AM	3	1450	R		0.1		-4	168	
25	4/4/2018	10:10:36 AM	0	1368	R		0.1		-11	61	
26	4/4/2018	10:10:48 AM	3	1509	R		0.1		-4	245	
27	4/4/2018	10:10:59 AM	0	1327	R		0.1		-11	8	
28	4/4/2018	10:11:11 AM	17	1362	R		0.1		27	53	
29	4/4/2018	10:11:23 AM	3	1485	R		0.1		-4	213	
30	4/4/2018	10:14:04 AM	3	1254	R		0.1	Grid 4	-4	-87	
31	4/4/2018	10:14:15 AM	0	1447	R		0.1		-11	164	
32	4/4/2018	10:14:27 AM	4	1205	R		0.1		-2	-151	
33	4/4/2018	10:14:39 AM	4	1223	R		0.1		-2	-128	
34	4/4/2018	10:14:51 AM	0	1203	R		0.1		-11	-154	
35	4/4/2018	10:15:02 AM	5	1324	R		0.1		0	4	
36	4/4/2018	10:15:14 AM	2	1433	R		0.1		-6	146	
37	4/4/2018	10:15:26 AM	2	1536	R		0.1		-6	280	
38	4/4/2018	10:15:38 AM	3	1577	R		0.1		-4	333	
39	4/4/2018	10:15:49 AM	5	1382	R		0.1		0	79	
40	4/4/2018	10:19:34 AM	4	1341	R		0.1	Grid 5	-2	26	
41	4/4/2018	10:19:46 AM	3	1522	R		0.1		-4	262	
42	4/4/2018	10:19:58 AM	0	1589	R		0.1		-11	349	
43	4/4/2018	10:20:10 AM	4	1452	R		0.1		-2	171	
44	4/4/2018	10:20:21 AM	10	1466	R		0.1		12	189	
45	4/4/2018	10:20:33 AM	10	1331	R		0.1		12	13	
46	4/4/2018	10:20:45 AM	2	1534	R		0.1		-6	277	

47	4/4/2018	10:20:57 AM	0	1486 R	0.1	-11	215	
48	4/4/2018	10:21:08 AM	0	1619 R	0.1	-11	388	
49	4/4/2018	10:21:20 AM	7	1366 R	0.1	5	59	
50	4/4/2018	10:23:33 AM	2	1306 R	0.1 Grid 6	-6	-20	
51	4/4/2018	10:23:45 AM	3	1459 R	0.1	-4	180	
52	4/4/2018	10:23:56 AM	8	1467 R	0.1	7	190	
53	4/4/2018	10:24:08 AM	7	1494 R	0.1	5	225	
54	4/4/2018	10:24:20 AM	6	1449 R	0.1	3	167	
55	4/4/2018	10:24:32 AM	11	1579 R	0.1	14	336	
56	4/4/2018	10:24:44 AM	2	1379 R	0.1	-6	75	
57	4/4/2018	10:24:55 AM	5	1343 R	0.1	0	29	
58	4/4/2018	10:25:07 AM	4	1306 R	0.1	-2	-20	
59	4/4/2018	10:25:19 AM	0	1459 R	0.1	-11	180	
60	4/4/2018	10:28:13 AM	3	1287 R	0.1 Grid 7	-4	-44	
61	4/4/2018	10:28:25 AM	0	1315 R	0.1	-11	-8	
62	4/4/2018	10:28:36 AM	0	1440 R	0.1	-11	155	
63	4/4/2018	10:28:48 AM	4	1478 R	0.1	-2	204	
64	4/4/2018	10:29:00 AM	1	1418 R	0.1	-8	126	
65	4/4/2018	10:29:12 AM	14	1414 R	0.1	20	121	
66	4/4/2018	10:29:23 AM	23	1461 R	0.1	40	182	
67	4/4/2018	10:29:35 AM	5	1650 R	0.1	0	428	
68	4/4/2018	10:29:47 AM	1	1526 R	0.1	-8	267	
69	4/4/2018	10:29:59 AM	13	1452 R	0.1	18	171	
70	4/4/2018	10:35:29 AM	2	1381 R	0.1 Grid 8	-6	78	
71	4/4/2018	10:35:41 AM	0	1464 R	0.1	-11	186	
72	4/4/2018	10:35:53 AM	0	1660 R	0.1	-11	441	
73	4/4/2018	10:36:04 AM	3	1557 R	0.1	-4	307	
74	4/4/2018	10:36:16 AM	3	1339 R	0.1	-4	23	
75	4/4/2018	10:36:28 AM	2	1237 R	0.1	-6	-109	
76	4/4/2018	10:36:40 AM	0	1454 R	0.1	-11	173	
77	4/4/2018	10:36:51 AM	11	1577 R	0.1	14	333	
78	4/4/2018	10:37:03 AM	2	1361 R	0.1	-6	52	
79	4/4/2018	10:37:15 AM	0	1501 R	0.1	-11	234	
80	4/4/2018	10:40:57 AM	5	1296 R	0.1 Grid 9	0	-33	
81	4/4/2018	10:41:09 AM	4	1558 R	0.1	-2	308	
82	4/4/2018	10:41:21 AM	1	1354 R	0.1	-8	43	
83	4/4/2018	10:41:32 AM	0	1337 R	0.1	-11	21	
84	4/4/2018	10:41:44 AM	12	1506 R	0.1	16	241	
85	4/4/2018	10:41:56 AM	3	1270 R	0.1	-4	-66	
86	4/4/2018	10:42:08 AM	10	1436 R	0.1	12	150	
87	4/4/2018	10:42:19 AM	2	1293 R	0.1	-6	-36	
88	4/4/2018	10:42:31 AM	0	1268 R	0.1	-11	-69	
89	4/4/2018	10:42:43 AM	0	1446 R	0.1	-11	163	
90	4/4/2018	10:46:01 AM	0	982 R	0.1 Grid 10	-11	-441	
91	4/4/2018	10:46:12 AM	13	1392 R	0.1	18	92	
92	4/4/2018	10:46:24 AM	3	1480 R	0.1	-4	207	
93	4/4/2018	10:46:36 AM	12	1366 R	0.1	16	59	
94	4/4/2018	10:46:48 AM	3	1368 R	0.1	-4	61	
95	4/4/2018	10:46:59 AM	0	1841 R	0.1	-11	677	
96	4/4/2018	10:47:11 AM	7	1514 R	0.1	5	251	
97	4/4/2018	10:47:23 AM	1	1574 R	0.1	-8	329	
98	4/4/2018	10:47:35 AM	5	1375 R	0.1	0	70	
99	4/4/2018	10:47:46 AM	4	1379 R	0.1	-2	75	
100	4/4/2018	10:54:49 AM	9	598 R	0.1 Grid 11	9	148	Metal
101	4/4/2018	10:55:01 AM	10	617 R	0.1	12	173	Metal
102	4/4/2018	10:55:13 AM	11	678 R	0.1	14	253	Metal
103	4/4/2018	10:55:25 AM	9	605 R	0.1	9	158	Metal
104	4/4/2018	10:55:36 AM	2	800 R	0.1	-6	411	Metal
105	4/4/2018	10:55:48 AM	3	1298 R	0.1	-4	-30	
106	4/4/2018	10:56:00 AM	3	819 R	0.1	-4	436	Metal
107	4/4/2018	10:56:12 AM	0	604 R	0.1	-11	156	Metal

108	4/4/2018	10:56:23 AM	2	639 R	0.1	-6	202	Metal
109	4/4/2018	10:56:35 AM	0	666 R	0.1	-11	237	Metal
110	4/4/2018	12:16:30 PM	8	1278 R	0.1 Grid 12	7	-56	
111	4/4/2018	12:16:42 PM	2	1309 R	0.1	-6	-16	
112	4/4/2018	12:16:54 PM	20	1427 R	0.1	34	138	
113	4/4/2018	12:17:06 PM	4	1330 R	0.1	-2	12	
114	4/4/2018	12:17:17 PM	1	1319 R	0.1	-8	-3	
115	4/4/2018	12:17:29 PM	3	1368 R	0.1	-4	61	
116	4/4/2018	12:17:41 PM	2	1456 R	0.1	-6	176	
117	4/4/2018	12:17:53 PM	0	1523 R	0.1	-11	263	
118	4/4/2018	12:18:04 PM	10	1392 R	0.1	12	92	
119	4/4/2018	12:18:16 PM	13	1521 R	0.1	18	260	
120	4/4/2018	12:21:33 PM	0	1276 R	0.1 Grid 13	-11	-59	
121	4/4/2018	12:21:44 PM	0	1306 R	0.1	-11	-20	
122	4/4/2018	12:21:56 PM	10	1362 R	0.1	12	53	
123	4/4/2018	12:22:08 PM	8	1301 R	0.1	7	-26	
124	4/4/2018	12:22:20 PM	14	1381 R	0.1	20	78	
125	4/4/2018	12:22:31 PM	12	1263 R	0.1	16	-75	
126	4/4/2018	12:22:43 PM	7	1300 R	0.1	5	-27	
127	4/4/2018	12:22:55 PM	10	1279 R	0.1	12	-55	
128	4/4/2018	12:23:07 PM	2	1271 R	0.1	-6	-65	
129	4/4/2018	12:23:18 PM	0	1332 R	0.1	-11	14	
130	4/4/2018	12:27:58 PM	3	1341 R	0.1 Grid 14	-4	26	
131	4/4/2018	12:28:10 PM	11	1251 R	0.1	14	-91	
132	4/4/2018	12:28:21 PM	12	1298 R	0.1	16	-30	
133	4/4/2018	12:28:33 PM	19	1294 R	0.1	31	-35	
134	4/4/2018	12:28:45 PM	28	1569 R	0.1	51	323	
135	4/4/2018	12:28:57 PM	12	1466 R	0.1	16	189	
136	4/4/2018	12:29:08 PM	3	1422 R	0.1	-4	131	
137	4/4/2018	12:29:20 PM	9	1288 R	0.1	9	-43	
138	4/4/2018	12:29:32 PM	15	1304 R	0.1	23	-22	
139	4/4/2018	12:29:44 PM	3	1376 R	0.1	-4	72	
140	4/4/2018	12:38:40 PM	0	1267 R	0.1 Grid 15	-11	-70	
141	4/4/2018	12:38:52 PM	0	702 R	0.1	-11	284	Metal
142	4/4/2018	12:39:03 PM	13	781 R	0.1	18	387	Metal
143	4/4/2018	12:39:15 PM	3	678 R	0.1	-4	253	Metal
144	4/4/2018	12:39:27 PM	3	645 R	0.1	-4	210	Metal
145	4/4/2018	12:39:39 PM	2	701 R	0.1	-6	282	Metal
146	4/4/2018	12:39:50 PM	6	644 R	0.1	3	208	Metal
147	4/4/2018	12:40:02 PM	1	657 R	0.1	-8	225	Metal
148	4/4/2018	12:40:14 PM	12	780 R	0.1	16	385	Metal
149	4/4/2018	12:40:26 PM	3	1431 R	0.1	-4	143	
150	4/4/2018	12:48:08 PM	5	592 R	0.1 Grid 16	0	141	Metal
151	4/4/2018	12:48:20 PM	1	765 R	0.1	-8	366	Metal
152	4/4/2018	12:48:31 PM	0	733 R	0.1	-11	324	Metal
153	4/4/2018	12:48:43 PM	4	741 R	0.1	-2	335	Metal
154	4/4/2018	12:48:55 PM	7	648 R	0.1	5	213	Metal
155	4/4/2018	12:49:07 PM	1	634 R	0.1	-8	195	Metal
156	4/4/2018	12:49:18 PM	4	631 R	0.1	-2	191	Metal
157	4/4/2018	12:49:30 PM	11	766 R	0.1	14	367	Metal
158	4/4/2018	12:49:42 PM	2	756 R	0.1	-6	354	Metal
159	4/4/2018	12:49:54 PM	2	665 R	0.1	-6	236	Metal
160	4/4/2018	12:56:11 PM	3	1321 R	0.1 Grid 17	-4	0	
161	4/4/2018	12:56:23 PM	3	1216 R	0.1	-4	-137	
162	4/4/2018	12:56:35 PM	4	1334 R	0.1	-2	17	
163	4/4/2018	12:56:47 PM	1	1237 R	0.1	-8	-109	
164	4/4/2018	12:56:58 PM	0	1232 R	0.1	-11	-116	
165	4/4/2018	12:57:10 PM	10	1250 R	0.1	12	-92	
166	4/4/2018	12:57:22 PM	2	1522 R	0.1	-6	262	
167	4/4/2018	12:57:34 PM	9	1422 R	0.1	9	131	
168	4/4/2018	1:03:56 PM	0	1278 R	0.1 Grid 18	-11	-56	

169	4/4/2018	1:04:08 PM	5	1645 R	0.1	0	422
170	4/4/2018	1:04:20 PM	4	1545 R	0.1	-2	292
171	4/4/2018	1:04:31 PM	3	1143 R	0.1	-4	-232
172	4/4/2018	1:04:43 PM	10	1140 R	0.1	12	-236
173	4/4/2018	1:04:55 PM	21	1241 R	0.1	36	-104
174	4/4/2018	1:05:07 PM	12	1452 R	0.1	16	171
175	4/4/2018	1:05:18 PM	2	1293 R	0.1	-6	-36
176	4/4/2018	1:05:30 PM	0	1446 R	0.1	-11	163
177	4/4/2018	1:05:42 PM	14	1340 R	0.1	20	25
178	4/4/2018	1:05:54 PM	3	1337 R	0.1	-4	21
179	4/4/2018	1:06:06 PM	4	1491 R	0.1	-2	221
180	4/4/2018	1:27:36 PM	13	1309 R	0.1 Grid 19	18	-16
181	4/4/2018	1:27:48 PM	3	1440 R	0.1	-4	155
182	4/4/2018	1:27:59 PM	5	1461 R	0.1	0	182
183	4/4/2018	1:28:11 PM	4	1518 R	0.1	-2	256
184	4/4/2018	1:28:23 PM	5	1377 R	0.1	0	73
185	4/4/2018	1:28:35 PM	1	1542 R	0.1	-8	288
186	4/4/2018	1:28:46 PM	0	1450 R	0.1	-11	168
187	4/4/2018	1:28:58 PM	6	1359 R	0.1	3	49
188	4/4/2018	1:29:10 PM	9	1568 R	0.1	9	322
189	4/4/2018	1:29:22 PM	18	1670 R	0.1	29	454
190	4/4/2018	1:39:10 PM	0	1312 R	0.1 Grid 20	-11	-12
191	4/4/2018	1:39:22 PM	12	1444 R	0.1	16	160
192	4/4/2018	1:39:34 PM	3	1399 R	0.1	-4	102
193	4/4/2018	1:39:45 PM	7	1490 R	0.1	5	220
194	4/4/2018	1:39:57 PM	1	1463 R	0.1	-8	185
195	4/4/2018	1:40:09 PM	4	1388 R	0.1	-2	87
196	4/4/2018	1:40:21 PM	9	1609 R	0.1	9	375
197	4/4/2018	1:40:32 PM	8	1488 R	0.1	7	217
198	4/4/2018	1:40:44 PM	14	1547 R	0.1	20	294
199	4/4/2018	1:40:56 PM	9	1700 R	0.1	9	493
200	4/4/2018	1:46:49 PM	5	1296 R	0.1 Grid 21	0	-33
201	4/4/2018	1:47:01 PM	15	1446 R	0.1	23	163
202	4/4/2018	1:47:13 PM	3	1461 R	0.1	-4	182
203	4/4/2018	1:47:24 PM	0	1627 R	0.1	-11	398
204	4/4/2018	1:47:36 PM	3	1578 R	0.1	-4	335
205	4/4/2018	1:47:48 PM	0	1595 R	0.1	-11	357
206	4/4/2018	1:48:00 PM	0	1735 R	0.1	-11	539
207	4/4/2018	1:48:11 PM	0	1563 R	0.1	-11	315
208	4/4/2018	1:48:23 PM	3	1456 R	0.1	-4	176
209	4/4/2018	1:48:35 PM	4	1490 R	0.1	-2	220
210	4/4/2018	1:52:45 PM	4	1333 R	0.1 Grid 22	-2	16
211	4/4/2018	1:52:57 PM	0	1578 R	0.1	-11	335
212	4/4/2018	1:53:09 PM	3	1515 R	0.1	-4	253
213	4/4/2018	1:53:20 PM	0	1447 R	0.1	-11	164
214	4/4/2018	1:53:32 PM	3	1641 R	0.1	-4	417
215	4/4/2018	1:53:44 PM	0	1643 R	0.1	-11	419
216	4/4/2018	1:53:56 PM	0	1539 R	0.1	-11	284
217	4/4/2018	1:54:07 PM	12	1631 R	0.1	16	404
218	4/4/2018	1:54:19 PM	3	1732 R	0.1	-4	535
219	4/4/2018	1:54:31 PM	4	1453 R	0.1	-2	172
220	4/4/2018	1:57:38 PM	8	1321 R	0.1 Grid 23	7	0
221	4/4/2018	1:57:50 PM	5	1543 R	0.1	0	289
222	4/4/2018	1:58:01 PM	13	1393 R	0.1	18	94
223	4/4/2018	1:58:13 PM	3	1399 R	0.1	-4	102
224	4/4/2018	1:58:25 PM	4	1507 R	0.1	-2	242
225	4/4/2018	1:58:37 PM	0	1601 R	0.1	-11	364
226	4/4/2018	1:58:48 PM	3	1449 R	0.1	-4	167
227	4/4/2018	1:59:00 PM	15	1526 R	0.1	23	267
228	4/4/2018	1:59:12 PM	11	1481 R	0.1	14	208
229	4/4/2018	1:59:24 PM	9	1515 R	0.1	9	253

230	4/4/2018	1:59:35 PM	9	1443 R	0.1	9	159	
231	4/4/2018	2:03:45 PM	6	1256 R	0.1 Grid 24	3	-85	
232	4/4/2018	2:03:57 PM	1	1265 R	0.1	-8	-73	
233	4/4/2018	2:04:08 PM	9	310 R	0.1	9	-1316	
234	4/4/2018	2:04:20 PM	5	1278 R	0.1	0	-56	
235	4/4/2018	2:04:32 PM	1	1249 R	0.1	-8	-94	
236	4/4/2018	2:04:44 PM	0	1368 R	0.1	-11	61	
237	4/4/2018	2:04:55 PM	3	1449 R	0.1	-4	167	
238	4/4/2018	2:05:07 PM	8	1276 R	0.1	7	-59	
239	4/4/2018	2:05:19 PM	2	1262 R	0.1	-6	-77	
240	4/4/2018	2:08:19 PM	18	603 R	0.1 Grid 25	29	155	Metal
241	4/4/2018	2:08:31 PM	16	720 R	0.1	25	307	Metal
242	4/4/2018	2:08:43 PM	11	663 R	0.1	14	233	Metal
243	4/4/2018	2:08:55 PM	12	614 R	0.1	16	169	Metal
244	4/4/2018	2:09:06 PM	3	1323 R	0.1	-4	3	
245	4/4/2018	2:09:18 PM	7	1509 R	0.1	5	245	
246	4/4/2018	2:09:30 PM	1	854 R	0.1	-8	482	Metal
247	4/4/2018	2:09:42 PM	3	617 R	0.1	-4	173	Metal
248	4/4/2018	2:09:53 PM	13	628 R	0.1	18	187	Metal
249	4/4/2018	2:10:05 PM	6	724 R	0.1	3	312	Metal
250	4/4/2018	2:14:27 PM	3	1239 R	0.1 Grid 26	-4	-107	
251	4/4/2018	2:14:38 PM	12	1339 R	0.1	16	23	
252	4/4/2018	2:14:50 PM	10	1321 R	0.1	12	0	
253	4/4/2018	2:15:02 PM	15	1255 R	0.1	23	-86	
254	4/4/2018	2:15:14 PM	3	1292 R	0.1	-4	-38	
255	4/4/2018	2:15:25 PM	0	1282 R	0.1	-11	-51	
256	4/4/2018	2:15:37 PM	0	1365 R	0.1	-11	57	
257	4/4/2018	2:15:49 PM	3	1418 R	0.1	-4	126	
258	4/4/2018	2:16:01 PM	0	1520 R	0.1	-11	259	
259	4/4/2018	2:16:12 PM	8	1404 R	0.1	7	108	
260	4/4/2018	2:18:38 PM	3	1204 R	0.1 Grid 27	-4	-152	
261	4/4/2018	2:18:49 PM	9	1304 R	0.1	9	-22	
262	4/4/2018	2:19:01 PM	6	1420 R	0.1	3	129	
263	4/4/2018	2:19:13 PM	21	1484 R	0.1	36	212	
264	4/4/2018	2:19:25 PM	4	1465 R	0.1	-2	187	
265	4/4/2018	2:19:36 PM	1	1433 R	0.1	-8	146	
266	4/4/2018	2:19:48 PM	5	1185 R	0.1	0	-177	
267	4/4/2018	2:20:00 PM	0	1399 R	0.1	-11	102	
268	4/4/2018	2:20:12 PM	6	1449 R	0.1	3	167	
269	4/4/2018	2:20:24 PM	0	1329 R	0.1	-11	10	
270	4/4/2018	2:23:05 PM	0	1298 R	0.1 Grid 28	-11	-30	
271	4/4/2018	2:23:16 PM	11	1435 R	0.1	14	148	
272	4/4/2018	2:23:28 PM	2	1579 R	0.1	-6	336	
273	4/4/2018	2:23:40 PM	0	1375 R	0.1	-11	70	
274	4/4/2018	2:23:52 PM	4	1643 R	0.1	-2	419	
275	4/4/2018	2:24:03 PM	1	1625 R	0.1	-8	396	
276	4/4/2018	2:24:15 PM	2	1593 R	0.1	-6	354	
277	4/4/2018	2:24:27 PM	3	1397 R	0.1	-4	99	
278	4/4/2018	2:24:39 PM	3	1282 R	0.1	-4	-51	
279	4/4/2018	2:24:50 PM	0	1278 R	0.1	-11	-56	
		Maximum:	28	1841		51	677	
		Average:	5	1291		1	133	
		StDev:	5	297		11	186	

Room 100 Upper Walls

2360 SN:268497
43-37 SN:093965

Cal Due Date: 10/10/2018
Surveyor: Thomas Hogan

Bldg. 218

Room 100 Upper Walls Grids 1 thru 28

Alpha Efficiency: 0.31
Beta/Gamma Efficiency: 0.352 Metal Wood
Alpha Background: 4.8 3.3 2.4
Beta/Gamma Background: 1321 484 701

S=Scaler, R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²		
									Alpha	Beta	
1	4/5/2018	12:41:49 PM	0	792	R			0.1 Grid 1	-11	118	Wood
2	4/5/2018	12:42:01 PM	5	915	R			0.1	0	279	Wood
3	4/5/2018	12:42:13 PM	5	1281	R			0.1	0	-52	
4	4/5/2018	12:42:24 PM	1	930	R			0.1	-8	298	Wood
5	4/5/2018	12:42:36 PM	5	778	R			0.1	0	383	Metal
6	4/5/2018	12:42:48 PM	5	715	R			0.1	0	301	Metal
7	4/5/2018	12:43:00 PM	4	756	R			0.1	-2	354	Metal
8	4/5/2018	12:43:11 PM	13	764	R			0.1	18	364	Metal
9	4/5/2018	12:43:23 PM	3	1298	R			0.1	-4	-30	
10	4/5/2018	12:50:21 PM	7	1313	R			0.1 Grid 2	5	-10	
11	4/5/2018	12:50:32 PM	0	1290	R			0.1	-11	-40	
12	4/5/2018	12:50:44 PM	6	1288	R			0.1	3	-43	
13	4/5/2018	12:50:56 PM	7	712	R			0.1	5	297	Metal
14	4/5/2018	12:51:08 PM	4	701	R			0.1	-2	282	Metal
15	4/5/2018	12:51:19 PM	3	721	R			0.1	-4	308	Metal
16	4/5/2018	12:51:31 PM	7	1305	R			0.1	5	-21	
17	4/5/2018	12:51:43 PM	8	1200	R			0.1	7	-158	
18	4/5/2018	12:51:55 PM	4	784	R			0.1	-2	391	Metal
19	4/5/2018	12:52:06 PM	9	757	R			0.1	9	355	Metal
20	4/5/2018	1:02:01 PM	8	1069	R			0.1 Grid 3	7	-328	
21	4/5/2018	1:02:13 PM	9	1442	R			0.1	9	158	
22	4/5/2018	1:02:25 PM	8	1486	R			0.1	7	215	
23	4/5/2018	1:02:36 PM	7	1315	R			0.1	5	-8	
24	4/5/2018	1:02:48 PM	8	1336	R			0.1	7	20	
25	4/5/2018	1:03:00 PM	5	1319	R			0.1	0	-3	
26	4/5/2018	1:03:12 PM	6	1280	R			0.1	3	-53	
27	4/5/2018	1:03:23 PM	4	1428	R			0.1	-2	139	
28	4/5/2018	1:03:35 PM	1	1629	R			0.1	-8	401	
29	4/5/2018	1:03:47 PM	11	1308	R			0.1	14	-17	
30	4/5/2018	1:09:24 PM	7	1310	R			0.1 Grid 4	5	-14	
31	4/5/2018	1:09:36 PM	8	1337	R			0.1	7	21	
32	4/5/2018	1:09:48 PM	4	1281	R			0.1	-2	-52	
33	4/5/2018	1:10:00 PM	5	821	R			0.1	0	156	Wood
34	4/5/2018	1:10:11 PM	5	875	R			0.1	0	226	Wood
35	4/5/2018	1:10:23 PM	7	1156	R			0.1	5	-215	
36	4/5/2018	1:10:35 PM	4	1122	R			0.1	-2	-259	
37	4/5/2018	1:10:47 PM	1	1345	R			0.1	-8	31	
38	4/5/2018	1:10:58 PM	7	1551	R			0.1	5	299	
39	4/5/2018	1:11:10 PM	6	1356	R			0.1	3	46	
40	4/5/2018	1:11:22 PM	8	1275	R			0.1	7	-60	
41	4/5/2018	1:19:50 PM	0	1365	R			0.1 Grid 5	-11	57	
42	4/5/2018	1:20:02 PM	7	1325	R			0.1	5	5	
43	4/5/2018	1:20:14 PM	1	1243	R			0.1	-8	-102	
44	4/5/2018	1:20:25 PM	8	1253	R			0.1	7	-89	
45	4/5/2018	1:20:37 PM	9	1247	R			0.1	9	-96	
46	4/5/2018	1:20:49 PM	6	1424	R			0.1	3	134	

47	4/5/2018	1:21:01 PM	7	1336 R	0.1	5	20
48	4/5/2018	1:21:12 PM	10	1278 R	0.1	12	-56
49	4/5/2018	1:21:24 PM	7	1311 R	0.1	5	-13
50	4/5/2018	1:27:47 PM	0	1234 R	0.1 Grid 6	-11	-113
51	4/5/2018	1:27:59 PM	0	1187 R	0.1	-11	-174
52	4/5/2018	1:28:10 PM	5	1312 R	0.1	0	-12
53	4/5/2018	1:28:22 PM	6	1310 R	0.1	3	-14
54	4/5/2018	1:28:34 PM	1	1344 R	0.1	-8	30
55	4/5/2018	1:28:46 PM	5	1295 R	0.1	0	-34
56	4/5/2018	1:28:57 PM	1	1469 R	0.1	-8	193
57	4/5/2018	1:29:09 PM	9	1311 R	0.1	9	-13
58	4/5/2018	1:29:21 PM	5	1305 R	0.1	0	-21
59	4/5/2018	1:29:33 PM	11	1270 R	0.1	14	-66
60	4/5/2018	1:32:50 PM	6	1297 R	0.1 Grid 7	3	-31
61	4/5/2018	1:33:01 PM	4	1298 R	0.1	-2	-30
62	4/5/2018	1:33:13 PM	8	1280 R	0.1	7	-53
63	4/5/2018	1:33:25 PM	7	1352 R	0.1	5	40
64	4/5/2018	1:33:37 PM	1	1461 R	0.1	-8	182
65	4/5/2018	1:33:48 PM	0	1332 R	0.1	-11	14
66	4/5/2018	1:34:00 PM	3	1245 R	0.1	-4	-99
67	4/5/2018	1:34:12 PM	4	1463 R	0.1	-2	185
68	4/5/2018	1:34:24 PM	4	1278 R	0.1	-2	-56
69	4/5/2018	1:34:35 PM	11	1316 R	0.1	14	-7
70	4/5/2018	1:37:26 PM	2	1299 R	0.1 Grid 8	-6	-29
71	4/5/2018	1:37:38 PM	10	1308 R	0.1	12	-17
72	4/5/2018	1:37:50 PM	2	1294 R	0.1	-6	-35
73	4/5/2018	1:38:01 PM	5	1280 R	0.1	0	-53
74	4/5/2018	1:38:13 PM	1	1303 R	0.1	-8	-23
75	4/5/2018	1:38:25 PM	4	1242 R	0.1	-2	-103
76	4/5/2018	1:38:37 PM	0	1206 R	0.1	-11	-150
77	4/5/2018	1:38:49 PM	0	1394 R	0.1	-11	95
78	4/5/2018	1:39:00 PM	15	1483 R	0.1	23	211
79	4/5/2018	1:39:12 PM	3	1399 R	0.1	-4	102
80	4/5/2018	1:41:35 PM	5	1301 R	0.1 Grid 9	0	-26
81	4/5/2018	1:41:47 PM	7	1350 R	0.1	5	38
82	4/5/2018	1:41:59 PM	13	1370 R	0.1	18	64
83	4/5/2018	1:42:11 PM	3	1334 R	0.1	-4	17
84	4/5/2018	1:42:22 PM	0	1400 R	0.1	-11	103
85	4/5/2018	1:42:34 PM	3	1267 R	0.1	-4	-70
86	4/5/2018	1:42:46 PM	4	1318 R	0.1	-2	-4
87	4/5/2018	1:42:58 PM	0	1242 R	0.1	-11	-103
88	4/5/2018	1:43:09 PM	5	1126 R	0.1	0	-254
89	4/5/2018	1:43:21 PM	6	1371 R	0.1	3	65
90	4/5/2018	1:43:33 PM	8	1372 R	0.1	7	66
91	4/5/2018	1:47:39 PM	7	1287 R	0.1 Grid 10	5	-44
92	4/5/2018	1:47:50 PM	1	1134 R	0.1	-8	-243
93	4/5/2018	1:48:02 PM	2	1201 R	0.1	-6	-156
94	4/5/2018	1:48:14 PM	2	1260 R	0.1	-6	-79
95	4/5/2018	1:48:26 PM	10	1274 R	0.1	12	-61
96	4/5/2018	1:48:37 PM	11	1249 R	0.1	14	-94
97	4/5/2018	1:48:49 PM	2	1312 R	0.1	-6	-12
98	4/5/2018	1:49:01 PM	0	1266 R	0.1	-11	-72
99	4/5/2018	1:49:13 PM	0	1290 R	0.1	-11	-40
100	4/5/2018	1:51:30 PM	0	1239 R	0.1 Grid 11	-11	-107
101	4/5/2018	1:51:41 PM	12	1317 R	0.1	16	-5
102	4/5/2018	1:51:53 PM	3	1304 R	0.1	-4	-22
103	4/5/2018	1:52:05 PM	2	1300 R	0.1	-6	-27
104	4/5/2018	1:52:17 PM	3	1354 R	0.1	-4	43
105	4/5/2018	1:52:28 PM	0	1281 R	0.1	-11	-52
106	4/5/2018	1:52:40 PM	8	1213 R	0.1	7	-141
107	4/5/2018	1:52:52 PM	2	1336 R	0.1	-6	20

108	4/5/2018	1:53:04 PM	5	1246 R	0.1	0	-98	
109	4/5/2018	1:53:15 PM	1	1265 R	0.1	-8	-73	
110	4/5/2018	1:58:46 PM	9	1312 R	0.1 Grid 12	9	-12	
111	4/5/2018	1:58:58 PM	2	1287 R	0.1	-6	-44	
112	4/5/2018	1:59:10 PM	12	1318 R	0.1	16	-4	
113	4/5/2018	1:59:21 PM	3	1361 R	0.1	-4	52	
114	4/5/2018	1:59:33 PM	0	1276 R	0.1	-11	-59	
115	4/5/2018	1:59:45 PM	14	1302 R	0.1	20	-25	
116	4/5/2018	1:59:57 PM	3	1275 R	0.1	-4	-60	
117	4/5/2018	2:00:08 PM	2	1219 R	0.1	-6	-133	
118	4/5/2018	2:00:20 PM	5	1279 R	0.1	0	-55	
119	4/5/2018	2:00:32 PM	3	1213 R	0.1	-4	-141	
120	4/5/2018	2:03:11 PM	0	1297 R	0.1 Grid 13	-11	-31	
121	4/5/2018	2:03:23 PM	7	1308 R	0.1	5	-17	
122	4/5/2018	2:03:34 PM	5	1261 R	0.1	0	-78	
123	4/5/2018	2:03:46 PM	3	1416 R	0.1	-4	124	
124	4/5/2018	2:03:58 PM	1	1326 R	0.1	-8	7	
125	4/5/2018	2:04:10 PM	2	1455 R	0.1	-6	174	
126	4/5/2018	2:04:21 PM	4	1368 R	0.1	-2	61	
127	4/5/2018	2:04:33 PM	3	1249 R	0.1	-4	-94	
128	4/5/2018	2:04:45 PM	5	1335 R	0.1	0	18	
129	4/5/2018	2:04:57 PM	0	1244 R	0.1	-11	-100	
130	4/5/2018	2:10:39 PM	3	1312 R	0.1 Grid 14	-4	-12	
131	4/5/2018	2:10:51 PM	7	1330 R	0.1	5	12	
132	4/5/2018	2:11:03 PM	10	1331 R	0.1	12	13	
133	4/5/2018	2:11:14 PM	12	1194 R	0.1	16	-165	
134	4/5/2018	2:11:26 PM	2	1183 R	0.1	-6	-180	
135	4/5/2018	2:11:38 PM	0	1385 R	0.1	-11	83	
136	4/5/2018	2:11:49 PM	4	1342 R	0.1	-2	27	
137	4/5/2018	2:12:01 PM	5	1436 R	0.1	0	150	
138	4/5/2018	2:12:13 PM	1	1387 R	0.1	-8	86	
139	4/5/2018	2:12:25 PM	2	1328 R	0.1	-6	9	
140	4/5/2018	2:18:08 PM	5	658 R	0.1 Grid 15	0	-56	Wood
141	4/5/2018	2:18:20 PM	7	734 R	0.1	5	43	Wood
142	4/5/2018	2:18:31 PM	4	708 R	0.1	-2	9	Wood
143	4/5/2018	2:18:43 PM	5	686 R	0.1	0	-20	Wood
144	4/5/2018	2:18:55 PM	0	837 R	0.1	-11	177	Wood
145	4/5/2018	2:19:06 PM	5	865 R	0.1	0	213	Wood
146	4/5/2018	2:19:18 PM	3	881 R	0.1	-4	234	Wood
147	4/5/2018	2:19:30 PM	5	799 R	0.1	0	128	Wood
148	4/5/2018	2:19:42 PM	7	712 R	0.1	5	14	Wood
149	4/5/2018	2:19:54 PM	2	669 R	0.1	-6	-42	Wood
150	4/5/2018	2:23:50 PM	2	1312 R	0.1 Grid 16	-6	-12	
151	4/5/2018	2:24:02 PM	3	1217 R	0.1	-4	-135	
152	4/5/2018	2:24:14 PM	7	1138 R	0.1	5	-238	
153	4/5/2018	2:24:26 PM	4	1200 R	0.1	-2	-158	
154	4/5/2018	2:24:38 PM	15	1378 R	0.1	23	74	
155	4/5/2018	2:24:49 PM	9	1212 R	0.1	9	-142	
156	4/5/2018	2:25:01 PM	2	1412 R	0.1	-6	118	
157	4/5/2018	2:25:13 PM	2	1199 R	0.1	-6	-159	
158	4/5/2018	2:25:25 PM	3	1312 R	0.1	-4	-12	
159	4/5/2018	2:25:36 PM	6	1422 R	0.1	3	131	
160	4/5/2018	2:30:25 PM	7	1312 R	0.1 Grid 17	5	-12	
161	4/5/2018	2:30:37 PM	1	1263 R	0.1	-8	-75	
162	4/5/2018	2:30:48 PM	5	1362 R	0.1	0	53	
163	4/5/2018	2:31:00 PM	4	1449 R	0.1	-2	167	
164	4/5/2018	2:31:12 PM	2	1385 R	0.1	-6	83	
165	4/5/2018	2:31:24 PM	9	1482 R	0.1	9	210	
166	4/5/2018	2:31:35 PM	6	1271 R	0.1	3	-65	
167	4/5/2018	2:31:47 PM	6	1539 R	0.1	3	284	
168	4/5/2018	2:31:59 PM	7	1650 R	0.1	5	428	

169	4/5/2018	2:32:11 PM	1	1454 R	0.1	-8	173	
170	4/5/2018	2:37:42 PM	3	1042 R	0.1 Grid 18	-4	-363	
171	4/5/2018	2:37:54 PM	12	1428 R	0.1	16	139	
172	4/5/2018	2:38:06 PM	3	1269 R	0.1	-4	-68	
173	4/5/2018	2:38:18 PM	11	799 R	0.1	14	128	Wood
174	4/5/2018	2:38:29 PM	2	830 R	0.1	-6	168	Wood
175	4/5/2018	2:38:41 PM	0	891 R	0.1	-11	247	Wood
176	4/5/2018	2:38:53 PM	0	743 R	0.1	-11	55	Wood
177	4/5/2018	2:39:05 PM	0	829 R	0.1	-11	167	Wood
178	4/5/2018	2:39:16 PM	12	1204 R	0.1	16	-152	
179	4/5/2018	2:39:28 PM	8	1328 R	0.1	7	9	
180	4/5/2018	2:42:51 PM	0	1286 R	0.1 Grid 19	-11	-46	
181	4/5/2018	2:43:02 PM	3	1356 R	0.1	-4	46	
182	4/5/2018	2:43:14 PM	7	1235 R	0.1	5	-112	
183	4/5/2018	2:43:26 PM	4	1112 R	0.1	-2	-272	
184	4/5/2018	2:43:38 PM	5	1267 R	0.1	0	-70	
185	4/5/2018	2:43:50 PM	3	1305 R	0.1	-4	-21	
186	4/5/2018	2:44:01 PM	8	1328 R	0.1	7	9	
187	4/5/2018	2:44:13 PM	11	1476 R	0.1	14	202	
188	4/5/2018	2:44:25 PM	2	1284 R	0.1	-6	-48	
189	4/5/2018	2:44:37 PM	0	1342 R	0.1	-11	27	
190	4/5/2018	2:49:15 PM	4	1310 R	0.1 Grid 20	-2	-14	
191	4/5/2018	2:49:26 PM	1	1265 R	0.1	-8	-73	
192	4/5/2018	2:49:38 PM	0	1310 R	0.1	-11	-14	
193	4/5/2018	2:49:50 PM	4	1256 R	0.1	-2	-85	
194	4/5/2018	2:50:02 PM	1	1325 R	0.1	-8	5	
195	4/5/2018	2:50:13 PM	7	1252 R	0.1	5	-90	
196	4/5/2018	2:50:25 PM	1	1239 R	0.1	-8	-107	
197	4/5/2018	2:50:37 PM	6	1363 R	0.1	3	55	
198	4/5/2018	2:50:49 PM	1	1378 R	0.1	-8	74	
199	4/5/2018	2:51:00 PM	8	1276 R	0.1	7	-59	
200	4/5/2018	2:52:58 PM	3	1355 R	0.1 Grid 21	-4	44	
201	4/5/2018	2:53:10 PM	2	1335 R	0.1	-6	18	
202	4/5/2018	2:53:22 PM	5	1295 R	0.1	0	-34	
203	4/5/2018	2:53:34 PM	0	1325 R	0.1	-11	5	
204	4/5/2018	2:53:45 PM	5	1541 R	0.1	0	286	
205	4/5/2018	2:53:57 PM	1	1466 R	0.1	-8	189	
206	4/5/2018	2:54:09 PM	0	1336 R	0.1	-11	20	
207	4/5/2018	2:54:21 PM	5	1482 R	0.1	0	210	
208	4/5/2018	2:54:32 PM	8	1515 R	0.1	7	253	
209	4/5/2018	2:54:44 PM	5	1204 R	0.1	0	-152	
210	4/5/2018	2:57:56 PM	0	1276 R	0.1 Grid 22	-11	-59	
211	4/5/2018	2:58:08 PM	3	1359 R	0.1	-4	49	
212	4/5/2018	2:58:19 PM	5	1312 R	0.1	0	-12	
213	4/5/2018	2:58:31 PM	7	1312 R	0.1	5	-12	
214	4/5/2018	2:58:43 PM	4	1383 R	0.1	-2	81	
215	4/5/2018	2:58:55 PM	9	1354 R	0.1	9	43	
216	4/5/2018	2:59:06 PM	3	1238 R	0.1	-4	-108	
217	4/5/2018	2:59:18 PM	7	1277 R	0.1	5	-57	
218	4/5/2018	2:59:30 PM	1	1287 R	0.1	-8	-44	
219	4/5/2018	2:59:42 PM	7	1315 R	0.1	5	-8	
220	4/5/2018	2:59:53 PM	9	1530 R	0.1	9	272	
221	4/5/2018	3:03:18 PM	0	1342 R	0.1 Grid 23	-11	27	
222	4/5/2018	3:03:29 PM	10	1364 R	0.1	12	56	
223	4/5/2018	3:03:41 PM	2	1252 R	0.1	-6	-90	
224	4/5/2018	3:03:53 PM	0	1383 R	0.1	-11	81	
225	4/5/2018	3:04:05 PM	0	1354 R	0.1	-11	43	
226	4/5/2018	3:04:16 PM	8	1446 R	0.1	7	163	
227	4/5/2018	3:04:28 PM	11	1328 R	0.1	14	9	
228	4/5/2018	3:04:40 PM	2	1317 R	0.1	-6	-5	
229	4/5/2018	3:04:52 PM	7	1287 R	0.1	5	-44	

230	4/5/2018	3:08:05 PM	8	1312 R	0.1 Grid 24	7	-12
231	4/5/2018	3:08:17 PM	4	1378 R	0.1	-2	74
232	4/5/2018	3:08:29 PM	3	1220 R	0.1	-4	-131
233	4/5/2018	3:08:40 PM	11	1252 R	0.1	14	-90
234	4/5/2018	3:08:52 PM	2	1338 R	0.1	-6	22
235	4/5/2018	3:09:04 PM	2	1190 R	0.1	-6	-171
236	4/5/2018	3:09:16 PM	3	1256 R	0.1	-4	-85
237	4/5/2018	3:09:28 PM	9	1458 R	0.1	9	178
238	4/5/2018	3:09:39 PM	2	1395 R	0.1	-6	96
239	4/5/2018	3:09:51 PM	6	1333 R	0.1	3	16
240	4/5/2018	3:11:44 PM	3	1286 R	0.1 Grid 25	-4	-46
241	4/5/2018	3:11:56 PM	4	1274 R	0.1	-2	-61
242	4/5/2018	3:12:08 PM	0	1343 R	0.1	-11	29
243	4/5/2018	3:12:20 PM	0	1394 R	0.1	-11	95
244	4/5/2018	3:12:31 PM	7	1351 R	0.1	5	39
245	4/5/2018	3:12:43 PM	1	1444 R	0.1	-8	160
246	4/5/2018	3:12:55 PM	12	1340 R	0.1	16	25
247	4/5/2018	3:13:07 PM	8	1401 R	0.1	7	104
248	4/5/2018	3:13:18 PM	2	1238 R	0.1	-6	-108
249	4/5/2018	3:13:30 PM	0	1428 R	0.1	-11	139
250	4/5/2018	3:18:49 PM	3	1310 R	0.1 Grid 26	-4	-14
251	4/5/2018	3:19:01 PM	0	1309 R	0.1	-11	-16
252	4/5/2018	3:19:13 PM	9	1296 R	0.1	9	-33
253	4/5/2018	3:19:25 PM	2	1288 R	0.1	-6	-43
254	4/5/2018	3:19:36 PM	3	1388 R	0.1	-4	87
255	4/5/2018	3:19:48 PM	2	1385 R	0.1	-6	83
256	4/5/2018	3:20:00 PM	4	1388 R	0.1	-2	87
257	4/5/2018	3:20:12 PM	5	1378 R	0.1	0	74
258	4/5/2018	3:20:23 PM	0	1300 R	0.1	-11	-27
259	4/5/2018	3:20:35 PM	10	1382 R	0.1	12	79
260	4/5/2018	3:26:07 PM	11	1257 R	0.1 Grid 27	14	-83
261	4/5/2018	3:26:19 PM	2	1313 R	0.1	-6	-10
262	4/5/2018	3:26:30 PM	4	1419 R	0.1	-2	128
263	4/5/2018	3:26:42 PM	5	1371 R	0.1	0	65
264	4/5/2018	3:26:54 PM	5	1348 R	0.1	0	35
265	4/5/2018	3:27:06 PM	13	1304 R	0.1	18	-22
266	4/5/2018	3:27:17 PM	3	1285 R	0.1	-4	-47
267	4/5/2018	3:27:29 PM	2	1389 R	0.1	-6	89
268	4/5/2018	3:27:41 PM	5	1287 R	0.1	0	-44
269	4/5/2018	3:27:53 PM	0	1232 R	0.1	-11	-116
270	4/5/2018	3:30:20 PM	4	1295 R	0.1 Grid 28	-2	-34
271	4/5/2018	3:30:32 PM	1	1357 R	0.1	-8	47
272	4/5/2018	3:30:44 PM	0	1535 R	0.1	-11	279
273	4/5/2018	3:30:56 PM	0	1363 R	0.1	-11	55
274	4/5/2018	3:31:07 PM	9	1262 R	0.1	9	-77
275	4/5/2018	3:31:19 PM	2	1255 R	0.1	-6	-86
276	4/5/2018	3:31:31 PM	2	1276 R	0.1	-6	-59
277	4/5/2018	3:31:43 PM	3	1267 R	0.1	-4	-70
278	4/5/2018	3:31:54 PM	4	1469 R	0.1	-2	193
279	4/5/2018	3:32:06 PM	4	1297 R	0.1	-2	-31
Maximum:			15	1650		23	428
Average:			5	1264		-1	19
StDev:			4	186		8	130

Room 100 Ceiling/Overhead

2360 SN:268497

43-37 SN:093965

Cal Due Date: 10/10/2018

Surveyor: Thomas Hogan

Bldg. 218

Room 100 Ceiling Grids 5 through 8

Alpha Efficiency: 0.31

Beta/Gamma Efficiency: 0.352

Alpha Background: 3.4

Beta/Gamma Background: 483

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count Time	Location	dpm/100cm ²	
								Alpha	Beta
1	4/6/2018	10:15:08 AM	0	587	R	0.1	Grid 5	-8	135
2	4/6/2018	10:15:20 AM	3	639	R	0.1		-1	203
3	4/6/2018	10:15:32 AM	0	609	R	0.1		-8	164
4	4/6/2018	10:15:44 AM	2	672	R	0.1		-3	246
5	4/6/2018	10:15:55 AM	5	596	R	0.1		4	147
6	4/6/2018	10:16:07 AM	3	692	R	0.1		-1	272
7	4/6/2018	10:16:19 AM	13	660	R	0.1		21	230
8	4/6/2018	10:16:31 AM	3	600	R	0.1		-1	152
9	4/6/2018	10:16:42 AM	0	566	R	0.1		-8	108
10	4/6/2018	10:22:43 AM	0	585	R	0.1	Grid 6	-8	133
11	4/6/2018	10:22:54 AM	5	630	R	0.1		4	191
12	4/6/2018	10:23:06 AM	1	701	R	0.1		-5	284
13	4/6/2018	10:23:18 AM	0	655	R	0.1		-8	224
14	4/6/2018	10:23:30 AM	4	618	R	0.1		1	176
15	4/6/2018	10:23:41 AM	0	664	R	0.1		-8	236
16	4/6/2018	10:23:53 AM	4	662	R	0.1		1	233
17	4/6/2018	10:24:05 AM	0	641	R	0.1		-8	206
18	4/6/2018	10:24:17 AM	3	674	R	0.1		-1	249
19	4/6/2018	10:24:28 AM	0	590	R	0.1		-8	139
20	4/6/2018	10:29:29 AM	5	567	R	0.1	Grid 7	4	109
21	4/6/2018	10:29:41 AM	1	600	R	0.1		-5	152
22	4/6/2018	10:29:53 AM	8	647	R	0.1		10	213
23	4/6/2018	10:30:05 AM	2	579	R	0.1		-3	125
24	4/6/2018	10:30:16 AM	17	658	R	0.1		30	228
25	4/6/2018	10:30:28 AM	12	665	R	0.1		19	237
26	4/6/2018	10:38:36 AM	0	560	R	0.1	Grid 8	-8	100
27	4/6/2018	10:38:47 AM	0	552	R	0.1		-8	90
28	4/6/2018	10:38:59 AM	11	588	R	0.1		17	137
29	4/6/2018	10:39:11 AM	7	601	R	0.1		8	154
30	4/6/2018	10:39:23 AM	11	578	R	0.1		17	124
31	4/6/2018	10:39:34 AM	2	553	R	0.1		-3	91
32	4/6/2018	10:39:46 AM	0	688	R	0.1		-8	267
33	4/6/2018	10:39:58 AM	0	667	R	0.1		-8	240
34	4/6/2018	10:40:10 AM	8	637	R	0.1		10	200
35	4/6/2018	10:40:21 AM	2	667	R	0.1		-3	240
36	4/6/2018	10:40:33 AM	0	605	R	0.1		-8	159
37	4/6/2018	10:40:45 AM	6	570	R	0.1		6	113
Maximum:			17	701				30	284
Average:			4	622				1	181
StDev:			4	44				10	57

Room 103 Floor

2360 SN:268497

43-37 SN:093

Cal Due Date: 10/10/2018

Surveyor: Thomas Hogan

Bldg. 218

Room 100 Ceiling

Alpha Efficiency: 0.31

Beta/Gamma Efficiency: 0.352

Alpha Background: 4.9

Beta/Gamma Background: 889

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count Time	Location	dpm/100cm ²	
								Alpha	Beta
1	4/9/2018	10:39:24 AM	8	719	R	0.1	Grid 1	7	-221
2	4/9/2018	10:39:35 AM	2	806	R	0.1		-6	-108
3	4/9/2018	10:39:47 AM	0	920	R	0.1		-11	40
4	4/9/2018	10:39:59 AM	0	930	R	0.1		-11	53
5	4/9/2018	10:40:11 AM	4	836	R	0.1		-2	-69
6	4/9/2018	10:40:22 AM	1	848	R	0.1		-9	-53
7	4/9/2018	10:40:34 AM	3	820	R	0.1		-4	-90
8	4/9/2018	10:40:46 AM	0	821	R	0.1		-11	-89
9	4/9/2018	10:40:58 AM	0	832	R	0.1		-11	-74
10	4/9/2018	10:51:32 AM	3	785	R	0.1	Grid 2	-4	-135
11	4/9/2018	10:51:44 AM	0	788	R	0.1		-11	-131
12	4/9/2018	10:51:56 AM	0	742	R	0.1		-11	-191
13	4/9/2018	10:52:07 AM	0	958	R	0.1		-11	90
14	4/9/2018	10:52:19 AM	0	905	R	0.1		-11	21
15	4/9/2018	10:52:31 AM	0	778	R	0.1		-11	-144
16	4/9/2018	10:52:43 AM	0	796	R	0.1		-11	-121
17	4/9/2018	10:52:54 AM	9	832	R	0.1		9	-74
18	4/9/2018	10:53:06 AM	21	799	R	0.1		36	-117
19	4/9/2018	10:53:18 AM	4	780	R	0.1		-2	-142
20	4/9/2018	10:54:25 AM	0	793	R	0.1	Grid 3	-11	-125
21	4/9/2018	10:54:36 AM	0	773	R	0.1		-11	-151
22	4/9/2018	10:54:48 AM	7	802	R	0.1		5	-113
23	4/9/2018	10:55:00 AM	1	865	R	0.1		-9	-31
24	4/9/2018	10:55:12 AM	0	724	R	0.1		-11	-215
25	4/9/2018	10:55:23 AM	11	836	R	0.1		14	-69
26	4/9/2018	10:55:35 AM	2	853	R	0.1		-6	-47
27	4/9/2018	10:55:47 AM	11	828	R	0.1		14	-79
28	4/9/2018	10:55:59 AM	11	807	R	0.1		14	-107
29	4/9/2018	10:56:10 AM	6	870	R	0.1		2	-25
30	4/9/2018	10:58:07 AM	4	849	R	0.1	Grid 4	-2	-52
31	4/9/2018	10:58:19 AM	4	785	R	0.1		-2	-135
32	4/9/2018	10:58:30 AM	13	823	R	0.1		18	-86
33	4/9/2018	10:58:42 AM	15	958	R	0.1		22	90
34	4/9/2018	10:58:54 AM	3	895	R	0.1		-4	8
35	4/9/2018	10:59:06 AM	0	1050	R	0.1		-11	210
36	4/9/2018	10:59:17 AM	6	994	R	0.1		2	137
37	4/9/2018	10:59:29 AM	1	841	R	0.1		-9	-62
38	4/9/2018	10:59:41 AM	0	871	R	0.1		-11	-23
39	4/9/2018	10:59:53 AM	0	835	R	0.1		-11	-70

40	4/9/2018	11:02:29 AM	8	816 R	0.1 Grid 5	7	-95
41	4/9/2018	11:02:41 AM	2	873 R	0.1	-6	-21
42	4/9/2018	11:02:53 AM	7	834 R	0.1	5	-72
43	4/9/2018	11:03:04 AM	1	736 R	0.1	-9	-199
44	4/9/2018	11:03:16 AM	0	1065 R	0.1	-11	229
45	4/9/2018	11:03:28 AM	0	875 R	0.1	-11	-18
46	4/9/2018	11:03:40 AM	0	884 R	0.1	-11	-7
47	4/9/2018	11:03:51 AM	0	884 R	0.1	-11	-7
48	4/9/2018	11:04:03 AM	11	862 R	0.1	14	-35
49	4/9/2018	11:04:15 AM	2	808 R	0.1	-6	-105
50	4/9/2018	12:24:40 PM	0	824 R	0.1 Grid 6	-11	-85
51	4/9/2018	12:24:51 PM	0	899 R	0.1	-11	13
52	4/9/2018	12:25:03 PM	4	886 R	0.1	-2	-4
53	4/9/2018	12:25:15 PM	1	799 R	0.1	-9	-117
54	4/9/2018	12:25:27 PM	0	851 R	0.1	-11	-49
55	4/9/2018	12:25:38 PM	0	988 R	0.1	-11	129
56	4/9/2018	12:25:50 PM	0	908 R	0.1	-11	25
57	4/9/2018	12:26:02 PM	0	749 R	0.1	-11	-182
58	4/9/2018	12:26:13 PM	0	787 R	0.1	-11	-133
59	4/9/2018	12:26:25 PM	8	781 R	0.1	7	-141
60	4/9/2018	12:27:56 PM	10	864 R	0.1 Grid 7	11	-33
61	4/9/2018	12:28:07 PM	10	855 R	0.1	11	-44
62	4/9/2018	12:28:19 PM	2	917 R	0.1	-6	36
63	4/9/2018	12:28:31 PM	0	874 R	0.1	-11	-20
64	4/9/2018	12:28:43 PM	0	890 R	0.1	-11	1
65	4/9/2018	12:28:54 PM	7	994 R	0.1	5	137
66	4/9/2018	12:29:06 PM	1	953 R	0.1	-9	83
67	4/9/2018	12:29:18 PM	0	836 R	0.1	-11	-69
68	4/9/2018	12:29:30 PM	17	798 R	0.1	27	-118
69	4/9/2018	12:29:41 PM	8	829 R	0.1	7	-78
70	4/9/2018	12:32:00 PM	6	842 R	0.1 Grid 8	2	-61
71	4/9/2018	12:32:12 PM	1	902 R	0.1	-9	17
72	4/9/2018	12:32:24 PM	0	861 R	0.1	-11	-36
73	4/9/2018	12:32:35 PM	23	801 R	0.1	40	-115
74	4/9/2018	12:32:47 PM	5	1060 R	0.1	0	223
75	4/9/2018	12:32:59 PM	5	1029 R	0.1	0	182
76	4/9/2018	12:33:11 PM	9	935 R	0.1	9	60
77	4/9/2018	12:33:22 PM	11	806 R	0.1	14	-108
78	4/9/2018	12:33:34 PM	2	834 R	0.1	-6	-72
79	4/9/2018	12:33:46 PM	5	807 R	0.1	0	-107
80	4/9/2018	12:51:15 PM	7	685 R	0.1 Grid 9	5	-266
81	4/9/2018	12:51:26 PM	7	912 R	0.1	5	30
82	4/9/2018	12:51:38 PM	4	834 R	0.1	-2	-72
83	4/9/2018	12:51:50 PM	1	872 R	0.1	-9	-22
84	4/9/2018	12:52:02 PM	0	885 R	0.1	-11	-5
85	4/9/2018	12:52:13 PM	0	832 R	0.1	-11	-74
86	4/9/2018	12:52:25 PM	0	802 R	0.1	-11	-113
87	4/9/2018	12:52:37 PM	12	894 R	0.1	16	7
88	4/9/2018	12:52:49 PM	3	952 R	0.1	-4	82
89	4/9/2018	12:53:00 PM	0	825 R	0.1	-11	-83
90	4/9/2018	12:56:25 PM	0	896 R	0.1 Grid 10	-11	9
91	4/9/2018	12:56:37 PM	5	900 R	0.1	0	14
92	4/9/2018	12:56:48 PM	12	944 R	0.1	16	72
93	4/9/2018	12:57:00 PM	3	925 R	0.1	-4	47

94	4/9/2018	12:57:12 PM	0	951 R	0.1	-11	81
95	4/9/2018	12:57:24 PM	12	997 R	0.1	16	141
96	4/9/2018	12:57:35 PM	16	980 R	0.1	25	118
97	4/9/2018	12:57:47 PM	3	1029 R	0.1	-4	182
98	4/9/2018	12:57:59 PM	15	995 R	0.1	22	138
99	4/9/2018	12:58:11 PM	3	889 R	0.1	-4	0
100	4/9/2018	1:01:53 PM	9	834 R	0.1 Grid 11	9	-72
101	4/9/2018	1:02:05 PM	2	975 R	0.1	-6	112
102	4/9/2018	1:02:16 PM	22	880 R	0.1	38	-12
103	4/9/2018	1:02:28 PM	12	882 R	0.1	16	-9
104	4/9/2018	1:02:40 PM	2	928 R	0.1	-6	51
105	4/9/2018	1:02:52 PM	5	914 R	0.1	0	33
106	4/9/2018	1:03:03 PM	29	1012 R	0.1	53	160
107	4/9/2018	1:03:15 PM	6	1002 R	0.1	2	147
108	4/9/2018	1:03:27 PM	1	913 R	0.1	-9	31
109	4/9/2018	1:03:39 PM	7	961 R	0.1	5	94
110	4/9/2018	1:07:55 PM	0	908 R	0.1 Grid 12	-11	25
111	4/9/2018	1:08:06 PM	0	853 R	0.1	-11	-47
112	4/9/2018	1:08:18 PM	0	849 R	0.1	-11	-52
113	4/9/2018	1:08:30 PM	0	932 R	0.1	-11	56
114	4/9/2018	1:08:42 PM	11	940 R	0.1	14	66
115	4/9/2018	1:08:53 PM	2	793 R	0.1	-6	-125
116	4/9/2018	1:09:05 PM	7	875 R	0.1	5	-18
117	4/9/2018	1:09:17 PM	1	813 R	0.1	-9	-99
118	4/9/2018	1:09:29 PM	5	929 R	0.1	0	52
119	4/9/2018	1:09:40 PM	0	981 R	0.1	-11	120
120	4/9/2018	1:20:42 PM	6	852 R	0.1 Grid 13	2	-48
121	4/9/2018	1:20:53 PM	0	834 R	0.1	-11	-72
122	4/9/2018	1:21:05 PM	18	900 R	0.1	29	14
123	4/9/2018	1:21:17 PM	4	859 R	0.1	-2	-39
124	4/9/2018	1:21:29 PM	1	969 R	0.1	-9	104
125	4/9/2018	1:21:40 PM	0	959 R	0.1	-11	91
126	4/9/2018	1:21:52 PM	0	1053 R	0.1	-11	213
127	4/9/2018	1:22:04 PM	12	849 R	0.1	16	-52
128	4/9/2018	1:22:16 PM	3	858 R	0.1	-4	-40
129	4/9/2018	1:22:27 PM	0	937 R	0.1	-11	62
130	4/9/2018	1:26:22 PM	0	832 R	0.1 Grid 14	-11	-74
131	4/9/2018	1:26:34 PM	9	917 R	0.1	9	36
132	4/9/2018	1:26:46 PM	7	906 R	0.1	5	22
133	4/9/2018	1:26:57 PM	9	858 R	0.1	9	-40
134	4/9/2018	1:27:09 PM	11	1020 R	0.1	14	171
135	4/9/2018	1:27:21 PM	14	967 R	0.1	20	102
136	4/9/2018	1:27:33 PM	12	953 R	0.1	16	83
137	4/9/2018	1:27:44 PM	2	973 R	0.1	-6	109
138	4/9/2018	1:27:56 PM	3	975 R	0.1	-4	112
139	4/9/2018	1:28:08 PM	0	845 R	0.1	-11	-57
140	4/9/2018	1:33:25 PM	6	951 R	0.1 Grid 15	2	81
141	4/9/2018	1:33:36 PM	13	849 R	0.1	18	-52
142	4/9/2018	1:33:48 PM	12	846 R	0.1	16	-56
143	4/9/2018	1:34:00 PM	3	1025 R	0.1	-4	177
144	4/9/2018	1:34:12 PM	0	1090 R	0.1	-11	262
145	4/9/2018	1:34:23 PM	0	1099 R	0.1	-11	273
146	4/9/2018	1:34:35 PM	0	1095 R	0.1	-11	268
147	4/9/2018	1:34:47 PM	9	949 R	0.1	9	78

148	4/9/2018	1:34:59 PM	17	932 R	0.1		27	56
149	4/9/2018	1:35:10 PM	20	909 R	0.1		33	26
150	4/9/2018	1:37:32 PM	7	860 R	0.1	Grid 16	5	-38
151	4/9/2018	1:37:44 PM	1	1089 R	0.1		-9	260
152	4/9/2018	1:37:55 PM	11	891 R	0.1		14	3
153	4/9/2018	1:38:07 PM	9	969 R	0.1		9	104
154	4/9/2018	1:38:19 PM	14	1085 R	0.1		20	255
155	4/9/2018	1:38:31 PM	14	935 R	0.1		20	60
156	4/9/2018	1:38:42 PM	8	1182 R	0.1		7	381
157	4/9/2018	1:38:54 PM	9	1179 R	0.1		9	377
158	4/9/2018	1:39:06 PM	2	1253 R	0.1		-6	474
159	4/9/2018	1:39:18 PM	0	1132 R	0.1		-11	316
160	4/9/2018	1:50:53 PM	0	829 R	0.1	Grid 17	-11	-78
161	4/9/2018	1:51:05 PM	0	971 R	0.1		-11	107
162	4/9/2018	1:51:17 PM	15	981 R	0.1		22	120
163	4/9/2018	1:51:28 PM	3	832 R	0.1		-4	-74
164	4/9/2018	1:51:40 PM	0	844 R	0.1		-11	-59
165	4/9/2018	1:51:52 PM	4	990 R	0.1		-2	131
166	4/9/2018	1:52:04 PM	0	978 R	0.1		-11	116
167	4/9/2018	1:52:15 PM	9	940 R	0.1		9	66
168	4/9/2018	1:52:27 PM	2	821 R	0.1		-6	-89
169	4/9/2018	1:52:39 PM	7	973 R	0.1		5	109
170	4/9/2018	1:54:42 PM	0	889 R	0.1	Grid 18	-11	0
171	4/9/2018	1:54:54 PM	6	877 R	0.1		2	-16
172	4/9/2018	1:55:06 PM	1	940 R	0.1		-9	66
173	4/9/2018	1:55:17 PM	0	1007 R	0.1		-11	154
174	4/9/2018	1:55:29 PM	18	988 R	0.1		29	129
175	4/9/2018	1:55:41 PM	4	947 R	0.1		-2	75
176	4/9/2018	1:55:53 PM	8	974 R	0.1		7	111
177	4/9/2018	1:56:04 PM	2	962 R	0.1		-6	95
178	4/9/2018	1:56:16 PM	3	1005 R	0.1		-4	151
179	4/9/2018	1:56:28 PM	19	953 R	0.1		31	83
180	4/9/2018	1:56:40 PM	4	1048 R	0.1		-2	207
181	4/9/2018	1:59:08 PM	0	893 R	0.1	Grid 19	-11	5
182	4/9/2018	1:59:20 PM	0	974 R	0.1		-11	111
183	4/9/2018	1:59:32 PM	0	1035 R	0.1		-11	190
184	4/9/2018	1:59:43 PM	0	919 R	0.1		-11	39
185	4/9/2018	1:59:55 PM	0	993 R	0.1		-11	135
186	4/9/2018	2:00:07 PM	15	965 R	0.1		22	99
187	4/9/2018	2:00:19 PM	27	872 R	0.1		49	-22
188	4/9/2018	2:00:30 PM	21	861 R	0.1		36	-36
189	4/9/2018	2:00:42 PM	12	924 R	0.1		16	46
190	4/9/2018	2:02:21 PM	8	907 R	0.1	Grid 20	7	23
191	4/9/2018	2:02:33 PM	5	865 R	0.1		0	-31
192	4/9/2018	2:02:45 PM	1	935 R	0.1		-9	60
193	4/9/2018	2:02:56 PM	4	997 R	0.1		-2	141
194	4/9/2018	2:03:08 PM	5	1058 R	0.1		0	220
195	4/9/2018	2:03:20 PM	11	1046 R	0.1		14	204
196	4/9/2018	2:03:32 PM	2	952 R	0.1		-6	82
197	4/9/2018	2:03:43 PM	0	884 R	0.1		-11	-7
198	4/9/2018	2:03:55 PM	7	958 R	0.1		5	90
199	4/9/2018	2:04:07 PM	4	999 R	0.1		-2	143
200	4/9/2018	2:06:17 PM	0	841 R	0.1	Grid 21	-11	-62
201	4/9/2018	2:06:29 PM	0	1079 R	0.1		-11	247

202	4/9/2018	2:06:41 PM	5	967 R	0.1	0	102
203	4/9/2018	2:06:53 PM	1	1031 R	0.1	-9	185
204	4/9/2018	2:07:04 PM	3	1081 R	0.1	-4	250
205	4/9/2018	2:07:16 PM	0	1104 R	0.1	-11	280
206	4/9/2018	2:07:28 PM	3	1015 R	0.1	-4	164
207	4/9/2018	2:07:40 PM	0	959 R	0.1	-11	91
208	4/9/2018	2:07:51 PM	7	950 R	0.1	5	79
209	4/9/2018	2:08:03 PM	1	976 R	0.1	-9	113
210	4/9/2018	2:09:26 PM	0	818 R	0.1 Grid 22	-11	-92
211	4/9/2018	2:09:38 PM	0	946 R	0.1	-11	74
212	4/9/2018	2:09:50 PM	0	884 R	0.1	-11	-7
213	4/9/2018	2:10:02 PM	0	1023 R	0.1	-11	174
214	4/9/2018	2:10:13 PM	7	1116 R	0.1	5	295
215	4/9/2018	2:10:25 PM	1	980 R	0.1	-9	118
216	4/9/2018	2:10:37 PM	10	1088 R	0.1	11	259
217	4/9/2018	2:10:49 PM	14	956 R	0.1	20	87
218	4/9/2018	2:11:00 PM	9	1020 R	0.1	9	171
219	4/9/2018	2:11:12 PM	2	946 R	0.1	-6	74
220	4/9/2018	2:12:33 PM	5	886 R	0.1 Grid 23	0	-4
221	4/9/2018	2:12:45 PM	0	993 R	0.1	-11	135
222	4/9/2018	2:12:57 PM	4	907 R	0.1	-2	23
223	4/9/2018	2:13:09 PM	0	885 R	0.1	-11	-5
224	4/9/2018	2:13:20 PM	0	907 R	0.1	-11	23
225	4/9/2018	2:13:32 PM	11	978 R	0.1	14	116
226	4/9/2018	2:13:44 PM	2	942 R	0.1	-6	69
227	4/9/2018	2:13:56 PM	4	878 R	0.1	-2	-14
228	4/9/2018	2:14:07 PM	4	948 R	0.1	-2	77
229	4/9/2018	2:14:19 PM	1	877 R	0.1	-9	-16
230	4/9/2018	2:16:34 PM	8	843 R	0.1 Grid 24	7	-60
231	4/9/2018	2:16:46 PM	2	926 R	0.1	-6	48
232	4/9/2018	2:16:58 PM	6	965 R	0.1	2	99
233	4/9/2018	2:17:10 PM	1	1089 R	0.1	-9	260
234	4/9/2018	2:17:21 PM	0	1028 R	0.1	-11	181
235	4/9/2018	2:17:33 PM	5	1079 R	0.1	0	247
236	4/9/2018	2:17:45 PM	4	1179 R	0.1	-2	377
237	4/9/2018	2:17:57 PM	0	1257 R	0.1	-11	479
238	4/9/2018	2:18:09 PM	10	1119 R	0.1	11	299
239	4/9/2018	2:18:20 PM	2	1224 R	0.1	-6	436
240	4/9/2018	2:20:30 PM	8	684 R	0.1 Grid 25	7	-267
241	4/9/2018	2:20:42 PM	2	889 R	0.1	-6	0
242	4/9/2018	2:20:53 PM	13	927 R	0.1	18	49
243	4/9/2018	2:21:05 PM	3	945 R	0.1	-4	73
244	4/9/2018	2:21:17 PM	0	912 R	0.1	-11	30
245	4/9/2018	2:21:29 PM	5	882 R	0.1	0	-9
246	4/9/2018	2:21:40 PM	4	922 R	0.1	-2	43
247	4/9/2018	2:21:52 PM	0	886 R	0.1	-11	-4
248	4/9/2018	2:22:04 PM	7	972 R	0.1	5	108
249	4/9/2018	2:22:16 PM	1	836 R	0.1	-9	-69
250	4/9/2018	2:23:31 PM	0	936 R	0.1 Grid 26	-11	61
251	4/9/2018	2:23:43 PM	4	912 R	0.1	-2	30
252	4/9/2018	2:23:55 PM	1	933 R	0.1	-9	57
253	4/9/2018	2:24:07 PM	3	851 R	0.1	-4	-49
254	4/9/2018	2:24:18 PM	0	1112 R	0.1	-11	290
255	4/9/2018	2:24:30 PM	5	1064 R	0.1	0	228

256	4/9/2018	2:24:42 PM	1	1008 R	0.1	-9	155
257	4/9/2018	2:24:54 PM	0	1009 R	0.1	-11	156
258	4/9/2018	2:25:05 PM	7	964 R	0.1	5	98
259	4/9/2018	2:25:17 PM	8	1020 R	0.1	7	171
260	4/9/2018	2:26:18 PM	19	901 R	0.1 Grid 27	31	16
261	4/9/2018	2:26:29 PM	4	1082 R	0.1	-2	251
262	4/9/2018	2:26:41 PM	20	999 R	0.1	33	143
263	4/9/2018	2:26:53 PM	4	948 R	0.1	-2	77
264	4/9/2018	2:27:05 PM	8	894 R	0.1	7	7
265	4/9/2018	2:27:16 PM	14	978 R	0.1	20	116
266	4/9/2018	2:27:28 PM	3	1129 R	0.1	-4	312
267	4/9/2018	2:27:40 PM	3	1194 R	0.1	-4	397
268	4/9/2018	2:27:52 PM	0	1104 R	0.1	-11	280
269	4/9/2018	2:28:03 PM	3	1048 R	0.1	-4	207
270	4/9/2018	2:30:01 PM	3	928 R	0.1 Grid 28	-4	51
271	4/9/2018	2:30:13 PM	11	1127 R	0.1	14	310
272	4/9/2018	2:30:25 PM	2	973 R	0.1	-6	109
273	4/9/2018	2:30:36 PM	0	1056 R	0.1	-11	217
274	4/9/2018	2:30:48 PM	4	1038 R	0.1	-2	194
275	4/9/2018	2:31:00 PM	1	1156 R	0.1	-9	348
276	4/9/2018	2:31:12 PM	0	1136 R	0.1	-11	322
277	4/9/2018	2:31:23 PM	0	1123 R	0.1	-11	305
278	4/9/2018	2:31:35 PM	11	1084 R	0.1	14	254
279	4/9/2018	2:31:47 PM	2	1115 R	0.1	-6	294
280	4/9/2018	2:32:57 PM	0	823 R	0.1 Grid 29	-11	-86
281	4/9/2018	2:33:09 PM	0	1033 R	0.1	-11	187
282	4/9/2018	2:33:21 PM	0	999 R	0.1	-11	143
283	4/9/2018	2:33:33 PM	0	1120 R	0.1	-11	301
284	4/9/2018	2:33:44 PM	7	1039 R	0.1	5	195
285	4/9/2018	2:33:56 PM	17	1016 R	0.1	27	165
286	4/9/2018	2:34:08 PM	4	921 R	0.1	-2	42
287	4/9/2018	2:34:20 PM	0	1133 R	0.1	-11	318
288	4/9/2018	2:34:31 PM	0	1082 R	0.1	-11	251
289	4/9/2018	2:34:43 PM	3	1152 R	0.1	-4	342
290	4/9/2018	2:38:50 PM	5	884 R	0.1 Grid 30	0	-7
291	4/9/2018	2:39:02 PM	7	1071 R	0.1	5	237
292	4/9/2018	2:39:14 PM	1	1111 R	0.1	-9	289
293	4/9/2018	2:39:25 PM	0	994 R	0.1	-11	137
294	4/9/2018	2:39:37 PM	0	1135 R	0.1	-11	320
295	4/9/2018	2:39:49 PM	0	993 R	0.1	-11	135
296	4/9/2018	2:40:01 PM	15	995 R	0.1	22	138
297	4/9/2018	2:40:12 PM	7	965 R	0.1	5	99
298	4/9/2018	2:40:24 PM	11	1098 R	0.1	14	272
299	4/9/2018	2:40:36 PM	2	920 R	0.1	-6	40
300	4/9/2018	2:42:06 PM	0	989 R	0.1 Grid 31	-11	130
301	4/9/2018	2:42:17 PM	9	975 R	0.1	9	112
302	4/9/2018	2:42:29 PM	2	1059 R	0.1	-6	221
303	4/9/2018	2:42:41 PM	0	1128 R	0.1	-11	311
304	4/9/2018	2:42:53 PM	0	1059 R	0.1	-11	221
305	4/9/2018	2:43:04 PM	3	1106 R	0.1	-4	282
306	4/9/2018	2:43:16 PM	15	1059 R	0.1	22	221
307	4/9/2018	2:43:28 PM	3	1092 R	0.1	-4	264
308	4/9/2018	2:43:40 PM	23	1168 R	0.1	40	363
309	4/9/2018	2:43:51 PM	5	1152 R	0.1	0	342

310	4/9/2018	2:45:09 PM	0	799 R	0.1	Grid 32	-11	-117
311	4/9/2018	2:45:21 PM	7	969 R	0.1		5	104
312	4/9/2018	2:45:32 PM	7	1051 R	0.1		5	211
313	4/9/2018	2:45:44 PM	7	965 R	0.1		5	99
314	4/9/2018	2:45:56 PM	4	960 R	0.1		-2	92
315	4/9/2018	2:46:08 PM	6	1018 R	0.1		2	168
316	4/9/2018	2:46:19 PM	1	1136 R	0.1		-9	322
317	4/9/2018	2:46:31 PM	0	1255 R	0.1		-11	476
318	4/9/2018	2:46:43 PM	0	1149 R	0.1		-11	338
319	4/9/2018	2:46:55 PM	0	1209 R	0.1		-11	417
320	4/9/2018	2:53:42 PM	11	834 R	0.1	Grid 33	14	-72
321	4/9/2018	2:53:54 PM	2	896 R	0.1		-6	9
322	4/9/2018	2:54:05 PM	10	875 R	0.1		11	-18
323	4/9/2018	2:54:17 PM	5	930 R	0.1		0	53
324	4/9/2018	2:54:29 PM	1	984 R	0.1		-9	124
325	4/9/2018	2:54:41 PM	0	951 R	0.1		-11	81
326	4/9/2018	2:54:52 PM	0	912 R	0.1		-11	30
327	4/9/2018	2:55:04 PM	0	849 R	0.1		-11	-52
328	4/9/2018	2:55:16 PM	0	904 R	0.1		-11	20
329	4/9/2018	2:55:28 PM	0	978 R	0.1		-11	116
330	4/9/2018	2:56:42 PM	0	918 R	0.1	Grid 34	-11	38
331	4/9/2018	2:56:53 PM	12	980 R	0.1		16	118
332	4/9/2018	2:57:05 PM	2	1027 R	0.1		-6	180
333	4/9/2018	2:57:17 PM	0	939 R	0.1		-11	65
334	4/9/2018	2:57:29 PM	0	869 R	0.1		-11	-26
335	4/9/2018	2:57:45 PM	0	963 R	0.1		-11	96
336	4/9/2018	2:57:57 PM	0	1039 R	0.1		-11	195
337	4/9/2018	2:58:08 PM	3	918 R	0.1		-4	38
338	4/9/2018	2:58:20 PM	0	938 R	0.1		-11	64
339	4/9/2018	2:58:32 PM	14	998 R	0.1		20	142
340	4/9/2018	3:00:10 PM	5	900 R	0.1	Grid 35	0	14
341	4/9/2018	3:00:22 PM	1	1018 R	0.1		-9	168
342	4/9/2018	3:00:34 PM	9	972 R	0.1		9	108
343	4/9/2018	3:00:46 PM	2	894 R	0.1		-6	7
344	4/9/2018	3:00:57 PM	9	943 R	0.1		9	70
345	4/9/2018	3:01:09 PM	2	991 R	0.1		-6	133
346	4/9/2018	3:01:21 PM	4	1008 R	0.1		-2	155
347	4/9/2018	3:01:33 PM	1	1048 R	0.1		-9	207
348	4/9/2018	3:01:44 PM	8	1073 R	0.1		7	240
349	4/9/2018	3:01:56 PM	8	1078 R	0.1		7	246
350	4/9/2018	3:03:03 PM	0	882 R	0.1	Grid 36	-11	-9
351	4/9/2018	3:03:14 PM	0	903 R	0.1		-11	18
352	4/9/2018	3:03:26 PM	0	1099 R	0.1		-11	273
353	4/9/2018	3:03:38 PM	0	925 R	0.1		-11	47
354	4/9/2018	3:03:50 PM	3	883 R	0.1		-4	-8
355	4/9/2018	3:04:01 PM	21	874 R	0.1		36	-20
356	4/9/2018	3:04:13 PM	4	919 R	0.1		-2	39
357	4/9/2018	3:04:25 PM	1	873 R	0.1		-9	-21
358	4/9/2018	3:04:37 PM	18	933 R	0.1		29	57
359	4/9/2018	3:04:48 PM	4	966 R	0.1		-2	100
360	4/9/2018	3:05:47 PM	22	882 R	0.1	Grid 37	38	-9
361	4/9/2018	3:05:59 PM	19	986 R	0.1		31	126
362	4/9/2018	3:06:11 PM	4	990 R	0.1		-2	131
363	4/9/2018	3:06:23 PM	4	894 R	0.1		-2	7

364	4/9/2018	3:06:34 PM	1	1046 R	0.1	-9	204
365	4/9/2018	3:06:46 PM	0	967 R	0.1	-11	102
366	4/9/2018	3:06:58 PM	0	970 R	0.1	-11	105
367	4/9/2018	3:07:10 PM	0	840 R	0.1	-11	-64
368	4/9/2018	3:07:21 PM	3	958 R	0.1	-4	90
369	4/9/2018	3:07:33 PM	0	944 R	0.1	-11	72
370	4/9/2018	3:08:56 PM	10	941 R	0.1 Grid 38	11	68
371	4/9/2018	3:09:08 PM	2	1051 R	0.1	-6	211
372	4/9/2018	3:09:20 PM	5	878 R	0.1	0	-14
373	4/9/2018	3:09:32 PM	1	1026 R	0.1	-9	178
374	4/9/2018	3:09:43 PM	9	941 R	0.1	9	68
375	4/9/2018	3:09:55 PM	18	959 R	0.1	29	91
376	4/9/2018	3:10:07 PM	4	1066 R	0.1	-2	230
377	4/9/2018	3:10:19 PM	1	973 R	0.1	-9	109
378	4/9/2018	3:10:30 PM	0	1130 R	0.1	-11	314
379	4/9/2018	3:10:42 PM	0	925 R	0.1	-11	47
380	4/9/2018	3:11:54 PM	0	820 R	0.1 Grid 39	-11	-90
381	4/9/2018	3:12:06 PM	0	969 R	0.1	-11	104
382	4/9/2018	3:12:17 PM	15	967 R	0.1	22	102
383	4/9/2018	3:12:29 PM	13	1142 R	0.1	18	329
384	4/9/2018	3:12:41 PM	8	1068 R	0.1	7	233
385	4/9/2018	3:12:53 PM	2	1002 R	0.1	-6	147
386	4/9/2018	3:13:04 PM	8	975 R	0.1	7	112
387	4/9/2018	3:13:16 PM	8	849 R	0.1	7	-52
388	4/9/2018	3:13:28 PM	16	902 R	0.1	25	17
389	4/9/2018	3:13:40 PM	3	1026 R	0.1	-4	178
390	4/9/2018	3:14:40 PM	0	930 R	0.1 Grid 40	-11	53
391	4/9/2018	3:14:52 PM	3	964 R	0.1	-4	98
392	4/9/2018	3:15:04 PM	5	1052 R	0.1	0	212
393	4/9/2018	3:15:16 PM	1	949 R	0.1	-9	78
394	4/9/2018	3:15:27 PM	17	1065 R	0.1	27	229
395	4/9/2018	3:15:39 PM	3	1069 R	0.1	-4	234
396	4/9/2018	3:15:51 PM	0	1080 R	0.1	-11	249
397	4/9/2018	3:16:03 PM	0	1200 R	0.1	-11	405
398	4/9/2018	3:16:14 PM	0	1079 R	0.1	-11	247
399	4/9/2018	3:16:26 PM	0	1235 R	0.1	-11	450
400	4/9/2018	3:19:00 PM	4	833 R	0.1 Grid 41	-2	-73
401	4/9/2018	3:19:11 PM	1	987 R	0.1	-9	128
402	4/9/2018	3:19:23 PM	0	954 R	0.1	-11	85
403	4/9/2018	3:19:35 PM	0	966 R	0.1	-11	100
404	4/9/2018	3:19:47 PM	0	1056 R	0.1	-11	217
405	4/9/2018	3:19:58 PM	3	904 R	0.1	-4	20
406	4/9/2018	3:20:10 PM	12	1005 R	0.1	16	151
407	4/9/2018	3:20:22 PM	3	925 R	0.1	-4	47
408	4/9/2018	3:20:34 PM	16	906 R	0.1	25	22
409	4/9/2018	3:20:45 PM	11	1010 R	0.1	14	158
410	4/9/2018	3:21:55 PM	0	823 R	0.1 Grid 42	-11	-86
411	4/9/2018	3:22:07 PM	0	883 R	0.1	-11	-8
412	4/9/2018	3:22:19 PM	0	967 R	0.1	-11	102
413	4/9/2018	3:22:30 PM	4	982 R	0.1	-2	121
414	4/9/2018	3:22:42 PM	1	912 R	0.1	-9	30
415	4/9/2018	3:22:54 PM	4	844 R	0.1	-2	-59
416	4/9/2018	3:23:06 PM	6	977 R	0.1	2	115
417	4/9/2018	3:23:17 PM	1	940 R	0.1	-9	66

418	4/9/2018	3:23:29 PM	0	957 R	0.1	-11	89
419	4/9/2018	3:23:41 PM	0	880 R	0.1	-11	-12
420	4/9/2018	3:24:53 PM	0	840 R	0.1 Grid 43	-11	-64
421	4/9/2018	3:25:05 PM	0	931 R	0.1	-11	55
422	4/9/2018	3:25:16 PM	0	952 R	0.1	-11	82
423	4/9/2018	3:25:28 PM	0	947 R	0.1	-11	75
424	4/9/2018	3:25:40 PM	4	967 R	0.1	-2	102
425	4/9/2018	3:25:52 PM	1	880 R	0.1	-9	-12
426	4/9/2018	3:26:03 PM	0	897 R	0.1	-11	10
427	4/9/2018	3:26:15 PM	0	899 R	0.1	-11	13
428	4/9/2018	3:26:27 PM	8	930 R	0.1	7	53
429	4/9/2018	3:26:39 PM	2	950 R	0.1	-6	79
430	4/9/2018	3:28:22 PM	0	827 R	0.1 Grid 44	-11	-81
431	4/9/2018	3:28:34 PM	7	854 R	0.1	5	-46
432	4/9/2018	3:28:45 PM	1	921 R	0.1	-9	42
433	4/9/2018	3:28:57 PM	15	903 R	0.1	22	18
434	4/9/2018	3:29:09 PM	10	877 R	0.1	11	-16
435	4/9/2018	3:29:21 PM	15	988 R	0.1	22	129
436	4/9/2018	3:29:33 PM	10	946 R	0.1	11	74
437	4/9/2018	3:29:44 PM	6	936 R	0.1	2	61
438	4/9/2018	3:29:56 PM	13	908 R	0.1	18	25
439	4/9/2018	3:30:08 PM	3	1061 R	0.1	-4	224
440	4/9/2018	3:31:06 PM	4	861 R	0.1 Grid 45	-2	-36
441	4/9/2018	3:31:17 PM	1	1050 R	0.1	-9	210
442	4/9/2018	3:31:29 PM	19	937 R	0.1	31	62
443	4/9/2018	3:31:41 PM	4	935 R	0.1	-2	60
444	4/9/2018	3:31:53 PM	6	976 R	0.1	2	113
445	4/9/2018	3:32:04 PM	6	903 R	0.1	2	18
446	4/9/2018	3:32:16 PM	10	1019 R	0.1	11	169
447	4/9/2018	3:32:28 PM	10	904 R	0.1	11	20
448	4/9/2018	3:32:40 PM	2	876 R	0.1	-6	-17
449	4/9/2018	3:32:51 PM	0	885 R	0.1	-11	-5
450	4/9/2018	3:33:36 PM	3	836 R	0.1 Grid 46	-4	-69
451	4/9/2018	3:33:48 PM	19	1013 R	0.1	31	161
452	4/9/2018	3:34:00 PM	16	1002 R	0.1	25	147
453	4/9/2018	3:34:11 PM	9	916 R	0.1	9	35
454	4/9/2018	3:34:23 PM	8	852 R	0.1	7	-48
455	4/9/2018	3:34:35 PM	22	1066 R	0.1	38	230
456	4/9/2018	3:34:47 PM	11	1024 R	0.1	14	176
457	4/9/2018	3:34:58 PM	20	970 R	0.1	33	105
458	4/9/2018	3:35:10 PM	14	1053 R	0.1	20	213
459	4/9/2018	3:35:22 PM	3	871 R	0.1	-4	-23
460	4/9/2018	3:36:27 PM	0	936 R	0.1 Grid 47	-11	61
461	4/9/2018	3:36:38 PM	6	1066 R	0.1	2	230
462	4/9/2018	3:36:50 PM	1	970 R	0.1	-9	105
463	4/9/2018	3:37:02 PM	4	1006 R	0.1	-2	152
464	4/9/2018	3:37:14 PM	4	978 R	0.1	-2	116
465	4/9/2018	3:37:25 PM	11	1040 R	0.1	14	197
466	4/9/2018	3:37:37 PM	2	1063 R	0.1	-6	226
467	4/9/2018	3:37:49 PM	0	1029 R	0.1	-11	182
468	4/9/2018	3:38:01 PM	0	965 R	0.1	-11	99
469	4/9/2018	3:38:12 PM	11	971 R	0.1	14	107
470	4/9/2018	3:39:44 PM	0	934 R	0.1 Grid 48	-11	59
471	4/9/2018	3:39:55 PM	0	1046 R	0.1	-11	204

472	4/9/2018	3:40:07 PM	3	1035 R	0.1	-4	190
473	4/9/2018	3:40:19 PM	0	1176 R	0.1	-11	374
474	4/9/2018	3:40:31 PM	11	1036 R	0.1	14	191
475	4/9/2018	3:40:42 PM	9	1118 R	0.1	9	298
476	4/9/2018	3:40:54 PM	2	1123 R	0.1	-6	305
477	4/9/2018	3:41:06 PM	0	1121 R	0.1	-11	302
478	4/9/2018	3:41:18 PM	3	1175 R	0.1	-4	372
479	4/9/2018	3:41:30 PM	0	1182 R	0.1	-11	381
		Maximum:	29	1257		53	479
		Average:	5	952		0	82
		StDev:	6	102		13	133

2360 SN:268497

43-37 SN:093965

Cal Due Date:

10/10/2018

Surveyor:

Thomas Hogan

Bldg. 218

Room 103 Floor Grids 49 thru 56

Alpha Efficiency: 0.31

Beta/Gamma Efficiency: 0.352

Alpha Background: 4.9

Beta/Gamma Background: 899

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²	
									Alpha	Beta
1	4/10/2018	9:09:46 AM	0	920	R		0.1	Grid 49	-11	27
2	4/10/2018	9:09:57 AM	0	879	R		0.1		-11	-26
3	4/10/2018	9:10:09 AM	15	844	R		0.1		22	-72
4	4/10/2018	9:10:21 AM	3	900	R		0.1		-4	1
5	4/10/2018	9:10:33 AM	0	891	R		0.1		-11	-10
6	4/10/2018	9:11:56 AM	3	846	R		0.1	Grid 50	-4	-69
7	4/10/2018	9:12:08 AM	0	904	R		0.1		-11	7
8	4/10/2018	9:12:19 AM	6	889	R		0.1		2	-13
9	4/10/2018	9:12:31 AM	1	870	R		0.1		-9	-38
10	4/10/2018	9:12:43 AM	7	854	R		0.1		5	-59
11	4/10/2018	9:12:55 AM	12	888	R		0.1		16	-14
12	4/10/2018	9:14:05 AM	0	855	R		0.1	Grid 51	-11	-57
13	4/10/2018	9:14:16 AM	0	904	R		0.1		-11	7
14	4/10/2018	9:14:28 AM	0	893	R		0.1		-11	-8
15	4/10/2018	9:14:40 AM	0	893	R		0.1		-11	-8
16	4/10/2018	9:14:52 AM	0	834	R		0.1		-11	-85
17	4/10/2018	9:15:03 AM	0	862	R		0.1		-11	-48
18	4/10/2018	9:16:50 AM	15	822	R		0.1	Grid 52	22	-100
19	4/10/2018	9:17:02 AM	3	870	R		0.1		-4	-38
20	4/10/2018	9:17:14 AM	0	853	R		0.1		-11	-60
21	4/10/2018	9:17:26 AM	7	854	R		0.1		5	-59
22	4/10/2018	9:17:37 AM	1	913	R		0.1		-9	18
23	4/10/2018	9:17:49 AM	10	812	R		0.1		11	-113
24	4/10/2018	9:19:22 AM	0	869	R		0.1	Grid 53	-11	-39
25	4/10/2018	9:19:34 AM	0	802	R		0.1		-11	-126
26	4/10/2018	9:19:45 AM	0	825	R		0.1		-11	-96
27	4/10/2018	9:19:57 AM	0	961	R		0.1		-11	81
28	4/10/2018	9:20:09 AM	3	897	R		0.1		-4	-3
29	4/10/2018	9:20:21 AM	5	931	R		0.1		0	42
30	4/10/2018	9:21:42 AM	0	825	R		0.1	Grid 54	-11	-96
31	4/10/2018	9:21:54 AM	3	883	R		0.1		-4	-21
32	4/10/2018	9:22:06 AM	0	862	R		0.1		-11	-48
33	4/10/2018	9:22:17 AM	3	962	R		0.1		-4	82
34	4/10/2018	9:22:29 AM	0	854	R		0.1		-11	-59
35	4/10/2018	9:22:41 AM	3	964	R		0.1		-4	85
36	4/10/2018	9:23:51 AM	0	845	R		0.1	Grid 55	-11	-70
37	4/10/2018	9:24:02 AM	0	941	R		0.1		-11	55
38	4/10/2018	9:24:14 AM	0	982	R		0.1		-11	108
39	4/10/2018	9:24:26 AM	0	1040	R		0.1		-11	184
40	4/10/2018	9:24:38 AM	0	995	R		0.1		-11	125

41	4/10/2018	9:24:49 AM	0	1052 R	0.1	-11	199
42	4/10/2018	9:25:01 AM	0	1008 R	0.1	-11	142
43	4/10/2018	9:25:52 AM	18	803 R	0.1 Grid 56	29	-125
44	4/10/2018	9:26:04 AM	12	1036 R	0.1	16	178
45	4/10/2018	9:26:16 AM	6	1167 R	0.1	2	349
46	4/10/2018	9:26:28 AM	1	1134 R	0.1	-9	306
47	4/10/2018	9:26:39 AM	0	1099 R	0.1	-11	260
48	4/10/2018	9:26:51 AM	10	1103 R	0.1	11	266
49	4/10/2018	9:27:03 AM	2	1130 R	0.1	-6	301
		Maximum:	18	1167		29	349
		Average:	3	919		-4	26
		StDev:	5	94		10	122

Room 103 Lower Wall

2360# 297743

43-37 #302111

Cal Due Date: 10/10/2018

Surveyor: Adolfo Matus/ Josefina Matus

Bldg. 218

Room 103 Lower North and East Wall

Alpha Efficiency: 0.319

Beta/Gamma Efficiency: 0.384 Metal

Alpha Background: 8.3 4.1

Beta/Gamma Background: 1511 539

S=Scaler, R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²		
									Alpha	Beta	
1	4/4/2018	2:04:20 PM	0	639	R	0.1	Grid 1	-18	119	Metal	
2	4/4/2018	2:04:32 PM	0	600	R	0.1		-18	73	Metal	
3	4/4/2018	2:04:43 PM	3	591	R	0.1		-11	62	Metal	
4	4/4/2018	2:04:55 PM	0	411	R	0.1		-18	-153	Metal	
5	4/4/2018	2:05:07 PM	13	581	R	0.1		10	50	Metal	
6	4/4/2018	2:05:18 PM	3	556	R	0.1		-11	20	Metal	
7	4/4/2018	2:05:30 PM	11	584	R	0.1		6	54	Metal	
8	4/4/2018	2:05:41 PM	2	583	R	0.1		-14	53	Metal	
9	4/4/2018	2:05:53 PM	0	570	R	0.1		-18	37	Metal	
10	4/4/2018	2:06:15 PM	4	544	R	0.1		-9	6	Metal	
11	4/4/2018	2:08:03 PM	5	487	R	0.1	Grid 2	-7	-62	Metal	
12	4/4/2018	2:08:14 PM	1	562	R	0.1		-16	27	Metal	
13	4/4/2018	2:08:26 PM	6	484	R	0.1		-5	-66	Metal	
14	4/4/2018	2:08:38 PM	9	505	R	0.1		2	-41	Metal	
15	4/4/2018	2:08:49 PM	13	499	R	0.1		10	-48	Metal	
16	4/4/2018	2:09:01 PM	3	507	R	0.1		-11	-38	Metal	
17	4/4/2018	2:09:13 PM	0	503	R	0.1		-18	-43	Metal	
18	4/4/2018	2:09:24 PM	0	519	R	0.1		-18	-24	Metal	
19	4/4/2018	2:09:36 PM	4	483	R	0.1		-9	-67	Metal	
20	4/4/2018	2:09:48 PM	4	535	R	0.1		-9	-5	Metal	
21	4/4/2018	2:11:06 PM	11	513	R	0.1	Grid 3	6	-31	Metal	
22	4/4/2018	2:11:17 PM	21	474	R	0.1		27	-78	Metal	
23	4/4/2018	2:11:29 PM	4	518	R	0.1		-9	-25	Metal	
24	4/4/2018	2:11:41 PM	4	499	R	0.1		-9	-48	Metal	
25	4/4/2018	2:11:52 PM	1	549	R	0.1		-16	12	Metal	
26	4/4/2018	2:12:04 PM	13	480	R	0.1		10	-70	Metal	
27	4/4/2018	2:12:16 PM	7	462	R	0.1		-3	-92	Metal	
28	4/4/2018	2:12:27 PM	1	503	R	0.1		-16	-43	Metal	
29	4/4/2018	2:12:39 PM	0	510	R	0.1		-18	-35	Metal	
30	4/4/2018	2:12:51 PM	0	589	R	0.1		-18	60	Metal	
31	4/4/2018	2:14:38 PM	0	529	R	0.1	Grid 4	-18	-12	Metal	
32	4/4/2018	2:14:50 PM	3	491	R	0.1		-11	-57	Metal	
33	4/4/2018	2:15:01 PM	0	545	R	0.1		-18	7	Metal	
34	4/4/2018	2:15:13 PM	15	468	R	0.1		14	-85	Metal	
35	4/4/2018	2:15:25 PM	15	400	R	0.1		14	-166	Metal	
36	4/4/2018	2:15:36 PM	13	408	R	0.1		10	-156	Metal	
37	4/4/2018	2:15:48 PM	3	514	R	0.1		-11	-30	Metal	
38	4/4/2018	2:16:00 PM	10	540	R	0.1		4	1	Metal	
39	4/4/2018	2:16:11 PM	2	515	R	0.1		-14	-29	Metal	
40	4/4/2018	2:16:23 PM	7	459	R	0.1		-3	-95	Metal	
41	4/4/2018	2:17:37 PM	0	515	R	0.1	Grid 5	-18	-29	Metal	
42	4/4/2018	2:17:49 PM	7	498	R	0.1		-3	-49	Metal	
43	4/4/2018	2:18:00 PM	1	510	R	0.1		-16	-35	Metal	
44	4/4/2018	2:18:12 PM	5	508	R	0.1		-7	-37	Metal	

45	4/4/2018	2:18:24 PM	1	492 R	0.1	-16	-56	Metal
46	4/4/2018	2:18:35 PM	6	475 R	0.1	-5	-76	Metal
47	4/4/2018	2:18:47 PM	11	508 R	0.1	6	-37	Metal
48	4/4/2018	2:18:59 PM	6	520 R	0.1	-5	-23	Metal
49	4/4/2018	2:19:10 PM	1	530 R	0.1	-16	-11	Metal
50	4/4/2018	2:19:22 PM	0	507 R	0.1	-18	-38	Metal
51	4/4/2018	2:20:22 PM	9	500 R	0.1 Grid 6	2	-47	Metal
52	4/4/2018	2:20:34 PM	20	486 R	0.1	25	-63	Metal
53	4/4/2018	2:20:45 PM	4	541 R	0.1	-9	2	Metal
54	4/4/2018	2:20:57 PM	4	499 R	0.1	-9	-48	Metal
55	4/4/2018	2:21:09 PM	1	553 R	0.1	-16	17	Metal
56	4/4/2018	2:21:20 PM	0	508 R	0.1	-18	-37	Metal
57	4/4/2018	2:21:32 PM	3	568 R	0.1	-11	35	Metal
58	4/4/2018	2:21:44 PM	4	518 R	0.1	-9	-25	Metal
59	4/4/2018	2:21:55 PM	10	502 R	0.1	4	-44	Metal
60	4/4/2018	2:22:07 PM	11	518 R	0.1	6	-25	Metal
61	4/4/2018	2:23:32 PM	0	523 R	0.1 Grid 7	-18	-19	Metal
62	4/4/2018	2:23:43 PM	0	580 R	0.1	-18	49	Metal
63	4/4/2018	2:23:55 PM	9	543 R	0.1	2	5	Metal
64	4/4/2018	2:24:07 PM	22	541 R	0.1	30	2	Metal
65	4/4/2018	2:24:18 PM	5	543 R	0.1	-7	5	Metal
66	4/4/2018	2:24:30 PM	1	585 R	0.1	-16	55	Metal
67	4/4/2018	2:24:42 PM	0	516 R	0.1	-18	-27	Metal
68	4/4/2018	2:24:53 PM	6	509 R	0.1	-5	-36	Metal
69	4/4/2018	2:25:05 PM	1	499 R	0.1	-16	-48	Metal
70	4/4/2018	2:25:16 PM	5	479 R	0.1	-7	-72	Metal
71	4/4/2018	2:26:13 PM	0	498 R	0.1 Grid 8	-18	-1209	
72	4/4/2018	2:26:25 PM	2	631 R	0.1	-14	-1050	
73	4/4/2018	2:26:37 PM	0	799 R	0.1	-18	-850	
74	4/4/2018	2:26:48 PM	5	981 R	0.1	-7	-632	
75	4/4/2018	2:27:00 PM	1	1205 R	0.1	-16	-365	
76	4/4/2018	2:27:11 PM	0	1095 R	0.1	-18	-496	
77	4/4/2018	2:27:23 PM	10	1060 R	0.1	4	-538	
78	4/4/2018	2:27:35 PM	7	750 R	0.1	-3	-908	
79	4/4/2018	2:27:46 PM	11	634 R	0.1	6	-1046	
80	4/4/2018	2:27:58 PM	14	569 R	0.1	12	-1124	
81	4/4/2018	2:31:30 PM	8	1399 R	0.1 Grid 9	-1	-134	
82	4/4/2018	2:31:42 PM	8	1454 R	0.1	-1	-68	
83	4/4/2018	2:31:54 PM	6	1531 R	0.1	-5	24	
84	4/4/2018	2:32:05 PM	1	1491 R	0.1	-16	-24	
85	4/4/2018	2:32:17 PM	7	1770 R	0.1	-3	309	
86	4/4/2018	2:32:28 PM	1	1716 R	0.1	-16	245	
87	4/4/2018	2:32:40 PM	11	1690 R	0.1	6	214	
88	4/4/2018	2:32:52 PM	9	1564 R	0.1	2	63	
89	4/4/2018	2:33:03 PM	2	1723 R	0.1	-14	253	
90	4/4/2018	2:33:15 PM	3	1579 R	0.1	-11	81	
91	4/4/2018	2:35:39 PM	4	1505 R	0.1 Grid 10	-9	-7	
92	4/4/2018	2:35:51 PM	1	1503 R	0.1	-16	-10	
93	4/4/2018	2:36:02 PM	0	1728 R	0.1	-18	259	
94	4/4/2018	2:36:14 PM	13	1444 R	0.1	10	-80	
95	4/4/2018	2:36:26 PM	3	1441 R	0.1	-11	-84	
96	4/4/2018	2:36:37 PM	9	1593 R	0.1	2	98	
97	4/4/2018	2:36:49 PM	2	1548 R	0.1	-14	44	
98	4/4/2018	2:37:01 PM	17	1691 R	0.1	19	215	
99	4/4/2018	2:37:12 PM	4	2110 R	0.1	-9	715	
100	4/4/2018	2:37:24 PM	20	1914 R	0.1	25	481	
101	4/4/2018	2:40:49 PM	6	1498 R	0.1 Grid 11	-5	-16	
102	4/4/2018	2:41:00 PM	9	1513 R	0.1	2	2	
103	4/4/2018	2:41:12 PM	2	1474 R	0.1	-14	-44	

104	4/4/2018	2:41:24 PM	0	1468 R	0.1	-18	-51	
105	4/4/2018	2:41:35 PM	6	1453 R	0.1	-5	-69	
106	4/4/2018	2:41:47 PM	1	1498 R	0.1	-16	-16	
107	4/4/2018	2:41:59 PM	0	1504 R	0.1	-18	-8	
108	4/4/2018	2:42:10 PM	0	1478 R	0.1	-18	-39	
109	4/4/2018	2:42:22 PM	0	1451 R	0.1	-18	-72	
110	4/4/2018	2:42:34 PM	0	1487 R	0.1	-18	-29	
111	4/4/2018	2:44:52 PM	11	1485 R	0.1 Grid 12	6	-31	
112	4/4/2018	2:45:04 PM	2	1504 R	0.1	-14	-8	
113	4/4/2018	2:45:15 PM	3	1499 R	0.1	-11	-14	
114	4/4/2018	2:45:27 PM	0	1501 R	0.1	-18	-12	
115	4/4/2018	2:45:39 PM	36	1454 R	0.1	60	-68	
116	4/4/2018	2:45:50 PM	11	1454 R	0.1	6	-68	
117	4/4/2018	2:46:02 PM	14	1498 R	0.1	12	-16	
118	4/4/2018	2:46:14 PM	8	1465 R	0.1	-1	-55	
119	4/4/2018	2:46:25 PM	2	1504 R	0.1	-14	-8	
120	4/4/2018	2:46:37 PM	14	1456 R	0.1	12	-66	
121	4/4/2018	2:48:02 PM	0	1555 R	0.1 Grid 13	-18	53	
122	4/4/2018	2:48:14 PM	8	1455 R	0.1	-1	-67	
123	4/4/2018	2:48:26 PM	9	1523 R	0.1	2	14	
124	4/4/2018	2:48:37 PM	11	1498 R	0.1	6	-16	
125	4/4/2018	2:48:49 PM	5	1460 R	0.1	-7	-61	
126	4/4/2018	2:49:01 PM	7	1477 R	0.1	-3	-41	
127	4/4/2018	2:49:12 PM	1	1453 R	0.1	-16	-69	
128	4/4/2018	2:49:24 PM	0	1499 R	0.1	-18	-14	
129	4/4/2018	2:49:36 PM	8	1465 R	0.1	-1	-55	
130	4/4/2018	2:49:47 PM	5	1512 R	0.1	-7	1	
131	4/4/2018	2:51:06 PM	16	1455 R	0.1 Grid 14	17	-67	
132	4/4/2018	2:51:18 PM	11	1518 R	0.1	6	8	
133	4/4/2018	2:51:29 PM	2	1553 R	0.1	-14	50	
134	4/4/2018	2:51:41 PM	5	1497 R	0.1	-7	-17	
135	4/4/2018	2:51:53 PM	1	1485 R	0.1	-16	-31	
136	4/4/2018	2:52:04 PM	13	1455 R	0.1	10	-67	
137	4/4/2018	2:52:16 PM	7	1486 R	0.1	-3	-30	
138	4/4/2018	2:52:28 PM	12	1146 R	0.1	8	-436	
139	4/4/2018	2:52:39 PM	3	1502 R	0.1	-11	-11	
140	4/4/2018	2:52:51 PM	9	1486 R	0.1	2	-30	
141	4/4/2018	2:53:58 PM	8	1476 R	0.1 Grid 15	-1	-42	
142	4/4/2018	2:54:09 PM	6	1459 R	0.1	-5	-62	
143	4/4/2018	2:54:21 PM	1	1506 R	0.1	-16	-6	
144	4/4/2018	2:54:33 PM	6	1508 R	0.1	-5	-4	
145	4/4/2018	2:54:44 PM	12	1487 R	0.1	8	-29	
146	4/4/2018	2:54:56 PM	3	1499 R	0.1	-11	-14	
147	4/4/2018	2:55:08 PM	13	1487 R	0.1	10	-29	
148	4/4/2018	2:55:19 PM	3	1477 R	0.1	-11	-41	
149	4/4/2018	2:55:31 PM	0	1512 R	0.1	-18	1	
150	4/4/2018	2:55:42 PM	3	1642 R	0.1	-11	156	
151	4/4/2018	3:02:27 PM	11	518 R	0.1 Grid 31	6	-25	Metal
152	4/4/2018	3:02:39 PM	8	652 R	0.1	-1	135	Metal
153	4/4/2018	3:02:50 PM	2	603 R	0.1	-14	76	Metal
154	4/4/2018	3:03:02 PM	9	543 R	0.1	2	5	Metal
155	4/4/2018	3:03:14 PM	2	621 R	0.1	-14	98	Metal
156	4/4/2018	3:03:25 PM	0	583 R	0.1	-18	53	Metal
157	4/4/2018	3:03:37 PM	0	603 R	0.1	-18	76	Metal
158	4/4/2018	3:03:49 PM	0	627 R	0.1	-18	105	Metal
159	4/4/2018	3:04:00 PM	0	696 R	0.1	-18	187	Metal
160	4/4/2018	3:04:12 PM	0	705 R	0.1	-18	198	Metal
161	4/4/2018	3:04:44 PM	13	522 R	0.1 Grid 32	10	-20	Metal
162	4/4/2018	3:04:55 PM	18	502 R	0.1	21	-44	Metal

163	4/4/2018	3:05:07 PM	21	458 R	0.1	27	-97	Metal
164	4/4/2018	3:05:19 PM	5	524 R	0.1	-7	-18	Metal
165	4/4/2018	3:05:30 PM	16	523 R	0.1	17	-19	Metal
166	4/4/2018	3:05:42 PM	3	525 R	0.1	-11	-17	Metal
167	4/4/2018	3:05:54 PM	0	536 R	0.1	-18	-4	Metal
168	4/4/2018	3:06:05 PM	9	521 R	0.1	2	-21	Metal
169	4/4/2018	3:06:17 PM	5	551 R	0.1	-7	14	Metal
170	4/4/2018	3:06:29 PM	1	495 R	0.1	-16	-53	Metal
171	4/4/2018	3:08:45 PM	0	501 R	0.1 Grid 33	-18	-45	Metal
172	4/4/2018	3:08:57 PM	0	523 R	0.1	-18	-19	Metal
173	4/4/2018	3:09:08 PM	16	533 R	0.1	17	-7	Metal
174	4/4/2018	3:09:20 PM	9	560 R	0.1	2	25	Metal
175	4/4/2018	3:09:32 PM	2	528 R	0.1	-14	-13	Metal
176	4/4/2018	3:09:43 PM	7	511 R	0.1	-3	-33	Metal
177	4/4/2018	3:09:55 PM	1	523 R	0.1	-16	-19	Metal
178	4/4/2018	3:10:07 PM	10	499 R	0.1	4	-48	Metal
179	4/4/2018	3:10:18 PM	2	577 R	0.1	-14	45	Metal
180	4/4/2018	3:10:30 PM	0	555 R	0.1	-18	19	Metal
181	4/4/2018	3:11:18 PM	7	554 R	0.1 Grid 34	-3	18	Metal
182	4/4/2018	3:11:30 PM	1	512 R	0.1	-16	-32	Metal
183	4/4/2018	3:11:42 PM	5	519 R	0.1	-7	-24	Metal
184	4/4/2018	3:11:53 PM	1	548 R	0.1	-16	11	Metal
185	4/4/2018	3:12:05 PM	0	521 R	0.1	-18	-21	Metal
186	4/4/2018	3:12:16 PM	0	577 R	0.1	-18	45	Metal
187	4/4/2018	3:12:28 PM	13	497 R	0.1	10	-50	Metal
188	4/4/2018	3:12:40 PM	6	493 R	0.1	-5	-55	Metal
189	4/4/2018	3:12:51 PM	1	497 R	0.1	-16	-50	Metal
190	4/4/2018	3:13:03 PM	0	496 R	0.1	-18	-51	Metal
191	4/4/2018	3:14:15 PM	11	501 R	0.1 Grid 35	6	-45	Metal
192	4/4/2018	3:14:27 PM	21	520 R	0.1	27	-23	Metal
193	4/4/2018	3:14:38 PM	4	476 R	0.1	-9	-75	Metal
194	4/4/2018	3:14:50 PM	17	484 R	0.1	19	-66	Metal
195	4/4/2018	3:15:02 PM	4	549 R	0.1	-9	12	Metal
196	4/4/2018	3:15:13 PM	0	499 R	0.1	-18	-48	Metal
197	4/4/2018	3:15:25 PM	0	487 R	0.1	-18	-62	Metal
198	4/4/2018	3:15:37 PM	3	480 R	0.1	-11	-70	Metal
199	4/4/2018	3:15:48 PM	7	537 R	0.1	-3	-2	Metal
200	4/4/2018	3:16:00 PM	1	470 R	0.1	-16	-82	Metal
201	4/4/2018	3:16:57 PM	0	543 R	0.1 Grid 36	-18	5	Metal
202	4/4/2018	3:17:09 PM	18	517 R	0.1	21	-26	Metal
203	4/4/2018	3:17:21 PM	4	563 R	0.1	-9	29	Metal
204	4/4/2018	3:17:32 PM	13	499 R	0.1	10	-48	Metal
205	4/4/2018	3:17:44 PM	15	463 R	0.1	14	-91	Metal
206	4/4/2018	3:17:55 PM	3	466 R	0.1	-11	-87	Metal
207	4/4/2018	3:18:07 PM	12	521 R	0.1	8	-21	Metal
208	4/4/2018	3:18:19 PM	18	497 R	0.1	21	-50	Metal
209	4/4/2018	3:18:30 PM	4	498 R	0.1	-9	-49	Metal
210	4/4/2018	3:18:42 PM	1	506 R	0.1	-16	-39	Metal
211	4/4/2018	3:18:54 PM	10	664 R	0.1	4	149	Metal
212	4/4/2018	3:19:05 PM	2	723 R	0.1	-14	220	Metal
213	4/4/2018	3:19:17 PM	4	645 R	0.1	-9	126	Metal
214	4/4/2018	3:20:06 PM	6	504 R	0.1 Grid 37	-5	-42	Metal
215	4/4/2018	3:20:18 PM	4	503 R	0.1	-9	-43	Metal
216	4/4/2018	3:20:29 PM	10	458 R	0.1	4	-97	Metal
217	4/4/2018	3:20:41 PM	10	542 R	0.1	4	4	Metal
218	4/4/2018	3:20:53 PM	25	547 R	0.1	36	10	Metal
219	4/4/2018	3:21:04 PM	14	506 R	0.1	12	-39	Metal
220	4/4/2018	3:21:16 PM	3	423 R	0.1	-11	-138	Metal
221	4/4/2018	3:22:20 PM	0	473 R	0.1 Grid 38	-18	-79	Metal

222	4/4/2018	3:22:32 PM	3	615 R	0.1	-11	91	Metal
223	4/4/2018	3:22:44 PM	11	920 R	0.1	6	455	Metal
224	4/4/2018	3:22:55 PM	5	1238 R	0.1	-7	834	Metal
225	4/4/2018	3:23:07 PM	17	1541 R	0.1	19	1196	Metal
226	4/4/2018	3:23:19 PM	4	995 R	0.1	-9	544	Metal
227	4/4/2018	3:23:30 PM	0	732 R	0.1	-18	230	Metal
228	4/4/2018	3:23:42 PM	0	652 R	0.1	-18	135	Metal
229	4/4/2018	3:23:54 PM	0	589 R	0.1	-18	60	Metal
230	4/4/2018	3:24:05 PM	0	512 R	0.1	-18	-32	Metal
231	4/4/2018	3:28:25 PM	3	1467 R	0.1 Grid 39	-11	-53	
232	4/4/2018	3:28:37 PM	7	1431 R	0.1	-3	-95	
233	4/4/2018	3:28:49 PM	4	1705 R	0.1	-9	231	
234	4/4/2018	3:29:00 PM	1	1716 R	0.1	-16	245	
235	4/4/2018	3:29:12 PM	7	1505 R	0.1	-3	-7	
236	4/4/2018	3:29:24 PM	19	1933 R	0.1	23	504	
237	4/4/2018	3:29:35 PM	10	1735 R	0.1	4	267	
238	4/4/2018	3:29:47 PM	9	1614 R	0.1	2	123	
239	4/4/2018	3:29:59 PM	2	1738 R	0.1	-14	271	
240	4/4/2018	3:30:10 PM	0	1833 R	0.1	-18	384	
241	4/4/2018	3:31:19 PM	0	1654 R	0.1 Grid 40	-18	171	
242	4/4/2018	3:31:31 PM	7	1713 R	0.1	-3	241	
243	4/4/2018	3:31:42 PM	1	1525 R	0.1	-16	17	
244	4/4/2018	3:31:54 PM	0	1472 R	0.1	-18	-47	
245	4/4/2018	3:32:06 PM	4	1499 R	0.1	-9	-14	
246	4/4/2018	3:32:17 PM	10	1559 R	0.1	4	57	
247	4/4/2018	3:32:29 PM	8	1779 R	0.1	-1	320	
248	4/4/2018	3:32:41 PM	10	1705 R	0.1	4	231	
249	4/4/2018	3:32:52 PM	2	1652 R	0.1	-14	168	
250	4/4/2018	3:33:04 PM	11	1642 R	0.1	6	156	
251	4/4/2018	3:33:49 PM	4	1517 R	0.1 Grid 41	-9	7	
252	4/4/2018	3:34:01 PM	10	1480 R	0.1	4	-37	
253	4/4/2018	3:34:12 PM	2	1512 R	0.1	-14	1	
254	4/4/2018	3:34:24 PM	12	1602 R	0.1	8	109	
255	4/4/2018	3:34:36 PM	19	1505 R	0.1	23	-7	
256	4/4/2018	3:34:47 PM	14	1579 R	0.1	12	81	
257	4/4/2018	3:34:59 PM	15	1729 R	0.1	14	260	
258	4/4/2018	3:35:11 PM	10	1499 R	0.1	4	-14	
259	4/4/2018	3:35:22 PM	19	1489 R	0.1	23	-26	
260	4/4/2018	3:35:34 PM	9	1447 R	0.1	2	-76	
261	4/4/2018	3:36:21 PM	0	1489 R	0.1 Grid 42	-18	-26	
262	4/4/2018	3:36:33 PM	0	1502 R	0.1	-18	-11	
263	4/4/2018	3:36:44 PM	10	1467 R	0.1	4	-53	
264	4/4/2018	3:36:56 PM	10	1647 R	0.1	4	162	
265	4/4/2018	3:37:08 PM	6	1493 R	0.1	-5	-21	
266	4/4/2018	3:37:19 PM	1	1476 R	0.1	-16	-42	
267	4/4/2018	3:37:31 PM	3	1503 R	0.1	-11	-10	
268	4/4/2018	3:37:43 PM	11	1440 R	0.1	6	-85	
269	4/4/2018	3:37:54 PM	2	1517 R	0.1	-14	7	
270	4/4/2018	3:38:06 PM	0	1573 R	0.1	-18	74	
271	4/4/2018	3:39:16 PM	17	1477 R	0.1 Grid 43	19	-41	
272	4/4/2018	3:39:27 PM	4	1504 R	0.1	-9	-8	
273	4/4/2018	3:39:39 PM	0	1428 R	0.1	-18	-99	
274	4/4/2018	3:39:51 PM	10	1486 R	0.1	4	-30	
275	4/4/2018	3:40:02 PM	17	1487 R	0.1	19	-29	
276	4/4/2018	3:40:14 PM	4	1432 R	0.1	-9	-94	
277	4/4/2018	3:40:26 PM	0	1503 R	0.1	-18	-10	
278	4/4/2018	3:40:37 PM	0	1499 R	0.1	-18	-14	
279	4/4/2018	3:40:54 PM	0	1512 R	0.1	-18	1	
280	4/4/2018	3:41:06 PM	8	1513 R	0.1	-1	2	

281	4/4/2018	3:42:03 PM	0	1499 R	0.1 Grid 44	-18	-14
282	4/4/2018	3:42:14 PM	3	1504 R	0.1	-11	-8
283	4/4/2018	3:42:26 PM	0	1512 R	0.1	-18	1
284	4/4/2018	3:42:38 PM	15	1522 R	0.1	14	13
285	4/4/2018	3:42:49 PM	24	1561 R	0.1	34	60
286	4/4/2018	3:43:01 PM	23	1497 R	0.1	32	-17
287	4/4/2018	3:43:13 PM	28	1593 R	0.1	42	98
288	4/4/2018	3:43:24 PM	9	1472 R	0.1	2	-47
289	4/4/2018	3:43:36 PM	16	1583 R	0.1	17	86
290	4/4/2018	3:43:48 PM	14	1497 R	0.1	12	-17
291	4/4/2018	3:45:22 PM	0	1504 R	0.1 Grid 45	-18	-8
292	4/4/2018	3:45:33 PM	8	1541 R	0.1	-1	36
293	4/4/2018	3:45:45 PM	8	1493 R	0.1	-1	-21
294	4/4/2018	3:45:57 PM	15	1486 R	0.1	14	-30
295	4/4/2018	3:46:08 PM	3	1445 R	0.1	-11	-79
296	4/4/2018	3:46:20 PM	0	1578 R	0.1	-18	80
297	4/4/2018	3:46:32 PM	14	1463 R	0.1	12	-57
298	4/4/2018	3:46:43 PM	19	1608 R	0.1	23	116
299	4/4/2018	3:46:55 PM	13	1523 R	0.1	10	14
300	4/4/2018	3:47:07 PM	3	1700 R	0.1	-11	226
		Maximum:	36	2110		60	1196
		Average:	6	1018		-4	-8
		StDev:	6	505		13	213

2360# 297743

43-37 #302111

Cal Due Date: 10/10/2018

Surveyor: Josefina Matus

Bldg. 218

Room 103 Lower South&West Walls Grids 16 thru 30 46 thru 60

Alpha Efficiency: 0.319

Beta/Gamma Efficiency: 0.384 Metal

Alpha Background: 8.3 4.1

Beta/Gamma Background: 1511 539

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²		
									Alpha	Beta	
1	4/4/2018	10:01:15 AM	0	1527	R		0.1	Grid 16	-18	19	
2	4/4/2018	10:01:27 AM	2	1499	R		0.1		-14	-14	
3	4/4/2018	10:01:38 AM	0	1512	R		0.1		-18	1	
4	4/4/2018	10:01:50 AM	3	1523	R		0.1		-11	14	
5	4/4/2018	10:02:01 AM	2	1503	R		0.1		-14	-10	
6	4/4/2018	10:02:13 AM	4	1519	R		0.1		-9	10	
7	4/4/2018	10:02:25 AM	10	1487	R		0.1		4	-29	
8	4/4/2018	10:02:36 AM	2	1632	R		0.1		-14	144	
9	4/4/2018	10:02:48 AM	10	1557	R		0.1		4	55	
10	4/4/2018	10:05:06 AM	0	1578	R		0.1	Grid 17	-18	80	
11	4/4/2018	10:05:17 AM	0	1510	R		0.1		-18	-1	
12	4/4/2018	10:05:29 AM	7	1446	R		0.1		-3	-78	
13	4/4/2018	10:05:41 AM	1	1512	R		0.1		-16	1	
14	4/4/2018	10:05:52 AM	3	1592	R		0.1		-11	97	
15	4/4/2018	10:06:04 AM	0	1451	R		0.1		-18	-72	
16	4/4/2018	10:06:16 AM	12	1490	R		0.1		8	-25	
17	4/4/2018	10:06:27 AM	3	1530	R		0.1		-11	23	
18	4/4/2018	10:06:39 AM	4	1524	R		0.1		-9	16	
19	4/4/2018	10:06:51 AM	3	1494	R		0.1		-11	-20	
20	4/4/2018	10:08:22 AM	4	1543	R		0.1	Grid 18	-9	38	
21	4/4/2018	10:08:34 AM	0	1476	R		0.1		-18	-42	
22	4/4/2018	10:08:45 AM	5	1482	R		0.1		-7	-35	
23	4/4/2018	10:08:57 AM	2	1510	R		0.1		-14	-1	
24	4/4/2018	10:09:08 AM	0	887	R		0.1		-18	415	Metal
25	4/4/2018	10:09:20 AM	11	698	R		0.1		6	190	Metal
26	4/4/2018	10:09:32 AM	2	618	R		0.1		-14	94	Metal
27	4/4/2018	10:09:43 AM	0	824	R		0.1		-18	340	Metal
28	4/4/2018	10:09:55 AM	19	1452	R		0.1		23	-70	
29	4/4/2018	10:10:07 AM	8	1534	R		0.1		-1	27	
30	4/4/2018	10:13:43 AM	0	606	R		0.1	Grid 19	-18	80	Metal
31	4/4/2018	10:13:54 AM	11	639	R		0.1		6	119	Metal
32	4/4/2018	10:14:06 AM	15	641	R		0.1		14	122	Metal
33	4/4/2018	10:14:18 AM	3	587	R		0.1		-11	57	Metal
34	4/4/2018	10:14:29 AM	0	641	R		0.1		-18	122	Metal
35	4/4/2018	10:14:41 AM	0	610	R		0.1		-18	85	Metal
36	4/4/2018	10:14:53 AM	11	658	R		0.1		6	142	Metal
37	4/4/2018	10:15:04 AM	9	606	R		0.1		2	80	Metal
38	4/4/2018	10:15:16 AM	11	580	R		0.1		6	49	Metal
39	4/4/2018	10:15:27 AM	6	869	R		0.1		-5	394	Metal
40	4/4/2018	10:19:59 AM	0	452	R		0.1	Grid 20	-18	-104	Metal
41	4/4/2018	10:20:10 AM	0	662	R		0.1		-18	147	Metal
42	4/4/2018	10:20:22 AM	6	626	R		0.1		-5	104	Metal
43	4/4/2018	10:20:34 AM	1	582	R		0.1		-16	51	Metal
44	4/4/2018	10:20:45 AM	7	685	R		0.1		-3	174	Metal
45	4/4/2018	10:20:57 AM	4	663	R		0.1		-9	148	Metal
46	4/4/2018	10:21:09 AM	10	775	R		0.1		4	282	Metal
47	4/4/2018	10:21:20 AM	2	630	R		0.1		-14	109	Metal

48	4/4/2018	10:21:32 AM	0	579 R	0.1	-18	48	Metal
49	4/4/2018	10:21:44 AM	6	615 R	0.1	-5	91	Metal
50	4/4/2018	10:23:20 AM	4	552 R	0.1 Grid 21	-9	16	Metal
51	4/4/2018	10:23:32 AM	3	583 R	0.1	-11	53	Metal
52	4/4/2018	10:23:43 AM	5	715 R	0.1	-7	210	Metal
53	4/4/2018	10:23:55 AM	3	659 R	0.1	-11	143	Metal
54	4/4/2018	10:24:07 AM	2	534 R	0.1	-14	-6	Metal
55	4/4/2018	10:24:18 AM	2	564 R	0.1	-14	30	Metal
56	4/4/2018	10:24:30 AM	1	637 R	0.1	-16	117	Metal
57	4/4/2018	10:24:41 AM	0	692 R	0.1	-18	183	Metal
58	4/4/2018	10:24:53 AM	3	709 R	0.1	-11	203	Metal
59	4/4/2018	10:25:05 AM	7	628 R	0.1	-3	106	Metal
60	4/4/2018	10:28:58 AM	4	537 R	0.1 Grid 22	-9	-2	Metal
61	4/4/2018	10:29:09 AM	1	563 R	0.1	-16	29	Metal
62	4/4/2018	10:29:21 AM	18	680 R	0.1	21	168	Metal
63	4/4/2018	10:29:33 AM	4	685 R	0.1	-9	174	Metal
64	4/4/2018	10:29:44 AM	5	689 R	0.1	-7	179	Metal
65	4/4/2018	10:29:56 AM	1	704 R	0.1	-16	197	Metal
66	4/4/2018	10:30:08 AM	5	627 R	0.1	-7	105	Metal
67	4/4/2018	10:30:19 AM	10	700 R	0.1	4	192	Metal
68	4/4/2018	10:30:31 AM	5	652 R	0.1	-7	135	Metal
69	4/4/2018	10:30:43 AM	13	544 R	0.1	10	6	Metal
70	4/4/2018	10:30:54 AM	7	627 R	0.1	-3	105	Metal
71	4/4/2018	10:33:28 AM	0	450 R	0.1 Grid 23	-18	-106	Metal
72	4/4/2018	10:33:39 AM	0	561 R	0.1	-18	26	Metal
73	4/4/2018	10:33:51 AM	5	618 R	0.1	-7	94	Metal
74	4/4/2018	10:34:03 AM	6	701 R	0.1	-5	193	Metal
75	4/4/2018	10:34:14 AM	1	685 R	0.1	-16	174	Metal
76	4/4/2018	10:34:26 AM	0	577 R	0.1	-18	45	Metal
77	4/4/2018	10:34:37 AM	19	518 R	0.1	23	-25	Metal
78	4/4/2018	10:34:49 AM	4	882 R	0.1	-9	409	Metal
79	4/4/2018	10:35:01 AM	7	836 R	0.1	-3	354	Metal
80	4/4/2018	10:46:05 AM	3	1451 R	0.1 Grid 24	-11	-72	
81	4/4/2018	10:46:16 AM	5	1511 R	0.1	-7	0	
82	4/4/2018	10:46:28 AM	0	1434 R	0.1	-18	-92	
83	4/4/2018	10:46:40 AM	7	1490 R	0.1	-3	-25	
84	4/4/2018	10:46:51 AM	8	1487 R	0.1	-1	-29	
85	4/4/2018	10:47:03 AM	2	1510 R	0.1	-14	-1	
86	4/4/2018	10:47:15 AM	0	1543 R	0.1	-18	38	
87	4/4/2018	10:47:26 AM	5	1467 R	0.1	-7	-53	
88	4/4/2018	10:47:38 AM	1	1508 R	0.1	-16	-4	
89	4/4/2018	10:47:49 AM	6	1499 R	0.1	-5	-14	
90	4/4/2018	10:51:36 AM	5	1487 R	0.1 Grid 25	-7	-29	
91	4/4/2018	10:51:47 AM	6	1482 R	0.1	-5	-35	
92	4/4/2018	10:51:59 AM	3	1461 R	0.1	-11	-60	
93	4/4/2018	10:52:11 AM	4	1444 R	0.1	-9	-80	
94	4/4/2018	10:52:22 AM	9	1590 R	0.1	2	94	
95	4/4/2018	10:52:34 AM	2	1503 R	0.1	-14	-10	
96	4/4/2018	10:52:46 AM	8	1510 R	0.1	-1	-1	
97	4/4/2018	10:52:57 AM	21	1503 R	0.1	27	-10	
98	4/4/2018	10:53:09 AM	5	1449 R	0.1	-7	-74	
99	4/4/2018	10:53:21 AM	13	1501 R	0.1	10	-12	
100	4/4/2018	10:55:17 AM	0	1467 R	0.1 Grid 26	-18	-53	
101	4/4/2018	10:55:28 AM	4	1488 R	0.1	-9	-27	
102	4/4/2018	10:55:40 AM	16	1496 R	0.1	17	-18	
103	4/4/2018	10:55:51 AM	9	1501 R	0.1	2	-12	
104	4/4/2018	10:56:03 AM	5	1502 R	0.1	-7	-11	
105	4/4/2018	10:56:15 AM	14	1432 R	0.1	12	-94	
106	4/4/2018	10:56:26 AM	14	1488 R	0.1	12	-27	
107	4/4/2018	10:56:38 AM	6	1499 R	0.1	-5	-14	
108	4/4/2018	10:56:50 AM	11	1522 R	0.1	6	13	
109	4/4/2018	10:57:01 AM	17	1537 R	0.1	19	31	

110	4/4/2018	11:01:13 AM	7	1500 R	0.1 Grid 27	-3	-13
111	4/4/2018	11:01:25 AM	1	1527 R	0.1	-16	19
112	4/4/2018	11:01:36 AM	0	1496 R	0.1	-18	-18
113	4/4/2018	11:01:48 AM	3	1441 R	0.1	-11	-84
114	4/4/2018	11:02:00 AM	3	1442 R	0.1	-11	-82
115	4/4/2018	11:02:11 AM	25	1418 R	0.1	36	-111
116	4/4/2018	11:02:23 AM	21	1487 R	0.1	27	-29
117	4/4/2018	11:02:35 AM	20	1409 R	0.1	25	-122
118	4/4/2018	11:02:46 AM	4	1497 R	0.1	-9	-17
119	4/4/2018	11:02:58 AM	1	1489 R	0.1	-16	-26
120	4/4/2018	12:08:20 PM	20	1488 R	0.1 Grid 28	25	-27
121	4/4/2018	12:08:31 PM	4	1500 R	0.1	-9	-13
122	4/4/2018	12:08:43 PM	1	1467 R	0.1	-16	-53
123	4/4/2018	12:08:55 PM	0	1524 R	0.1	-18	16
124	4/4/2018	12:09:06 PM	4	1515 R	0.1	-9	5
125	4/4/2018	12:09:18 PM	1	1529 R	0.1	-16	21
126	4/4/2018	12:09:30 PM	4	1499 R	0.1	-9	-14
127	4/4/2018	12:09:41 PM	1	1529 R	0.1	-16	21
128	4/4/2018	12:09:53 PM	0	1563 R	0.1	-18	62
129	4/4/2018	12:10:04 PM	6	1477 R	0.1	-5	-41
130	4/4/2018	12:12:20 PM	9	1497 R	0.1 Grid 29	2	-17
131	4/4/2018	12:12:31 PM	18	1521 R	0.1	21	12
132	4/4/2018	12:12:43 PM	10	1584 R	0.1	4	87
133	4/4/2018	12:12:55 PM	2	1488 R	0.1	-14	-27
134	4/4/2018	12:13:06 PM	5	1467 R	0.1	-7	-53
135	4/4/2018	12:13:18 PM	16	1562 R	0.1	17	61
136	4/4/2018	12:13:30 PM	3	1501 R	0.1	-11	-12
137	4/4/2018	12:13:41 PM	0	1457 R	0.1	-18	-64
138	4/4/2018	12:13:53 PM	23	1487 R	0.1	32	-29
139	4/4/2018	12:14:05 PM	5	1600 R	0.1	-7	106
140	4/4/2018	12:17:37 PM	0	1456 R	0.1 Grid 30	-18	-66
141	4/4/2018	12:17:48 PM	5	1521 R	0.1	-7	12
142	4/4/2018	12:18:00 PM	4	1456 R	0.1	-9	-66
143	4/4/2018	12:18:12 PM	8	1431 R	0.1	-1	-95
144	4/4/2018	12:18:23 PM	2	1513 R	0.1	-14	2
145	4/4/2018	12:23:50 PM	4	1506 R	0.1 Grid 46	-9	-6
146	4/4/2018	12:24:02 PM	8	1470 R	0.1	-1	-49
147	4/4/2018	12:24:14 PM	11	1613 R	0.1	6	122
148	4/4/2018	12:24:25 PM	9	1619 R	0.1	2	129
149	4/4/2018	12:24:37 PM	11	1479 R	0.1	6	-38
150	4/4/2018	12:24:49 PM	12	1500 R	0.1	8	-13
151	4/4/2018	12:25:00 PM	9	1476 R	0.1	2	-42
152	4/4/2018	12:25:12 PM	11	1490 R	0.1	6	-25
153	4/4/2018	12:25:23 PM	2	1445 R	0.1	-14	-79
154	4/4/2018	12:25:35 PM	9	1535 R	0.1	2	29
155	4/4/2018	12:29:58 PM	11	1487 R	0.1 Grid 47	6	-29
156	4/4/2018	12:30:09 PM	9	1523 R	0.1	2	14
157	4/4/2018	12:30:21 PM	2	1648 R	0.1	-14	163
158	4/4/2018	12:30:32 PM	11	1530 R	0.1	6	23
159	4/4/2018	12:30:44 PM	13	1505 R	0.1	10	-7
160	4/4/2018	12:30:56 PM	8	1491 R	0.1	-1	-24
161	4/4/2018	12:31:07 PM	2	1502 R	0.1	-14	-11
162	4/4/2018	12:31:19 PM	0	1498 R	0.1	-18	-16
163	4/4/2018	12:31:31 PM	0	1432 R	0.1	-18	-94
164	4/4/2018	12:31:42 PM	0	1464 R	0.1	-18	-56
165	4/4/2018	12:33:15 PM	0	1499 R	0.1 Grid 48	-18	-14
166	4/4/2018	12:33:27 PM	0	1476 R	0.1	-18	-42
167	4/4/2018	12:33:39 PM	8	1513 R	0.1	-1	2
168	4/4/2018	12:33:50 PM	2	1448 R	0.1	-14	-75
169	4/4/2018	12:34:02 PM	0	1637 R	0.1	-18	150
170	4/4/2018	12:34:13 PM	0	1523 R	0.1	-18	14
171	4/4/2018	12:34:25 PM	11	1500 R	0.1	6	-13

172	4/4/2018	12:34:37 PM	2	1508 R	0.1	-14	-4	
173	4/4/2018	12:34:48 PM	0	1614 R	0.1	-18	123	
174	4/4/2018	12:35:00 PM	3	1487 R	0.1	-11	-29	
175	4/4/2018	12:35:12 PM	0	1487 R	0.1	-18	-29	
176	4/4/2018	12:38:53 PM	0	519 R	0.1 Grid 49	-18	-24	Metal
177	4/4/2018	12:39:05 PM	0	766 R	0.1	-18	271	Metal
178	4/4/2018	12:39:16 PM	11	801 R	0.1	6	313	Metal
179	4/4/2018	12:39:28 PM	7	859 R	0.1	-3	382	Metal
180	4/4/2018	12:39:40 PM	10	771 R	0.1	4	277	Metal
181	4/4/2018	12:39:51 PM	17	774 R	0.1	19	280	Metal
182	4/4/2018	12:40:03 PM	11	575 R	0.1	6	43	Metal
183	4/4/2018	12:40:15 PM	25	658 R	0.1	36	142	Metal
184	4/4/2018	12:40:26 PM	6	741 R	0.1	-5	241	Metal
185	4/4/2018	12:40:38 PM	1	635 R	0.1	-16	115	Metal
186	4/4/2018	12:43:19 PM	0	565 R	0.1 Grid 50	-18	31	Metal
187	4/4/2018	12:43:30 PM	8	616 R	0.1	-1	92	Metal
188	4/4/2018	12:43:42 PM	15	684 R	0.1	14	173	Metal
189	4/4/2018	12:43:54 PM	3	663 R	0.1	-11	148	Metal
190	4/4/2018	12:44:05 PM	14	673 R	0.1	12	160	Metal
191	4/4/2018	12:44:17 PM	6	738 R	0.1	-5	237	Metal
192	4/4/2018	12:44:29 PM	1	524 R	0.1	-16	-18	Metal
193	4/4/2018	12:44:40 PM	6	712 R	0.1	-5	206	Metal
194	4/4/2018	12:44:52 PM	13	725 R	0.1	10	222	Metal
195	4/4/2018	12:45:03 PM	3	696 R	0.1	-11	187	Metal
196	4/4/2018	12:47:44 PM	7	526 R	0.1 Grid 51	-3	-16	Metal
197	4/4/2018	12:47:55 PM	1	492 R	0.1	-16	-56	Metal
198	4/4/2018	12:48:07 PM	0	577 R	0.1	-18	45	Metal
199	4/4/2018	12:48:19 PM	29	589 R	0.1	45	60	Metal
200	4/4/2018	12:48:30 PM	6	563 R	0.1	-5	29	Metal
201	4/4/2018	12:48:42 PM	1	595 R	0.1	-16	67	Metal
202	4/4/2018	12:48:53 PM	0	786 R	0.1	-18	295	Metal
203	4/4/2018	12:49:05 PM	15	605 R	0.1	14	79	Metal
204	4/4/2018	12:49:17 PM	11	676 R	0.1	6	163	Metal
205	4/4/2018	12:49:28 PM	2	744 R	0.1	-14	245	Metal
206	4/4/2018	12:53:47 PM	0	497 R	0.1 Grid 52	-18	-50	Metal
207	4/4/2018	12:53:58 PM	0	615 R	0.1	-18	91	Metal
208	4/4/2018	12:54:10 PM	11	580 R	0.1	6	49	Metal
209	4/4/2018	12:54:22 PM	2	738 R	0.1	-14	237	Metal
210	4/4/2018	12:54:33 PM	14	647 R	0.1	12	129	Metal
211	4/4/2018	12:54:45 PM	3	672 R	0.1	-11	159	Metal
212	4/4/2018	12:54:57 PM	9	605 R	0.1	2	79	Metal
213	4/4/2018	12:55:08 PM	2	736 R	0.1	-14	235	Metal
214	4/4/2018	12:55:20 PM	0	642 R	0.1	-18	123	Metal
215	4/4/2018	12:55:32 PM	0	683 R	0.1	-18	172	Metal
216	4/4/2018	12:57:22 PM	3	593 R	0.1 Grid 53	-11	64	Metal
217	4/4/2018	12:57:34 PM	0	623 R	0.1	-18	100	Metal
218	4/4/2018	12:57:45 PM	0	715 R	0.1	-18	210	Metal
219	4/4/2018	12:57:57 PM	0	720 R	0.1	-18	216	Metal
220	4/4/2018	12:58:09 PM	12	689 R	0.1	8	179	Metal
221	4/4/2018	12:58:20 PM	3	772 R	0.1	-11	278	Metal
222	4/4/2018	12:58:32 PM	0	568 R	0.1	-18	35	Metal
223	4/4/2018	12:58:44 PM	0	524 R	0.1	-18	-18	Metal
224	4/4/2018	12:58:55 PM	16	626 R	0.1	17	104	Metal
225	4/4/2018	12:59:07 PM	21	576 R	0.1	27	44	Metal
226	4/4/2018	1:01:38 PM	8	1456 R	0.1 Grid 54	-1	-66	
227	4/4/2018	1:01:50 PM	12	1575 R	0.1	8	76	
228	4/4/2018	1:02:01 PM	3	1512 R	0.1	-11	1	
229	4/4/2018	1:02:13 PM	20	1498 R	0.1	25	-16	
230	4/4/2018	1:02:24 PM	4	1434 R	0.1	-9	-92	
231	4/4/2018	1:02:36 PM	11	1476 R	0.1	6	-42	
232	4/4/2018	1:02:48 PM	2	1469 R	0.1	-14	-50	
233	4/4/2018	1:02:59 PM	6	1505 R	0.1	-5	-7	

234	4/4/2018	1:03:11 PM	1	1431 R	0.1	-16	-95
235	4/4/2018	1:03:23 PM	0	1515 R	0.1	-18	5
236	4/4/2018	1:05:52 PM	0	1498 R	0.1 Grid 55	-18	-16
237	4/4/2018	1:06:04 PM	27	1512 R	0.1	40	1
238	4/4/2018	1:06:15 PM	6	1447 R	0.1	-5	-76
239	4/4/2018	1:06:27 PM	1	1531 R	0.1	-16	24
240	4/4/2018	1:06:39 PM	12	1489 R	0.1	8	-26
241	4/4/2018	1:06:50 PM	12	1487 R	0.1	8	-29
242	4/4/2018	1:07:02 PM	7	1456 R	0.1	-3	-66
243	4/4/2018	1:07:14 PM	6	1552 R	0.1	-5	49
244	4/4/2018	1:07:25 PM	1	1481 R	0.1	-16	-36
245	4/4/2018	1:07:37 PM	3	1541 R	0.1	-11	36
246	4/4/2018	1:10:33 PM	23	1509 R	0.1 Grid 56	32	-2
247	4/4/2018	1:10:44 PM	19	1503 R	0.1	23	-10
248	4/4/2018	1:10:56 PM	13	1545 R	0.1	10	41
249	4/4/2018	1:11:08 PM	13	1489 R	0.1	10	-26
250	4/4/2018	1:11:19 PM	3	1514 R	0.1	-11	4
251	4/4/2018	1:11:31 PM	3	1527 R	0.1	-11	19
252	4/4/2018	1:11:43 PM	17	1486 R	0.1	19	-30
253	4/4/2018	1:11:54 PM	39	1436 R	0.1	66	-89
254	4/4/2018	1:12:06 PM	20	1488 R	0.1	25	-27
255	4/4/2018	1:12:18 PM	4	1567 R	0.1	-9	67
256	4/4/2018	1:14:39 PM	0	1567 R	0.1 Grid 57	-18	67
257	4/4/2018	1:14:50 PM	0	1442 R	0.1	-18	-82
258	4/4/2018	1:15:02 PM	10	1532 R	0.1	4	25
259	4/4/2018	1:15:14 PM	6	1516 R	0.1	-5	6
260	4/4/2018	1:15:25 PM	1	1521 R	0.1	-16	12
261	4/4/2018	1:15:37 PM	0	1455 R	0.1	-18	-67
262	4/4/2018	1:15:49 PM	0	1498 R	0.1	-18	-16
263	4/4/2018	1:16:00 PM	0	1484 R	0.1	-18	-32
264	4/4/2018	1:16:12 PM	7	1470 R	0.1	-3	-49
265	4/4/2018	1:16:24 PM	1	1504 R	0.1	-16	-8
266	4/4/2018	1:18:22 PM	3	1532 R	0.1 Grid 58	-11	25
267	4/4/2018	1:18:34 PM	6	1498 R	0.1	-5	-16
268	4/4/2018	1:18:45 PM	1	1493 R	0.1	-16	-21
269	4/4/2018	1:18:57 PM	0	1517 R	0.1	-18	7
270	4/4/2018	1:19:09 PM	0	1504 R	0.1	-18	-8
271	4/4/2018	1:19:20 PM	5	1489 R	0.1	-7	-26
272	4/4/2018	1:19:32 PM	4	1440 R	0.1	-9	-85
273	4/4/2018	1:19:44 PM	13	1409 R	0.1	10	-122
274	4/4/2018	1:19:55 PM	6	1478 R	0.1	-5	-39
275	4/4/2018	1:20:07 PM	12	1492 R	0.1	8	-23
276	4/4/2018	1:20:55 PM	0	1431 R	0.1 Grid 59	-18	-95
277	4/4/2018	1:21:07 PM	0	1453 R	0.1	-18	-69
278	4/4/2018	1:21:19 PM	10	1453 R	0.1	4	-69
279	4/4/2018	1:21:30 PM	2	1454 R	0.1	-14	-68
280	4/4/2018	1:21:42 PM	5	1543 R	0.1	-7	38
281	4/4/2018	1:21:54 PM	13	1499 R	0.1	10	-14
282	4/4/2018	1:22:05 PM	6	1513 R	0.1	-5	2
283	4/4/2018	1:22:17 PM	11	1535 R	0.1	6	29
284	4/4/2018	1:22:29 PM	2	1497 R	0.1	-14	-17
285	4/4/2018	1:22:40 PM	8	1492 R	0.1	-1	-23
286	4/4/2018	1:23:30 PM	3	1572 R	0.1 Grid 60	-11	73
287	4/4/2018	1:23:42 PM	0	1499 R	0.1	-18	-14
288	4/4/2018	1:23:53 PM	3	1512 R	0.1	-11	1
289	4/4/2018	1:24:05 PM	18	1459 R	0.1	21	-62
290	4/4/2018	1:24:17 PM	4	1514 R	0.1	-9	4
291	4/4/2018	1:24:28 PM	1	1534 R	0.1	-16	27
292	4/4/2018	1:24:40 PM	0	1518 R	0.1	-18	8
293	4/4/2018	1:24:52 PM	29	1548 R	0.1	45	44
294	4/4/2018	1:25:03 PM	18	1511 R	0.1	21	0
295	4/4/2018	1:25:15 PM	36	1458 R	0.1	60	-63

Maximum:	39	1648	66	415
Average:	6	1201	-4	38
StDev:	7	413	14	103

Room 103 Upper Wall

2360# 297743

43-37 #302111

Cal Due Date: 10/10/2018

Surveyor: Adolfo Matus

Bldg 218

Room 103 Upper Wall Grids 9 thru 30 39 thru 60

Alpha Efficiency: 0.319

Beta/Gamma Efficiency: 0.384 Metal

Alpha Background: 8.3 4.1

Beta/Gamma Background: 1511 539

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²	
									Alpha	Beta
1	4/5/2018	12:35:38 PM	3	1543	R	0.1	Grid 9	-11	38	
2	4/5/2018	12:35:50 PM	4	1747	R	0.1		-9	282	
3	4/5/2018	12:36:02 PM	3	1689	R	0.1		-11	212	
4	4/5/2018	12:36:13 PM	5	1562	R	0.1		-7	61	
5	4/5/2018	12:36:25 PM	6	1631	R	0.1		-5	143	
6	4/5/2018	12:36:37 PM	1	1504	R	0.1		-16	-8	
7	4/5/2018	12:36:48 PM	4	1495	R	0.1		-9	-19	
8	4/5/2018	12:37:00 PM	1	1565	R	0.1		-16	64	
9	4/5/2018	12:37:12 PM	6	1528	R	0.1		-5	20	
10	4/5/2018	12:38:02 PM	8	1455	R	0.1	Grid 10	-1	-67	
11	4/5/2018	12:38:13 PM	2	1456	R	0.1		-14	-66	
12	4/5/2018	12:38:25 PM	4	1505	R	0.1		-9	-7	
13	4/5/2018	12:38:37 PM	5	1543	R	0.1		-7	38	
14	4/5/2018	12:38:48 PM	0	1498	R	0.1		-18	-16	
15	4/5/2018	12:39:00 PM	4	1553	R	0.1		-9	50	
16	4/5/2018	12:39:12 PM	6	1606	R	0.1		-5	113	
17	4/5/2018	12:39:23 PM	1	1595	R	0.1		-16	100	
18	4/5/2018	12:39:35 PM	4	1452	R	0.1		-9	-70	
19	4/5/2018	12:39:47 PM	1	1543	R	0.1		-16	38	
20	4/5/2018	12:40:33 PM	18	1455	R	0.1	Grid 11	21	-67	
21	4/5/2018	12:40:45 PM	4	1476	R	0.1		-9	-42	
22	4/5/2018	12:40:56 PM	1	1512	R	0.1		-16	1	
23	4/5/2018	12:41:08 PM	4	1437	R	0.1		-9	-88	
24	4/5/2018	12:41:20 PM	7	1454	R	0.1		-3	-68	
25	4/5/2018	12:41:31 PM	13	1499	R	0.1		10	-14	
26	4/5/2018	12:41:43 PM	11	1545	R	0.1		6	41	
27	4/5/2018	12:41:55 PM	6	1538	R	0.1		-5	32	
28	4/5/2018	12:42:06 PM	12	1510	R	0.1		8	-1	
29	4/5/2018	12:42:18 PM	11	1455	R	0.1		6	-67	
30	4/5/2018	12:43:16 PM	0	1543	R	0.1	Grid 12	-18	38	
31	4/5/2018	12:43:27 PM	3	1376	R	0.1		-11	-161	
32	4/5/2018	12:43:39 PM	0	1454	R	0.1		-18	-68	
33	4/5/2018	12:43:50 PM	3	1523	R	0.1		-11	14	
34	4/5/2018	12:44:02 PM	5	1516	R	0.1		-7	6	
35	4/5/2018	12:44:14 PM	7	1499	R	0.1		-3	-14	
36	4/5/2018	12:44:25 PM	4	1478	R	0.1		-9	-39	
37	4/5/2018	12:44:37 PM	5	1450	R	0.1		-7	-73	
38	4/5/2018	12:44:49 PM	13	1453	R	0.1		10	-69	
39	4/5/2018	12:45:00 PM	3	1455	R	0.1		-11	-67	
40	4/5/2018	12:45:51 PM	0	1526	R	0.1	Grid 13	-18	18	
41	4/5/2018	12:46:03 PM	11	1455	R	0.1		6	-67	
42	4/5/2018	12:46:14 PM	2	1434	R	0.1		-14	-92	
43	4/5/2018	12:46:26 PM	6	1577	R	0.1		-5	79	
44	4/5/2018	12:46:38 PM	10	1439	R	0.1		4	-86	
45	4/5/2018	12:46:49 PM	2	1469	R	0.1		-14	-50	

46	4/5/2018	12:47:01 PM	0	1460 R	0.1	-18	-61
47	4/5/2018	12:47:12 PM	0	1499 R	0.1	-18	-14
48	4/5/2018	12:47:24 PM	15	1456 R	0.1	14	-66
49	4/5/2018	12:47:36 PM	8	1476 R	0.1	-1	-42
50	4/5/2018	12:48:36 PM	3	1544 R	0.1 Grid 14	-11	39
51	4/5/2018	12:48:48 PM	4	1435 R	0.1	-9	-91
52	4/5/2018	12:49:00 PM	9	1625 R	0.1	2	136
53	4/5/2018	12:49:11 PM	7	1541 R	0.1	-3	36
54	4/5/2018	12:49:23 PM	1	1675 R	0.1	-16	196
55	4/5/2018	12:49:35 PM	0	1486 R	0.1	-18	-30
56	4/5/2018	12:49:46 PM	0	1655 R	0.1	-18	172
57	4/5/2018	12:49:58 PM	12	1544 R	0.1	8	39
58	4/5/2018	12:50:10 PM	6	1463 R	0.1	-5	-57
59	4/5/2018	12:50:21 PM	8	1608 R	0.1	-1	116
60	4/5/2018	12:51:00 PM	0	1513 R	0.1 Grid 15	-18	2
61	4/5/2018	12:51:11 PM	0	1477 R	0.1	-18	-41
62	4/5/2018	12:51:23 PM	0	1598 R	0.1	-18	104
63	4/5/2018	12:51:35 PM	5	1455 R	0.1	-7	-67
64	4/5/2018	12:51:46 PM	1	1512 R	0.1	-16	1
65	4/5/2018	12:51:58 PM	0	1582 R	0.1	-18	85
66	4/5/2018	12:52:10 PM	0	1519 R	0.1	-18	10
67	4/5/2018	12:52:21 PM	6	1671 R	0.1	-5	191
68	4/5/2018	12:52:33 PM	1	1686 R	0.1	-16	209
69	4/5/2018	12:52:45 PM	4	1535 R	0.1	-9	29
70	4/5/2018	12:55:53 PM	11	1533 R	0.1 Grid 16	6	26
71	4/5/2018	12:56:05 PM	2	1488 R	0.1	-14	-27
72	4/5/2018	12:56:16 PM	5	1626 R	0.1	-7	137
73	4/5/2018	12:56:28 PM	7	1593 R	0.1	-3	98
74	4/5/2018	12:56:39 PM	1	1553 R	0.1	-16	50
75	4/5/2018	12:56:51 PM	0	1734 R	0.1	-18	266
76	4/5/2018	12:57:03 PM	9	1667 R	0.1	2	186
77	4/5/2018	12:57:14 PM	6	1622 R	0.1	-5	132
78	4/5/2018	12:57:26 PM	1	1589 R	0.1	-16	93
79	4/5/2018	12:57:38 PM	0	1872 R	0.1	-18	431
80	4/5/2018	12:58:16 PM	3	1497 R	0.1 Grid 17	-11	-17
81	4/5/2018	12:58:28 PM	0	1724 R	0.1	-18	254
82	4/5/2018	12:58:39 PM	0	1770 R	0.1	-18	309
83	4/5/2018	12:58:51 PM	6	1764 R	0.1	-5	302
84	4/5/2018	12:59:03 PM	1	1653 R	0.1	-16	169
85	4/5/2018	12:59:14 PM	9	1764 R	0.1	2	302
86	4/5/2018	12:59:26 PM	2	1779 R	0.1	-14	320
87	4/5/2018	12:59:38 PM	8	1702 R	0.1	-1	228
88	4/5/2018	12:59:49 PM	5	1803 R	0.1	-7	348
89	4/5/2018	1:00:01 PM	7	1660 R	0.1	-3	178
90	4/5/2018	1:01:08 PM	0	1512 R	0.1 Grid 18	-18	1
91	4/5/2018	1:01:20 PM	0	1534 R	0.1	-18	27
92	4/5/2018	1:01:32 PM	9	1467 R	0.1	2	-53
93	4/5/2018	1:01:43 PM	5	1842 R	0.1	-7	395
94	4/5/2018	1:01:55 PM	12	1758 R	0.1	8	295
95	4/5/2018	1:02:07 PM	11	1648 R	0.1	6	163
96	4/5/2018	1:02:18 PM	2	1444 R	0.1	-14	-80
97	4/5/2018	1:02:30 PM	0	1517 R	0.1	-18	7
98	4/5/2018	1:02:42 PM	12	1456 R	0.1	8	-66
99	4/5/2018	1:02:53 PM	9	1655 R	0.1	2	172
100	4/5/2018	1:04:13 PM	0	1457 R	0.1 Grid 19	-18	-64
101	4/5/2018	1:04:25 PM	11	1541 R	0.1	6	36
102	4/5/2018	1:04:36 PM	2	1508 R	0.1	-14	-4
103	4/5/2018	1:04:48 PM	0	1456 R	0.1	-18	-66
104	4/5/2018	1:04:59 PM	0	1498 R	0.1	-18	-16
105	4/5/2018	1:05:11 PM	8	1508 R	0.1	-1	-4

106	4/5/2018	1:05:23 PM	6	1467 R	0.1	-5	-53	
107	4/5/2018	1:05:34 PM	1	1587 R	0.1	-16	91	
108	4/5/2018	1:05:46 PM	17	1522 R	0.1	19	13	
109	4/5/2018	1:05:58 PM	11	1518 R	0.1	6	8	
110	4/5/2018	1:08:06 PM	3	660 R	0.1 Grid 20	-11	144	Metal
111	4/5/2018	1:08:17 PM	3	903 R	0.1	-11	434	Metal
112	4/5/2018	1:08:29 PM	0	817 R	0.1	-18	332	Metal
113	4/5/2018	1:08:41 PM	5	837 R	0.1	-7	356	Metal
114	4/5/2018	1:08:52 PM	1	757 R	0.1	-16	260	Metal
115	4/5/2018	1:09:04 PM	9	715 R	0.1	2	210	Metal
116	4/5/2018	1:09:16 PM	2	761 R	0.1	-14	265	Metal
117	4/5/2018	1:09:27 PM	3	771 R	0.1	-11	277	Metal
118	4/5/2018	1:09:39 PM	4	936 R	0.1	-9	474	Metal
119	4/5/2018	1:09:51 PM	9	921 R	0.1	2	456	Metal
120	4/5/2018	1:10:21 PM	0	649 R	0.1 Grid 21	-18	131	Metal
121	4/5/2018	1:10:33 PM	0	922 R	0.1	-18	457	Metal
122	4/5/2018	1:10:45 PM	0	782 R	0.1	-18	290	Metal
123	4/5/2018	1:10:56 PM	10	749 R	0.1	4	251	Metal
124	4/5/2018	1:11:08 PM	13	724 R	0.1	10	221	Metal
125	4/5/2018	1:11:20 PM	3	770 R	0.1	-11	276	Metal
126	4/5/2018	1:11:31 PM	4	785 R	0.1	-9	294	Metal
127	4/5/2018	1:11:43 PM	1	854 R	0.1	-16	376	Metal
128	4/5/2018	1:11:55 PM	0	815 R	0.1	-18	329	Metal
129	4/5/2018	1:12:06 PM	6	808 R	0.1	-5	321	Metal
130	4/5/2018	1:13:52 PM	3	587 R	0.1 Grid 22	-11	57	Metal
131	4/5/2018	1:14:04 PM	4	834 R	0.1	-9	352	Metal
132	4/5/2018	1:14:16 PM	2	798 R	0.1	-14	309	Metal
133	4/5/2018	1:14:27 PM	3	737 R	0.1	-11	236	Metal
134	4/5/2018	1:14:39 PM	5	782 R	0.1	-7	290	Metal
135	4/5/2018	1:14:50 PM	4	824 R	0.1	-9	340	Metal
136	4/5/2018	1:15:02 PM	1	855 R	0.1	-16	377	Metal
137	4/5/2018	1:15:14 PM	0	846 R	0.1	-18	366	Metal
138	4/5/2018	1:15:25 PM	3	762 R	0.1	-11	266	Metal
139	4/5/2018	1:15:37 PM	3	858 R	0.1	-11	381	Metal
140	4/5/2018	1:16:26 PM	4	680 R	0.1 Grid 23	-9	168	Metal
141	4/5/2018	1:16:38 PM	9	742 R	0.1	2	242	Metal
142	4/5/2018	1:16:49 PM	2	820 R	0.1	-14	335	Metal
143	4/5/2018	1:17:01 PM	4	788 R	0.1	-9	297	Metal
144	4/5/2018	1:17:13 PM	6	599 R	0.1	-5	72	Metal
145	4/5/2018	1:17:24 PM	9	764 R	0.1	2	268	Metal
146	4/5/2018	1:17:36 PM	2	745 R	0.1	-14	246	Metal
147	4/5/2018	1:17:48 PM	3	808 R	0.1	-11	321	Metal
148	4/5/2018	1:17:59 PM	4	702 R	0.1	-9	194	Metal
149	4/5/2018	1:18:11 PM	2	770 R	0.1	-14	276	Metal
150	4/5/2018	1:18:48 PM	5	1455 R	0.1 Grid 24	-7	-67	
151	4/5/2018	1:19:00 PM	1	1521 R	0.1	-16	12	
152	4/5/2018	1:19:12 PM	21	1709 R	0.1	27	236	
153	4/5/2018	1:19:23 PM	5	1609 R	0.1	-7	117	
154	4/5/2018	1:19:35 PM	20	1721 R	0.1	25	251	
155	4/5/2018	1:19:47 PM	4	1658 R	0.1	-9	175	
156	4/5/2018	1:19:58 PM	4	1566 R	0.1	-9	66	
157	4/5/2018	1:20:10 PM	1	1609 R	0.1	-16	117	
158	4/5/2018	1:20:22 PM	0	1606 R	0.1	-18	113	
159	4/5/2018	1:20:33 PM	4	1501 R	0.1	-9	-12	
160	4/5/2018	1:23:32 PM	6	1551 R	0.1 Grid 25	-5	48	
161	4/5/2018	1:23:44 PM	10	1444 R	0.1	4	-80	
162	4/5/2018	1:23:55 PM	2	1542 R	0.1	-14	37	
163	4/5/2018	1:24:07 PM	17	1512 R	0.1	19	1	
164	4/5/2018	1:24:18 PM	4	1618 R	0.1	-9	128	
165	4/5/2018	1:24:30 PM	10	1513 R	0.1	4	2	

166	4/5/2018	1:24:42 PM	2	1573 R	0.1	-14	74
167	4/5/2018	1:24:53 PM	3	1565 R	0.1	-11	64
168	4/5/2018	1:25:05 PM	6	1487 R	0.1	-5	-29
169	4/5/2018	1:25:17 PM	6	1630 R	0.1	-5	142
170	4/5/2018	1:26:19 PM	0	1512 R	0.1 Grid 26	-18	1
171	4/5/2018	1:26:31 PM	7	1499 R	0.1	-3	-14
172	4/5/2018	1:26:42 PM	1	1519 R	0.1	-16	10
173	4/5/2018	1:26:54 PM	0	1512 R	0.1	-18	1
174	4/5/2018	1:27:06 PM	4	1584 R	0.1	-9	87
175	4/5/2018	1:27:17 PM	7	1632 R	0.1	-3	144
176	4/5/2018	1:27:29 PM	1	1467 R	0.1	-16	-53
177	4/5/2018	1:27:41 PM	0	1488 R	0.1	-18	-27
178	4/5/2018	1:27:52 PM	0	1442 R	0.1	-18	-82
179	4/5/2018	1:28:04 PM	20	1506 R	0.1	25	-6
180	4/5/2018	1:30:51 PM	7	1502 R	0.1 Grid 27	-3	-11
181	4/5/2018	1:31:03 PM	1	1448 R	0.1	-16	-75
182	4/5/2018	1:31:14 PM	4	1455 R	0.1	-9	-67
183	4/5/2018	1:31:26 PM	5	1512 R	0.1	-7	1
184	4/5/2018	1:31:38 PM	15	1487 R	0.1	14	-29
185	4/5/2018	1:31:49 PM	3	1452 R	0.1	-11	-70
186	4/5/2018	1:32:01 PM	15	1513 R	0.1	14	2
187	4/5/2018	1:32:13 PM	21	1534 R	0.1	27	27
188	4/5/2018	1:32:24 PM	24	1523 R	0.1	34	14
189	4/5/2018	1:32:36 PM	5	1710 R	0.1	-7	237
190	4/5/2018	1:32:48 PM	1	1490 R	0.1	-16	-25
191	4/5/2018	1:33:08 PM	0	1481 R	0.1 Grid 28	-18	-36
192	4/5/2018	1:33:19 PM	9	1501 R	0.1	2	-12
193	4/5/2018	1:33:31 PM	25	1579 R	0.1	36	81
194	4/5/2018	1:33:43 PM	5	1541 R	0.1	-7	36
195	4/5/2018	1:33:54 PM	1	1507 R	0.1	-16	-5
196	4/5/2018	1:34:06 PM	5	1468 R	0.1	-7	-51
197	4/5/2018	1:34:17 PM	1	1532 R	0.1	-16	25
198	4/5/2018	1:34:29 PM	3	1524 R	0.1	-11	16
199	4/5/2018	1:34:41 PM	6	1512 R	0.1	-5	1
200	4/5/2018	1:36:14 PM	4	1487 R	0.1 Grid 29	-9	-29
201	4/5/2018	1:36:26 PM	5	1666 R	0.1	-7	185
202	4/5/2018	1:36:37 PM	15	1691 R	0.1	14	215
203	4/5/2018	1:36:49 PM	3	1648 R	0.1	-11	163
204	4/5/2018	1:37:01 PM	0	1440 R	0.1	-18	-85
205	4/5/2018	1:37:12 PM	3	1556 R	0.1	-11	54
206	4/5/2018	1:37:24 PM	7	1706 R	0.1	-3	233
207	4/5/2018	1:37:36 PM	4	1638 R	0.1	-9	152
208	4/5/2018	1:37:47 PM	1	1542 R	0.1	-16	37
209	4/5/2018	1:37:59 PM	0	1599 R	0.1	-18	105
210	4/5/2018	1:38:28 PM	0	1488 R	0.1 Grid 30	-18	-27
211	4/5/2018	1:38:40 PM	0	1510 R	0.1	-18	-1
212	4/5/2018	1:38:52 PM	11	1478 R	0.1	6	-39
213	4/5/2018	1:39:03 PM	14	1481 R	0.1	12	-36
214	4/5/2018	1:39:15 PM	14	1487 R	0.1	12	-29
215	4/5/2018	1:39:27 PM	13	1504 R	0.1	10	-8
216	4/5/2018	1:39:38 PM	3	1624 R	0.1	-11	135
217	4/5/2018	1:39:50 PM	4	1475 R	0.1	-9	-43
218	4/5/2018	1:40:02 PM	3	1577 R	0.1	-11	79
219	4/5/2018	1:40:13 PM	4	1545 R	0.1	-9	41
220	4/5/2018	1:46:20 PM	3	1438 R	0.1 Grid 39	-11	-87
221	4/5/2018	1:46:32 PM	11	1646 R	0.1	6	161
222	4/5/2018	1:46:43 PM	2	1733 R	0.1	-14	265
223	4/5/2018	1:46:55 PM	0	1502 R	0.1	-18	-11
224	4/5/2018	1:47:06 PM	13	1557 R	0.1	10	55
225	4/5/2018	1:47:18 PM	6	1483 R	0.1	-5	-33

226	4/5/2018	1:47:30 PM	1	1695 R	0.1	-16	220
227	4/5/2018	1:47:41 PM	8	1633 R	0.1	-1	146
228	4/5/2018	1:47:53 PM	2	1565 R	0.1	-14	64
229	4/5/2018	1:48:05 PM	0	1784 R	0.1	-18	326
230	4/5/2018	1:49:04 PM	3	1487 R	0.1 Grid 40	-11	-29
231	4/5/2018	1:49:15 PM	4	1446 R	0.1	-9	-78
232	4/5/2018	1:49:27 PM	11	1475 R	0.1	6	-43
233	4/5/2018	1:49:39 PM	8	1592 R	0.1	-1	97
234	4/5/2018	1:49:50 PM	2	1604 R	0.1	-14	111
235	4/5/2018	1:50:02 PM	12	1496 R	0.1	8	-18
236	4/5/2018	1:50:13 PM	2	1530 R	0.1	-14	23
237	4/5/2018	1:50:25 PM	0	1487 R	0.1	-18	-29
238	4/5/2018	1:50:37 PM	0	1675 R	0.1	-18	196
239	4/5/2018	1:50:48 PM	3	1549 R	0.1	-11	45
240	4/5/2018	1:52:50 PM	11	1465 R	0.1 Grid 41	6	-55
241	4/5/2018	1:53:01 PM	2	1549 R	0.1	-14	45
242	4/5/2018	1:53:13 PM	0	1601 R	0.1	-18	107
243	4/5/2018	1:53:25 PM	0	1744 R	0.1	-18	278
244	4/5/2018	1:53:36 PM	14	1845 R	0.1	12	399
245	4/5/2018	1:53:48 PM	11	1565 R	0.1	6	64
246	4/5/2018	1:54:00 PM	11	1491 R	0.1	6	-24
247	4/5/2018	1:54:11 PM	2	1499 R	0.1	-14	-14
248	4/5/2018	1:54:23 PM	4	1532 R	0.1	-9	25
249	4/5/2018	1:54:35 PM	0	1494 R	0.1	-18	-20
250	4/5/2018	1:55:14 PM	4	1486 R	0.1 Grid 42	-9	-30
251	4/5/2018	1:55:25 PM	1	1733 R	0.1	-16	265
252	4/5/2018	1:55:37 PM	16	1515 R	0.1	17	5
253	4/5/2018	1:55:48 PM	3	1545 R	0.1	-11	41
254	4/5/2018	1:56:00 PM	11	1588 R	0.1	6	92
255	4/5/2018	1:56:12 PM	2	1483 R	0.1	-14	-33
256	4/5/2018	1:56:23 PM	0	1647 R	0.1	-18	162
257	4/5/2018	1:56:35 PM	0	1595 R	0.1	-18	100
258	4/5/2018	1:56:47 PM	0	1448 R	0.1	-18	-75
259	4/5/2018	1:56:58 PM	0	1479 R	0.1	-18	-38
260	4/5/2018	2:01:05 PM	11	1476 R	0.1 Grid 43	6	-42
261	4/5/2018	2:01:16 PM	2	1576 R	0.1	-14	78
262	4/5/2018	2:01:28 PM	10	1763 R	0.1	4	301
263	4/5/2018	2:01:40 PM	2	1790 R	0.1	-14	333
264	4/5/2018	2:01:51 PM	42	1840 R	0.1	73	393
265	4/5/2018	2:02:03 PM	14	1513 R	0.1	12	2
266	4/5/2018	2:02:15 PM	3	1490 R	0.1	-11	-25
267	4/5/2018	2:02:26 PM	11	1431 R	0.1	6	-95
268	4/5/2018	2:02:38 PM	2	1503 R	0.1	-14	-10
269	4/5/2018	2:02:50 PM	0	1472 R	0.1	-18	-47
270	4/5/2018	2:03:35 PM	0	1503 R	0.1 Grid 44	-18	-10
271	4/5/2018	2:03:47 PM	0	1482 R	0.1	-18	-35
272	4/5/2018	2:03:59 PM	33	1451 R	0.1	53	-72
273	4/5/2018	2:04:10 PM	7	1481 R	0.1	-3	-36
274	4/5/2018	2:04:22 PM	11	1594 R	0.1	6	99
275	4/5/2018	2:04:34 PM	12	1849 R	0.1	8	403
276	4/5/2018	2:04:45 PM	7	1611 R	0.1	-3	119
277	4/5/2018	2:04:57 PM	1	1745 R	0.1	-16	279
278	4/5/2018	2:05:08 PM	11	1576 R	0.1	6	78
279	4/5/2018	2:05:20 PM	2	1658 R	0.1	-14	175
280	4/5/2018	2:06:41 PM	0	1487 R	0.1 Grid 45	-18	-29
281	4/5/2018	2:06:53 PM	11	1587 R	0.1	6	91
282	4/5/2018	2:07:05 PM	15	1455 R	0.1	14	-67
283	4/5/2018	2:07:16 PM	3	1456 R	0.1	-11	-66
284	4/5/2018	2:07:28 PM	3	1496 R	0.1	-11	-18
285	4/5/2018	2:07:40 PM	4	1434 R	0.1	-9	-92

286	4/5/2018	2:07:51 PM	4	1454 R	0.1	-9	-68	
287	4/5/2018	2:08:03 PM	7	1498 R	0.1	-3	-16	
288	4/5/2018	2:08:15 PM	1	1728 R	0.1	-16	259	
289	4/5/2018	2:08:26 PM	0	1500 R	0.1	-18	-13	
290	4/5/2018	2:09:10 PM	15	1499 R	0.1 Grid 46	14	-14	
291	4/5/2018	2:09:22 PM	11	1498 R	0.1	6	-16	
292	4/5/2018	2:09:33 PM	17	1731 R	0.1	19	263	
293	4/5/2018	2:09:45 PM	4	1657 R	0.1	-9	174	
294	4/5/2018	2:09:57 PM	0	1639 R	0.1	-18	153	
295	4/5/2018	2:10:08 PM	4	1751 R	0.1	-9	286	
296	4/5/2018	2:10:20 PM	1	1620 R	0.1	-16	130	
297	4/5/2018	2:10:32 PM	3	1498 R	0.1	-11	-16	
298	4/5/2018	2:10:43 PM	0	1489 R	0.1	-18	-26	
299	4/5/2018	2:10:55 PM	3	1501 R	0.1	-11	-12	
300	4/5/2018	2:13:23 PM	4	1486 R	0.1 Grid 47	-9	-30	
301	4/5/2018	2:13:34 PM	3	1778 R	0.1	-11	319	
302	4/5/2018	2:13:46 PM	0	1680 R	0.1	-18	202	
303	4/5/2018	2:13:57 PM	3	1525 R	0.1	-11	17	
304	4/5/2018	2:14:09 PM	3	1668 R	0.1	-11	187	
305	4/5/2018	2:14:21 PM	7	1846 R	0.1	-3	400	
306	4/5/2018	2:14:32 PM	1	1787 R	0.1	-16	329	
307	4/5/2018	2:14:44 PM	12	1855 R	0.1	8	410	
308	4/5/2018	2:14:56 PM	3	1769 R	0.1	-11	308	
309	4/5/2018	2:15:07 PM	7	1690 R	0.1	-3	214	
310	4/5/2018	2:15:56 PM	10	1487 R	0.1 Grid 48	4	-29	
311	4/5/2018	2:16:08 PM	19	1635 R	0.1	23	148	
312	4/5/2018	2:16:19 PM	7	1597 R	0.1	-3	103	
313	4/5/2018	2:16:31 PM	14	1586 R	0.1	12	89	
314	4/5/2018	2:16:43 PM	14	1586 R	0.1	12	89	
315	4/5/2018	2:16:54 PM	7	1677 R	0.1	-3	198	
316	4/5/2018	2:17:06 PM	15	1614 R	0.1	14	123	
317	4/5/2018	2:17:18 PM	3	1844 R	0.1	-11	397	
318	4/5/2018	2:17:29 PM	0	1510 R	0.1	-18	-1	
319	4/5/2018	2:17:41 PM	14	1610 R	0.1	12	118	
320	4/5/2018	2:18:55 PM	0	669 R	0.1 Grid 49	-18	155	Metal
321	4/5/2018	2:19:07 PM	0	862 R	0.1	-18	385	Metal
322	4/5/2018	2:19:19 PM	10	866 R	0.1	4	390	Metal
323	4/5/2018	2:19:30 PM	6	802 R	0.1	-5	314	Metal
324	4/5/2018	2:19:47 PM	0	862 R	0.1	-18	385	Metal
325	4/5/2018	2:19:59 PM	0	786 R	0.1	-18	295	Metal
326	4/5/2018	2:20:10 PM	20	819 R	0.1	25	334	Metal
327	4/5/2018	2:20:22 PM	20	822 R	0.1	25	338	Metal
328	4/5/2018	2:20:34 PM	4	870 R	0.1	-9	395	Metal
329	4/5/2018	2:20:50 PM	7	828 R	0.1	-3	345	Metal
330	4/5/2018	2:22:03 PM	5	1505 R	0.1 Grid 50	-7	-7	
331	4/5/2018	2:22:15 PM	1	1516 R	0.1	-16	6	
332	4/5/2018	2:22:27 PM	0	1550 R	0.1	-18	47	
333	4/5/2018	2:22:38 PM	0	1619 R	0.1	-18	129	
334	4/5/2018	2:22:50 PM	7	1467 R	0.1	-3	-53	
335	4/5/2018	2:23:01 PM	1	1433 R	0.1	-16	-93	
336	4/5/2018	2:23:13 PM	0	823 R	0.1	-18	339	Metal
337	4/5/2018	2:23:25 PM	6	842 R	0.1	-5	362	Metal
338	4/5/2018	2:23:36 PM	1	815 R	0.1	-16	329	Metal
339	4/5/2018	2:23:48 PM	0	860 R	0.1	-18	383	Metal
340	4/5/2018	2:27:35 PM	0	1465 R	0.1 Grid 51	-18	-55	
341	4/5/2018	2:27:46 PM	0	1593 R	0.1	-18	98	
342	4/5/2018	2:27:58 PM	0	1558 R	0.1	-18	56	
343	4/5/2018	2:28:10 PM	7	1452 R	0.1	-3	-70	
344	4/5/2018	2:28:21 PM	1	1531 R	0.1	-16	24	
345	4/5/2018	2:28:33 PM	0	1455 R	0.1	-18	-67	

346	4/5/2018	2:28:45 PM	0	786 R	0.1	-18	295	Metal
347	4/5/2018	2:28:56 PM	8	812 R	0.1	-1	326	Metal
348	4/5/2018	2:29:08 PM	8	736 R	0.1	-1	235	Metal
349	4/5/2018	2:29:19 PM	5	823 R	0.1	-7	339	Metal
350	4/5/2018	2:30:57 PM	4	1497 R	0.1 Grid 52	-9	-17	
351	4/5/2018	2:31:09 PM	1	1550 R	0.1	-16	47	
352	4/5/2018	2:31:21 PM	12	1582 R	0.1	8	85	
353	4/5/2018	2:31:32 PM	3	1668 R	0.1	-11	187	
354	4/5/2018	2:31:44 PM	0	1529 R	0.1	-18	21	
355	4/5/2018	2:31:56 PM	0	1578 R	0.1	-18	80	
356	4/5/2018	2:32:07 PM	0	1437 R	0.1	-18	-88	
357	4/5/2018	2:32:19 PM	6	864 R	0.1	-5	388	Metal
358	4/5/2018	2:32:31 PM	6	837 R	0.1	-5	356	Metal
359	4/5/2018	2:32:42 PM	7	688 R	0.1	-3	178	Metal
360	4/5/2018	2:32:54 PM	9	820 R	0.1	2	335	Metal
361	4/5/2018	2:33:30 PM	0	1232 R	0.1 Grid 53	-18	-333	
362	4/5/2018	2:33:42 PM	0	1435 R	0.1	-18	-91	
363	4/5/2018	2:33:53 PM	7	1662 R	0.1	-3	180	
364	4/5/2018	2:34:05 PM	16	1684 R	0.1	17	206	
365	4/5/2018	2:34:17 PM	14	1694 R	0.1	12	218	
366	4/5/2018	2:34:28 PM	12	855 R	0.1	8	377	Metal
367	4/5/2018	2:34:40 PM	9	828 R	0.1	2	345	Metal
368	4/5/2018	2:34:52 PM	7	786 R	0.1	-3	295	Metal
369	4/5/2018	2:35:03 PM	9	732 R	0.1	2	230	Metal
370	4/5/2018	2:36:22 PM	0	1545 R	0.1 Grid 54	-18	41	
371	4/5/2018	2:36:33 PM	0	1661 R	0.1	-18	179	
372	4/5/2018	2:36:45 PM	0	1472 R	0.1	-18	-47	
373	4/5/2018	2:36:57 PM	0	1758 R	0.1	-18	295	
374	4/5/2018	2:37:08 PM	0	1739 R	0.1	-18	272	
375	4/5/2018	2:37:20 PM	0	1673 R	0.1	-18	193	
376	4/5/2018	2:37:32 PM	6	1500 R	0.1	-5	-13	
377	4/5/2018	2:37:43 PM	30	1767 R	0.1	47	305	
378	4/5/2018	2:37:55 PM	7	1571 R	0.1	-3	72	
379	4/5/2018	2:38:06 PM	1	1681 R	0.1	-16	203	
380	4/5/2018	2:42:09 PM	7	1513 R	0.1 Grid 55	-3	2	
381	4/5/2018	2:42:27 PM	0	1639 R	0.1	-18	153	
382	4/5/2018	2:42:39 PM	0	1591 R	0.1	-18	95	
383	4/5/2018	2:42:51 PM	4	1649 R	0.1	-9	165	
384	4/5/2018	2:43:02 PM	1	1576 R	0.1	-16	78	
385	4/5/2018	2:43:14 PM	0	1609 R	0.1	-18	117	
386	4/5/2018	2:43:26 PM	16	1457 R	0.1	17	-64	
387	4/5/2018	2:43:37 PM	7	1482 R	0.1	-3	-35	
388	4/5/2018	2:43:49 PM	1	1556 R	0.1	-16	54	
389	4/5/2018	2:44:01 PM	0	1574 R	0.1	-18	75	
390	4/5/2018	2:45:13 PM	6	1476 R	0.1 Grid 56	-5	-42	
391	4/5/2018	2:45:25 PM	12	1645 R	0.1	8	160	
392	4/5/2018	2:45:36 PM	3	1689 R	0.1	-11	212	
393	4/5/2018	2:45:48 PM	0	1684 R	0.1	-18	206	
394	4/5/2018	2:46:00 PM	0	1538 R	0.1	-18	32	
395	4/5/2018	2:46:11 PM	12	1626 R	0.1	8	137	
396	4/5/2018	2:46:23 PM	3	1527 R	0.1	-11	19	
397	4/5/2018	2:46:35 PM	0	1703 R	0.1	-18	229	
398	4/5/2018	2:46:46 PM	0	1608 R	0.1	-18	116	
399	4/5/2018	2:46:58 PM	7	1652 R	0.1	-3	168	
400	4/5/2018	2:48:12 PM	6	1545 R	0.1 Grid 57	-5	41	
401	4/5/2018	2:48:24 PM	1	1460 R	0.1	-16	-61	
402	4/5/2018	2:48:35 PM	0	1486 R	0.1	-18	-30	
403	4/5/2018	2:48:47 PM	9	1480 R	0.1	2	-37	
404	4/5/2018	2:48:59 PM	2	1614 R	0.1	-14	123	
405	4/5/2018	2:49:10 PM	0	1633 R	0.1	-18	146	

406	4/5/2018	2:49:22 PM	10	1610 R	0.1	4	118
407	4/5/2018	2:49:34 PM	2	1586 R	0.1	-14	89
408	4/5/2018	2:49:45 PM	12	1572 R	0.1	8	73
409	4/5/2018	2:49:57 PM	17	1595 R	0.1	19	100
410	4/5/2018	2:50:37 PM	17	1541 R	0.1 Grid 58	19	36
411	4/5/2018	2:50:49 PM	9	1607 R	0.1	2	115
412	4/5/2018	2:51:00 PM	7	1512 R	0.1	-3	1
413	4/5/2018	2:51:12 PM	4	1521 R	0.1	-9	12
414	4/5/2018	2:51:24 PM	5	1655 R	0.1	-7	172
415	4/5/2018	2:51:35 PM	7	1496 R	0.1	-3	-18
416	4/5/2018	2:51:47 PM	1	1522 R	0.1	-16	13
417	4/5/2018	2:51:59 PM	0	1524 R	0.1	-18	16
418	4/5/2018	2:52:10 PM	4	1449 R	0.1	-9	-74
419	4/5/2018	2:52:22 PM	1	1498 R	0.1	-16	-16
420	4/5/2018	2:53:19 PM	0	1533 R	0.1 Grid 59	-18	26
421	4/5/2018	2:53:31 PM	9	1445 R	0.1	2	-79
422	4/5/2018	2:53:42 PM	2	1498 R	0.1	-14	-16
423	4/5/2018	2:53:54 PM	4	1751 R	0.1	-9	286
424	4/5/2018	2:54:06 PM	1	1647 R	0.1	-16	162
425	4/5/2018	2:54:17 PM	10	1858 R	0.1	4	414
426	4/5/2018	2:54:29 PM	2	1726 R	0.1	-14	257
427	4/5/2018	2:54:41 PM	13	1650 R	0.1	10	166
428	4/5/2018	2:54:52 PM	12	1642 R	0.1	8	156
429	4/5/2018	2:55:04 PM	8	1511 R	0.1	-1	0
430	4/5/2018	2:55:55 PM	6	1565 R	0.1 Grid 60	-5	64
431	4/5/2018	2:56:07 PM	1	1690 R	0.1	-16	214
432	4/5/2018	2:56:19 PM	10	1554 R	0.1	4	51
433	4/5/2018	2:56:30 PM	18	1531 R	0.1	21	24
434	4/5/2018	2:56:42 PM	4	1433 R	0.1	-9	-93
435	4/5/2018	2:56:54 PM	1	1501 R	0.1	-16	-12
436	4/5/2018	2:57:05 PM	7	1463 R	0.1	-3	-57
437	4/5/2018	2:57:17 PM	1	1468 R	0.1	-16	-51
438	4/5/2018	2:57:29 PM	19	1677 R	0.1	23	198
439	4/5/2018	2:57:40 PM	4	1497 R	0.1	-9	-17
		Maximum:	42	1872		73	474
		Average:	5	1448		-6	99
		StDev:	6	293		12	145

Room 103 Ceiling/Overhead

2360 SN:297743

43-37 #302111

Cal Due Date: 10/10/2018

Surveyor: Adolfo Matus

Bldg. 218

Room 103 Ceiling Grids 1 thru 8 25 thru 32 49 thru 56

Alpha Efficiency: 0.31

Beta/Gamma Efficiency: 0.352

Alpha Background: 4.1

Beta/Gamma Background: 539

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²	
									Alpha	Beta
1	4/6/2018	10:16:27 AM	14	600	R	0.1	Grid 1	22	79	
2	4/6/2018	10:16:39 AM	3	735	R	0.1		-2	255	
3	4/6/2018	10:16:51 AM	0	666	R	0.1		-9	165	
4	4/6/2018	10:17:02 AM	0	667	R	0.1		-9	167	
5	4/6/2018	10:17:14 AM	0	812	R	0.1		-9	355	
6	4/6/2018	10:17:26 AM	0	744	R	0.1		-9	267	
7	4/6/2018	10:17:37 AM	6	846	R	0.1		4	400	
8	4/6/2018	10:17:49 AM	1	839	R	0.1		-7	391	
9	4/6/2018	10:18:00 AM	6	792	R	0.1		4	329	
10	4/6/2018	10:19:39 AM	6	569	R	0.1	Grid 2	4	39	
11	4/6/2018	10:19:51 AM	5	677	R	0.1		2	180	
12	4/6/2018	10:20:02 AM	10	609	R	0.1		13	91	
13	4/6/2018	10:20:14 AM	2	782	R	0.1		-5	316	
14	4/6/2018	10:20:26 AM	0	746	R	0.1		-9	269	
15	4/6/2018	10:20:37 AM	5	817	R	0.1		2	362	
16	4/6/2018	10:20:49 AM	1	809	R	0.1		-7	351	
17	4/6/2018	10:21:01 AM	18	657	R	0.1		31	154	
18	4/6/2018	10:21:12 AM	12	817	R	0.1		18	362	
19	4/6/2018	10:21:24 AM	12	745	R	0.1		18	268	
20	4/6/2018	10:25:34 AM	11	634	R	0.1	Grid 3	15	124	
21	4/6/2018	10:25:46 AM	5	743	R	0.1		2	266	
22	4/6/2018	10:25:58 AM	7	767	R	0.1		6	297	
23	4/6/2018	10:26:09 AM	13	753	R	0.1		20	279	
24	4/6/2018	10:26:21 AM	8	841	R	0.1		9	393	
25	4/6/2018	10:26:33 AM	14	789	R	0.1		22	325	
26	4/6/2018	10:26:44 AM	3	797	R	0.1		-2	336	
27	4/6/2018	10:26:56 AM	0	724	R	0.1		-9	241	
28	4/6/2018	10:27:07 AM	0	874	R	0.1		-9	436	
29	4/6/2018	10:27:19 AM	0	767	R	0.1		-9	297	
30	4/6/2018	10:29:21 AM	0	701	R	0.1	Grid 4	-9	211	
31	4/6/2018	10:29:33 AM	4	1016	R	0.1		0	621	
32	4/6/2018	10:29:44 AM	1	1054	R	0.1		-7	670	
33	4/6/2018	10:29:56 AM	0	1050	R	0.1		-9	665	
34	4/6/2018	10:30:07 AM	0	928	R	0.1		-9	506	
35	4/6/2018	10:30:19 AM	0	899	R	0.1		-9	469	
36	4/6/2018	10:30:31 AM	10	842	R	0.1		13	394	
37	4/6/2018	10:30:42 AM	2	871	R	0.1		-5	432	
38	4/6/2018	10:30:54 AM	22	1019	R	0.1		40	625	
39	4/6/2018	10:31:06 AM	5	891	R	0.1		2	458	

40	4/6/2018	10:35:55 AM	4	910 R	0.1	Grid 5	0	483
41	4/6/2018	10:36:07 AM	1	1171 R	0.1		-7	823
42	4/6/2018	10:36:19 AM	0	1250 R	0.1		-9	925
43	4/6/2018	10:36:30 AM	6	1628 R	0.1		4	1418
44	4/6/2018	10:36:42 AM	1	1502 R	0.1		-7	1254
45	4/6/2018	10:36:54 AM	8	1365 R	0.1		9	1075
46	4/6/2018	10:37:05 AM	5	1322 R	0.1		2	1019
47	4/6/2018	10:37:17 AM	1	1313 R	0.1		-7	1007
48	4/6/2018	10:37:29 AM	0	924 R	0.1		-9	501
49	4/6/2018	10:37:40 AM	3	1093 R	0.1		-2	721
50	4/6/2018	10:46:55 AM	0	1104 R	0.1	Grid 6	-9	735
51	4/6/2018	10:47:06 AM	0	1253 R	0.1		-9	929
52	4/6/2018	10:47:18 AM	0	1255 R	0.1		-9	932
53	4/6/2018	10:47:30 AM	0	1141 R	0.1		-9	784
54	4/6/2018	10:47:41 AM	0	1102 R	0.1		-9	733
55	4/6/2018	10:47:53 AM	11	1207 R	0.1		15	870
56	4/6/2018	10:48:05 AM	2	1190 R	0.1		-5	847
57	4/6/2018	10:48:16 AM	0	1031 R	0.1		-9	640
58	4/6/2018	10:48:28 AM	0	1159 R	0.1		-9	807
59	4/6/2018	10:48:40 AM	6	1288 R	0.1		4	975
60	4/6/2018	10:48:51 AM	5	1413 R	0.1		2	1138
61	4/6/2018	10:56:05 AM	15	842 R	0.1	Grid 7	24	394
62	4/6/2018	10:56:17 AM	3	1176 R	0.1		-2	829
63	4/6/2018	10:56:29 AM	0	1015 R	0.1		-9	620
64	4/6/2018	10:56:40 AM	3	1096 R	0.1		-2	725
65	4/6/2018	10:56:52 AM	0	1037 R	0.1		-9	648
66	4/6/2018	10:57:04 AM	0	1023 R	0.1		-9	630
67	4/6/2018	10:57:15 AM	0	1006 R	0.1		-9	608
68	4/6/2018	10:57:27 AM	0	1021 R	0.1		-9	627
69	4/6/2018	10:57:39 AM	0	958 R	0.1		-9	545
70	4/6/2018	10:58:38 AM	4	918 R	0.1	Grid 8	0	493
71	4/6/2018	10:58:49 AM	14	940 R	0.1		22	522
72	4/6/2018	10:59:01 AM	3	918 R	0.1		-2	493
73	4/6/2018	10:59:13 AM	18	797 R	0.1		31	336
74	4/6/2018	10:59:24 AM	4	994 R	0.1		0	592
75	4/6/2018	10:59:36 AM	4	767 R	0.1		0	297
76	4/6/2018	10:59:48 AM	1	784 R	0.1		-7	319
77	4/6/2018	10:59:59 AM	0	880 R	0.1		-9	444
78	4/6/2018	11:00:11 AM	0	862 R	0.1		-9	420
79	4/6/2018	11:00:23 AM	0	845 R	0.1		-9	398
80	4/6/2018	12:35:22 PM	0	752 R	0.1	Grid 25	-9	277
81	4/6/2018	12:35:34 PM	5	814 R	0.1		2	358
82	4/6/2018	12:35:45 PM	1	853 R	0.1		-7	409
83	4/6/2018	12:35:57 PM	0	869 R	0.1		-9	430
84	4/6/2018	12:36:09 PM	0	947 R	0.1		-9	531
85	4/6/2018	12:36:20 PM	4	917 R	0.1		0	492
86	4/6/2018	12:36:32 PM	1	794 R	0.1		-7	332
87	4/6/2018	12:36:44 PM	0	805 R	0.1		-9	346
88	4/6/2018	12:36:55 PM	0	714 R	0.1		-9	228
89	4/6/2018	12:37:07 PM	0	780 R	0.1		-9	314
90	4/6/2018	12:38:40 PM	3	626 R	0.1	Grid 26	-2	113
91	4/6/2018	12:38:52 PM	7	647 R	0.1		6	141
92	4/6/2018	12:39:04 PM	13	764 R	0.1		20	293
93	4/6/2018	12:39:15 PM	7	838 R	0.1		6	389

94	4/6/2018	12:39:27 PM	6	861 R	0.1	4	419
95	4/6/2018	12:39:38 PM	12	715 R	0.1	18	229
96	4/6/2018	12:39:50 PM	3	910 R	0.1	-2	483
97	4/6/2018	12:40:02 PM	0	785 R	0.1	-9	320
98	4/6/2018	12:40:13 PM	0	815 R	0.1	-9	359
99	4/6/2018	12:40:25 PM	0	915 R	0.1	-9	489
100	4/6/2018	12:42:35 PM	4	736 R	0.1 Grid 27	0	256
101	4/6/2018	12:42:46 PM	8	824 R	0.1	9	371
102	4/6/2018	12:42:58 PM	2	765 R	0.1	-5	294
103	4/6/2018	12:43:10 PM	10	644 R	0.1	13	137
104	4/6/2018	12:43:21 PM	20	845 R	0.1	35	398
105	4/6/2018	12:43:33 PM	4	760 R	0.1	0	288
106	4/6/2018	12:43:45 PM	1	765 R	0.1	-7	294
107	4/6/2018	12:43:56 PM	3	730 R	0.1	-2	249
108	4/6/2018	12:44:08 PM	5	976 R	0.1	2	569
109	4/6/2018	12:44:20 PM	4	828 R	0.1	0	376
110	4/6/2018	12:48:10 PM	3	507 R	0.1 Grid 28	-2	-42
111	4/6/2018	12:48:22 PM	4	754 R	0.1	0	280
112	4/6/2018	12:48:33 PM	1	777 R	0.1	-7	310
113	4/6/2018	12:48:45 PM	0	823 R	0.1	-9	370
114	4/6/2018	12:48:57 PM	0	747 R	0.1	-9	271
115	4/6/2018	12:49:08 PM	0	830 R	0.1	-9	379
116	4/6/2018	12:49:20 PM	5	825 R	0.1	2	372
117	4/6/2018	12:49:32 PM	1	861 R	0.1	-7	419
118	4/6/2018	12:49:43 PM	6	761 R	0.1	4	289
119	4/6/2018	12:49:55 PM	5	697 R	0.1	2	206
120	4/6/2018	12:52:06 PM	3	753 R	0.1 Grid 29	-2	279
121	4/6/2018	12:52:17 PM	0	697 R	0.1	-9	206
122	4/6/2018	12:52:29 PM	9	713 R	0.1	11	226
123	4/6/2018	12:52:41 PM	5	853 R	0.1	2	409
124	4/6/2018	12:52:52 PM	10	911 R	0.1	13	484
125	4/6/2018	12:53:04 PM	2	942 R	0.1	-5	525
126	4/6/2018	12:53:16 PM	5	885 R	0.1	2	450
127	4/6/2018	12:53:27 PM	1	907 R	0.1	-7	479
128	4/6/2018	12:53:39 PM	3	870 R	0.1	-2	431
129	4/6/2018	12:53:50 PM	0	751 R	0.1	-9	276
130	4/6/2018	12:54:58 PM	3	611 R	0.1 Grid 30	-2	94
131	4/6/2018	12:55:09 PM	0	716 R	0.1	-9	230
132	4/6/2018	12:55:21 PM	4	830 R	0.1	0	379
133	4/6/2018	12:55:33 PM	1	846 R	0.1	-7	400
134	4/6/2018	12:55:44 PM	0	742 R	0.1	-9	264
135	4/6/2018	12:55:56 PM	3	812 R	0.1	-2	355
136	4/6/2018	12:56:07 PM	4	764 R	0.1	0	293
137	4/6/2018	12:56:19 PM	2	708 R	0.1	-5	220
138	4/6/2018	12:56:31 PM	0	830 R	0.1	-9	379
139	4/6/2018	12:56:42 PM	4	854 R	0.1	0	410
140	4/6/2018	12:57:58 PM	0	666 R	0.1 Grid 31	-9	165
141	4/6/2018	12:58:10 PM	0	786 R	0.1	-9	322
142	4/6/2018	12:58:21 PM	6	753 R	0.1	4	279
143	4/6/2018	12:58:33 PM	1	882 R	0.1	-7	446
144	4/6/2018	12:58:45 PM	4	823 R	0.1	0	370
145	4/6/2018	12:58:56 PM	5	797 R	0.1	2	336
146	4/6/2018	12:59:08 PM	3	882 R	0.1	-2	446
147	4/6/2018	12:59:20 PM	6	779 R	0.1	4	312

148	4/6/2018	12:59:31 PM	6	860 R	0.1	4	418
149	4/6/2018	12:59:43 PM	1	862 R	0.1	-7	420
150	4/6/2018	1:02:32 PM	0	651 R	0.1 Grid 32	-9	146
151	4/6/2018	1:02:44 PM	0	754 R	0.1	-9	280
152	4/6/2018	1:02:56 PM	0	785 R	0.1	-9	320
153	4/6/2018	1:03:07 PM	0	740 R	0.1	-9	262
154	4/6/2018	1:03:19 PM	8	812 R	0.1	9	355
155	4/6/2018	1:03:31 PM	6	802 R	0.1	4	342
156	4/6/2018	1:03:42 PM	1	802 R	0.1	-7	342
157	4/6/2018	1:03:54 PM	0	805 R	0.1	-9	346
158	4/6/2018	1:04:06 PM	5	802 R	0.1	2	342
159	4/6/2018	1:04:17 PM	5	870 R	0.1	2	431
160	4/6/2018	1:07:58 PM	4	698 R	0.1 Grid 49	0	207
161	4/6/2018	1:08:09 PM	1	753 R	0.1	-7	279
162	4/6/2018	1:08:21 PM	12	811 R	0.1	18	354
163	4/6/2018	1:08:33 PM	3	882 R	0.1	-2	446
164	4/6/2018	1:08:44 PM	11	620 R	0.1	15	105
165	4/6/2018	1:11:06 PM	9	679 R	0.1 Grid 50	11	182
166	4/6/2018	1:11:17 PM	2	823 R	0.1	-5	370
167	4/6/2018	1:11:29 PM	0	754 R	0.1	-9	280
168	4/6/2018	1:11:41 PM	0	783 R	0.1	-9	318
169	4/6/2018	1:11:52 PM	0	802 R	0.1	-9	342
170	4/6/2018	1:13:30 PM	3	735 R	0.1 Grid 51	-2	255
171	4/6/2018	1:13:42 PM	0	812 R	0.1	-9	355
172	4/6/2018	1:13:53 PM	0	814 R	0.1	-9	358
173	4/6/2018	1:14:05 PM	6	856 R	0.1	4	413
174	4/6/2018	1:14:17 PM	1	955 R	0.1	-7	541
175	4/6/2018	1:16:26 PM	0	710 R	0.1 Grid 52	-9	223
176	4/6/2018	1:16:37 PM	0	775 R	0.1	-9	307
177	4/6/2018	1:16:49 PM	7	915 R	0.1	6	489
178	4/6/2018	1:17:01 PM	1	866 R	0.1	-7	426
179	4/6/2018	1:17:12 PM	0	915 R	0.1	-9	489
180	4/6/2018	1:18:35 PM	0	731 R	0.1 Grid 53	-9	250
181	4/6/2018	1:18:47 PM	0	796 R	0.1	-9	335
182	4/6/2018	1:18:58 PM	0	963 R	0.1	-9	552
183	4/6/2018	1:19:10 PM	0	908 R	0.1	-9	480
184	4/6/2018	1:19:22 PM	0	992 R	0.1	-9	590
185	4/6/2018	1:20:32 PM	8	766 R	0.1 Grid 54	9	295
186	4/6/2018	1:20:44 PM	7	837 R	0.1	6	388
187	4/6/2018	1:20:56 PM	1	1028 R	0.1	-7	637
188	4/6/2018	1:21:07 PM	9	1010 R	0.1	11	613
189	4/6/2018	1:21:19 PM	2	918 R	0.1	-5	493
190	4/6/2018	1:25:30 PM	6	706 R	0.1 Grid 55	4	217
191	4/6/2018	1:25:41 PM	16	808 R	0.1	26	350
192	4/6/2018	1:25:53 PM	8	830 R	0.1	9	379
193	4/6/2018	1:26:05 PM	5	963 R	0.1	2	552
194	4/6/2018	1:26:16 PM	8	900 R	0.1	9	470
195	4/6/2018	1:27:17 PM	5	780 R	0.1 Grid 56	2	314
196	4/6/2018	1:27:29 PM	0	836 R	0.1	-9	387
197	4/6/2018	1:27:41 PM	3	1308 R	0.1	-2	1001
198	4/6/2018	1:27:52 PM	8	1093 R	0.1	9	721
199	4/6/2018	1:28:04 PM	2	1016 R	0.1	-5	621
		Maximum:	22	1628		40	1418
		Average:	4	864		-1	424

StDev: 4 173

10 226

Room 103A Floor

2360 SN:268497

43-37 SN:093965

Cal Due Date: 10/10/2018

Surveyor: Thomas Hogan

Bldg 218

Room 103A Floor Grids 1 thru 45

Alpha Efficiency: 0.31

Beta/Gamma Efficiency: 0.352

Alpha Background: 3.3

Beta/Gamma Background: 484

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count Time	Location	dpm/100cm ²	
								Alpha	Beta
1	4/10/2018	10:33:15 AM	0	502	R	0.1	Grid 1	-7	23
2	4/10/2018	10:33:27 AM	11	569	R	0.1		17	111
3	4/10/2018	10:33:39 AM	2	582	R	0.1		-3	128
4	4/10/2018	10:33:50 AM	2	789	R	0.1		-3	397
5	4/10/2018	10:34:02 AM	0	781	R	0.1		-7	387
6	4/10/2018	10:34:14 AM	3	632	R	0.1		-1	193
7	4/10/2018	10:34:26 AM	9	643	R	0.1		13	207
8	4/10/2018	10:34:37 AM	2	502	R	0.1		-3	23
9	4/10/2018	10:34:49 AM	7	513	R	0.1		8	38
10	4/10/2018	10:36:02 AM	5	484	R	0.1	Grid 2	4	0
11	4/10/2018	10:36:14 AM	1	487	R	0.1		-5	4
12	4/10/2018	10:36:26 AM	3	537	R	0.1		-1	69
13	4/10/2018	10:36:37 AM	5	506	R	0.1		4	29
14	4/10/2018	10:36:49 AM	4	431	R	0.1		2	-69
15	4/10/2018	10:37:01 AM	3	468	R	0.1		-1	-21
16	4/10/2018	10:37:13 AM	4	551	R	0.1		2	87
17	4/10/2018	10:37:24 AM	4	537	R	0.1		2	69
18	4/10/2018	10:37:36 AM	7	511	R	0.1		8	35
19	4/10/2018	10:37:48 AM	3	690	R	0.1		-1	268
20	4/10/2018	10:39:33 AM	0	1187	R	0.1	Grid 3	-7	915
21	4/10/2018	10:39:45 AM	5	915	R	0.1		4	561
22	4/10/2018	10:39:57 AM	1	844	R	0.1		-5	469
23	4/10/2018	10:40:09 AM	4	879	R	0.1		2	514
24	4/10/2018	10:40:20 AM	3	866	R	0.1		-1	497
25	4/10/2018	10:40:32 AM	3	871	R	0.1		-1	504
26	4/10/2018	10:40:44 AM	2	527	R	0.1		-3	56
27	4/10/2018	10:40:56 AM	8	455	R	0.1		10	-38
28	4/10/2018	10:41:07 AM	2	473	R	0.1		-3	-14
29	4/10/2018	10:41:19 AM	7	565	R	0.1		8	105
30	4/10/2018	10:42:30 AM	6	740	R	0.1	Grid 4	6	333
31	4/10/2018	10:42:42 AM	1	668	R	0.1		-5	240
32	4/10/2018	10:42:53 AM	6	702	R	0.1		6	284
33	4/10/2018	10:43:05 AM	9	874	R	0.1		13	508
34	4/10/2018	10:43:17 AM	2	866	R	0.1		-3	497
35	4/10/2018	10:43:29 AM	3	799	R	0.1		-1	410
36	4/10/2018	10:43:40 AM	0	856	R	0.1		-7	484
37	4/10/2018	10:43:52 AM	4	821	R	0.1		2	439
38	4/10/2018	10:44:04 AM	1	625	R	0.1		-5	184
39	4/10/2018	10:44:16 AM	4	1065	R	0.1		2	756
40	4/10/2018	10:46:17 AM	3	568	R	0.1	Grid 5	-1	109

41	4/10/2018	10:46:29 AM	8	683 R	0.1	10	259
42	4/10/2018	10:46:40 AM	9	795 R	0.1	13	405
43	4/10/2018	10:46:52 AM	9	807 R	0.1	13	420
44	4/10/2018	10:47:04 AM	26	856 R	0.1	50	484
45	4/10/2018	10:47:16 AM	15	982 R	0.1	26	648
46	4/10/2018	10:47:28 AM	3	1060 R	0.1	-1	750
47	4/10/2018	10:47:39 AM	0	860 R	0.1	-7	489
48	4/10/2018	10:47:51 AM	12	660 R	0.1	19	229
49	4/10/2018	10:48:03 AM	3	1077 R	0.1	-1	772
50	4/10/2018	10:49:59 AM	0	764 R	0.1 Grid 6	-7	364
51	4/10/2018	10:50:11 AM	9	971 R	0.1	13	634
52	4/10/2018	10:50:23 AM	2	888 R	0.1	-3	526
53	4/10/2018	10:50:34 AM	0	1199 R	0.1	-7	931
54	4/10/2018	10:50:46 AM	0	1390 R	0.1	-7	1179
55	4/10/2018	10:50:58 AM	0	1100 R	0.1	-7	802
56	4/10/2018	10:51:10 AM	0	1027 R	0.1	-7	707
57	4/10/2018	10:51:21 AM	11	956 R	0.1	17	614
58	4/10/2018	10:51:33 AM	8	951 R	0.1	10	608
59	4/10/2018	10:51:45 AM	2	921 R	0.1	-3	569
60	4/10/2018	10:55:07 AM	0	864 R	0.1 Grid 7	-7	495
61	4/10/2018	10:55:19 AM	0	912 R	0.1	-7	557
62	4/10/2018	10:55:31 AM	7	921 R	0.1	8	569
63	4/10/2018	10:55:43 AM	1	916 R	0.1	-5	562
64	4/10/2018	10:55:54 AM	6	1011 R	0.1	6	686
65	4/10/2018	10:56:06 AM	1	816 R	0.1	-5	432
66	4/10/2018	10:56:18 AM	4	843 R	0.1	2	467
67	4/10/2018	10:56:30 AM	3	798 R	0.1	-1	409
68	4/10/2018	10:56:41 AM	4	610 R	0.1	2	164
69	4/10/2018	10:56:53 AM	0	963 R	0.1	-7	624
70	4/10/2018	10:59:34 AM	11	739 R	0.1 Grid 8	17	332
71	4/10/2018	10:59:46 AM	2	700 R	0.1	-3	281
72	4/10/2018	10:59:58 AM	7	675 R	0.1	8	249
73	4/10/2018	11:00:10 AM	1	558 R	0.1	-5	96
74	4/10/2018	11:00:21 AM	15	656 R	0.1	26	224
75	4/10/2018	11:00:33 AM	7	774 R	0.1	8	377
76	4/10/2018	11:00:45 AM	18	687 R	0.1	33	264
77	4/10/2018	11:00:57 AM	6	717 R	0.1	6	303
78	4/10/2018	11:01:08 AM	15	907 R	0.1	26	551
79	4/10/2018	11:01:20 AM	9	1031 R	0.1	13	712
80	4/10/2018	11:03:27 AM	8	1203 R	0.1 Grid 9	10	936
81	4/10/2018	11:03:39 AM	2	1032 R	0.1	-3	713
82	4/10/2018	11:03:51 AM	4	1060 R	0.1	2	750
83	4/10/2018	11:04:02 AM	3	1237 R	0.1	-1	980
84	4/10/2018	11:04:14 AM	5	1206 R	0.1	4	940
85	4/10/2018	12:48:16 PM	0	697 R	0.1 Grid 10	-7	277
86	4/10/2018	12:48:27 PM	3	798 R	0.1	-1	409
87	4/10/2018	12:48:39 PM	4	598 R	0.1	2	148
88	4/10/2018	12:48:51 PM	3	550 R	0.1	-1	86
89	4/10/2018	12:49:03 PM	0	589 R	0.1	-7	137
90	4/10/2018	12:49:14 PM	12	626 R	0.1	19	185
91	4/10/2018	12:49:26 PM	3	612 R	0.1	-1	167
92	4/10/2018	12:49:38 PM	0	583 R	0.1	-7	129
93	4/10/2018	12:49:50 PM	7	725 R	0.1	8	314
94	4/10/2018	12:50:01 PM	1	727 R	0.1	-5	316
95	4/10/2018	12:51:24 PM	4	550 R	0.1 Grid 11	2	86

96	4/10/2018	12:51:36 PM	1	553 R	0.1	-5	90
97	4/10/2018	12:51:48 PM	4	562 R	0.1	2	102
98	4/10/2018	12:52:00 PM	5	539 R	0.1	4	72
99	4/10/2018	12:52:11 PM	3	617 R	0.1	-1	173
100	4/10/2018	12:52:23 PM	4	757 R	0.1	2	355
101	4/10/2018	12:52:35 PM	10	712 R	0.1	15	297
102	4/10/2018	12:52:47 PM	2	761 R	0.1	-3	361
103	4/10/2018	12:52:58 PM	0	679 R	0.1	-7	254
104	4/10/2018	12:53:10 PM	16	632 R	0.1	28	193
105	4/10/2018	12:54:31 PM	11	687 R	0.1 Grid 12	17	264
106	4/10/2018	12:54:43 PM	2	908 R	0.1	-3	552
107	4/10/2018	12:54:54 PM	0	875 R	0.1	-7	509
108	4/10/2018	12:55:06 PM	6	793 R	0.1	6	402
109	4/10/2018	12:55:18 PM	1	811 R	0.1	-5	426
110	4/10/2018	12:55:30 PM	0	681 R	0.1	-7	256
111	4/10/2018	12:55:41 PM	0	671 R	0.1	-7	243
112	4/10/2018	12:55:53 PM	18	798 R	0.1	33	409
113	4/10/2018	12:56:05 PM	4	842 R	0.1	2	466
114	4/10/2018	12:56:17 PM	1	611 R	0.1	-5	165
115	4/10/2018	12:57:32 PM	12	728 R	0.1 Grid 13	19	318
116	4/10/2018	12:57:44 PM	2	630 R	0.1	-3	190
117	4/10/2018	12:57:55 PM	0	679 R	0.1	-7	254
118	4/10/2018	12:58:07 PM	0	752 R	0.1	-7	349
119	4/10/2018	12:58:19 PM	0	938 R	0.1	-7	591
120	4/10/2018	12:58:31 PM	14	906 R	0.1	24	549
121	4/10/2018	12:58:42 PM	10	1318 R	0.1	15	1086
122	4/10/2018	12:58:54 PM	6	1453 R	0.1	6	1261
123	4/10/2018	12:59:06 PM	1	1503 R	0.1	-5	1326
124	4/10/2018	12:59:18 PM	7	1216 R	0.1	8	953
125	4/10/2018	1:02:53 PM	13	800 R	0.1 Grid 14	22	411
126	4/10/2018	1:03:04 PM	3	1222 R	0.1	-1	961
127	4/10/2018	1:03:16 PM	0	1472 R	0.1	-7	1286
128	4/10/2018	1:03:28 PM	5	1448 R	0.1	4	1255
129	4/10/2018	1:03:40 PM	5	1541 R	0.1	4	1376
130	4/10/2018	1:03:51 PM	1	1124 R	0.1	-5	833
131	4/10/2018	1:04:03 PM	3	731 R	0.1	-1	322
132	4/10/2018	1:04:15 PM	2	523 R	0.1	-3	51
133	4/10/2018	1:04:27 PM	1	794 R	0.1	-5	404
134	4/10/2018	1:04:38 PM	3	795 R	0.1	-1	405
135	4/10/2018	1:08:58 PM	3	682 R	0.1 Grid 15	-1	258
136	4/10/2018	1:09:10 PM	8	1107 R	0.1	10	811
137	4/10/2018	1:09:21 PM	2	1079 R	0.1	-3	774
138	4/10/2018	1:09:33 PM	0	856 R	0.1	-7	484
139	4/10/2018	1:09:45 PM	8	863 R	0.1	10	493
140	4/10/2018	1:13:08 PM	0	1037 R	0.1 Grid 16	-7	720
141	4/10/2018	1:13:20 PM	11	919 R	0.1	17	566
142	4/10/2018	1:13:32 PM	22	834 R	0.1	41	456
143	4/10/2018	1:13:43 PM	5	721 R	0.1	4	308
144	4/10/2018	1:13:55 PM	5	590 R	0.1	4	138
145	4/10/2018	1:14:07 PM	1	578 R	0.1	-5	122
146	4/10/2018	1:14:19 PM	0	592 R	0.1	-7	141
147	4/10/2018	1:14:30 PM	3	677 R	0.1	-1	251
148	4/10/2018	1:14:42 PM	0	607 R	0.1	-7	160
149	4/10/2018	1:14:54 PM	11	607 R	0.1	17	160
150	4/10/2018	1:16:31 PM	0	589 R	0.1 Grid 17	-7	137

151	4/10/2018	1:16:43 PM	0	585 R	0.1	-7	131
152	4/10/2018	1:16:54 PM	2	603 R	0.1	-3	155
153	4/10/2018	1:17:06 PM	0	762 R	0.1	-7	362
154	4/10/2018	1:17:18 PM	1	1023 R	0.1	-5	702
155	4/10/2018	1:17:30 PM	2	830 R	0.1	-3	450
156	4/10/2018	1:17:41 PM	2	852 R	0.1	-3	479
157	4/10/2018	1:17:53 PM	0	816 R	0.1	-7	432
158	4/10/2018	1:18:05 PM	7	762 R	0.1	8	362
159	4/10/2018	1:18:17 PM	1	707 R	0.1	-5	290
160	4/10/2018	1:19:27 PM	2	916 R	0.1 Grid 18	-3	562
161	4/10/2018	1:19:38 PM	5	1277 R	0.1	4	1032
162	4/10/2018	1:19:50 PM	3	1363 R	0.1	-1	1144
163	4/10/2018	1:20:02 PM	3	956 R	0.1	-1	614
164	4/10/2018	1:20:14 PM	2	737 R	0.1	-3	329
165	4/10/2018	1:32:26 PM	3	560 R	0.1 Grid 19	-1	99
166	4/10/2018	1:32:38 PM	0	551 R	0.1	-7	87
167	4/10/2018	1:32:49 PM	3	603 R	0.1	-1	155
168	4/10/2018	1:33:01 PM	7	613 R	0.1	8	168
169	4/10/2018	1:33:13 PM	1	807 R	0.1	-5	420
170	4/10/2018	1:33:25 PM	3	734 R	0.1	-1	325
171	4/10/2018	1:33:36 PM	3	802 R	0.1	-1	414
172	4/10/2018	1:33:48 PM	3	629 R	0.1	-1	189
173	4/10/2018	1:34:00 PM	6	551 R	0.1	6	87
174	4/10/2018	1:34:12 PM	0	620 R	0.1	-7	177
175	4/10/2018	1:36:58 PM	7	620 R	0.1 Grid 20	8	177
176	4/10/2018	1:37:10 PM	5	572 R	0.1	4	115
177	4/10/2018	1:37:21 PM	3	701 R	0.1	-1	282
178	4/10/2018	1:37:33 PM	2	838 R	0.1	-3	461
179	4/10/2018	1:37:45 PM	2	717 R	0.1	-3	303
180	4/10/2018	1:37:57 PM	1	704 R	0.1	-5	286
181	4/10/2018	1:38:08 PM	7	852 R	0.1	8	479
182	4/10/2018	1:38:20 PM	1	801 R	0.1	-5	413
183	4/10/2018	1:38:32 PM	13	676 R	0.1	22	250
184	4/10/2018	1:38:44 PM	24	730 R	0.1	46	320
185	4/10/2018	1:42:44 PM	4	609 R	0.1 Grid 21	2	163
186	4/10/2018	1:42:55 PM	11	652 R	0.1	17	219
187	4/10/2018	1:43:07 PM	6	855 R	0.1	6	483
188	4/10/2018	1:43:19 PM	9	718 R	0.1	13	305
189	4/10/2018	1:43:31 PM	2	779 R	0.1	-3	384
190	4/10/2018	1:43:42 PM	0	926 R	0.1	-7	575
191	4/10/2018	1:43:54 PM	0	769 R	0.1	-7	371
192	4/10/2018	1:44:06 PM	6	1222 R	0.1	6	961
193	4/10/2018	1:44:18 PM	1	1021 R	0.1	-5	699
194	4/10/2018	1:44:29 PM	0	813 R	0.1	-7	428
195	4/10/2018	1:48:50 PM	4	692 R	0.1 Grid 22	2	271
196	4/10/2018	1:49:01 PM	0	756 R	0.1	-7	354
197	4/10/2018	1:49:13 PM	10	847 R	0.1	15	473
198	4/10/2018	1:49:25 PM	2	929 R	0.1	-3	579
199	4/10/2018	1:49:37 PM	4	1116 R	0.1	2	823
200	4/10/2018	1:49:48 PM	0	700 R	0.1	-7	281
201	4/10/2018	1:50:00 PM	3	924 R	0.1	-1	573
202	4/10/2018	1:50:12 PM	3	604 R	0.1	-1	156
203	4/10/2018	1:50:24 PM	1	617 R	0.1	-5	173
204	4/10/2018	1:50:35 PM	6	887 R	0.1	6	525
205	4/10/2018	1:52:43 PM	0	1106 R	0.1 Grid 23	-7	810

206	4/10/2018	1:52:55 PM	4	991 R	0.1	2	660
207	4/10/2018	1:53:06 PM	5	797 R	0.1	4	407
208	4/10/2018	1:53:18 PM	4	691 R	0.1	2	269
209	4/10/2018	1:53:30 PM	3	710 R	0.1	-1	294
210	4/10/2018	1:58:07 PM	4	697 R	0.1 Grid 25	2	277
211	4/10/2018	1:58:19 PM	6	874 R	0.1	6	508
212	4/10/2018	1:58:31 PM	1	1106 R	0.1	-5	810
213	4/10/2018	1:58:42 PM	0	1061 R	0.1	-7	751
214	4/10/2018	1:58:54 PM	9	974 R	0.1	13	638
215	4/10/2018	2:02:11 PM	0	727 R	0.1 Grid 26	-7	316
216	4/10/2018	2:02:23 PM	6	831 R	0.1	6	452
217	4/10/2018	2:02:35 PM	12	881 R	0.1	19	517
218	4/10/2018	2:02:47 PM	3	1040 R	0.1	-1	724
219	4/10/2018	2:02:58 PM	3	1192 R	0.1	-1	922
220	4/10/2018	2:03:10 PM	0	720 R	0.1	-7	307
221	4/10/2018	2:03:22 PM	4	788 R	0.1	2	396
222	4/10/2018	2:03:34 PM	5	1268 R	0.1	4	1021
223	4/10/2018	2:03:45 PM	0	699 R	0.1	-7	280
224	4/10/2018	2:03:57 PM	8	833 R	0.1	10	454
225	4/10/2018	2:17:06 PM	0	504 R	0.1 Grid 27	-7	26
226	4/10/2018	2:17:18 PM	0	464 R	0.1	-7	-26
227	4/10/2018	2:17:29 PM	3	528 R	0.1	-1	57
228	4/10/2018	2:17:41 PM	0	711 R	0.1	-7	295
229	4/10/2018	2:17:53 PM	3	749 R	0.1	-1	345
230	4/10/2018	2:43:54 PM	5	754 R	0.1 Grid 28	4	351
231	4/10/2018	2:44:05 PM	0	864 R	0.1	-7	495
232	4/10/2018	2:44:17 PM	5	865 R	0.1	4	496
233	4/10/2018	2:44:29 PM	3	881 R	0.1	-1	517
234	4/10/2018	2:44:41 PM	0	739 R	0.1	-7	332
235	4/10/2018	2:44:52 PM	6	766 R	0.1	6	367
236	4/10/2018	2:45:04 PM	7	779 R	0.1	8	384
237	4/10/2018	2:45:16 PM	4	829 R	0.1	2	449
238	4/10/2018	2:45:28 PM	0	885 R	0.1	-7	522
239	4/10/2018	2:45:39 PM	3	1026 R	0.1	-1	706
240	4/10/2018	2:47:25 PM	11	506 R	0.1 Grid 29	17	29
241	4/10/2018	2:47:37 PM	2	556 R	0.1	-3	94
242	4/10/2018	2:47:48 PM	5	792 R	0.1	4	401
243	4/10/2018	2:48:00 PM	3	807 R	0.1	-1	420
244	4/10/2018	2:48:12 PM	4	772 R	0.1	2	375
245	4/10/2018	2:48:24 PM	8	690 R	0.1	10	268
246	4/10/2018	2:48:35 PM	10	657 R	0.1	15	225
247	4/10/2018	2:48:47 PM	2	715 R	0.1	-3	301
248	4/10/2018	2:48:59 PM	0	638 R	0.1	-7	200
249	4/10/2018	2:49:11 PM	12	602 R	0.1	19	154
250	4/10/2018	2:50:38 PM	0	517 R	0.1 Grid 30	-7	43
251	4/10/2018	2:50:50 PM	8	662 R	0.1	10	232
252	4/10/2018	2:51:02 PM	2	624 R	0.1	-3	182
253	4/10/2018	2:51:13 PM	0	584 R	0.1	-7	130
254	4/10/2018	2:51:25 PM	0	589 R	0.1	-7	137
255	4/10/2018	2:51:37 PM	3	656 R	0.1	-1	224
256	4/10/2018	2:51:49 PM	5	630 R	0.1	4	190
257	4/10/2018	2:52:00 PM	4	635 R	0.1	2	197
258	4/10/2018	2:52:12 PM	0	729 R	0.1	-7	319
259	4/10/2018	2:52:24 PM	3	950 R	0.1	-1	607
260	4/10/2018	2:55:09 PM	4	949 R	0.1 Grid 31	2	605

261	4/10/2018	2:55:20 PM	4	1177 R	0.1	2	902
262	4/10/2018	2:55:32 PM	6	811 R	0.1	6	426
263	4/10/2018	2:55:44 PM	0	713 R	0.1	-7	298
264	4/10/2018	2:55:56 PM	3	667 R	0.1	-1	238
265	4/10/2018	2:56:07 PM	3	668 R	0.1	-1	240
266	4/10/2018	2:56:19 PM	6	588 R	0.1	6	135
267	4/10/2018	2:56:31 PM	2	630 R	0.1	-3	190
268	4/10/2018	2:56:43 PM	8	691 R	0.1	10	269
269	4/10/2018	2:56:54 PM	2	778 R	0.1	-3	383
270	4/10/2018	3:00:01 PM	15	622 R	0.1 Grid 32	26	180
271	4/10/2018	3:00:13 PM	3	890 R	0.1	-1	528
272	4/10/2018	3:00:25 PM	7	887 R	0.1	8	525
273	4/10/2018	3:00:36 PM	1	675 R	0.1	-5	249
274	4/10/2018	3:00:48 PM	0	947 R	0.1	-7	603
275	4/10/2018	3:01:00 PM	0	1014 R	0.1	-7	690
276	4/10/2018	3:01:12 PM	11	754 R	0.1	17	351
277	4/10/2018	3:01:24 PM	14	701 R	0.1	24	282
278	4/10/2018	3:01:35 PM	3	721 R	0.1	-1	308
279	4/10/2018	3:01:47 PM	0	896 R	0.1	-7	536
280	4/10/2018	3:05:58 PM	0	590 R	0.1 Grid 33	-7	138
281	4/10/2018	3:06:09 PM	6	611 R	0.1	6	165
282	4/10/2018	3:06:21 PM	1	655 R	0.1	-5	223
283	4/10/2018	3:06:33 PM	0	571 R	0.1	-7	113
284	4/10/2018	3:06:45 PM	0	651 R	0.1	-7	217
285	4/10/2018	3:10:14 PM	3	512 R	0.1 Grid 34	-1	36
286	4/10/2018	3:10:26 PM	5	615 R	0.1	4	171
287	4/10/2018	3:10:37 PM	4	630 R	0.1	2	190
288	4/10/2018	3:10:49 PM	0	767 R	0.1	-7	368
289	4/10/2018	3:11:01 PM	4	752 R	0.1	2	349
290	4/10/2018	3:11:13 PM	3	596 R	0.1	-1	146
291	4/10/2018	3:11:24 PM	0	590 R	0.1	-7	138
292	4/10/2018	3:11:36 PM	6	894 R	0.1	6	534
293	4/10/2018	3:11:48 PM	1	901 R	0.1	-5	543
294	4/10/2018	3:12:00 PM	0	719 R	0.1	-7	306
295	4/10/2018	3:16:21 PM	3	507 R	0.1 Grid 35	-1	30
296	4/10/2018	3:16:33 PM	0	721 R	0.1	-7	308
297	4/10/2018	3:16:45 PM	0	521 R	0.1	-7	48
298	4/10/2018	3:16:56 PM	8	587 R	0.1	10	134
299	4/10/2018	3:17:08 PM	2	716 R	0.1	-3	302
300	4/10/2018	3:17:20 PM	0	691 R	0.1	-7	269
301	4/10/2018	3:17:32 PM	4	712 R	0.1	2	297
302	4/10/2018	3:17:43 PM	1	726 R	0.1	-5	315
303	4/10/2018	3:17:55 PM	5	597 R	0.1	4	147
304	4/10/2018	3:18:07 PM	4	542 R	0.1	2	75
305	4/11/2018	8:55:24 AM	5	521 R	0.1 Grid 36	4	48
306	4/11/2018	8:55:36 AM	0	651 R	0.1	-7	217
307	4/11/2018	8:55:47 AM	10	633 R	0.1	15	194
308	4/11/2018	8:55:59 AM	2	585 R	0.1	-3	131
309	4/11/2018	8:56:11 AM	0	783 R	0.1	-7	389
310	4/11/2018	8:59:13 AM	3	748 R	0.1 Grid 37	-1	344
311	4/11/2018	8:59:25 AM	4	618 R	0.1	2	174
312	4/11/2018	8:59:36 AM	0	559 R	0.1	-7	98
313	4/11/2018	8:59:48 AM	5	521 R	0.1	4	48
314	4/11/2018	9:00:00 AM	4	495 R	0.1	2	14
315	4/11/2018	9:00:12 AM	13	614 R	0.1	22	169

316	4/11/2018	9:00:23 AM	15	540 R	0.1	26	73
317	4/11/2018	9:00:35 AM	3	632 R	0.1	-1	193
318	4/11/2018	9:00:47 AM	4	682 R	0.1	2	258
319	4/11/2018	9:00:59 AM	5	689 R	0.1	4	267
320	4/11/2018	9:06:07 AM	4	532 R	0.1 Grid 38	2	62
321	4/11/2018	9:06:19 AM	0	595 R	0.1	-7	144
322	4/11/2018	9:06:31 AM	3	587 R	0.1	-1	134
323	4/11/2018	9:06:43 AM	0	681 R	0.1	-7	256
324	4/11/2018	9:06:54 AM	0	543 R	0.1	-7	77
325	4/11/2018	9:07:06 AM	0	512 R	0.1	-7	36
326	4/11/2018	9:07:18 AM	3	577 R	0.1	-1	121
327	4/11/2018	9:07:30 AM	7	510 R	0.1	8	34
328	4/11/2018	9:07:41 AM	6	615 R	0.1	6	171
329	4/11/2018	9:07:53 AM	1	551 R	0.1	-5	87
330	4/11/2018	9:10:10 AM	0	544 R	0.1 Grid 39	-7	78
331	4/11/2018	9:10:22 AM	5	528 R	0.1	4	57
332	4/11/2018	9:10:34 AM	7	662 R	0.1	8	232
333	4/11/2018	9:10:45 AM	1	521 R	0.1	-5	48
334	4/11/2018	9:10:57 AM	0	613 R	0.1	-7	168
335	4/11/2018	9:11:09 AM	4	565 R	0.1	2	105
336	4/11/2018	9:11:21 AM	8	471 R	0.1	10	-17
337	4/11/2018	9:11:32 AM	2	644 R	0.1	-3	208
338	4/11/2018	9:11:44 AM	0	671 R	0.1	-7	243
339	4/11/2018	9:11:56 AM	0	680 R	0.1	-7	255
340	4/11/2018	9:14:50 AM	3	562 R	0.1 Grid 40	-1	102
341	4/11/2018	9:15:02 AM	5	593 R	0.1	4	142
342	4/11/2018	9:15:14 AM	0	587 R	0.1	-7	134
343	4/11/2018	9:15:25 AM	4	550 R	0.1	2	86
344	4/11/2018	9:15:37 AM	3	608 R	0.1	-1	161
345	4/11/2018	9:15:49 AM	4	546 R	0.1	2	81
346	4/11/2018	9:16:01 AM	3	553 R	0.1	-1	90
347	4/11/2018	9:16:12 AM	0	719 R	0.1	-7	306
348	4/11/2018	9:16:24 AM	0	636 R	0.1	-7	198
349	4/11/2018	9:16:36 AM	10	630 R	0.1	15	190
350	4/11/2018	9:18:52 AM	3	693 R	0.1 Grid 41	-1	272
351	4/11/2018	9:19:03 AM	0	618 R	0.1	-7	174
352	4/11/2018	9:19:15 AM	0	663 R	0.1	-7	233
353	4/11/2018	9:19:27 AM	14	600 R	0.1	24	151
354	4/11/2018	9:19:39 AM	11	575 R	0.1	17	118
355	4/11/2018	9:19:50 AM	2	660 R	0.1	-3	229
356	4/11/2018	9:20:02 AM	10	699 R	0.1	15	280
357	4/11/2018	9:20:14 AM	2	735 R	0.1	-3	327
358	4/11/2018	9:20:26 AM	0	850 R	0.1	-7	476
359	4/11/2018	9:20:37 AM	8	1075 R	0.1	10	769
360	4/11/2018	9:25:17 AM	7	590 R	0.1 Grid 42	8	138
361	4/11/2018	9:25:28 AM	5	592 R	0.1	4	141
362	4/11/2018	9:25:40 AM	18	857 R	0.1	33	486
363	4/11/2018	9:25:52 AM	4	852 R	0.1	2	479
364	4/11/2018	9:26:04 AM	13	759 R	0.1	22	358
365	4/11/2018	9:26:15 AM	11	689 R	0.1	17	267
366	4/11/2018	9:26:27 AM	2	728 R	0.1	-3	318
367	4/11/2018	9:26:39 AM	16	703 R	0.1	28	285
368	4/11/2018	9:26:51 AM	9	694 R	0.1	13	273
369	4/11/2018	9:27:02 AM	2	665 R	0.1	-3	236
370	4/11/2018	9:29:59 AM	0	666 R	0.1 Grid 43	-7	237

371	4/11/2018	9:30:11 AM	10	661 R	0.1	15	230	
372	4/11/2018	9:30:23 AM	2	640 R	0.1	-3	203	
373	4/11/2018	9:30:35 AM	0	653 R	0.1	-7	220	
374	4/11/2018	9:30:47 AM	3	537 R	0.1	-1	69	
375	4/11/2018	9:30:58 AM	0	501 R	0.1	-7	22	
376	4/11/2018	9:31:10 AM	5	557 R	0.1	4	95	
377	4/11/2018	9:31:22 AM	1	609 R	0.1	-5	163	
378	4/11/2018	9:31:34 AM	6	517 R	0.1	6	43	
379	4/11/2018	9:31:45 AM	35	617 R	0.1	70	173	
380	4/11/2018	9:33:18 AM	5	553 R	0.1 Grid 44	4	90	
381	4/11/2018	9:33:30 AM	7	597 R	0.1	8	147	
382	4/11/2018	9:33:41 AM	1	545 R	0.1	-5	79	
383	4/11/2018	9:33:53 AM	9	667 R	0.1	13	238	
384	4/11/2018	9:34:05 AM	14	533 R	0.1	24	64	
385	4/11/2018	9:34:17 AM	3	583 R	0.1	-1	129	
386	4/11/2018	9:34:28 AM	7	525 R	0.1	8	53	
387	4/11/2018	9:34:40 AM	1	642 R	0.1	-5	206	
388	4/11/2018	9:34:52 AM	0	633 R	0.1	-7	194	
389	4/11/2018	9:35:04 AM	0	649 R	0.1	-7	215	
390	4/11/2018	9:41:23 AM	0	613 R	0.1 Grid 45	-7	168	
391	4/11/2018	9:41:34 AM	5	989 R	0.1	4	657	
392	4/11/2018	9:41:46 AM	1	807 R	0.1	-5	420	
393	4/11/2018	9:41:58 AM	0	919 R	0.1	-7	566	
394	4/11/2018	9:42:10 AM	0	812 R	0.1	-7	427	
			Maximum:	35	1541		70	1376
			Average:	4	747		2	343
			StDev:	5	199		10	259

Room 103A Lower Wall

2360 SN:297743

43-37# 302111

Cal Due Date: 10/10/2018

Surveyor: Josefina Matus/ Joan Cosgrove

Bldg 218

Room 103A Lower Wall Grids 1 thru 52

Alpha Efficiency: 0.319

Beta/Gamma Efficiency: 0.384

Alpha Background: 4.1

Beta/Gamma Background: 539

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²	
									Alpha	Beta
1	4/9/2018	9:37:59 AM	0	490	R	0.1	Grid 1	-9	-58	
2	4/9/2018	9:38:10 AM	4	634	R	0.1		0	113	
3	4/9/2018	9:38:22 AM	1	532	R	0.1		-7	-8	
4	4/9/2018	9:38:34 AM	3	560	R	0.1		-2	25	
5	4/9/2018	9:38:45 AM	0	586	R	0.1		-9	56	
6	4/9/2018	9:38:57 AM	2	466	R	0.1		-5	-87	
7	4/9/2018	9:39:09 AM	0	584	R	0.1		-9	54	
8	4/9/2018	9:39:20 AM	2	653	R	0.1		-5	136	
9	4/9/2018	9:39:32 AM	0	569	R	0.1		-9	36	
10	4/9/2018	9:39:44 AM	6	478	R	0.1		4	-73	
11	4/9/2018	9:41:10 AM	0	499	R	0.1	Grid 2	-9	-48	
12	4/9/2018	9:41:22 AM	5	556	R	0.1		2	20	
13	4/9/2018	9:41:33 AM	1	518	R	0.1		-7	-25	
14	4/9/2018	9:41:45 AM	4	583	R	0.1		0	53	
15	4/9/2018	9:41:56 AM	1	563	R	0.1		-7	29	
16	4/9/2018	9:42:08 AM	0	656	R	0.1		-9	140	
17	4/9/2018	9:42:20 AM	7	590	R	0.1		6	61	
18	4/9/2018	9:42:31 AM	1	504	R	0.1		-7	-42	
19	4/9/2018	9:42:43 AM	8	548	R	0.1		8	11	
20	4/9/2018	9:43:36 AM	4	512	R	0.1	Grid 3	0	-32	
21	4/9/2018	9:43:48 AM	1	692	R	0.1		-7	183	
22	4/9/2018	9:43:59 AM	0	644	R	0.1		-9	125	
23	4/9/2018	9:44:11 AM	8	713	R	0.1		8	208	
24	4/9/2018	9:44:23 AM	14	786	R	0.1		21	295	
25	4/9/2018	9:44:34 AM	3	719	R	0.1		-2	215	
26	4/9/2018	9:44:46 AM	0	800	R	0.1		-9	311	
27	4/9/2018	9:44:57 AM	0	650	R	0.1		-9	132	
28	4/9/2018	9:45:09 AM	15	495	R	0.1		23	-53	
29	4/9/2018	9:45:21 AM	3	612	R	0.1		-2	87	
30	4/9/2018	9:45:47 AM	10	904	R	0.1	Grid 4	13	436	
31	4/9/2018	9:45:59 AM	2	1266	R	0.1		-5	867	
32	4/9/2018	9:46:10 AM	4	1235	R	0.1		0	830	
33	4/9/2018	9:46:22 AM	3	1288	R	0.1		-2	894	
34	4/9/2018	9:46:34 AM	10	1428	R	0.1		13	1061	
35	4/9/2018	9:46:45 AM	10	1309	R	0.1		13	919	
36	4/9/2018	9:46:57 AM	7	1184	R	0.1		6	770	
37	4/9/2018	9:47:08 AM	7	1196	R	0.1		6	784	
38	4/9/2018	9:47:20 AM	1	979	R	0.1		-7	525	

39	4/9/2018	9:47:32 AM	0	736 R	0.1	-9	235
40	4/9/2018	9:49:40 AM	5	1308 R	0.1 Grid 5	2	918
41	4/9/2018	9:49:51 AM	1	1332 R	0.1	-7	946
42	4/9/2018	9:50:03 AM	3	1220 R	0.1	-2	813
43	4/9/2018	9:50:15 AM	0	1042 R	0.1	-9	600
44	4/9/2018	9:50:26 AM	4	2053 R	0.1	0	1807
45	4/9/2018	9:50:38 AM	3	2244 R	0.1	-2	2034
46	4/9/2018	9:50:50 AM	2	1650 R	0.1	-5	1326
47	4/9/2018	9:51:01 AM	7	1599 R	0.1	6	1265
48	4/9/2018	9:51:13 AM	1	1936 R	0.1	-7	1667
49	4/9/2018	9:51:25 AM	0	1864 R	0.1	-9	1581
50	4/9/2018	9:53:14 AM	0	1468 R	0.1 Grid 6	-9	1108
51	4/9/2018	9:53:26 AM	15	1470 R	0.1	23	1111
52	4/9/2018	9:53:37 AM	17	1543 R	0.1	28	1198
53	4/9/2018	9:53:49 AM	3	1593 R	0.1	-2	1258
54	4/9/2018	9:54:01 AM	3	1466 R	0.1	-2	1106
55	4/9/2018	9:54:12 AM	4	1466 R	0.1	0	1106
56	4/9/2018	9:54:24 AM	4	1421 R	0.1	0	1052
57	4/9/2018	9:54:36 AM	0	1817 R	0.1	-9	1525
58	4/9/2018	9:54:47 AM	7	1491 R	0.1	6	1136
59	4/9/2018	9:54:59 AM	1	1439 R	0.1	-7	1074
60	4/9/2018	9:57:36 AM	0	1050 R	0.1 Grid 7	-9	610
61	4/9/2018	9:57:47 AM	0	1193 R	0.1	-9	780
62	4/9/2018	9:57:59 AM	0	1067 R	0.1	-9	630
63	4/9/2018	9:58:11 AM	3	930 R	0.1	-2	467
64	4/9/2018	9:58:22 AM	0	936 R	0.1	-9	474
65	4/9/2018	9:58:34 AM	15	1268 R	0.1	23	870
66	4/9/2018	9:58:46 AM	3	1167 R	0.1	-2	749
67	4/9/2018	9:58:57 AM	0	1136 R	0.1	-9	712
68	4/9/2018	9:59:09 AM	0	1156 R	0.1	-9	736
69	4/9/2018	9:59:21 AM	12	1636 R	0.1	17	1309
70	4/9/2018	9:59:56 AM	3	715 R	0.1 Grid 8	-2	210
71	4/9/2018	10:00:07 AM	0	716 R	0.1	-9	211
72	4/9/2018	10:00:19 AM	14	720 R	0.1	21	216
73	4/9/2018	10:00:31 AM	3	748 R	0.1	-2	249
74	4/9/2018	10:00:42 AM	12	899 R	0.1	17	430
75	4/9/2018	10:00:54 AM	3	827 R	0.1	-2	344
76	4/9/2018	10:01:06 AM	0	782 R	0.1	-9	290
77	4/9/2018	10:01:17 AM	0	739 R	0.1	-9	239
78	4/9/2018	10:01:29 AM	4	879 R	0.1	0	406
79	4/9/2018	10:01:41 AM	1	658 R	0.1	-7	142
80	4/9/2018	10:01:52 AM	6	791 R	0.1	4	301
81	4/9/2018	12:27:26 PM	0	738 R	0.1 Grid 9	-9	237
82	4/9/2018	12:27:38 PM	3	840 R	0.1	-2	359
83	4/9/2018	12:27:49 PM	0	883 R	0.1	-9	410
84	4/9/2018	12:28:01 PM	0	992 R	0.1	-9	541
85	4/9/2018	12:28:12 PM	9	901 R	0.1	11	432
86	4/9/2018	12:28:24 PM	2	906 R	0.1	-5	438
87	4/9/2018	12:28:36 PM	12	1045 R	0.1	17	604
88	4/9/2018	12:28:47 PM	3	899 R	0.1	-2	430
89	4/9/2018	12:28:59 PM	0	962 R	0.1	-9	505
90	4/9/2018	12:29:11 PM	0	812 R	0.1	-9	326
91	4/9/2018	12:31:34 PM	0	838 R	0.1 Grid 10	-9	357

92	4/9/2018 12:31:46 PM	4	1026 R	0.1	0	581
93	4/9/2018 12:31:57 PM	1	933 R	0.1	-7	470
94	4/9/2018 12:32:09 PM	0	789 R	0.1	-9	298
95	4/9/2018 12:32:21 PM	6	907 R	0.1	4	439
96	4/9/2018 12:32:32 PM	9	933 R	0.1	11	470
97	4/9/2018 12:32:44 PM	2	881 R	0.1	-5	408
98	4/9/2018 12:32:56 PM	3	686 R	0.1	-2	175
99	4/9/2018 12:33:07 PM	13	756 R	0.1	19	259
100	4/9/2018 12:33:19 PM	3	718 R	0.1	-2	214
101	4/9/2018 12:33:30 PM	0	946 R	0.1	-9	486
102	4/9/2018 12:35:24 PM	0	519 R	0.1 Grid 11	-9	-24
103	4/9/2018 12:35:36 PM	3	490 R	0.1	-2	-58
104	4/9/2018 12:35:47 PM	0	477 R	0.1	-9	-74
105	4/9/2018 12:35:59 PM	4	534 R	0.1	0	-6
106	4/9/2018 12:36:10 PM	1	506 R	0.1	-7	-39
107	4/9/2018 12:36:22 PM	3	518 R	0.1	-2	-25
108	4/9/2018 12:36:34 PM	8	562 R	0.1	8	27
109	4/9/2018 12:36:45 PM	8	547 R	0.1	8	10
110	4/9/2018 12:36:57 PM	2	558 R	0.1	-5	23
111	4/9/2018 12:37:09 PM	0	577 R	0.1	-9	45
112	4/9/2018 12:39:11 PM	12	643 R	0.1 Grid 12	17	124
113	4/9/2018 12:39:22 PM	3	821 R	0.1	-2	336
114	4/9/2018 12:39:34 PM	2	917 R	0.1	-5	451
115	4/9/2018 12:39:46 PM	3	726 R	0.1	-2	223
116	4/9/2018 12:39:57 PM	4	699 R	0.1	0	191
117	4/9/2018 12:40:09 PM	2	737 R	0.1	-5	236
118	4/9/2018 12:40:21 PM	4	811 R	0.1	0	325
119	4/9/2018 12:40:32 PM	7	703 R	0.1	6	196
120	4/9/2018 12:40:44 PM	6	664 R	0.1	4	149
121	4/9/2018 12:40:55 PM	9	613 R	0.1	11	88
122	4/9/2018 12:44:00 PM	7	651 R	0.1 Grid 13	6	134
123	4/9/2018 12:44:11 PM	9	778 R	0.1	11	285
124	4/9/2018 12:44:23 PM	2	747 R	0.1	-5	248
125	4/9/2018 12:44:34 PM	4	821 R	0.1	0	336
126	4/9/2018 12:44:46 PM	1	653 R	0.1	-7	136
127	4/9/2018 12:44:58 PM	21	804 R	0.1	36	316
128	4/9/2018 12:45:09 PM	5	1039 R	0.1	2	597
129	4/9/2018 12:45:21 PM	4	942 R	0.1	0	481
130	4/9/2018 12:45:33 PM	1	1010 R	0.1	-7	562
131	4/9/2018 12:45:44 PM	5	712 R	0.1	2	206
132	4/9/2018 1:05:55 PM	8	1108 R	0.1 Grid 14	8	679
133	4/9/2018 1:06:07 PM	7	1237 R	0.1	6	833
134	4/9/2018 1:06:19 PM	4	1229 R	0.1	0	823
135	4/9/2018 1:06:30 PM	5	1214 R	0.1	2	805
136	4/9/2018 1:06:42 PM	6	1181 R	0.1	4	766
137	4/9/2018 1:06:54 PM	8	1327 R	0.1	8	940
138	4/9/2018 1:07:05 PM	7	1340 R	0.1	6	956
139	4/9/2018 1:07:17 PM	0	1254 R	0.1	-9	853
140	4/9/2018 1:07:29 PM	11	1432 R	0.1	15	1066
141	4/9/2018 1:07:40 PM	10	1510 R	0.1	13	1159
142	4/9/2018 1:07:52 PM	2	998 R	0.1	-5	548
143	4/9/2018 1:38:05 PM	3	1009 R	0.1 Grid 15	-2	561
144	4/9/2018 1:38:17 PM	13	1106 R	0.1	19	677

145	4/9/2018	1:38:28 PM	3	1061 R	0.1	-2	623
146	4/9/2018	1:38:40 PM	8	951 R	0.1	8	492
147	4/9/2018	1:38:52 PM	7	1090 R	0.1	6	657
148	4/9/2018	1:39:03 PM	6	818 R	0.1	4	333
149	4/9/2018	1:39:15 PM	1	632 R	0.1	-7	111
150	4/9/2018	1:39:27 PM	8	1267 R	0.1	8	869
151	4/9/2018	1:39:38 PM	7	1204 R	0.1	6	793
152	4/9/2018	1:39:50 PM	9	1080 R	0.1	11	646
153	4/9/2018	1:44:10 PM	7	577 R	0.1 Grid 16	6	45
154	4/9/2018	1:44:21 PM	8	652 R	0.1	8	135
155	4/9/2018	1:44:33 PM	5	686 R	0.1	2	175
156	4/9/2018	1:44:45 PM	7	624 R	0.1	6	101
157	4/9/2018	1:44:56 PM	9	606 R	0.1	11	80
158	4/9/2018	1:45:08 PM	5	562 R	0.1	2	27
159	4/9/2018	1:45:19 PM	6	857 R	0.1	4	379
160	4/9/2018	1:45:31 PM	5	828 R	0.1	2	345
161	4/9/2018	1:45:43 PM	5	539 R	0.1	2	0
162	4/9/2018	1:45:54 PM	8	589 R	0.1	8	60
163	4/9/2018	1:51:26 PM	4	558 R	0.1 Grid 17	0	23
164	4/9/2018	1:51:38 PM	13	542 R	0.1	19	4
165	4/9/2018	1:51:50 PM	3	454 R	0.1	-2	-101
166	4/9/2018	1:52:01 PM	0	668 R	0.1	-9	154
167	4/9/2018	1:52:13 PM	0	761 R	0.1	-9	265
168	4/9/2018	1:52:25 PM	6	844 R	0.1	4	364
169	4/9/2018	1:52:36 PM	7	762 R	0.1	6	266
170	4/9/2018	1:52:48 PM	1	525 R	0.1	-7	-17
171	4/9/2018	1:53:00 PM	7	750 R	0.1	6	252
172	4/9/2018	1:53:11 PM	6	632 R	0.1	4	111
173	4/9/2018	2:02:04 PM	4	572 R	0.1 Grid 18	0	39
174	4/9/2018	2:02:16 PM	8	584 R	0.1	8	54
175	4/9/2018	2:02:28 PM	3	434 R	0.1	-2	-125
176	4/9/2018	2:02:39 PM	7	516 R	0.1	6	-27
177	4/9/2018	2:02:51 PM	0	592 R	0.1	-9	63
178	4/9/2018	2:03:03 PM	15	661 R	0.1	23	146
179	4/9/2018	2:03:14 PM	3	611 R	0.1	-2	86
180	4/9/2018	2:03:26 PM	14	562 R	0.1	21	27
181	4/9/2018	2:03:38 PM	12	709 R	0.1	17	203
182	4/9/2018	2:03:49 PM	2	837 R	0.1	-5	356
183	4/9/2018	2:08:44 PM	7	612 R	0.1 Grid 19	6	87
184	4/9/2018	2:08:56 PM	6	531 R	0.1	4	-10
185	4/9/2018	2:09:07 PM	5	520 R	0.1	2	-23
186	4/9/2018	2:09:19 PM	4	597 R	0.1	0	69
187	4/9/2018	2:09:30 PM	19	602 R	0.1	32	75
188	4/9/2018	2:09:42 PM	7	546 R	0.1	6	8
189	4/9/2018	2:09:54 PM	10	536 R	0.1	13	-4
190	4/9/2018	2:10:05 PM	6	481 R	0.1	4	-69
191	4/9/2018	2:10:17 PM	15	623 R	0.1	23	100
192	4/9/2018	2:10:29 PM	3	728 R	0.1	-2	226
193	4/9/2018	2:13:19 PM	0	560 R	0.1 Grid 20	-9	25
194	4/9/2018	2:13:31 PM	0	572 R	0.1	-9	39
195	4/9/2018	2:13:42 PM	3	491 R	0.1	-2	-57
196	4/9/2018	2:13:54 PM	0	530 R	0.1	-9	-11
197	4/9/2018	2:14:06 PM	11	724 R	0.1	15	221

198	4/9/2018	2:14:17 PM	2	553 R	0.1	-5	17
199	4/9/2018	2:14:29 PM	16	680 R	0.1	26	168
200	4/9/2018	2:14:40 PM	3	666 R	0.1	-2	152
201	4/9/2018	2:14:52 PM	6	628 R	0.1	4	106
202	4/9/2018	2:15:04 PM	5	705 R	0.1	2	198
203	4/9/2018	2:18:13 PM	8	506 R	0.1 Grid 21	8	-39
204	4/9/2018	2:18:25 PM	3	525 R	0.1	-2	-17
205	4/9/2018	2:18:36 PM	6	562 R	0.1	4	27
206	4/9/2018	2:18:48 PM	1	560 R	0.1	-7	25
207	4/9/2018	2:19:00 PM	0	672 R	0.1	-9	159
208	4/9/2018	2:19:11 PM	3	697 R	0.1	-2	189
209	4/9/2018	2:19:23 PM	7	729 R	0.1	6	227
210	4/9/2018	2:19:35 PM	1	729 R	0.1	-7	227
211	4/9/2018	2:19:46 PM	9	525 R	0.1	11	-17
212	4/9/2018	2:19:58 PM	13	671 R	0.1	19	158
213	4/9/2018	2:21:19 PM	23	616 R	0.1 Grid 22	41	92
214	4/9/2018	2:21:30 PM	15	676 R	0.1	23	163
215	4/9/2018	2:21:42 PM	3	684 R	0.1	-2	173
216	4/9/2018	2:21:54 PM	9	604 R	0.1	11	78
217	4/9/2018	2:22:05 PM	10	671 R	0.1	13	158
218	4/9/2018	2:22:17 PM	7	678 R	0.1	6	166
219	4/9/2018	2:22:29 PM	1	519 R	0.1	-7	-24
220	4/9/2018	2:22:40 PM	5	682 R	0.1	2	171
221	4/9/2018	2:22:52 PM	4	558 R	0.1	0	23
222	4/9/2018	2:23:04 PM	7	588 R	0.1	6	58
223	4/9/2018	2:37:54 PM	0	563 R	0.1 Grid 23	-9	29
224	4/9/2018	2:38:05 PM	0	573 R	0.1	-9	41
225	4/9/2018	2:38:17 PM	0	622 R	0.1	-9	99
226	4/9/2018	2:38:29 PM	11	767 R	0.1	15	272
227	4/9/2018	2:38:40 PM	2	806 R	0.1	-5	319
228	4/9/2018	2:38:52 PM	7	911 R	0.1	6	444
229	4/9/2018	2:39:04 PM	6	919 R	0.1	4	453
230	4/9/2018	2:39:15 PM	0	640 R	0.1	-9	121
231	4/9/2018	2:39:27 PM	10	619 R	0.1	13	95
232	4/9/2018	2:39:39 PM	2	584 R	0.1	-5	54
233	4/9/2018	2:43:23 PM	0	514 R	0.1 Grid 24	-9	-30
234	4/9/2018	2:43:35 PM	9	582 R	0.1	11	51
235	4/9/2018	2:43:46 PM	2	614 R	0.1	-5	89
236	4/9/2018	2:43:58 PM	0	681 R	0.1	-9	169
237	4/9/2018	2:44:09 PM	0	578 R	0.1	-9	47
238	4/9/2018	2:44:21 PM	0	677 R	0.1	-9	165
239	4/9/2018	2:44:33 PM	16	575 R	0.1	26	43
240	4/9/2018	2:44:44 PM	3	588 R	0.1	-2	58
241	4/9/2018	2:44:56 PM	5	679 R	0.1	2	167
242	4/9/2018	2:45:08 PM	6	758 R	0.1	4	261
243	4/9/2018	2:47:30 PM	3	582 R	0.1 Grid 25	-2	51
244	4/9/2018	2:47:42 PM	4	517 R	0.1	0	-26
245	4/9/2018	2:47:53 PM	5	616 R	0.1	2	92
246	4/9/2018	2:48:05 PM	9	589 R	0.1	11	60
247	4/9/2018	2:48:16 PM	2	485 R	0.1	-5	-64
248	4/9/2018	2:48:28 PM	12	417 R	0.1	17	-146
249	4/9/2018	2:48:40 PM	3	561 R	0.1	-2	26
250	4/9/2018	2:48:51 PM	10	631 R	0.1	13	110

251	4/9/2018	2:49:03 PM	2	701 R	0.1	-5	193
252	4/9/2018	2:49:15 PM	10	738 R	0.1	13	237
253	4/9/2018	2:51:13 PM	0	523 R	0.1 Grid 26	-9	-19
254	4/9/2018	2:51:24 PM	0	465 R	0.1	-9	-88
255	4/9/2018	2:51:36 PM	0	663 R	0.1	-9	148
256	4/9/2018	2:51:48 PM	8	750 R	0.1	8	252
257	4/9/2018	2:51:59 PM	7	589 R	0.1	6	60
258	4/9/2018	2:52:11 PM	1	573 R	0.1	-7	41
259	4/9/2018	2:52:23 PM	10	506 R	0.1	13	-39
260	4/9/2018	2:52:34 PM	7	652 R	0.1	6	135
261	4/9/2018	2:52:46 PM	7	512 R	0.1	6	-32
262	4/9/2018	2:52:58 PM	1	501 R	0.1	-7	-45
263	4/9/2018	2:55:46 PM	0	532 R	0.1 Grid 27	-9	-8
264	4/9/2018	2:55:58 PM	20	491 R	0.1	34	-57
265	4/9/2018	2:56:10 PM	14	632 R	0.1	21	111
266	4/9/2018	2:56:21 PM	9	625 R	0.1	11	103
267	4/9/2018	2:56:33 PM	2	590 R	0.1	-5	61
268	4/9/2018	2:56:45 PM	0	693 R	0.1	-9	184
269	4/9/2018	2:56:56 PM	9	616 R	0.1	11	92
270	4/9/2018	2:57:08 PM	13	740 R	0.1	19	240
271	4/9/2018	2:57:20 PM	3	593 R	0.1	-2	64
272	4/9/2018	2:57:31 PM	4	578 R	0.1	0	47
273	4/9/2018	2:59:40 PM	4	508 R	0.1 Grid 28	0	-37
274	4/9/2018	2:59:52 PM	5	567 R	0.1	2	33
275	4/9/2018	3:00:03 PM	8	557 R	0.1	8	21
276	4/9/2018	3:00:15 PM	9	543 R	0.1	11	5
277	4/9/2018	3:00:27 PM	8	534 R	0.1	8	-6
278	4/9/2018	3:00:38 PM	8	615 R	0.1	8	91
279	4/9/2018	3:00:50 PM	7	581 R	0.1	6	50
280	4/9/2018	3:01:01 PM	6	538 R	0.1	4	-1
281	4/9/2018	3:01:13 PM	4	538 R	0.1	0	-1
282	4/9/2018	3:01:25 PM	8	687 R	0.1	8	177
283	4/9/2018	3:03:24 PM	7	649 R	0.1 Grid 29	6	131
284	4/9/2018	3:03:35 PM	0	869 R	0.1	-9	394
285	4/9/2018	3:03:47 PM	6	965 R	0.1	4	508
286	4/9/2018	3:03:59 PM	5	1097 R	0.1	2	666
287	4/9/2018	3:04:10 PM	6	1093 R	0.1	4	661
288	4/9/2018	3:04:22 PM	5	1218 R	0.1	2	810
289	4/9/2018	3:04:34 PM	4	1117 R	0.1	0	690
290	4/9/2018	3:04:45 PM	55	781 R	0.1	110	289
291	4/9/2018	3:04:57 PM	0	685 R	0.1	-9	174
292	4/9/2018	3:05:08 PM	8	617 R	0.1	8	93
293	4/9/2018	3:07:33 PM	10	907 R	0.1 Grid 30	13	439
294	4/9/2018	3:07:45 PM	2	1375 R	0.1	-5	998
295	4/9/2018	3:07:57 PM	3	1343 R	0.1	-2	959
296	4/9/2018	3:08:08 PM	0	853 R	0.1	-9	375
297	4/9/2018	3:08:20 PM	9	998 R	0.1	11	548
298	4/9/2018	3:08:32 PM	8	546 R	0.1	8	8
299	4/9/2018	3:08:43 PM	9	402 R	0.1	11	-163
300	4/9/2018	3:08:55 PM	2	1132 R	0.1	-5	708
301	4/9/2018	3:09:07 PM	0	1318 R	0.1	-9	930
302	4/9/2018	3:09:18 PM	4	1200 R	0.1	0	789
303	4/9/2018	3:10:12 PM	5	973 R	0.1 Grid 31	2	518

304	4/9/2018	3:10:24 PM	0	845 R	0.1	-9	365
305	4/9/2018	3:10:35 PM	6	1082 R	0.1	4	648
306	4/9/2018	3:10:47 PM	18	1470 R	0.1	30	1111
307	4/9/2018	3:10:59 PM	10	2418 R	0.1	13	2242
308	4/9/2018	3:11:10 PM	2	2094 R	0.1	-5	1855
309	4/9/2018	3:11:22 PM	0	1831 R	0.1	-9	1542
310	4/9/2018	3:11:34 PM	13	766 R	0.1	19	271
311	4/9/2018	3:11:45 PM	3	498 R	0.1	-2	-49
312	4/9/2018	3:11:57 PM	7	577 R	0.1	6	45
313	4/9/2018	3:13:02 PM	6	1183 R	0.1 Grid 32	4	768
314	4/9/2018	3:13:14 PM	9	1710 R	0.1	11	1397
315	4/9/2018	3:13:25 PM	7	1758 R	0.1	6	1455
316	4/9/2018	3:13:37 PM	8	1667 R	0.1	8	1346
317	4/9/2018	3:13:49 PM	4	1688 R	0.1	0	1371
318	4/9/2018	3:14:00 PM	7	1274 R	0.1	6	877
319	4/9/2018	3:14:12 PM	8	1224 R	0.1	8	817
320	4/9/2018	3:14:24 PM	6	1439 R	0.1	4	1074
321	4/9/2018	3:14:35 PM	6	1645 R	0.1	4	1320
322	4/9/2018	3:14:47 PM	1	1683 R	0.1	-7	1365
323	4/9/2018	3:16:19 PM	10	1282 R	0.1 Grid 33	13	887
324	4/9/2018	3:16:30 PM	7	1567 R	0.1	6	1227
325	4/9/2018	3:16:42 PM	6	1438 R	0.1	4	1073
326	4/9/2018	3:16:54 PM	9	1243 R	0.1	11	840
327	4/9/2018	3:17:05 PM	5	1160 R	0.1	2	741
328	4/9/2018	3:17:17 PM	1	1092 R	0.1	-7	660
329	4/9/2018	3:17:29 PM	0	1013 R	0.1	-9	566
330	4/9/2018	3:17:40 PM	0	1123 R	0.1	-9	697
331	4/9/2018	3:17:52 PM	11	1256 R	0.1	15	856
332	4/9/2018	3:18:04 PM	2	1251 R	0.1	-5	850
333	4/9/2018	3:19:36 PM	11	875 R	0.1 Grid 34	15	401
334	4/9/2018	3:19:48 PM	14	867 R	0.1	21	391
335	4/9/2018	3:19:59 PM	6	938 R	0.1	4	476
336	4/9/2018	3:20:11 PM	1	905 R	0.1	-7	437
337	4/9/2018	3:20:23 PM	11	904 R	0.1	15	436
338	4/9/2018	3:20:34 PM	2	766 R	0.1	-5	271
339	4/9/2018	3:20:46 PM	7	695 R	0.1	6	186
340	4/9/2018	3:20:58 PM	1	886 R	0.1	-7	414
341	4/9/2018	3:21:09 PM	8	843 R	0.1	8	363
342	4/9/2018	3:21:21 PM	7	1068 R	0.1	6	631
343	4/9/2018	3:25:27 PM	5	987 R	0.1 Grid 35	2	535
344	4/9/2018	3:25:39 PM	5	1163 R	0.1	2	745
345	4/9/2018	3:25:51 PM	6	1021 R	0.1	4	575
346	4/9/2018	3:26:02 PM	19	1186 R	0.1	32	772
347	4/9/2018	3:26:14 PM	8	1077 R	0.1	8	642
348	4/9/2018	3:26:26 PM	21	912 R	0.1	36	445
349	4/9/2018	3:26:37 PM	12	816 R	0.1	17	331
350	4/9/2018	3:26:49 PM	19	1050 R	0.1	32	610
351	4/9/2018	3:27:01 PM	15	881 R	0.1	23	408
352	4/9/2018	3:27:12 PM	3	1039 R	0.1	-2	597
353	4/9/2018	3:28:21 PM	3	929 R	0.1 Grid 36	-2	465
354	4/9/2018	3:28:33 PM	2	988 R	0.1	-5	536
355	4/9/2018	3:28:45 PM	8	1154 R	0.1	8	734
356	4/9/2018	3:28:56 PM	9	1172 R	0.1	11	755

357	4/9/2018	3:29:08 PM	7	1136 R	0.1	6	712
358	4/9/2018	3:29:20 PM	5	1053 R	0.1	2	613
359	4/9/2018	3:29:31 PM	7	915 R	0.1	6	449
360	4/9/2018	3:29:43 PM	4	898 R	0.1	0	428
361	4/9/2018	3:29:55 PM	1	946 R	0.1	-7	486
362	4/9/2018	3:30:06 PM	4	830 R	0.1	0	347
363	4/9/2018	3:31:03 PM	11	970 R	0.1 Grid 37	15	514
364	4/9/2018	3:31:15 PM	2	1170 R	0.1	-5	753
365	4/9/2018	3:31:26 PM	0	1230 R	0.1	-9	825
366	4/9/2018	3:31:38 PM	0	1056 R	0.1	-9	617
367	4/9/2018	3:31:50 PM	9	1269 R	0.1	11	871
368	4/9/2018	3:32:01 PM	8	904 R	0.1	8	436
369	4/9/2018	3:32:13 PM	2	649 R	0.1	-5	131
370	4/9/2018	3:32:25 PM	0	652 R	0.1	-9	135
371	4/9/2018	3:32:36 PM	10	777 R	0.1	13	284
372	4/9/2018	3:32:48 PM	2	772 R	0.1	-5	278
373	4/9/2018	3:34:20 PM	3	649 R	0.1 Grid 38	-2	131
374	4/9/2018	3:34:32 PM	11	888 R	0.1	15	416
375	4/9/2018	3:34:44 PM	2	956 R	0.1	-5	498
376	4/9/2018	3:34:55 PM	0	1175 R	0.1	-9	759
377	4/9/2018	3:35:07 PM	4	1248 R	0.1	0	846
378	4/9/2018	3:35:19 PM	3	890 R	0.1	-2	419
379	4/9/2018	3:35:30 PM	0	941 R	0.1	-9	480
380	4/9/2018	3:35:42 PM	4	934 R	0.1	0	471
381	4/9/2018	3:35:54 PM	1	855 R	0.1	-7	377
382	4/9/2018	3:36:05 PM	13	730 R	0.1	19	228
383	4/9/2018	3:38:34 PM	8	1047 R	0.1 Grid 39	8	606
384	4/9/2018	3:38:46 PM	2	1540 R	0.1	-5	1194
385	4/9/2018	3:38:58 PM	4	1760 R	0.1	0	1457
386	4/9/2018	3:39:09 PM	1	1559 R	0.1	-7	1217
387	4/9/2018	3:39:21 PM	6	1219 R	0.1	4	811
388	4/9/2018	3:39:33 PM	3	842 R	0.1	-2	362
389	4/9/2018	3:39:44 PM	6	932 R	0.1	4	469
390	4/9/2018	3:39:56 PM	7	808 R	0.1	6	321
391	4/9/2018	3:40:08 PM	5	852 R	0.1	2	373
392	4/9/2018	3:40:19 PM	1	798 R	0.1	-7	309
393	4/9/2018	3:44:36 PM	0	497 R	0.1 Grid 49	-9	-50
394	4/9/2018	3:44:48 PM	3	554 R	0.1	-2	18
395	4/9/2018	3:44:59 PM	5	596 R	0.1	2	68
396	4/9/2018	3:45:11 PM	1	720 R	0.1	-7	216
397	4/9/2018	3:45:23 PM	3	772 R	0.1	-2	278
398	4/9/2018	3:45:34 PM	6	732 R	0.1	4	230
399	4/9/2018	3:45:46 PM	6	704 R	0.1	4	197
400	4/9/2018	3:45:58 PM	7	500 R	0.1	6	-47
401	4/9/2018	3:46:09 PM	3	522 R	0.1	-2	-20
402	4/9/2018	3:46:21 PM	4	437 R	0.1	0	-122
403	4/9/2018	3:47:58 PM	2	354 R	0.1 Grid 50	-5	-221
404	4/9/2018	3:48:10 PM	3	438 R	0.1	-2	-121
405	4/9/2018	3:48:22 PM	2	626 R	0.1	-5	104
406	4/9/2018	3:48:33 PM	7	626 R	0.1	6	104
407	4/9/2018	3:48:45 PM	3	550 R	0.1	-2	13
408	4/9/2018	3:48:57 PM	7	567 R	0.1	6	33
409	4/9/2018	3:49:08 PM	5	499 R	0.1	2	-48

410	4/9/2018	3:49:20 PM	4	761 R	0.1	0	265
411	4/9/2018	3:49:31 PM	3	561 R	0.1	-2	26
412	4/9/2018	3:49:43 PM	4	544 R	0.1	0	6
413	4/9/2018	3:52:09 PM	6	555 R	0.1 Grid 51	4	19
414	4/9/2018	3:52:21 PM	3	413 R	0.1	-2	-150
415	4/9/2018	3:52:32 PM	8	367 R	0.1	8	-205
416	4/9/2018	3:52:44 PM	6	340 R	0.1	4	-237
417	4/9/2018	3:52:56 PM	4	402 R	0.1	0	-163
418	4/9/2018	3:53:07 PM	3	497 R	0.1	-2	-50
419	4/9/2018	3:54:17 PM	9	506 R	0.1 Grid 52	11	-39
420	4/9/2018	3:54:29 PM	3	521 R	0.1	-2	-21
421	4/9/2018	3:54:41 PM	3	624 R	0.1	-2	101
422	4/9/2018	3:54:52 PM	2	466 R	0.1	-5	-87
423	4/9/2018	3:55:04 PM	5	498 R	0.1	2	-49
424	4/9/2018	3:55:16 PM	4	650 R	0.1	0	132
		Maximum:	55	2418		110	2242
		Average:	5	847		2	368
		StDev:	5	347		11	414

Room 103A Upper Wall

2360 SN:297743

43-37 #302111

Cal Due Date:

10/10/2018

Surveyor:

Josefina Matus

Bldg 218

Room 103A Upper Wall Grids 1 thru 32

Alpha Efficiency: 0.319

Beta/Gamma Efficiency: 0.384

Alpha Background: 4.1

Beta/Gamma Background: 539

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²	
									Alpha	Beta
1	4/10/2018	9:30:12 AM	13	595	R		0.1	Grid 1	19	67
2	4/10/2018	9:30:24 AM	3	704	R		0.1		-2	197
3	4/10/2018	9:30:35 AM	0	832	R		0.1		-9	350
4	4/10/2018	9:30:47 AM	0	585	R		0.1		-9	55
5	4/10/2018	9:30:59 AM	16	602	R		0.1		26	75
6	4/10/2018	9:31:10 AM	3	540	R		0.1		-2	1
7	4/10/2018	9:31:22 AM	3	632	R		0.1		-2	111
8	4/10/2018	9:31:34 AM	4	468	R		0.1		0	-85
9	4/10/2018	9:31:45 AM	7	509	R		0.1		6	-36
10	4/10/2018	9:31:57 AM	1	530	R		0.1		-7	-11
11	4/10/2018	9:35:41 AM	7	553	R		0.1	Grid 2	6	17
12	4/10/2018	9:35:53 AM	5	621	R		0.1		2	98
13	4/10/2018	9:36:05 AM	1	566	R		0.1		-7	32
14	4/10/2018	9:36:16 AM	0	498	R		0.1		-9	-49
15	4/10/2018	9:36:28 AM	4	449	R		0.1		0	-107
16	4/10/2018	9:36:40 AM	3	499	R		0.1		-2	-48
17	4/10/2018	9:36:51 AM	11	553	R		0.1		15	17
18	4/10/2018	9:37:03 AM	2	567	R		0.1		-5	33
19	4/10/2018	9:37:15 AM	0	543	R		0.1		-9	5
20	4/10/2018	9:38:59 AM	7	579	R		0.1	Grid 3	6	48
21	4/10/2018	9:39:10 AM	1	629	R		0.1		-7	107
22	4/10/2018	9:39:22 AM	11	713	R		0.1		15	208
23	4/10/2018	9:39:34 AM	2	834	R		0.1		-5	352
24	4/10/2018	9:39:45 AM	7	682	R		0.1		6	171
25	4/10/2018	9:39:57 AM	1	929	R		0.1		-7	465
26	4/10/2018	9:40:08 AM	0	817	R		0.1		-9	332
27	4/10/2018	9:40:20 AM	3	539	R		0.1		-2	0
28	4/10/2018	9:40:32 AM	0	570	R		0.1		-9	37
29	4/10/2018	9:40:43 AM	0	478	R		0.1		-9	-73
30	4/10/2018	9:48:46 AM	0	756	R		0.1	Grid 4	-9	259
31	4/10/2018	9:48:58 AM	0	1008	R		0.1		-9	560
32	4/10/2018	9:49:09 AM	17	1214	R		0.1		28	805
33	4/10/2018	9:49:21 AM	3	1127	R		0.1		-2	702
34	4/10/2018	9:49:32 AM	0	1188	R		0.1		-9	774
35	4/10/2018	9:49:44 AM	6	1027	R		0.1		4	582
36	4/10/2018	9:49:56 AM	1	1195	R		0.1		-7	783
37	4/10/2018	9:50:07 AM	0	1398	R		0.1		-9	1025
38	4/10/2018	9:50:19 AM	3	1628	R		0.1		-2	1299
39	4/10/2018	9:50:31 AM	0	1844	R		0.1		-9	1557
40	4/10/2018	9:53:34 AM	4	883	R		0.1	Grid 5	0	410
41	4/10/2018	9:53:46 AM	5	1651	R		0.1		2	1327

42	4/10/2018	9:53:58 AM	4	2010 R	0.1	0	1755
43	4/10/2018	9:54:09 AM	5	1991 R	0.1	2	1733
44	4/10/2018	9:54:21 AM	13	1954 R	0.1	19	1688
45	4/10/2018	9:54:33 AM	13	2063 R	0.1	19	1818
46	4/10/2018	9:54:44 AM	3	1746 R	0.1	-2	1440
47	4/10/2018	9:54:56 AM	0	2030 R	0.1	-9	1779
48	4/10/2018	9:55:08 AM	11	2219 R	0.1	15	2005
49	4/10/2018	9:55:19 AM	14	2229 R	0.1	21	2017
50	4/10/2018	10:00:42 AM	11	1553 R	0.1 Grid 6	15	1210
51	4/10/2018	10:00:53 AM	9	1785 R	0.1	11	1487
52	4/10/2018	10:01:05 AM	2	1774 R	0.1	-5	1474
53	4/10/2018	10:01:17 AM	0	1648 R	0.1	-9	1323
54	4/10/2018	10:01:28 AM	4	1584 R	0.1	0	1247
55	4/10/2018	10:01:40 AM	1	1519 R	0.1	-7	1169
56	4/10/2018	10:01:52 AM	3	1620 R	0.1	-2	1290
57	4/10/2018	10:02:03 AM	4	1782 R	0.1	0	1483
58	4/10/2018	10:02:15 AM	2	1885 R	0.1	-5	1606
59	4/10/2018	10:02:27 AM	3	1890 R	0.1	-2	1612
60	4/10/2018	10:08:24 AM	3	1148 R	0.1 Grid 7	-2	727
61	4/10/2018	10:08:35 AM	3	1412 R	0.1	-2	1042
62	4/10/2018	10:08:47 AM	7	1372 R	0.1	6	994
63	4/10/2018	10:08:58 AM	1	1319 R	0.1	-7	931
64	4/10/2018	10:09:10 AM	6	1442 R	0.1	4	1077
65	4/10/2018	10:09:22 AM	1	1395 R	0.1	-7	1021
66	4/10/2018	10:09:33 AM	3	1415 R	0.1	-2	1045
67	4/10/2018	10:09:45 AM	6	1350 R	0.1	4	968
68	4/10/2018	10:09:57 AM	0	1530 R	0.1	-9	1182
69	4/10/2018	10:10:08 AM	5	1285 R	0.1	2	890
70	4/10/2018	10:12:23 AM	0	719 R	0.1 Grid 8	-9	215
71	4/10/2018	10:12:35 AM	19	1043 R	0.1	32	601
72	4/10/2018	10:12:47 AM	10	955 R	0.1	13	496
73	4/10/2018	10:12:58 AM	2	1116 R	0.1	-5	688
74	4/10/2018	10:13:10 AM	0	960 R	0.1	-9	502
75	4/10/2018	10:13:22 AM	4	1211 R	0.1	0	802
76	4/10/2018	10:13:33 AM	11	1082 R	0.1	15	648
77	4/10/2018	10:13:45 AM	2	1054 R	0.1	-5	614
78	4/10/2018	10:13:56 AM	5	899 R	0.1	2	430
79	4/10/2018	10:14:08 AM	4	1000 R	0.1	0	550
80	4/10/2018	10:15:48 AM	3	888 R	0.1 Grid 9	-2	416
81	4/10/2018	10:16:00 AM	0	961 R	0.1	-9	504
82	4/10/2018	10:16:12 AM	12	1086 R	0.1	17	653
83	4/10/2018	10:16:23 AM	14	934 R	0.1	21	471
84	4/10/2018	10:16:35 AM	3	1021 R	0.1	-2	575
85	4/10/2018	10:16:47 AM	0	983 R	0.1	-9	530
86	4/10/2018	10:16:58 AM	0	1078 R	0.1	-9	643
87	4/10/2018	10:17:10 AM	0	1041 R	0.1	-9	599
88	4/10/2018	10:17:21 AM	3	843 R	0.1	-2	363
89	4/10/2018	10:17:33 AM	10	941 R	0.1	13	480
90	4/10/2018	10:18:57 AM	6	776 R	0.1 Grid 10	4	283
91	4/10/2018	10:19:09 AM	12	1042 R	0.1	17	600
92	4/10/2018	10:19:20 AM	18	1001 R	0.1	30	551
93	4/10/2018	10:19:32 AM	29	1076 R	0.1	54	641
94	4/10/2018	10:19:43 AM	22	1062 R	0.1	39	624
95	4/10/2018	10:19:55 AM	16	1019 R	0.1	26	573
96	4/10/2018	10:20:07 AM	11	842 R	0.1	15	362
97	4/10/2018	10:20:18 AM	2	1043 R	0.1	-5	601

98	4/10/2018	10:20:30 AM	12	1065 R	0.1	17	628
99	4/10/2018	10:20:42 AM	15	1337 R	0.1	23	952
100	4/10/2018	10:22:49 AM	7	935 R	0.1 Grid 11	6	473
101	4/10/2018	10:23:01 AM	5	1154 R	0.1	2	734
102	4/10/2018	10:23:12 AM	1	1311 R	0.1	-7	921
103	4/10/2018	10:23:24 AM	0	1789 R	0.1	-9	1492
104	4/10/2018	10:23:36 AM	4	1576 R	0.1	0	1237
105	4/10/2018	10:23:47 AM	11	1322 R	0.1	15	934
106	4/10/2018	10:23:59 AM	2	1357 R	0.1	-5	976
107	4/10/2018	10:24:11 AM	0	1368 R	0.1	-9	989
108	4/10/2018	10:24:22 AM	11	1478 R	0.1	15	1120
109	4/10/2018	10:24:34 AM	6	1627 R	0.1	4	1298
110	4/10/2018	10:27:18 AM	16	1625 R	0.1 Grid 12	26	1296
111	4/10/2018	10:27:30 AM	3	1579 R	0.1	-2	1241
112	4/10/2018	10:27:41 AM	0	1468 R	0.1	-9	1108
113	4/10/2018	10:27:53 AM	20	1642 R	0.1	34	1316
114	4/10/2018	10:28:05 AM	10	1740 R	0.1	13	1433
115	4/10/2018	10:28:16 AM	7	1780 R	0.1	6	1481
116	4/10/2018	10:28:28 AM	9	1673 R	0.1	11	1353
117	4/10/2018	10:28:39 AM	2	1684 R	0.1	-5	1366
118	4/10/2018	10:28:51 AM	4	1709 R	0.1	0	1396
119	4/10/2018	10:29:03 AM	3	1671 R	0.1	-2	1351
120	4/10/2018	10:35:28 AM	5	1011 R	0.1 Grid 13	2	563
121	4/10/2018	10:35:39 AM	6	1272 R	0.1	4	875
122	4/10/2018	10:35:51 AM	8	1167 R	0.1	8	749
123	4/10/2018	10:36:03 AM	8	1274 R	0.1	8	877
124	4/10/2018	10:36:14 AM	26	1377 R	0.1	47	1000
125	4/10/2018	10:36:26 AM	6	1660 R	0.1	4	1338
126	4/10/2018	10:36:37 AM	1	1454 R	0.1	-7	1092
127	4/10/2018	10:36:49 AM	10	1463 R	0.1	13	1103
128	4/10/2018	10:37:01 AM	11	1362 R	0.1	15	982
129	4/10/2018	10:37:12 AM	2	1387 R	0.1	-5	1012
130	4/10/2018	10:57:02 AM	7	508 R	0.1 Grid 22	6	-37
131	4/10/2018	10:57:13 AM	1	503 R	0.1	-7	-43
132	4/10/2018	10:57:25 AM	11	677 R	0.1	15	165
133	4/10/2018	10:57:37 AM	5	582 R	0.1	2	51
134	4/10/2018	10:57:48 AM	1	654 R	0.1	-7	137
135	4/10/2018	10:58:00 AM	3	670 R	0.1	-2	156
136	4/10/2018	10:58:11 AM	4	656 R	0.1	0	140
137	4/10/2018	11:00:19 AM	9	565 R	0.1 Grid 23	11	31
138	4/10/2018	11:00:30 AM	2	624 R	0.1	-5	101
139	4/10/2018	11:00:42 AM	0	648 R	0.1	-9	130
140	4/10/2018	11:00:54 AM	10	588 R	0.1	13	58
141	4/10/2018	11:01:05 AM	2	622 R	0.1	-5	99
142	4/10/2018	11:01:17 AM	2	742 R	0.1	-5	242
143	4/10/2018	11:01:29 AM	7	632 R	0.1	6	111
144	4/10/2018	11:01:40 AM	4	677 R	0.1	0	165
145	4/10/2018	11:01:52 AM	5	730 R	0.1	2	228
146	4/10/2018	11:02:04 AM	5	558 R	0.1	2	23
147	4/10/2018	12:28:26 PM	2	611 R	0.1 Grid 24	-5	86
148	4/10/2018	12:28:38 PM	3	744 R	0.1	-2	245
149	4/10/2018	12:28:49 PM	0	902 R	0.1	-9	433
150	4/10/2018	12:29:01 PM	8	794 R	0.1	8	304
151	4/10/2018	12:29:13 PM	9	1210 R	0.1	11	801
152	4/10/2018	12:29:24 PM	10	893 R	0.1	13	422
153	4/10/2018	12:29:36 PM	2	797 R	0.1	-5	308

154	4/10/2018	12:29:48 PM	0	644 R	0.1	-9	125
155	4/10/2018	12:29:59 PM	3	660 R	0.1	-2	144
156	4/10/2018	12:30:11 PM	5	615 R	0.1	2	91
157	4/10/2018	12:34:02 PM	0	690 R	0.1 Grid 25	-9	180
158	4/10/2018	12:34:14 PM	11	844 R	0.1	15	364
159	4/10/2018	12:34:25 PM	2	689 R	0.1	-5	179
160	4/10/2018	12:34:37 PM	17	723 R	0.1	28	220
161	4/10/2018	12:34:49 PM	4	896 R	0.1	0	426
162	4/10/2018	12:35:00 PM	11	1002 R	0.1	15	552
163	4/10/2018	12:35:12 PM	6	933 R	0.1	4	470
164	4/10/2018	12:35:24 PM	1	1064 R	0.1	-7	626
165	4/10/2018	12:35:35 PM	0	913 R	0.1	-9	446
166	4/10/2018	12:35:47 PM	10	1027 R	0.1	13	582
167	4/10/2018	12:38:36 PM	16	545 R	0.1 Grid 26	26	7
168	4/10/2018	12:38:47 PM	3	629 R	0.1	-2	107
169	4/10/2018	12:38:59 PM	5	685 R	0.1	2	174
170	4/10/2018	12:39:11 PM	7	580 R	0.1	6	49
171	4/10/2018	12:39:22 PM	3	685 R	0.1	-2	174
172	4/10/2018	1:06:47 PM	5	601 R	0.1 Grid 27	2	74
173	4/10/2018	1:06:59 PM	6	795 R	0.1	4	305
174	4/10/2018	1:07:11 PM	0	645 R	0.1	-9	126
175	4/10/2018	1:07:22 PM	4	639 R	0.1	0	119
176	4/10/2018	1:07:34 PM	1	754 R	0.1	-7	257
177	4/10/2018	1:07:46 PM	4	674 R	0.1	0	161
178	4/10/2018	1:07:57 PM	6	728 R	0.1	4	226
179	4/10/2018	1:08:09 PM	7	673 R	0.1	6	160
180	4/10/2018	1:08:21 PM	1	673 R	0.1	-7	160
181	4/10/2018	1:08:32 PM	5	577 R	0.1	2	45
182	4/10/2018	1:10:29 PM	6	578 R	0.1 Grid 28	4	47
183	4/10/2018	1:10:40 PM	3	673 R	0.1	-2	160
184	4/10/2018	1:10:52 PM	0	564 R	0.1	-9	30
185	4/10/2018	1:11:03 PM	11	460 R	0.1	15	-94
186	4/10/2018	1:11:15 PM	2	470 R	0.1	-5	-82
187	4/10/2018	1:11:27 PM	4	522 R	0.1	0	-20
188	4/10/2018	1:11:38 PM	1	537 R	0.1	-7	-2
189	4/10/2018	1:11:50 PM	0	450 R	0.1	-9	-106
190	4/10/2018	1:12:02 PM	0	537 R	0.1	-9	-2
191	4/10/2018	1:12:13 PM	13	502 R	0.1	19	-44
192	4/10/2018	1:18:23 PM	11	571 R	0.1 Grid 29	15	38
193	4/10/2018	1:18:34 PM	2	604 R	0.1	-5	78
194	4/10/2018	1:18:46 PM	6	597 R	0.1	4	69
195	4/10/2018	1:18:58 PM	5	663 R	0.1	2	148
196	4/10/2018	1:19:09 PM	7	512 R	0.1	6	-32
197	4/10/2018	1:19:21 PM	8	572 R	0.1	8	39
198	4/10/2018	1:19:33 PM	5	567 R	0.1	2	33
199	4/10/2018	1:19:44 PM	3	581 R	0.1	-2	50
200	4/10/2018	1:19:56 PM	4	688 R	0.1	0	178
201	4/10/2018	1:20:08 PM	0	639 R	0.1	-9	119
202	4/10/2018	1:31:07 PM	5	701 R	0.1 Grid 30	2	193
203	4/10/2018	1:31:19 PM	1	974 R	0.1	-7	519
204	4/10/2018	1:31:31 PM	4	1231 R	0.1	0	826
205	4/10/2018	1:31:42 PM	5	997 R	0.1	2	546
206	4/10/2018	1:31:54 PM	9	973 R	0.1	11	518
207	4/10/2018	1:32:06 PM	2	813 R	0.1	-5	327
208	4/10/2018	1:32:17 PM	10	848 R	0.1	13	369
209	4/10/2018	1:32:29 PM	11	1071 R	0.1	15	635

210	4/10/2018	1:32:41 PM	9	1149 R	0.1	11	728
211	4/10/2018	1:32:52 PM	2	1188 R	0.1	-5	774
212	4/10/2018	1:35:38 PM	0	1121 R	0.1 Grid 31	-9	694
213	4/10/2018	1:35:50 PM	11	1296 R	0.1	15	903
214	4/10/2018	1:36:02 PM	2	1347 R	0.1	-5	964
215	4/10/2018	1:36:13 PM	0	1347 R	0.1	-9	964
216	4/10/2018	1:36:25 PM	0	1229 R	0.1	-9	823
217	4/10/2018	1:36:37 PM	12	981 R	0.1	17	527
218	4/10/2018	1:36:48 PM	3	1570 R	0.1	-2	1230
219	4/10/2018	1:37:00 PM	8	1594 R	0.1	8	1259
220	4/10/2018	1:37:12 PM	2	1532 R	0.1	-5	1185
221	4/10/2018	1:37:23 PM	14	1602 R	0.1	21	1268
222	4/10/2018	2:08:48 PM	0	1345 R	0.1 Grid 32	-9	962
223	4/10/2018	2:09:00 PM	0	1474 R	0.1	-9	1116
224	4/10/2018	2:09:12 PM	0	1505 R	0.1	-9	1153
225	4/10/2018	2:09:23 PM	11	1422 R	0.1	15	1054
226	4/10/2018	2:09:35 PM	14	1413 R	0.1	21	1043
227	4/10/2018	2:09:47 PM	11	1448 R	0.1	15	1085
228	4/10/2018	2:09:58 PM	5	1695 R	0.1	2	1379
229	4/10/2018	2:10:10 PM	1	1593 R	0.1	-7	1258
230	4/10/2018	2:10:22 PM	0	1494 R	0.1	-9	1140
231	4/10/2018	2:10:33 PM	11	1407 R	0.1	15	1036
232	4/10/2018	2:10:45 PM	2	1477 R	0.1	-5	1119
233	4/10/2018	2:10:56 PM	8	1214 R	0.1	8	805
234	4/10/2018	2:11:08 PM	8	1189 R	0.1	8	776
Maximum:			29	2229		54	2017
Average:			5	1043		3	602
StDEv:			5	434		11	517

2360 SN:297743

43-37 #302111

Cal Due Date: 10/10/2018

Surveyor: Adolfo Matus

Bldg 218

Room 103 A Upper Walls Grids 33 thru 52

Alpha Efficiency: 0.319

Beta/Gamma Efficiency: 0.384

Alpha Background: 4.1

Beta/Gamma Background: 539

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²	
									Alpha	Beta
1	4/11/2018	1:05:51 PM	3	1055	R		0.1	Grid 33	-2	616
2	4/11/2018	1:06:02 PM	0	1342	R		0.1		-9	958
3	4/11/2018	1:06:14 PM	7	1363	R		0.1		6	983
4	4/11/2018	1:06:25 PM	1	1275	R		0.1		-7	878
5	4/11/2018	1:06:37 PM	0	1376	R		0.1		-9	999
6	4/11/2018	1:06:49 PM	26	1469	R		0.1		47	1110
7	4/11/2018	1:07:00 PM	6	1645	R		0.1		4	1320
8	4/11/2018	1:07:12 PM	1	1566	R		0.1		-7	1225
9	4/11/2018	1:07:24 PM	8	1474	R		0.1		8	1116
10	4/11/2018	1:10:39 PM	11	1016	R		0.1	Grid 34	15	569
11	4/11/2018	1:10:50 PM	2	1008	R		0.1		-5	560
12	4/11/2018	1:11:02 PM	5	922	R		0.1		2	457
13	4/11/2018	1:11:14 PM	1	955	R		0.1		-7	496
14	4/11/2018	1:11:25 PM	0	1185	R		0.1		-9	771
15	4/11/2018	1:11:37 PM	10	1026	R		0.1		13	581
16	4/11/2018	1:11:49 PM	14	1068	R		0.1		21	631
17	4/11/2018	1:12:00 PM	3	1128	R		0.1		-2	703
18	4/11/2018	1:12:12 PM	11	1129	R		0.1		15	704
19	4/11/2018	1:12:24 PM	2	1358	R		0.1		-5	977
20	4/11/2018	1:15:55 PM	3	1026	R		0.1	Grid 35	-2	581
21	4/11/2018	1:16:06 PM	3	1146	R		0.1		-2	724
22	4/11/2018	1:16:18 PM	0	1378	R		0.1		-9	1001
23	4/11/2018	1:16:30 PM	0	1270	R		0.1		-9	872
24	4/11/2018	1:16:41 PM	4	1323	R		0.1		0	935
25	4/11/2018	1:16:53 PM	13	1357	R		0.1		19	976
26	4/11/2018	1:17:05 PM	11	1553	R		0.1		15	1210
27	4/11/2018	1:17:16 PM	2	1665	R		0.1		-5	1344
28	4/11/2018	1:17:28 PM	4	1388	R		0.1		0	1013
29	4/11/2018	1:17:39 PM	1	1360	R		0.1		-7	980
30	4/11/2018	1:19:31 PM	0	862	R		0.1	Grid 36	-9	385
31	4/11/2018	1:19:43 PM	0	1050	R		0.1		-9	610
32	4/11/2018	1:19:54 PM	5	1348	R		0.1		2	965
33	4/11/2018	1:20:06 PM	1	1228	R		0.1		-7	822
34	4/11/2018	1:20:18 PM	0	1142	R		0.1		-9	720
35	4/11/2018	1:20:29 PM	12	964	R		0.1		17	507
36	4/11/2018	1:20:41 PM	2	1040	R		0.1		-5	598
37	4/11/2018	1:20:53 PM	20	1412	R		0.1		34	1042
38	4/11/2018	1:21:04 PM	4	1428	R		0.1		0	1061
39	4/11/2018	1:21:16 PM	1	1447	R		0.1		-7	1083
40	4/11/2018	1:22:43 PM	3	822	R		0.1	Grid 37	-2	338

41	4/11/2018	1:22:54 PM	0	1203 R	0.1	-9	792
42	4/11/2018	1:23:06 PM	0	1414 R	0.1	-9	1044
43	4/11/2018	1:23:18 PM	0	1413 R	0.1	-9	1043
44	4/11/2018	1:23:29 PM	12	1278 R	0.1	17	882
45	4/11/2018	1:23:41 PM	12	1279 R	0.1	17	883
46	4/11/2018	1:23:53 PM	3	1488 R	0.1	-2	1132
47	4/11/2018	1:24:04 PM	9	1258 R	0.1	11	858
48	4/11/2018	1:24:16 PM	5	1558 R	0.1	2	1216
49	4/11/2018	1:24:28 PM	4	1411 R	0.1	0	1040
50	4/11/2018	1:24:39 PM	4	1606 R	0.1	0	1273
51	4/11/2018	1:29:43 PM	5	1087 R	0.1 Grid 38	2	654
52	4/11/2018	1:29:55 PM	1	1224 R	0.1	-7	817
53	4/11/2018	1:30:07 PM	0	1416 R	0.1	-9	1046
54	4/11/2018	1:30:18 PM	3	1480 R	0.1	-2	1123
55	4/11/2018	1:30:30 PM	0	1342 R	0.1	-9	958
56	4/11/2018	1:30:42 PM	0	1599 R	0.1	-9	1265
57	4/11/2018	1:30:53 PM	0	1639 R	0.1	-9	1313
58	4/11/2018	1:31:05 PM	0	1364 R	0.1	-9	984
59	4/11/2018	1:31:17 PM	3	1432 R	0.1	-2	1066
60	4/11/2018	1:33:30 PM	3	993 R	0.1 Grid 39	-2	542
61	4/11/2018	1:33:42 PM	7	1199 R	0.1	6	788
62	4/11/2018	1:33:53 PM	1	1704 R	0.1	-7	1390
63	4/11/2018	1:34:05 PM	0	1786 R	0.1	-9	1488
64	4/11/2018	1:34:17 PM	9	1998 R	0.1	11	1741
65	4/11/2018	1:34:28 PM	2	2289 R	0.1	-5	2088
66	4/11/2018	1:34:40 PM	0	1926 R	0.1	-9	1655
67	4/11/2018	1:34:52 PM	0	1861 R	0.1	-9	1577
68	4/11/2018	1:35:03 PM	3	1661 R	0.1	-2	1339
69	4/11/2018	1:35:15 PM	0	1604 R	0.1	-9	1271
70	4/11/2018	1:40:00 PM	0	1351 R	0.1 Grid 40	-9	969
71	4/11/2018	1:40:12 PM	0	1684 R	0.1	-9	1366
72	4/11/2018	1:40:23 PM	7	1472 R	0.1	6	1113
73	4/11/2018	1:40:35 PM	1	1637 R	0.1	-7	1310
74	4/11/2018	1:40:46 PM	0	1904 R	0.1	-9	1629
75	4/11/2018	1:40:58 PM	0	2472 R	0.1	-9	2306
76	4/11/2018	1:41:10 PM	0	3095 R	0.1	-9	3050
77	4/11/2018	1:41:21 PM	0	2702 R	0.1	-9	2581
78	4/11/2018	1:41:33 PM	0	2157 R	0.1	-9	1931
79	4/11/2018	1:41:45 PM	10	2084 R	0.1	13	1843
80	4/11/2018	1:45:06 PM	0	1480 R	0.1 Grid 41	-9	1123
81	4/11/2018	1:45:18 PM	0	1420 R	0.1	-9	1051
82	4/11/2018	1:45:30 PM	4	1150 R	0.1	0	729
83	4/11/2018	1:45:41 PM	4	1482 R	0.1	0	1125
84	4/11/2018	1:45:53 PM	13	1157 R	0.1	19	737
85	4/11/2018	1:46:05 PM	3	1033 R	0.1	-2	589
86	4/11/2018	1:46:16 PM	0	2007 R	0.1	-9	1752
87	4/11/2018	1:46:28 PM	8	2435 R	0.1	8	2262
88	4/11/2018	1:46:40 PM	7	1830 R	0.1	6	1540
89	4/11/2018	1:46:51 PM	1	1622 R	0.1	-7	1292
90	4/11/2018	1:47:58 PM	0	697 R	0.1 Grid 42	-9	189
91	4/11/2018	1:48:09 PM	3	1279 R	0.1	-2	883
92	4/11/2018	1:48:21 PM	0	1608 R	0.1	-9	1276
93	4/11/2018	1:48:33 PM	0	2298 R	0.1	-9	2099
94	4/11/2018	2:05:28 PM	8	1696 R	0.1	8	1381
95	4/11/2018	2:05:39 PM	6	2021 R	0.1	4	1768

96	4/11/2018 2:05:51 PM	15	1440 R	0.1	23	1075
97	4/11/2018 2:06:03 PM	3	1339 R	0.1	-2	955
98	4/11/2018 2:06:14 PM	9	2363 R	0.1	11	2176
99	4/11/2018 2:06:26 PM	11	2716 R	0.1	15	2598
100	4/11/2018 2:07:00 PM	0	858 R	0.1 Grid 43	-9	381
101	4/11/2018 2:07:11 PM	0	1124 R	0.1	-9	698
102	4/11/2018 2:07:23 PM	13	2361 R	0.1	19	2174
103	4/11/2018 2:07:35 PM	3	2169 R	0.1	-2	1945
104	4/11/2018 2:07:46 PM	13	3316 R	0.1	19	3314
105	4/11/2018 2:07:58 PM	7	2376 R	0.1	6	2192
106	4/11/2018 2:08:10 PM	24	2277 R	0.1	43	2074
107	4/11/2018 2:08:21 PM	5	1885 R	0.1	2	1606
108	4/11/2018 2:08:33 PM	1	1832 R	0.1	-7	1543
109	4/11/2018 2:08:45 PM	0	3950 R	0.1	-9	4070
110	4/11/2018 2:15:30 PM	3	1500 R	0.1 Grid 44	-2	1147
111	4/11/2018 2:15:41 PM	4	1103 R	0.1	0	673
112	4/11/2018 2:15:53 PM	1	875 R	0.1	-7	401
113	4/11/2018 2:16:05 PM	0	1566 R	0.1	-9	1225
114	4/11/2018 2:16:16 PM	4	1475 R	0.1	0	1117
115	4/11/2018 2:16:28 PM	1	1387 R	0.1	-7	1012
116	4/11/2018 2:16:40 PM	0	1081 R	0.1	-9	647
117	4/11/2018 2:16:51 PM	0	3381 R	0.1	-9	3391
118	4/11/2018 2:17:03 PM	6	4111 R	0.1	4	4262
119	4/11/2018 2:17:15 PM	1	2834 R	0.1	-7	2738
120	4/11/2018 2:17:26 PM	15	3223 R	0.1	23	3203
121	4/11/2018 2:46:50 PM	3	790 R	0.1 Grid 45	-2	299
122	4/11/2018 2:47:02 PM	15	649 R	0.1	23	131
123	4/11/2018 2:47:14 PM	7	682 R	0.1	6	171
124	4/11/2018 2:47:25 PM	1	736 R	0.1	-7	235
125	4/11/2018 2:47:37 PM	0	910 R	0.1	-9	443
126	4/11/2018 2:47:49 PM	6	1010 R	0.1	4	562
127	4/11/2018 2:48:00 PM	1	1187 R	0.1	-7	773
128	4/11/2018 2:48:12 PM	0	1106 R	0.1	-9	677
129	4/11/2018 2:48:24 PM	11	1091 R	0.1	15	659
130	4/11/2018 2:49:50 PM	4	835 R	0.1 Grid 46	0	353
131	4/11/2018 2:50:01 PM	7	899 R	0.1	6	430
132	4/11/2018 2:50:13 PM	8	1063 R	0.1	8	625
133	4/11/2018 2:50:24 PM	6	1008 R	0.1	4	560
134	4/11/2018 2:50:36 PM	11	1184 R	0.1	15	770
135	4/11/2018 2:50:48 PM	2	781 R	0.1	-5	289
136	4/11/2018 2:50:59 PM	0	1088 R	0.1	-9	655
137	4/11/2018 2:51:11 PM	6	1311 R	0.1	4	921
138	4/11/2018 2:51:23 PM	5	1557 R	0.1	2	1215
139	4/11/2018 2:51:34 PM	8	1080 R	0.1	8	646
139	4/11/2018 2:51:54 PM	8	972 R	0.1	8	517
140	4/11/2018 2:53:20 PM	4	530 R	0.1 Grid 47	0	-11
141	4/11/2018 2:53:32 PM	0	783 R	0.1	-9	291
142	4/11/2018 2:53:43 PM	0	1022 R	0.1	-9	576
143	4/11/2018 2:53:55 PM	8	858 R	0.1	8	381
144	4/11/2018 2:54:07 PM	2	618 R	0.1	-5	94
145	4/11/2018 2:54:18 PM	12	759 R	0.1	17	263
146	4/11/2018 2:54:30 PM	20	876 R	0.1	34	402
147	4/11/2018 2:54:42 PM	13	901 R	0.1	19	432
148	4/11/2018 2:54:53 PM	3	1192 R	0.1	-2	779
149	4/11/2018 2:55:05 PM	0	897 R	0.1	-9	427

150	4/11/2018 2:55:54 PM	3	1427 R	0.1	Grid 48	-2	1060
151	4/11/2018 2:56:06 PM	0	774 R	0.1		-9	280
152	4/11/2018 2:56:17 PM	13	670 R	0.1		19	156
153	4/11/2018 2:56:29 PM	7	574 R	0.1		6	42
154	4/11/2018 2:56:41 PM	13	528 R	0.1		19	-13
155	4/11/2018 2:56:52 PM	14	526 R	0.1		21	-16
156	4/11/2018 2:57:04 PM	3	579 R	0.1		-2	48
157	4/11/2018 2:57:16 PM	0	645 R	0.1		-9	126
158	4/11/2018 2:57:27 PM	0	642 R	0.1		-9	123
159	4/11/2018 2:57:39 PM	0	729 R	0.1		-9	227
160	4/11/2018 2:59:10 PM	28	535 R	0.1	Grid 49	51	-5
161	4/11/2018 2:59:21 PM	6	535 R	0.1		4	-5
162	4/11/2018 2:59:33 PM	1	552 R	0.1		-7	16
163	4/11/2018 2:59:45 PM	3	639 R	0.1		-2	119
164	4/11/2018 2:59:56 PM	2	689 R	0.1		-5	179
165	4/11/2018 3:00:08 PM	4	737 R	0.1		0	236
166	4/11/2018 3:00:20 PM	5	759 R	0.1		2	263
167	4/11/2018 3:00:31 PM	10	658 R	0.1		13	142
168	4/11/2018 3:00:43 PM	18	576 R	0.1		30	44
169	4/11/2018 3:00:54 PM	13	653 R	0.1		19	136
170	4/11/2018 3:04:56 PM	0	486 R	0.1	Grid 50	-9	-63
171	4/11/2018 3:05:08 PM	5	561 R	0.1		2	26
172	4/11/2018 3:05:19 PM	1	547 R	0.1		-7	10
173	4/11/2018 3:05:31 PM	0	553 R	0.1		-9	17
174	4/11/2018 3:05:43 PM	3	670 R	0.1		-2	156
175	4/11/2018 3:05:54 PM	0	715 R	0.1		-9	210
176	4/11/2018 3:06:06 PM	0	730 R	0.1		-9	228
177	4/11/2018 3:06:18 PM	15	593 R	0.1		23	64
178	4/11/2018 3:06:29 PM	3	600 R	0.1		-2	73
179	4/11/2018 3:06:41 PM	0	563 R	0.1		-9	29
180	4/11/2018 3:15:54 PM	11	568 R	0.1	Grid 51	15	35
181	4/11/2018 3:16:06 PM	8	499 R	0.1		8	-48
182	4/11/2018 3:16:18 PM	2	628 R	0.1		-5	106
183	4/11/2018 3:16:29 PM	5	513 R	0.1		2	-31
184	4/11/2018 3:16:41 PM	1	653 R	0.1		-7	136
185	4/11/2018 3:16:53 PM	3	540 R	0.1		-2	1
186	4/11/2018 3:17:04 PM	4	627 R	0.1		0	105
187	4/11/2018 3:17:16 PM	4	749 R	0.1		0	251
188	4/11/2018 3:17:28 PM	6	737 R	0.1		4	236
189	4/11/2018 3:17:39 PM	5	657 R	0.1		2	141
190	4/11/2018 3:20:28 PM	5	546 R	0.1	Grid 52	2	8
191	4/11/2018 3:20:39 PM	9	725 R	0.1		11	222
192	4/11/2018 3:20:51 PM	7	589 R	0.1		6	60
193	4/11/2018 3:21:03 PM	6	534 R	0.1		4	-6
194	4/11/2018 3:21:14 PM	1	596 R	0.1		-7	68
195	4/11/2018 3:21:26 PM	23	620 R	0.1		41	97
196	4/11/2018 3:21:38 PM	5	645 R	0.1		2	126
197	4/11/2018 3:21:49 PM	18	645 R	0.1		30	126
198	4/11/2018 3:22:01 PM	4	684 R	0.1		0	173
199	4/11/2018 3:22:12 PM	1	626 R	0.1		-7	104
	Maximum:	28	4111			51	4262
	Average:	5	1258			2	858
	StDev:	6	650			12	776

Room 103A Ceiling/Overhead

2360 SN:297743

43-93# 302111

Cal Due Date: 10/10/2018

Surveyor: Adolfo Matus

Bldg. 218

Room 103A Ceiling Grids 3-5-6-14-15-20-22-25-30-33-40-43

Alpha Efficiency: 0.319

Beta/Gamma Efficiency: 0.384

Alpha Background: 4.1

Beta/Gamma Background: 539

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count Time	Location	dpm/100cm ²	
								Alpha	Beta
1	4/12/2018	10:21:06 AM	0	481	R	0.1	Grid 3	-9	-69
2	4/12/2018	10:21:17 AM	0	523	R	0.1		-9	-19
3	4/12/2018	10:21:29 AM	0	628	R	0.1		-9	106
4	4/12/2018	10:21:41 AM	0	564	R	0.1		-9	30
5	4/12/2018	10:21:52 AM	0	634	R	0.1		-9	113
6	4/12/2018	10:22:04 AM	10	571	R	0.1		13	38
7	4/12/2018	10:22:16 AM	4	564	R	0.1		0	30
8	4/12/2018	10:22:27 AM	0	484	R	0.1		-9	-66
9	4/12/2018	10:22:39 AM	3	549	R	0.1		-2	12
10	4/12/2018	10:28:03 AM	0	711	R	0.1	Grid 5	-9	205
11	4/12/2018	10:28:15 AM	3	640	R	0.1		-2	121
12	4/12/2018	10:28:27 AM	8	566	R	0.1		8	32
13	4/12/2018	10:28:38 AM	6	796	R	0.1		4	307
14	4/12/2018	10:28:50 AM	11	843	R	0.1		15	363
15	4/12/2018	10:29:02 AM	2	809	R	0.1		-5	322
16	4/12/2018	10:29:13 AM	7	781	R	0.1		6	289
17	4/12/2018	10:29:25 AM	6	781	R	0.1		4	289
18	4/12/2018	10:29:37 AM	1	854	R	0.1		-7	376
19	4/12/2018	10:29:48 AM	0	814	R	0.1		-9	328
20	4/12/2018	10:43:21 AM	7	678	R	0.1	Grid 6	6	166
21	4/12/2018	10:43:33 AM	1	880	R	0.1		-7	407
22	4/12/2018	10:43:44 AM	6	865	R	0.1		4	389
23	4/12/2018	10:43:56 AM	6	832	R	0.1		4	350
24	4/12/2018	10:44:07 AM	5	806	R	0.1		2	319
25	4/12/2018	10:44:19 AM	21	727	R	0.1		36	224
26	4/12/2018	10:44:31 AM	15	854	R	0.1		23	376
27	4/12/2018	10:44:42 AM	3	698	R	0.1		-2	190
28	4/12/2018	10:44:54 AM	11	750	R	0.1		15	252
29	4/12/2018	10:45:06 AM	2	742	R	0.1		-5	242
30	4/12/2018	10:49:41 AM	10	588	R	0.1	Grid 14	13	58
31	4/12/2018	10:49:52 AM	2	617	R	0.1		-5	93
32	4/12/2018	10:50:04 AM	10	670	R	0.1		13	156
33	4/12/2018	10:50:16 AM	7	706	R	0.1		6	199
34	4/12/2018	10:50:27 AM	1	739	R	0.1		-7	239
35	4/12/2018	10:50:39 AM	0	689	R	0.1		-9	179
36	4/12/2018	10:50:50 AM	3	717	R	0.1		-2	212
37	4/12/2018	10:51:02 AM	0	848	R	0.1		-9	369
38	4/12/2018	10:51:14 AM	4	612	R	0.1		0	87
39	4/12/2018	10:51:25 AM	6	602	R	0.1		4	75

40	4/12/2018	12:13:41 PM	3	583 R	0.1 Grid 15	-2	53
41	4/12/2018	12:13:53 PM	3	752 R	0.1	-2	254
42	4/12/2018	12:14:05 PM	6	732 R	0.1	4	230
43	4/12/2018	12:14:16 PM	1	837 R	0.1	-7	356
44	4/12/2018	12:14:28 PM	0	756 R	0.1	-9	259
45	4/12/2018	12:14:40 PM	3	821 R	0.1	-2	336
46	4/12/2018	12:14:59 PM	5	801 R	0.1	2	313
47	4/12/2018	12:15:10 PM	4	833 R	0.1	0	351
48	4/12/2018	12:15:22 PM	1	803 R	0.1	-7	315
49	4/12/2018	12:15:34 PM	0	719 R	0.1	-9	215
50	4/12/2018	12:28:43 PM	7	614 R	0.1 Grid 20	6	89
51	4/12/2018	12:28:55 PM	1	663 R	0.1	-7	148
52	4/12/2018	12:29:06 PM	2	622 R	0.1	-5	99
53	4/12/2018	12:29:18 PM	3	556 R	0.1	-2	20
54	4/12/2018	12:29:30 PM	0	713 R	0.1	-9	208
55	4/12/2018	12:29:41 PM	0	603 R	0.1	-9	76
56	4/12/2018	12:29:53 PM	12	642 R	0.1	17	123
57	4/12/2018	12:30:05 PM	3	645 R	0.1	-2	126
58	4/12/2018	12:30:16 PM	0	639 R	0.1	-9	119
59	4/12/2018	12:30:28 PM	3	661 R	0.1	-2	146
60	4/12/2018	12:39:05 PM	0	523 R	0.1 Grid 22	-9	-19
61	4/12/2018	12:39:17 PM	8	842 R	0.1	8	362
62	4/12/2018	12:39:29 PM	5	801 R	0.1	2	313
63	4/12/2018	12:39:40 PM	9	720 R	0.1	11	216
64	4/12/2018	12:39:52 PM	2	679 R	0.1	-5	167
65	4/12/2018	12:40:04 PM	3	672 R	0.1	-2	159
66	4/12/2018	12:40:15 PM	2	646 R	0.1	-5	128
67	4/12/2018	12:40:27 PM	3	615 R	0.1	-2	91
68	4/12/2018	12:40:39 PM	2	703 R	0.1	-5	196
69	4/12/2018	12:40:50 PM	4	640 R	0.1	0	121
70	4/12/2018	12:54:57 PM	2	766 R	0.1 Grid 25	-5	271
71	4/12/2018	12:55:09 PM	2	786 R	0.1	-5	295
72	4/12/2018	12:55:20 PM	3	817 R	0.1	-2	332
73	4/12/2018	12:55:32 PM	0	822 R	0.1	-9	338
74	4/12/2018	12:55:44 PM	6	824 R	0.1	4	340
75	4/12/2018	12:55:55 PM	1	841 R	0.1	-7	360
76	4/12/2018	12:56:07 PM	0	842 R	0.1	-9	362
77	4/12/2018	12:56:19 PM	0	833 R	0.1	-9	351
78	4/12/2018	12:56:30 PM	5	825 R	0.1	2	341
79	4/12/2018	12:56:42 PM	15	670 R	0.1	23	156
80	4/12/2018	1:08:31 PM	4	516 R	0.1 Grid 30	0	-27
81	4/12/2018	1:08:43 PM	7	554 R	0.1	6	18
82	4/12/2018	1:08:55 PM	9	608 R	0.1	11	82
83	4/12/2018	1:09:06 PM	10	637 R	0.1	13	117
84	4/12/2018	1:09:18 PM	2	631 R	0.1	-5	110
85	4/12/2018	1:09:30 PM	22	688 R	0.1	39	178
86	4/12/2018	1:09:41 PM	5	783 R	0.1	2	291
87	4/12/2018	1:09:53 PM	1	637 R	0.1	-7	117
88	4/12/2018	1:10:06 PM	5	536 R	0.1	2	-4
89	4/12/2018	1:10:17 PM	1	651 R	0.1	-7	134
90	4/12/2018	1:17:53 PM	3	676 R	0.1 Grid 33	-2	163
91	4/12/2018	1:18:04 PM	4	843 R	0.1	0	363
92	4/12/2018	1:18:16 PM	2	806 R	0.1	-5	319
93	4/12/2018	1:18:28 PM	0	731 R	0.1	-9	229

94	4/12/2018	1:18:39 PM	8	765 R	0.1	8	270
95	4/12/2018	1:19:03 PM	3	488 R	0.1	-2	-61
96	4/12/2018	1:19:15 PM	0	586 R	0.1	-9	56
97	4/12/2018	1:19:26 PM	6	644 R	0.1	4	125
98	4/12/2018	1:19:38 PM	5	612 R	0.1	2	87
99	4/12/2018	1:19:50 PM	5	604 R	0.1	2	78
100	4/12/2018	1:24:40 PM	3	523 R	0.1 Grid 40	-2	-19
101	4/12/2018	1:24:51 PM	10	599 R	0.1	13	72
102	4/12/2018	1:25:03 PM	2	586 R	0.1	-5	56
103	4/12/2018	1:25:15 PM	0	603 R	0.1	-9	76
104	4/12/2018	1:25:26 PM	0	568 R	0.1	-9	35
105	4/12/2018	1:25:38 PM	7	523 R	0.1	6	-19
106	4/12/2018	1:25:50 PM	1	812 R	0.1	-7	326
107	4/12/2018	1:26:01 PM	10	568 R	0.1	13	35
108	4/12/2018	1:26:13 PM	2	606 R	0.1	-5	80
109	4/12/2018	1:26:25 PM	17	598 R	0.1	28	70
110	4/12/2018	1:26:36 PM	10	642 R	0.1	13	123
111	4/12/2018	1:34:00 PM	7	566 R	0.1 Grid 43	6	32
112	4/12/2018	1:34:12 PM	1	749 R	0.1	-7	251
113	4/12/2018	1:34:24 PM	2	679 R	0.1	-5	167
114	4/12/2018	1:34:35 PM	3	530 R	0.1	-2	-11
115	4/12/2018	1:34:47 PM	0	511 R	0.1	-9	-33
116	4/12/2018	1:34:59 PM	12	634 R	0.1	17	113
117	4/12/2018	1:35:10 PM	21	671 R	0.1	36	158
118	4/12/2018	1:35:22 PM	11	603 R	0.1	15	76
119	4/12/2018	1:35:33 PM	23	553 R	0.1	41	17
		Maximum:	23	880		41	407
		Average:	5	682		1	171
		StDev:	5	107		11	127

Tunnel Floor

2360 SN:268488

43-37 #190672

Cal Due Date:

10/27/2018

Surveyor:

Adolfo Matus

Tunnel

Floor Grids 1 thru 5

Alpha Efficiency: 0.302

Beta/Gamma Efficiency: 0.37

Alpha Background: 5.8

Beta/Gamma Background: 881

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²	
									Alpha	Beta
1	4/19/2018	9:16:55 AM	3	834	R	0.1	Grid 1	-6	-58	
2	4/19/2018	9:17:07 AM	7	901	R	0.1		3	25	
3	4/19/2018	9:17:18 AM	1	812	R	0.1		-11	-85	
4	4/19/2018	9:17:30 AM	0	880	R	0.1		-13	-1	
5	4/19/2018	9:17:42 AM	0	821	R	0.1		-13	-74	
6	4/19/2018	9:17:53 AM	7	847	R	0.1		3	-42	
7	4/19/2018	9:18:05 AM	6	889	R	0.1		0	10	
8	4/19/2018	9:18:17 AM	4	843	R	0.1		-4	-47	
9	4/19/2018	9:18:29 AM	1	897	R	0.1		-11	20	
10	4/19/2018	9:21:25 AM	0	817	R	0.1	Grid 2	-13	-79	
11	4/19/2018	9:21:37 AM	4	821	R	0.1		-4	-74	
12	4/19/2018	9:21:49 AM	1	906	R	0.1		-11	31	
13	4/19/2018	9:22:00 AM	11	870	R	0.1		12	-14	
14	4/19/2018	9:22:12 AM	8	831	R	0.1		5	-62	
15	4/19/2018	9:22:24 AM	2	882	R	0.1		-9	1	
16	4/19/2018	9:22:35 AM	0	833	R	0.1		-13	-59	
17	4/19/2018	9:22:47 AM	17	847	R	0.1		25	-42	
18	4/19/2018	9:22:59 AM	11	869	R	0.1		12	-15	
19	4/19/2018	9:23:11 AM	13	875	R	0.1		16	-7	
20	4/19/2018	9:25:35 AM	0	890	R	0.1	Grid 3	-13	11	
21	4/19/2018	9:25:47 AM	7	846	R	0.1		3	-43	
22	4/19/2018	9:25:59 AM	13	855	R	0.1		16	-32	
23	4/19/2018	9:26:10 AM	6	879	R	0.1		0	-2	
24	4/19/2018	9:26:22 AM	1	899	R	0.1		-11	22	
25	4/19/2018	9:26:34 AM	7	823	R	0.1		3	-72	
26	4/19/2018	9:26:45 AM	1	845	R	0.1		-11	-45	
27	4/19/2018	9:26:57 AM	2	841	R	0.1		-9	-50	
28	4/19/2018	9:27:09 AM	3	825	R	0.1		-6	-69	
29	4/19/2018	9:27:21 AM	0	856	R	0.1		-13	-31	
30	4/19/2018	9:29:46 AM	5	823	R	0.1	Grid 4	-2	-72	
31	4/19/2018	9:29:58 AM	1	856	R	0.1		-11	-31	
32	4/19/2018	9:30:09 AM	0	858	R	0.1		-13	-28	
33	4/19/2018	9:30:21 AM	0	818	R	0.1		-13	-78	
34	4/19/2018	9:30:33 AM	7	820	R	0.1		3	-76	
35	4/19/2018	9:30:45 AM	1	860	R	0.1		-11	-26	
36	4/19/2018	9:30:56 AM	0	849	R	0.1		-13	-40	
37	4/19/2018	9:31:08 AM	8	888	R	0.1		5	9	
38	4/19/2018	9:31:20 AM	2	823	R	0.1		-9	-72	
39	4/19/2018	9:31:31 AM	7	827	R	0.1		3	-67	
40	4/19/2018	9:35:50 AM	0	887	R	0.1	Grid 5	-13	7	
41	4/19/2018	9:36:01 AM	3	879	R	0.1		-6	-2	

42	4/19/2018 9:36:13 AM	0	847 R	0.1	-13	-42
43	4/19/2018 9:36:25 AM	2	877 R	0.1	-9	-5
44	4/19/2018 9:36:36 AM	4	868 R	0.1	-4	-16
45	4/19/2018 9:36:48 AM	3	842 R	0.1	-6	-48
46	4/19/2018 9:37:00 AM	4	835 R	0.1	-4	-57
47	4/19/2018 9:37:11 AM	8	893 R	0.1	5	15
48	4/19/2018 9:37:23 AM	5	842 R	0.1	-2	-48
49	4/19/2018 9:37:35 AM	6	862 R	0.1	0	-24
	Maximum:	17	906		25	31
	Average:	4	855		-4	-32
	StDev:	4	27		9	33

Tunnel Lower/Upper Walls

2360 SN:297766

43-93# 323074

Cal Due Date: 12/20/2018

Surveyor: Joan Cosgrove

Tunnel

Grids 1 thru 8 16 thru 20

Alpha Efficiency: 0.404

Beta/Gamma Efficiency: 0.254

Alpha Background: 1

Beta/Gamma Background: 192

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²	
									Alpha	Beta
1	4/5/2018	10:10:37 AM	7	190	R	0.1	Grid 1	10	-21	
2	4/5/2018	10:10:49 AM	10	195	R	0.1		15	31	
3	4/5/2018	10:11:00 AM	2	182	R	0.1		2	-105	
4	4/5/2018	10:11:12 AM	2	191	R	0.1		2	-10	
5	4/5/2018	10:11:24 AM	0	212	R	0.1		-2	210	
6	4/5/2018	10:11:35 AM	2	241	R	0.1		2	514	
7	4/5/2018	10:11:47 AM	0	220	R	0.1		-2	294	
8	4/5/2018	10:11:59 AM	1	183	R	0.1		0	-94	
9	4/5/2018	10:12:10 AM	0	190	R	0.1		-2	-21	
10	4/5/2018	10:12:22 AM	1	185	R	0.1		0	-73	
11	4/5/2018	10:12:34 AM	2	192	R	0.1		2	0	
12	4/5/2018	10:12:45 AM	0	204	R	0.1		-2	126	
13	4/5/2018	10:12:57 AM	0	190	R	0.1		-2	-21	
14	4/5/2018	10:13:09 AM	8	191	R	0.1		12	-10	
15	4/5/2018	10:13:20 AM	7	195	R	0.1		10	31	
16	4/5/2018	10:13:32 AM	5	246	R	0.1		7	567	
17	4/5/2018	10:13:44 AM	1	240	R	0.1		0	504	
18	4/5/2018	10:13:55 AM	0	225	R	0.1		-2	346	
19	4/5/2018	10:14:07 AM	0	231	R	0.1		-2	409	
20	4/5/2018	10:14:19 AM	0	229	R	0.1		-2	388	
21	4/5/2018	10:14:30 AM	12	207	R	0.1		19	157	
22	4/5/2018	10:14:42 AM	3	222	R	0.1		3	315	
23	4/5/2018	10:14:54 AM	2	189	R	0.1		2	-31	
24	4/5/2018	10:15:05 AM	1	188	R	0.1		0	-42	
25	4/5/2018	10:15:17 AM	2	206	R	0.1		2	147	
26	4/5/2018	10:15:29 AM	3	191	R	0.1		3	-10	
27	4/5/2018	10:15:40 AM	2	198	R	0.1		2	63	
28	4/5/2018	10:15:52 AM	1	183	R	0.1		0	-94	
29	4/5/2018	10:16:04 AM	0	243	R	0.1		-2	535	
30	4/5/2018	10:16:15 AM	3	258	R	0.1		3	693	
31	4/5/2018	10:16:27 AM	4	237	R	0.1		5	472	
32	4/5/2018	10:16:39 AM	3	217	R	0.1		3	262	
33	4/5/2018	10:16:50 AM	0	243	R	0.1		-2	535	
34	4/5/2018	10:17:02 AM	3	197	R	0.1		3	52	
35	4/5/2018	10:17:14 AM	2	243	R	0.1		2	535	
36	4/5/2018	10:17:25 AM	2	208	R	0.1		2	168	
37	4/5/2018	10:17:37 AM	1	240	R	0.1		0	504	
38	4/5/2018	10:17:49 AM	2	245	R	0.1		2	556	

39	4/5/2018	10:18:00 AM	0	229 R	0.1	-2	388
40	4/5/2018	10:21:07 AM	2	187 R	0.1 Grid 2	2	-52
41	4/5/2018	10:21:19 AM	0	184 R	0.1	-2	-84
42	4/5/2018	10:21:31 AM	9	244 R	0.1	14	546
43	4/5/2018	10:21:42 AM	2	181 R	0.1	2	-115
44	4/5/2018	10:21:54 AM	11	191 R	0.1	17	-10
45	4/5/2018	10:22:06 AM	2	199 R	0.1	2	73
46	4/5/2018	10:22:17 AM	2	191 R	0.1	2	-10
47	4/5/2018	10:22:29 AM	0	212 R	0.1	-2	210
48	4/5/2018	10:22:41 AM	6	189 R	0.1	9	-31
49	4/5/2018	10:22:52 AM	11	189 R	0.1	17	-31
50	4/5/2018	10:23:04 AM	2	213 R	0.1	2	220
51	4/5/2018	10:23:16 AM	0	198 R	0.1	-2	63
52	4/5/2018	10:23:27 AM	6	267 R	0.1	9	787
53	4/5/2018	10:23:39 AM	1	261 R	0.1	0	724
54	4/5/2018	10:23:51 AM	0	195 R	0.1	-2	31
55	4/5/2018	10:24:02 AM	0	248 R	0.1	-2	588
56	4/5/2018	10:24:14 AM	7	271 R	0.1	10	829
57	4/5/2018	10:24:26 AM	18	246 R	0.1	29	567
58	4/5/2018	10:24:37 AM	4	227 R	0.1	5	367
59	4/5/2018	10:24:49 AM	1	198 R	0.1	0	63
60	4/5/2018	10:25:01 AM	0	242 R	0.1	-2	525
61	4/5/2018	10:25:12 AM	7	256 R	0.1	10	672
62	4/5/2018	10:25:24 AM	1	212 R	0.1	0	210
63	4/5/2018	10:25:36 AM	2	202 R	0.1	2	105
64	4/5/2018	10:25:47 AM	0	231 R	0.1	-2	409
65	4/5/2018	10:25:59 AM	3	223 R	0.1	3	325
66	4/5/2018	10:26:11 AM	0	259 R	0.1	-2	703
67	4/5/2018	10:26:22 AM	0	260 R	0.1	-2	714
68	4/5/2018	10:26:34 AM	11	255 R	0.1	17	661
69	4/5/2018	10:26:46 AM	9	224 R	0.1	14	336
70	4/5/2018	10:26:57 AM	2	211 R	0.1	2	199
71	4/5/2018	10:27:09 AM	10	191 R	0.1	15	-10
72	4/5/2018	10:27:21 AM	2	231 R	0.1	2	409
73	4/5/2018	10:27:32 AM	4	270 R	0.1	5	819
74	4/5/2018	10:27:44 AM	1	266 R	0.1	0	777
75	4/5/2018	10:27:56 AM	2	277 R	0.1	2	892
76	4/5/2018	10:28:07 AM	1	263 R	0.1	0	745
77	4/5/2018	10:28:19 AM	2	270 R	0.1	2	819
78	4/5/2018	10:28:31 AM	3	266 R	0.1	3	777
79	4/5/2018	10:28:42 AM	3	275 R	0.1	3	871
80	4/5/2018	10:34:01 AM	2	199 R	0.1 Grid 3	2	73
81	4/5/2018	10:34:13 AM	2	238 R	0.1	2	483
82	4/5/2018	10:34:24 AM	1	259 R	0.1	0	703
83	4/5/2018	10:34:36 AM	2	192 R	0.1	2	0
84	4/5/2018	10:34:48 AM	2	187 R	0.1	2	-52
85	4/5/2018	10:34:59 AM	0	196 R	0.1	-2	42
86	4/5/2018	10:35:11 AM	0	190 R	0.1	-2	-21
87	4/5/2018	10:35:23 AM	8	223 R	0.1	12	325
88	4/5/2018	10:35:34 AM	2	223 R	0.1	2	325
89	4/5/2018	10:35:46 AM	7	232 R	0.1	10	420
90	4/5/2018	10:35:58 AM	11	240 R	0.1	17	504
91	4/5/2018	10:36:09 AM	4	262 R	0.1	5	735

92	4/5/2018	10:36:21 AM	1	204 R	0.1	0	126
93	4/5/2018	10:36:33 AM	2	242 R	0.1	2	525
94	4/5/2018	10:36:44 AM	3	254 R	0.1	3	651
95	4/5/2018	10:36:56 AM	2	208 R	0.1	2	168
96	4/5/2018	10:37:08 AM	1	255 R	0.1	0	661
97	4/5/2018	10:37:19 AM	2	231 R	0.1	2	409
98	4/5/2018	10:37:31 AM	2	189 R	0.1	2	-31
99	4/5/2018	10:37:43 AM	8	206 R	0.1	12	147
100	4/5/2018	10:37:54 AM	2	241 R	0.1	2	514
101	4/5/2018	10:38:06 AM	2	239 R	0.1	2	493
102	4/5/2018	10:38:18 AM	4	272 R	0.1	5	840
103	4/5/2018	10:38:29 AM	3	238 R	0.1	3	483
104	4/5/2018	10:38:41 AM	2	250 R	0.1	2	609
105	4/5/2018	10:38:53 AM	1	224 R	0.1	0	336
106	4/5/2018	10:39:04 AM	2	274 R	0.1	2	861
107	4/5/2018	10:39:16 AM	3	221 R	0.1	3	304
108	4/5/2018	10:39:28 AM	0	234 R	0.1	-2	441
109	4/5/2018	10:39:39 AM	8	258 R	0.1	12	693
110	4/5/2018	10:39:51 AM	2	265 R	0.1	2	766
111	4/5/2018	10:40:02 AM	0	245 R	0.1	-2	556
112	4/5/2018	10:40:14 AM	0	208 R	0.1	-2	168
113	4/5/2018	10:40:26 AM	0	223 R	0.1	-2	325
114	4/5/2018	10:40:37 AM	10	219 R	0.1	15	283
115	4/5/2018	10:40:49 AM	2	210 R	0.1	2	189
116	4/5/2018	10:41:01 AM	2	241 R	0.1	2	514
117	4/5/2018	10:41:12 AM	1	197 R	0.1	0	52
118	4/5/2018	10:41:24 AM	2	188 R	0.1	2	-42
119	4/5/2018	10:41:36 AM	3	203 R	0.1	3	115
120	4/5/2018	10:46:27 AM	2	192 R	0.1 Grid 4	2	0
121	4/5/2018	10:46:38 AM	1	202 R	0.1	0	105
122	4/5/2018	10:46:50 AM	2	229 R	0.1	2	388
123	4/5/2018	10:47:02 AM	5	230 R	0.1	7	399
124	4/5/2018	10:47:13 AM	5	214 R	0.1	7	231
125	4/5/2018	10:47:25 AM	4	207 R	0.1	5	157
126	4/5/2018	10:47:37 AM	8	197 R	0.1	12	52
127	4/5/2018	10:47:48 AM	2	200 R	0.1	2	84
128	4/5/2018	10:48:00 AM	0	274 R	0.1	-2	861
129	4/5/2018	10:48:12 AM	0	270 R	0.1	-2	819
130	4/5/2018	10:48:23 AM	8	211 R	0.1	12	199
131	4/5/2018	10:48:35 AM	2	241 R	0.1	2	514
132	4/5/2018	10:48:47 AM	2	214 R	0.1	2	231
133	4/5/2018	10:48:58 AM	3	204 R	0.1	3	126
134	4/5/2018	10:49:10 AM	2	220 R	0.1	2	294
135	4/5/2018	10:49:22 AM	1	227 R	0.1	0	367
136	4/5/2018	10:49:33 AM	2	240 R	0.1	2	504
137	4/5/2018	10:49:45 AM	0	241 R	0.1	-2	514
138	4/5/2018	10:49:57 AM	4	261 R	0.1	5	724
139	4/5/2018	10:50:08 AM	1	239 R	0.1	0	493
140	4/5/2018	10:50:20 AM	1	193 R	0.1	0	10
141	4/5/2018	10:50:32 AM	2	250 R	0.1	2	609
142	4/5/2018	10:50:43 AM	2	268 R	0.1	2	798
143	4/5/2018	10:50:55 AM	1	266 R	0.1	0	777
144	4/5/2018	10:51:07 AM	3	265 R	0.1	3	766

145	4/5/2018	10:51:18 AM	2	205 R	0.1	2	136
146	4/5/2018	10:51:30 AM	0	243 R	0.1	-2	535
147	4/5/2018	10:51:42 AM	6	287 R	0.1	9	997
148	4/5/2018	10:51:53 AM	1	204 R	0.1	0	126
149	4/5/2018	10:52:05 AM	11	188 R	0.1	17	-42
150	4/5/2018	10:52:16 AM	2	271 R	0.1	2	829
151	4/5/2018	10:52:28 AM	0	274 R	0.1	-2	861
152	4/5/2018	10:52:40 AM	8	262 R	0.1	12	735
153	4/5/2018	10:52:51 AM	2	244 R	0.1	2	546
154	4/5/2018	10:53:03 AM	2	245 R	0.1	2	556
155	4/5/2018	10:53:15 AM	1	243 R	0.1	0	535
156	4/5/2018	10:53:26 AM	2	187 R	0.1	2	-52
157	4/5/2018	10:53:38 AM	2	213 R	0.1	2	220
158	4/5/2018	10:53:50 AM	2	205 R	0.1	2	136
159	4/5/2018	10:54:01 AM	1	196 R	0.1	0	42
160	4/5/2018	10:59:56 AM	2	199 R	0.1 Grid 5	2	73
161	4/5/2018	11:00:08 AM	3	189 R	0.1	3	-31
162	4/5/2018	11:00:19 AM	4	206 R	0.1	5	147
163	4/5/2018	11:00:31 AM	2	220 R	0.1	2	294
164	4/5/2018	11:00:43 AM	2	220 R	0.1	2	294
165	4/5/2018	11:00:54 AM	3	236 R	0.1	3	462
166	4/5/2018	11:01:06 AM	1	191 R	0.1	0	-10
167	4/5/2018	11:01:18 AM	2	212 R	0.1	2	210
168	4/5/2018	11:01:29 AM	2	189 R	0.1	2	-31
169	4/5/2018	11:01:41 AM	0	216 R	0.1	-2	252
170	4/5/2018	11:01:53 AM	8	180 R	0.1	12	-126
171	4/5/2018	11:02:04 AM	2	221 R	0.1	2	304
172	4/5/2018	11:02:16 AM	1	193 R	0.1	0	10
173	4/5/2018	11:02:28 AM	2	190 R	0.1	2	-21
174	4/5/2018	11:02:39 AM	4	220 R	0.1	5	294
175	4/5/2018	11:02:51 AM	3	202 R	0.1	3	105
176	4/5/2018	11:03:03 AM	0	239 R	0.1	-2	493
177	4/5/2018	11:03:14 AM	10	188 R	0.1	15	-42
178	4/5/2018	11:03:26 AM	2	234 R	0.1	2	441
179	4/5/2018	11:03:38 AM	2	238 R	0.1	2	483
180	4/5/2018	11:03:49 AM	3	254 R	0.1	3	651
181	4/5/2018	11:04:01 AM	1	219 R	0.1	0	283
182	4/5/2018	11:04:13 AM	2	198 R	0.1	2	63
183	4/5/2018	11:04:24 AM	2	262 R	0.1	2	735
184	4/5/2018	11:04:36 AM	3	242 R	0.1	3	525
185	4/5/2018	11:04:48 AM	1	243 R	0.1	0	535
186	4/5/2018	11:04:59 AM	1	224 R	0.1	0	336
187	4/5/2018	11:05:11 AM	2	228 R	0.1	2	378
188	4/5/2018	11:05:23 AM	2	250 R	0.1	2	609
189	4/5/2018	11:05:34 AM	5	255 R	0.1	7	661
190	4/5/2018	11:05:46 AM	4	212 R	0.1	5	210
191	4/5/2018	11:05:58 AM	1	281 R	0.1	0	934
192	4/5/2018	11:06:09 AM	0	265 R	0.1	-2	766
193	4/5/2018	11:06:21 AM	0	241 R	0.1	-2	514
194	4/5/2018	11:06:33 AM	4	254 R	0.1	5	651
195	4/5/2018	11:06:44 AM	1	198 R	0.1	0	63
196	4/5/2018	11:06:56 AM	1	192 R	0.1	0	0
197	4/5/2018	11:07:08 AM	1	241 R	0.1	0	514

198	4/5/2018	11:07:19 AM	2	227 R	0.1	2	367
199	4/5/2018	11:07:31 AM	4	202 R	0.1	5	105
200	4/5/2018	12:15:25 PM	2	204 R	0.1 Grid 6	2	126
201	4/5/2018	12:15:37 PM	1	199 R	0.1	0	73
202	4/5/2018	12:15:49 PM	2	196 R	0.1	2	42
203	4/5/2018	12:16:00 PM	2	200 R	0.1	2	84
204	4/5/2018	12:16:12 PM	3	184 R	0.1	3	-84
205	4/5/2018	12:16:24 PM	5	192 R	0.1	7	0
206	4/5/2018	12:16:35 PM	0	203 R	0.1	-2	115
207	4/5/2018	12:16:47 PM	5	204 R	0.1	7	126
208	4/5/2018	12:16:59 PM	1	222 R	0.1	0	315
209	4/5/2018	12:17:10 PM	0	212 R	0.1	-2	210
210	4/5/2018	12:17:22 PM	8	201 R	0.1	12	94
211	4/5/2018	12:17:34 PM	2	262 R	0.1	2	735
212	4/5/2018	12:17:45 PM	11	248 R	0.1	17	588
213	4/5/2018	12:17:57 PM	2	249 R	0.1	2	598
214	4/5/2018	12:18:09 PM	1	264 R	0.1	0	756
215	4/5/2018	12:18:20 PM	2	203 R	0.1	2	115
216	4/5/2018	12:18:32 PM	2	189 R	0.1	2	-31
217	4/5/2018	12:18:44 PM	3	194 R	0.1	3	21
218	4/5/2018	12:18:55 PM	1	190 R	0.1	0	-21
219	4/5/2018	12:19:17 PM	2	205 R	0.1	2	136
220	4/5/2018	12:24:15 PM	5	188 R	0.1 Grid 7	7	-42
221	4/5/2018	12:24:27 PM	3	197 R	0.1	3	52
222	4/5/2018	12:24:38 PM	2	190 R	0.1	2	-21
223	4/5/2018	12:24:50 PM	2	198 R	0.1	2	63
224	4/5/2018	12:25:02 PM	3	238 R	0.1	3	483
225	4/5/2018	12:25:13 PM	0	199 R	0.1	-2	73
226	4/5/2018	12:25:25 PM	11	209 R	0.1	17	178
227	4/5/2018	12:25:37 PM	13	203 R	0.1	20	115
228	4/5/2018	12:25:48 PM	3	198 R	0.1	3	63
229	4/5/2018	12:26:00 PM	0	182 R	0.1	-2	-105
230	4/5/2018	12:26:12 PM	13	187 R	0.1	20	-52
231	4/5/2018	12:26:23 PM	3	202 R	0.1	3	105
232	4/5/2018	12:26:35 PM	7	192 R	0.1	10	0
233	4/5/2018	12:26:47 PM	1	199 R	0.1	0	73
234	4/5/2018	12:26:58 PM	2	187 R	0.1	2	-52
235	4/5/2018	12:27:10 PM	5	192 R	0.1	7	0
236	4/5/2018	12:27:22 PM	3	184 R	0.1	3	-84
237	4/5/2018	12:27:33 PM	4	201 R	0.1	5	94
238	4/5/2018	12:27:45 PM	9	244 R	0.1	14	546
239	4/5/2018	12:27:57 PM	2	197 R	0.1	2	52
240	4/5/2018	12:28:08 PM	2	191 R	0.1	2	-10
241	4/5/2018	12:28:20 PM	2	231 R	0.1	2	409
242	4/5/2018	12:28:32 PM	4	198 R	0.1	5	63
243	4/5/2018	12:28:43 PM	1	210 R	0.1	0	189
244	4/5/2018	12:28:55 PM	0	190 R	0.1	-2	-21
245	4/5/2018	12:29:07 PM	0	203 R	0.1	-2	115
246	4/5/2018	12:29:18 PM	3	194 R	0.1	3	21
247	4/5/2018	12:29:30 PM	0	233 R	0.1	-2	430
248	4/5/2018	12:29:42 PM	0	199 R	0.1	-2	73
249	4/5/2018	12:29:53 PM	0	188 R	0.1	-2	-42
250	4/5/2018	12:33:49 PM	16	217 R	0.1 Grid 8	26	262

251	4/5/2018	12:34:01 PM	3	220 R	0.1	3	294
252	4/5/2018	12:34:13 PM	6	189 R	0.1	9	-31
253	4/5/2018	12:34:24 PM	1	216 R	0.1	0	252
254	4/5/2018	12:34:36 PM	8	198 R	0.1	12	63
255	4/5/2018	12:34:48 PM	2	208 R	0.1	2	168
256	4/5/2018	12:34:59 PM	1	189 R	0.1	0	-31
257	4/5/2018	12:35:11 PM	2	186 R	0.1	2	-63
258	4/5/2018	12:35:23 PM	0	187 R	0.1	-2	-52
259	4/5/2018	12:35:34 PM	3	206 R	0.1	3	147
260	4/5/2018	12:35:46 PM	0	184 R	0.1	-2	-84
261	4/5/2018	12:35:58 PM	6	197 R	0.1	9	52
262	4/5/2018	12:36:09 PM	1	186 R	0.1	0	-63
263	4/5/2018	12:36:21 PM	0	188 R	0.1	-2	-42
264	4/5/2018	12:36:33 PM	0	193 R	0.1	-2	10
265	4/5/2018	12:36:44 PM	3	201 R	0.1	3	94
266	4/5/2018	12:36:56 PM	1	195 R	0.1	0	31
267	4/5/2018	12:37:08 PM	1	227 R	0.1	0	367
268	4/5/2018	12:37:19 PM	2	188 R	0.1	2	-42
269	4/5/2018	12:37:31 PM	2	184 R	0.1	2	-84
270	4/5/2018	12:37:43 PM	1	197 R	0.1	0	52
271	4/5/2018	12:37:54 PM	3	190 R	0.1	3	-21
272	4/5/2018	12:38:06 PM	3	193 R	0.1	3	10
273	4/5/2018	12:38:18 PM	2	205 R	0.1	2	136
274	4/5/2018	12:38:29 PM	1	190 R	0.1	0	-21
275	4/5/2018	12:38:41 PM	1	196 R	0.1	0	42
276	4/5/2018	12:38:53 PM	1	193 R	0.1	0	10
277	4/5/2018	12:39:04 PM	0	189 R	0.1	-2	-31
278	4/5/2018	12:39:16 PM	0	190 R	0.1	-2	-21
279	4/5/2018	12:39:28 PM	12	188 R	0.1	19	-42
280	4/5/2018	12:39:39 PM	6	191 R	0.1	9	-10
281	4/5/2018	12:39:51 PM	1	186 R	0.1	0	-63
282	4/5/2018	12:47:00 PM	2	195 R	0.1 Grid 16	2	31
283	4/5/2018	12:47:11 PM	1	187 R	0.1	0	-52
284	4/5/2018	12:47:23 PM	1	193 R	0.1	0	10
285	4/5/2018	12:47:35 PM	2	189 R	0.1	2	-31
286	4/5/2018	12:47:46 PM	3	197 R	0.1	3	52
287	4/5/2018	12:47:58 PM	2	199 R	0.1	2	73
288	4/5/2018	12:48:10 PM	1	202 R	0.1	0	105
289	4/5/2018	12:48:21 PM	4	190 R	0.1	5	-21
290	4/5/2018	12:48:33 PM	2	190 R	0.1	2	-21
291	4/5/2018	12:48:45 PM	1	199 R	0.1	0	73
292	4/5/2018	12:48:56 PM	2	252 R	0.1	2	630
293	4/5/2018	12:49:08 PM	2	205 R	0.1	2	136
294	4/5/2018	12:49:20 PM	2	186 R	0.1	2	-63
295	4/5/2018	12:49:31 PM	1	189 R	0.1	0	-31
296	4/5/2018	12:49:43 PM	3	200 R	0.1	3	84
297	4/5/2018	12:49:55 PM	2	195 R	0.1	2	31
298	4/5/2018	12:50:06 PM	3	217 R	0.1	3	262
299	4/5/2018	12:50:18 PM	2	207 R	0.1	2	157
300	4/5/2018	12:50:30 PM	1	183 R	0.1	0	-94
301	4/5/2018	12:50:41 PM	2	215 R	0.1	2	241
302	4/5/2018	12:50:53 PM	1	195 R	0.1	0	31
303	4/5/2018	12:51:05 PM	0	196 R	0.1	-2	42

304	4/5/2018	12:51:16 PM	0	225 R	0.1	-2	346
305	4/5/2018	12:51:28 PM	3	206 R	0.1	3	147
306	4/5/2018	12:51:40 PM	2	196 R	0.1	2	42
307	4/5/2018	12:51:51 PM	1	190 R	0.1	0	-21
308	4/5/2018	12:52:03 PM	3	225 R	0.1	3	346
309	4/5/2018	12:52:15 PM	0	204 R	0.1	-2	126
310	4/5/2018	12:52:26 PM	6	187 R	0.1	9	-52
311	4/5/2018	12:52:38 PM	1	193 R	0.1	0	10
312	4/5/2018	12:52:50 PM	2	185 R	0.1	2	-73
313	4/5/2018	12:53:01 PM	2	191 R	0.1	2	-10
314	4/5/2018	12:53:13 PM	3	189 R	0.1	3	-31
315	4/5/2018	12:53:25 PM	2	186 R	0.1	2	-63
316	4/5/2018	12:53:36 PM	1	188 R	0.1	0	-42
317	4/5/2018	12:53:48 PM	1	195 R	0.1	0	31
318	4/5/2018	12:54:00 PM	2	187 R	0.1	2	-52
319	4/5/2018	12:54:11 PM	2	188 R	0.1	2	-42
320	4/5/2018	12:58:49 PM	3	191 R	0.1 Grid 17	3	-10
321	4/5/2018	12:59:00 PM	1	191 R	0.1	0	-10
322	4/5/2018	12:59:12 PM	2	187 R	0.1	2	-52
323	4/5/2018	12:59:24 PM	1	203 R	0.1	0	115
324	4/5/2018	12:59:35 PM	2	190 R	0.1	2	-21
325	4/5/2018	12:59:47 PM	2	222 R	0.1	2	315
326	4/5/2018	12:59:59 PM	6	206 R	0.1	9	147
327	4/5/2018	1:00:10 PM	4	192 R	0.1	5	0
328	4/5/2018	1:00:22 PM	3	197 R	0.1	3	52
329	4/5/2018	1:00:34 PM	2	188 R	0.1	2	-42
330	4/5/2018	1:00:45 PM	1	188 R	0.1	0	-42
331	4/5/2018	1:00:57 PM	2	237 R	0.1	2	472
332	4/5/2018	1:01:09 PM	0	197 R	0.1	-2	52
333	4/5/2018	1:01:20 PM	8	196 R	0.1	12	42
334	4/5/2018	1:01:32 PM	7	195 R	0.1	10	31
335	4/5/2018	1:01:44 PM	1	201 R	0.1	0	94
336	4/5/2018	1:01:55 PM	2	195 R	0.1	2	31
337	4/5/2018	1:02:07 PM	3	193 R	0.1	3	10
338	4/5/2018	1:02:19 PM	1	188 R	0.1	0	-42
339	4/5/2018	1:02:30 PM	3	194 R	0.1	3	21
340	4/5/2018	1:02:42 PM	2	204 R	0.1	2	126
341	4/5/2018	1:02:54 PM	0	233 R	0.1	-2	430
342	4/5/2018	1:03:05 PM	0	211 R	0.1	-2	199
343	4/5/2018	1:03:17 PM	8	198 R	0.1	12	63
344	4/5/2018	1:03:29 PM	2	202 R	0.1	2	105
345	4/5/2018	1:03:40 PM	0	189 R	0.1	-2	-31
346	4/5/2018	1:03:52 PM	4	202 R	0.1	5	105
347	4/5/2018	1:04:04 PM	1	231 R	0.1	0	409
348	4/5/2018	1:04:15 PM	6	187 R	0.1	9	-52
349	4/5/2018	1:04:27 PM	1	184 R	0.1	0	-84
350	4/5/2018	1:04:38 PM	12	193 R	0.1	19	10
351	4/5/2018	1:04:50 PM	15	199 R	0.1	24	73
352	4/5/2018	1:05:02 PM	3	188 R	0.1	3	-42
353	4/5/2018	1:05:13 PM	1	229 R	0.1	0	388
354	4/5/2018	1:05:25 PM	2	188 R	0.1	2	-42
355	4/5/2018	1:05:37 PM	3	188 R	0.1	3	-42
356	4/5/2018	1:05:48 PM	3	205 R	0.1	3	136

357	4/5/2018	1:06:00 PM	2	192 R	0.1	2	0
358	4/5/2018	1:06:12 PM	1	190 R	0.1	0	-21
359	4/5/2018	1:06:23 PM	2	192 R	0.1	2	0
360	4/5/2018	1:10:24 PM	2	186 R	0.1 Grid 18	2	-63
361	4/5/2018	1:10:36 PM	1	189 R	0.1	0	-31
362	4/5/2018	1:10:47 PM	2	179 R	0.1	2	-136
363	4/5/2018	1:10:59 PM	0	187 R	0.1	-2	-52
364	4/5/2018	1:11:11 PM	0	193 R	0.1	-2	10
365	4/5/2018	1:11:22 PM	0	230 R	0.1	-2	399
366	4/5/2018	1:11:34 PM	8	230 R	0.1	12	399
367	4/5/2018	1:11:46 PM	2	254 R	0.1	2	651
368	4/5/2018	1:11:57 PM	3	191 R	0.1	3	-10
369	4/5/2018	1:12:09 PM	2	213 R	0.1	2	220
370	4/5/2018	1:12:21 PM	0	189 R	0.1	-2	-31
371	4/5/2018	1:12:32 PM	1	191 R	0.1	0	-10
372	4/5/2018	1:12:44 PM	2	205 R	0.1	2	136
373	4/5/2018	1:12:56 PM	3	209 R	0.1	3	178
374	4/5/2018	1:13:07 PM	0	227 R	0.1	-2	367
375	4/5/2018	1:13:19 PM	2	191 R	0.1	2	-10
376	4/5/2018	1:13:31 PM	2	209 R	0.1	2	178
377	4/5/2018	1:13:42 PM	1	200 R	0.1	0	84
378	4/5/2018	1:13:54 PM	1	189 R	0.1	0	-31
379	4/5/2018	1:14:06 PM	2	189 R	0.1	2	-31
380	4/5/2018	1:14:17 PM	3	190 R	0.1	3	-21
381	4/5/2018	1:14:29 PM	2	200 R	0.1	2	84
382	4/5/2018	1:14:41 PM	1	185 R	0.1	0	-73
383	4/5/2018	1:14:52 PM	2	211 R	0.1	2	199
384	4/5/2018	1:15:04 PM	3	189 R	0.1	3	-31
385	4/5/2018	1:15:16 PM	4	199 R	0.1	5	73
386	4/5/2018	1:15:27 PM	2	202 R	0.1	2	105
387	4/5/2018	1:15:39 PM	0	213 R	0.1	-2	220
388	4/5/2018	1:15:51 PM	0	194 R	0.1	-2	21
389	4/5/2018	1:16:02 PM	0	195 R	0.1	-2	31
390	4/5/2018	1:16:14 PM	4	183 R	0.1	5	-94
391	4/5/2018	1:16:26 PM	1	189 R	0.1	0	-31
392	4/5/2018	1:16:37 PM	0	183 R	0.1	-2	-94
393	4/5/2018	1:16:49 PM	3	188 R	0.1	3	-42
394	4/5/2018	1:17:01 PM	2	190 R	0.1	2	-21
395	4/5/2018	1:17:12 PM	1	188 R	0.1	0	-42
396	4/5/2018	1:17:24 PM	3	185 R	0.1	3	-73
397	4/5/2018	1:17:36 PM	0	198 R	0.1	-2	63
398	4/5/2018	1:17:47 PM	1	211 R	0.1	0	199
399	4/5/2018	1:17:59 PM	2	189 R	0.1	2	-31
400	4/5/2018	1:21:32 PM	3	189 R	0.1 Grid 19	3	-31
401	4/5/2018	1:21:44 PM	2	190 R	0.1	2	-21
402	4/5/2018	1:21:56 PM	1	186 R	0.1	0	-63
403	4/5/2018	1:22:07 PM	2	191 R	0.1	2	-10
404	4/5/2018	1:22:19 PM	1	186 R	0.1	0	-63
405	4/5/2018	1:22:31 PM	2	188 R	0.1	2	-42
406	4/5/2018	1:22:42 PM	0	195 R	0.1	-2	31
407	4/5/2018	1:22:54 PM	2	207 R	0.1	2	157
408	4/5/2018	1:23:06 PM	4	189 R	0.1	5	-31
409	4/5/2018	1:23:17 PM	1	229 R	0.1	0	388

410	4/5/2018	1:23:29 PM	1	228 R	0.1	0	378
411	4/5/2018	1:23:41 PM	1	195 R	0.1	0	31
412	4/5/2018	1:23:52 PM	2	190 R	0.1	2	-21
413	4/5/2018	1:24:04 PM	2	192 R	0.1	2	0
414	4/5/2018	1:24:16 PM	1	190 R	0.1	0	-21
415	4/5/2018	1:24:27 PM	1	193 R	0.1	0	10
416	4/5/2018	1:24:39 PM	0	185 R	0.1	-2	-73
417	4/5/2018	1:24:51 PM	2	215 R	0.1	2	241
418	4/5/2018	1:25:02 PM	3	190 R	0.1	3	-21
419	4/5/2018	1:25:14 PM	2	202 R	0.1	2	105
420	4/5/2018	1:25:26 PM	1	188 R	0.1	0	-42
421	4/5/2018	1:25:37 PM	2	191 R	0.1	2	-10
422	4/5/2018	1:25:49 PM	2	193 R	0.1	2	10
423	4/5/2018	1:26:01 PM	1	192 R	0.1	0	0
424	4/5/2018	1:26:12 PM	2	194 R	0.1	2	21
425	4/5/2018	1:26:24 PM	0	186 R	0.1	-2	-63
426	4/5/2018	1:26:36 PM	5	191 R	0.1	7	-10
427	4/5/2018	1:26:47 PM	1	192 R	0.1	0	0
428	4/5/2018	1:26:59 PM	2	190 R	0.1	2	-21
429	4/5/2018	1:27:11 PM	1	185 R	0.1	0	-73
430	4/5/2018	1:27:22 PM	2	186 R	0.1	2	-63
431	4/5/2018	1:27:34 PM	1	192 R	0.1	0	0
432	4/5/2018	1:27:46 PM	0	188 R	0.1	-2	-42
433	4/5/2018	1:27:57 PM	2	217 R	0.1	2	262
434	4/5/2018	1:28:09 PM	3	221 R	0.1	3	304
435	4/5/2018	1:28:21 PM	0	194 R	0.1	-2	21
436	4/5/2018	1:28:32 PM	0	185 R	0.1	-2	-73
437	4/5/2018	1:28:44 PM	0	192 R	0.1	-2	0
438	4/5/2018	1:28:56 PM	0	200 R	0.1	-2	84
439	4/5/2018	1:29:07 PM	11	203 R	0.1	17	115
440	4/5/2018	1:33:26 PM	0	202 R	0.1 Grid 20	-2	105
441	4/5/2018	1:33:37 PM	1	213 R	0.1	0	220
442	4/5/2018	1:33:49 PM	2	186 R	0.1	2	-63
443	4/5/2018	1:34:01 PM	1	190 R	0.1	0	-21
444	4/5/2018	1:34:12 PM	1	191 R	0.1	0	-10
445	4/5/2018	1:34:24 PM	2	196 R	0.1	2	42
446	4/5/2018	1:34:36 PM	3	187 R	0.1	3	-52
447	4/5/2018	1:34:47 PM	2	201 R	0.1	2	94
448	4/5/2018	1:34:59 PM	1	188 R	0.1	0	-42
449	4/5/2018	1:35:11 PM	1	191 R	0.1	0	-10
450	4/5/2018	1:35:22 PM	2	193 R	0.1	2	10
451	4/5/2018	1:35:34 PM	3	193 R	0.1	3	10
452	4/5/2018	1:35:46 PM	1	198 R	0.1	0	63
453	4/5/2018	1:35:57 PM	2	186 R	0.1	2	-63
454	4/5/2018	1:36:09 PM	2	211 R	0.1	2	199
455	4/5/2018	1:36:21 PM	4	193 R	0.1	5	10
456	4/5/2018	1:36:32 PM	2	223 R	0.1	2	325
457	4/5/2018	1:36:44 PM	1	190 R	0.1	0	-21
458	4/5/2018	1:36:56 PM	0	204 R	0.1	-2	126
459	4/5/2018	1:37:07 PM	3	195 R	0.1	3	31
460	4/5/2018	1:37:19 PM	1	227 R	0.1	0	367
461	4/5/2018	1:37:31 PM	2	201 R	0.1	2	94
462	4/5/2018	1:37:42 PM	1	196 R	0.1	0	42

463	4/5/2018	1:37:54 PM	1	196 R	0.1	0	42
464	4/5/2018	1:38:06 PM	3	193 R	0.1	3	10
465	4/5/2018	1:38:17 PM	2	206 R	0.1	2	147
466	4/5/2018	1:38:29 PM	1	199 R	0.1	0	73
467	4/5/2018	1:38:41 PM	2	220 R	0.1	2	294
468	4/5/2018	1:38:52 PM	1	192 R	0.1	0	0
469	4/5/2018	1:39:04 PM	4	191 R	0.1	5	-10
470	4/5/2018	1:39:16 PM	9	207 R	0.1	14	157
471	4/5/2018	1:39:27 PM	14	189 R	0.1	22	-31
472	4/5/2018	1:39:39 PM	3	202 R	0.1	3	105
473	4/5/2018	1:39:51 PM	2	201 R	0.1	2	94
474	4/5/2018	1:40:02 PM	1	191 R	0.1	0	-10
475	4/5/2018	1:40:14 PM	1	193 R	0.1	0	10
476	4/5/2018	1:40:26 PM	2	192 R	0.1	2	0
477	4/5/2018	1:40:37 PM	1	193 R	0.1	0	10
478	4/5/2018	1:40:49 PM	1	198 R	0.1	0	63
479	4/5/2018	1:41:01 PM	0	206 R	0.1	-2	147
		Maximum:	18	287		29	997
		Average:	3	209		3	182
		StDev:	3	25		5	257

2360 SN:297758

43-93# 299597

Cal Due Date: 2/14/2019

Surveyor: Richard Thatcher

Tunnel

Grids 9 thru 15 24 thru 30

Alpha Efficiency: 0.444

Beta/Gamma Efficiency: 0.313

Alpha Background: 1

Beta/Gamma Background: 175

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²	
									Alpha	Beta
1	4/5/2018	10:24:25 AM	2	171	R	0.1	Grid 9	2	-34	
2	4/5/2018	10:24:36 AM	0	180	R	0.1		-2	43	
3	4/5/2018	10:24:48 AM	3	188	R	0.1		3	111	
4	4/5/2018	10:25:00 AM	4	233	R	0.1		5	494	
5	4/5/2018	10:25:11 AM	0	212	R	0.1		-2	315	
6	4/5/2018	10:25:23 AM	3	222	R	0.1		3	400	
7	4/5/2018	10:25:35 AM	2	192	R	0.1		2	145	
8	4/5/2018	10:25:46 AM	0	252	R	0.1		-2	656	
9	4/5/2018	10:25:58 AM	1	196	R	0.1		0	179	
10	4/5/2018	10:26:09 AM	2	180	R	0.1		2	43	
11	4/5/2018	10:26:21 AM	0	228	R	0.1		-2	452	
12	4/5/2018	10:26:33 AM	9	232	R	0.1		12	486	
13	4/5/2018	10:26:44 AM	2	254	R	0.1		2	673	
14	4/5/2018	10:26:56 AM	3	275	R	0.1		3	852	
15	4/5/2018	10:27:08 AM	2	244	R	0.1		2	588	
16	4/5/2018	10:27:19 AM	1	246	R	0.1		0	605	
17	4/5/2018	10:27:31 AM	2	289	R	0.1		2	971	
18	4/5/2018	10:27:43 AM	1	249	R	0.1		0	630	
19	4/5/2018	10:27:54 AM	2	236	R	0.1		2	520	
20	4/5/2018	10:28:06 AM	0	271	R	0.1		-2	818	
21	4/5/2018	10:28:17 AM	3	219	R	0.1		3	375	
22	4/5/2018	10:28:29 AM	0	158	R	0.1		-2	-145	
23	4/5/2018	10:28:41 AM	1	201	R	0.1		0	222	
24	4/5/2018	10:28:52 AM	2	270	R	0.1		2	809	
25	4/5/2018	10:29:04 AM	1	266	R	0.1		0	775	
26	4/5/2018	10:29:16 AM	6	230	R	0.1		8	469	
27	4/5/2018	10:29:27 AM	1	271	R	0.1		0	818	
28	4/5/2018	10:29:39 AM	6	291	R	0.1		8	988	
29	4/5/2018	10:29:51 AM	1	268	R	0.1		0	792	
30	4/5/2018	10:30:02 AM	2	288	R	0.1		2	963	
31	4/5/2018	10:30:14 AM	4	290	R	0.1		5	980	
32	4/5/2018	10:30:25 AM	3	345	R	0.1		3	1448	
33	4/5/2018	10:30:37 AM	2	221	R	0.1		2	392	
34	4/5/2018	10:30:49 AM	2	256	R	0.1		2	690	
35	4/5/2018	10:31:00 AM	1	236	R	0.1		0	520	
36	4/5/2018	10:31:12 AM	0	228	R	0.1		-2	452	
37	4/5/2018	10:31:24 AM	10	221	R	0.1		14	392	
38	4/5/2018	10:31:35 AM	2	257	R	0.1		2	699	
39	4/5/2018	10:31:47 AM	1	200	R	0.1		0	213	
40	4/5/2018	10:34:27 AM	0	182	R	0.1	Grid 10	-2	60	
41	4/5/2018	10:34:38 AM	9	188	R	0.1		12	111	

42	4/5/2018	10:34:50 AM	2	237 R	0.1	2	528
43	4/5/2018	10:35:02 AM	0	234 R	0.1	-2	503
44	4/5/2018	10:35:13 AM	0	251 R	0.1	-2	647
45	4/5/2018	10:35:25 AM	12	222 R	0.1	17	400
46	4/5/2018	10:35:37 AM	3	234 R	0.1	3	503
47	4/5/2018	10:35:48 AM	2	213 R	0.1	2	324
48	4/5/2018	10:36:00 AM	3	182 R	0.1	3	60
49	4/5/2018	10:36:11 AM	1	169 R	0.1	0	-51
50	4/5/2018	10:36:23 AM	2	170 R	0.1	2	-43
51	4/5/2018	10:36:35 AM	1	256 R	0.1	0	690
52	4/5/2018	10:36:46 AM	9	196 R	0.1	12	179
53	4/5/2018	10:36:58 AM	6	236 R	0.1	8	520
54	4/5/2018	10:37:10 AM	1	255 R	0.1	0	682
55	4/5/2018	10:37:21 AM	0	256 R	0.1	-2	690
56	4/5/2018	10:37:33 AM	3	179 R	0.1	3	34
57	4/5/2018	10:37:45 AM	0	190 R	0.1	-2	128
58	4/5/2018	10:37:56 AM	0	226 R	0.1	-2	435
59	4/5/2018	10:38:08 AM	0	281 R	0.1	-2	903
60	4/5/2018	10:38:19 AM	4	198 R	0.1	5	196
61	4/5/2018	10:38:31 AM	6	289 R	0.1	8	971
62	4/5/2018	10:38:43 AM	1	217 R	0.1	0	358
63	4/5/2018	10:38:54 AM	0	171 R	0.1	-2	-34
64	4/5/2018	10:39:06 AM	1	239 R	0.1	0	545
65	4/5/2018	10:39:18 AM	2	228 R	0.1	2	452
66	4/5/2018	10:39:29 AM	3	225 R	0.1	3	426
67	4/5/2018	10:39:41 AM	1	202 R	0.1	0	230
68	4/5/2018	10:39:53 AM	2	222 R	0.1	2	400
69	4/5/2018	10:40:04 AM	1	215 R	0.1	0	341
70	4/5/2018	10:40:16 AM	2	271 R	0.1	2	818
71	4/5/2018	10:40:28 AM	3	216 R	0.1	3	349
72	4/5/2018	10:40:39 AM	4	195 R	0.1	5	170
73	4/5/2018	10:40:51 AM	0	265 R	0.1	-2	767
74	4/5/2018	10:41:02 AM	8	221 R	0.1	11	392
75	4/5/2018	10:41:14 AM	2	212 R	0.1	2	315
76	4/5/2018	10:41:26 AM	2	281 R	0.1	2	903
77	4/5/2018	10:41:37 AM	3	192 R	0.1	3	145
78	4/5/2018	10:41:49 AM	1	245 R	0.1	0	596
79	4/5/2018	10:42:01 AM	2	224 R	0.1	2	417
80	4/5/2018	10:46:16 AM	0	186 R	0.1 Grid 11	-2	94
81	4/5/2018	10:46:27 AM	6	202 R	0.1	8	230
82	4/5/2018	10:46:39 AM	1	203 R	0.1	0	239
83	4/5/2018	10:46:51 AM	9	176 R	0.1	12	9
84	4/5/2018	10:47:02 AM	2	219 R	0.1	2	375
85	4/5/2018	10:47:14 AM	2	226 R	0.1	2	435
86	4/5/2018	10:47:25 AM	4	237 R	0.1	5	528
87	4/5/2018	10:47:37 AM	4	206 R	0.1	5	264
88	4/5/2018	10:47:49 AM	1	230 R	0.1	0	469
89	4/5/2018	10:48:00 AM	2	219 R	0.1	2	375
90	4/5/2018	10:48:12 AM	3	187 R	0.1	3	102
91	4/5/2018	10:48:24 AM	2	206 R	0.1	2	264
92	4/5/2018	10:48:35 AM	1	212 R	0.1	0	315
93	4/5/2018	10:48:47 AM	1	216 R	0.1	0	349
94	4/5/2018	10:48:59 AM	9	269 R	0.1	12	801
95	4/5/2018	10:49:10 AM	2	178 R	0.1	2	26
96	4/5/2018	10:49:22 AM	0	283 R	0.1	-2	920
97	4/5/2018	10:49:33 AM	0	254 R	0.1	-2	673

98	4/5/2018	10:49:45 AM	13	175 R	0.1	19	0
99	4/5/2018	10:49:57 AM	7	274 R	0.1	9	843
100	4/5/2018	10:50:08 AM	1	277 R	0.1	0	869
101	4/5/2018	10:50:20 AM	0	235 R	0.1	-2	511
102	4/5/2018	10:50:32 AM	0	222 R	0.1	-2	400
103	4/5/2018	10:50:43 AM	0	251 R	0.1	-2	647
104	4/5/2018	10:50:55 AM	5	280 R	0.1	6	895
105	4/5/2018	10:51:06 AM	1	287 R	0.1	0	954
106	4/5/2018	10:51:18 AM	0	241 R	0.1	-2	562
107	4/5/2018	10:51:30 AM	0	267 R	0.1	-2	784
108	4/5/2018	10:51:41 AM	0	203 R	0.1	-2	239
109	4/5/2018	10:51:53 AM	6	272 R	0.1	8	826
110	4/5/2018	10:52:05 AM	5	257 R	0.1	6	699
111	4/5/2018	10:52:16 AM	1	248 R	0.1	0	622
112	4/5/2018	10:52:28 AM	2	220 R	0.1	2	383
113	4/5/2018	10:52:40 AM	3	255 R	0.1	3	682
114	4/5/2018	10:52:51 AM	1	278 R	0.1	0	878
115	4/5/2018	10:53:03 AM	2	285 R	0.1	2	937
116	4/5/2018	10:53:14 AM	0	287 R	0.1	-2	954
117	4/5/2018	10:53:26 AM	4	284 R	0.1	5	929
118	4/5/2018	10:53:38 AM	2	286 R	0.1	2	946
119	4/5/2018	10:53:49 AM	3	227 R	0.1	3	443
120	4/5/2018	10:57:48 AM	1	194 R	0.1 Grid 12	0	162
121	4/5/2018	10:58:00 AM	2	208 R	0.1	2	281
122	4/5/2018	10:58:12 AM	3	260 R	0.1	3	724
123	4/5/2018	10:58:23 AM	0	247 R	0.1	-2	613
124	4/5/2018	10:58:35 AM	3	247 R	0.1	3	613
125	4/5/2018	10:58:46 AM	4	202 R	0.1	5	230
126	4/5/2018	10:58:58 AM	3	215 R	0.1	3	341
127	4/5/2018	10:59:10 AM	2	245 R	0.1	2	596
128	4/5/2018	10:59:21 AM	0	201 R	0.1	-2	222
129	4/5/2018	10:59:33 AM	3	234 R	0.1	3	503
130	4/5/2018	10:59:45 AM	5	272 R	0.1	6	826
131	4/5/2018	10:59:56 AM	1	230 R	0.1	0	469
132	4/5/2018	11:00:08 AM	0	200 R	0.1	-2	213
133	4/5/2018	11:00:20 AM	0	179 R	0.1	-2	34
134	4/5/2018	11:00:31 AM	4	203 R	0.1	5	239
135	4/5/2018	11:00:43 AM	1	238 R	0.1	0	537
136	4/5/2018	11:00:54 AM	4	277 R	0.1	5	869
137	4/5/2018	11:01:06 AM	1	223 R	0.1	0	409
138	4/5/2018	11:01:18 AM	2	224 R	0.1	2	417
139	4/5/2018	11:01:29 AM	3	268 R	0.1	3	792
140	4/5/2018	11:01:41 AM	2	281 R	0.1	2	903
141	4/5/2018	11:01:53 AM	1	187 R	0.1	0	102
142	4/5/2018	11:02:04 AM	2	249 R	0.1	2	630
143	4/5/2018	11:02:16 AM	3	222 R	0.1	3	400
144	4/5/2018	11:02:27 AM	3	277 R	0.1	3	869
145	4/5/2018	11:02:39 AM	8	292 R	0.1	11	997
146	4/5/2018	11:02:51 AM	2	271 R	0.1	2	818
147	4/5/2018	11:03:02 AM	0	286 R	0.1	-2	946
148	4/5/2018	11:03:14 AM	3	272 R	0.1	3	826
149	4/5/2018	11:03:26 AM	2	288 R	0.1	2	963
150	4/5/2018	11:03:37 AM	1	254 R	0.1	0	673
151	4/5/2018	11:03:49 AM	2	239 R	0.1	2	545
152	4/5/2018	11:04:01 AM	2	254 R	0.1	2	673
153	4/5/2018	11:04:12 AM	4	262 R	0.1	5	741

154	4/5/2018	11:04:24 AM	5	266 R	0.1	6	775
155	4/5/2018	11:04:35 AM	11	248 R	0.1	15	622
156	4/5/2018	11:04:47 AM	2	279 R	0.1	2	886
157	4/5/2018	11:04:59 AM	1	278 R	0.1	0	878
158	4/5/2018	11:05:10 AM	2	257 R	0.1	2	699
159	4/5/2018	11:05:22 AM	5	213 R	0.1	6	324
160	4/5/2018	12:16:11 PM	3	196 R	0.1 Grid 13	3	179
161	4/5/2018	12:16:23 PM	2	201 R	0.1	2	222
162	4/5/2018	12:16:35 PM	2	187 R	0.1	2	102
163	4/5/2018	12:16:46 PM	1	176 R	0.1	0	9
164	4/5/2018	12:16:58 PM	3	186 R	0.1	3	94
165	4/5/2018	12:17:10 PM	2	192 R	0.1	2	145
166	4/5/2018	12:17:21 PM	1	165 R	0.1	0	-85
167	4/5/2018	12:17:33 PM	0	239 R	0.1	-2	545
168	4/5/2018	12:17:45 PM	11	228 R	0.1	15	452
169	4/5/2018	12:17:56 PM	2	252 R	0.1	2	656
170	4/5/2018	12:18:08 PM	1	214 R	0.1	0	332
171	4/5/2018	12:18:19 PM	1	195 R	0.1	0	170
172	4/5/2018	12:18:31 PM	3	236 R	0.1	3	520
173	4/5/2018	12:18:43 PM	2	280 R	0.1	2	895
174	4/5/2018	12:18:54 PM	2	287 R	0.1	2	954
175	4/5/2018	12:19:06 PM	0	216 R	0.1	-2	349
176	4/5/2018	12:19:18 PM	3	203 R	0.1	3	239
177	4/5/2018	12:19:29 PM	0	302 R	0.1	-2	1082
178	4/5/2018	12:19:41 PM	4	292 R	0.1	5	997
179	4/5/2018	12:19:52 PM	1	273 R	0.1	0	835
180	4/5/2018	12:20:04 PM	0	293 R	0.1	-2	1005
181	4/5/2018	12:20:16 PM	0	319 R	0.1	-2	1227
182	4/5/2018	12:20:27 PM	6	286 R	0.1	8	946
183	4/5/2018	12:20:39 PM	1	272 R	0.1	0	826
184	4/5/2018	12:20:51 PM	1	328 R	0.1	0	1304
185	4/5/2018	12:21:02 PM	2	240 R	0.1	2	554
186	4/5/2018	12:21:14 PM	0	227 R	0.1	-2	443
187	4/5/2018	12:21:26 PM	12	311 R	0.1	17	1159
188	4/5/2018	12:21:37 PM	3	315 R	0.1	3	1193
189	4/5/2018	12:21:49 PM	12	298 R	0.1	17	1048
190	4/5/2018	12:22:00 PM	3	281 R	0.1	3	903
191	4/5/2018	12:22:12 PM	0	276 R	0.1	-2	860
192	4/5/2018	12:22:24 PM	2	302 R	0.1	2	1082
193	4/5/2018	12:22:35 PM	3	291 R	0.1	3	988
194	4/5/2018	12:22:47 PM	4	266 R	0.1	5	775
195	4/5/2018	12:22:59 PM	1	284 R	0.1	0	929
196	4/5/2018	12:23:10 PM	0	231 R	0.1	-2	477
197	4/5/2018	12:23:22 PM	2	224 R	0.1	2	417
198	4/5/2018	12:23:33 PM	2	184 R	0.1	2	77
199	4/5/2018	12:23:45 PM	3	290 R	0.1	3	980
200	4/5/2018	12:26:04 PM	2	182 R	0.1 Grid 14	2	60
201	4/5/2018	12:26:16 PM	1	240 R	0.1	0	554
202	4/5/2018	12:26:28 PM	2	288 R	0.1	2	963
203	4/5/2018	12:26:39 PM	3	290 R	0.1	3	980
204	4/5/2018	12:26:51 PM	3	284 R	0.1	3	929
205	4/5/2018	12:27:03 PM	2	246 R	0.1	2	605
206	4/5/2018	12:27:14 PM	4	216 R	0.1	5	349
207	4/5/2018	12:27:26 PM	2	239 R	0.1	2	545
208	4/5/2018	12:27:38 PM	3	201 R	0.1	3	222
209	4/5/2018	12:27:49 PM	1	187 R	0.1	0	102

210	4/5/2018	12:28:01 PM	2	231 R	0.1	2	477
211	4/5/2018	12:28:12 PM	2	290 R	0.1	2	980
212	4/5/2018	12:28:24 PM	1	311 R	0.1	0	1159
213	4/5/2018	12:28:36 PM	2	303 R	0.1	2	1091
214	4/5/2018	12:28:47 PM	3	298 R	0.1	3	1048
215	4/5/2018	12:29:10 PM	1	187 R	0.1	0	102
216	4/5/2018	12:29:22 PM	1	181 R	0.1	0	51
217	4/5/2018	12:29:49 PM	3	173 R	0.1	3	-17
218	4/5/2018	12:30:00 PM	2	176 R	0.1	2	9
219	4/5/2018	12:30:12 PM	3	174 R	0.1	3	-9
220	4/5/2018	12:33:11 PM	5	180 R	0.1 Grid 15	6	43
221	4/5/2018	12:33:22 PM	2	185 R	0.1	2	85
222	4/5/2018	12:33:34 PM	0	191 R	0.1	-2	136
223	4/5/2018	12:33:46 PM	3	222 R	0.1	3	400
224	4/5/2018	12:33:57 PM	1	226 R	0.1	0	435
225	4/5/2018	12:34:09 PM	1	182 R	0.1	0	60
226	4/5/2018	12:34:20 PM	3	184 R	0.1	3	77
227	4/5/2018	12:34:32 PM	0	178 R	0.1	-2	26
228	4/5/2018	12:34:44 PM	0	198 R	0.1	-2	196
229	4/5/2018	12:34:55 PM	10	171 R	0.1	14	-34
230	4/5/2018	12:35:07 PM	2	176 R	0.1	2	9
231	4/5/2018	12:35:19 PM	0	198 R	0.1	-2	196
232	4/5/2018	12:35:30 PM	0	164 R	0.1	-2	-94
233	4/5/2018	12:35:42 PM	0	217 R	0.1	-2	358
234	4/5/2018	12:35:54 PM	0	207 R	0.1	-2	273
235	4/5/2018	12:36:05 PM	0	221 R	0.1	-2	392
236	4/5/2018	12:36:17 PM	15	271 R	0.1	22	818
237	4/5/2018	12:36:28 PM	3	181 R	0.1	3	51
238	4/5/2018	12:36:40 PM	1	192 R	0.1	0	145
239	4/5/2018	12:36:52 PM	2	183 R	0.1	2	68
240	4/5/2018	12:41:37 PM	2	178 R	0.1 Grid 24	2	26
241	4/5/2018	12:41:49 PM	1	175 R	0.1	0	0
242	4/5/2018	12:42:01 PM	3	188 R	0.1	3	111
243	4/5/2018	12:42:12 PM	2	180 R	0.1	2	43
244	4/5/2018	12:42:24 PM	2	171 R	0.1	2	-34
245	4/5/2018	12:42:36 PM	1	168 R	0.1	0	-60
246	4/5/2018	12:42:47 PM	1	169 R	0.1	0	-51
247	4/5/2018	12:42:59 PM	2	165 R	0.1	2	-85
248	4/5/2018	12:43:10 PM	0	166 R	0.1	-2	-77
249	4/5/2018	12:43:22 PM	2	170 R	0.1	2	-43
250	4/5/2018	12:43:34 PM	3	164 R	0.1	3	-94
251	4/5/2018	12:43:45 PM	1	178 R	0.1	0	26
252	4/5/2018	12:43:57 PM	2	199 R	0.1	2	204
253	4/5/2018	12:44:09 PM	2	174 R	0.1	2	-9
254	4/5/2018	12:44:20 PM	1	195 R	0.1	0	170
255	4/5/2018	12:44:32 PM	2	187 R	0.1	2	102
256	4/5/2018	12:44:43 PM	3	205 R	0.1	3	256
257	4/5/2018	12:44:55 PM	1	181 R	0.1	0	51
258	4/5/2018	12:45:07 PM	2	176 R	0.1	2	9
259	4/5/2018	12:45:18 PM	3	179 R	0.1	3	34
260	4/5/2018	12:45:30 PM	1	189 R	0.1	0	119
261	4/5/2018	12:45:42 PM	1	176 R	0.1	0	9
262	4/5/2018	12:45:53 PM	2	177 R	0.1	2	17
263	4/5/2018	12:46:05 PM	4	169 R	0.1	5	-51
264	4/5/2018	12:46:17 PM	1	171 R	0.1	0	-34
265	4/5/2018	12:46:28 PM	2	170 R	0.1	2	-43

266	4/5/2018	12:46:40 PM	1	171 R	0.1	0	-34
267	4/5/2018	12:46:51 PM	3	173 R	0.1	3	-17
268	4/5/2018	12:47:03 PM	1	235 R	0.1	0	511
269	4/5/2018	12:47:15 PM	2	179 R	0.1	2	34
270	4/5/2018	12:47:26 PM	3	181 R	0.1	3	51
271	4/5/2018	12:47:38 PM	0	170 R	0.1	-2	-43
272	4/5/2018	12:47:50 PM	7	231 R	0.1	9	477
273	4/5/2018	12:48:01 PM	1	185 R	0.1	0	85
274	4/5/2018	12:48:13 PM	0	166 R	0.1	-2	-77
275	4/5/2018	12:48:24 PM	18	186 R	0.1	26	94
276	4/5/2018	12:48:36 PM	4	252 R	0.1	5	656
277	4/5/2018	12:48:48 PM	1	171 R	0.1	0	-34
278	4/5/2018	12:48:59 PM	0	229 R	0.1	-2	460
279	4/5/2018	12:49:11 PM	0	169 R	0.1	-2	-51
280	4/5/2018	12:52:44 PM	0	177 R	0.1 Grid 25	-2	17
281	4/5/2018	12:52:55 PM	0	179 R	0.1	-2	34
282	4/5/2018	12:53:07 PM	7	181 R	0.1	9	51
283	4/5/2018	12:53:19 PM	1	192 R	0.1	0	145
284	4/5/2018	12:53:30 PM	1	188 R	0.1	0	111
285	4/5/2018	12:53:42 PM	2	177 R	0.1	2	17
286	4/5/2018	12:53:54 PM	2	182 R	0.1	2	60
287	4/5/2018	12:54:05 PM	3	176 R	0.1	3	9
288	4/5/2018	12:54:17 PM	2	176 R	0.1	2	9
289	4/5/2018	12:54:28 PM	2	186 R	0.1	2	94
290	4/5/2018	12:54:40 PM	0	185 R	0.1	-2	85
291	4/5/2018	12:54:52 PM	7	208 R	0.1	9	281
292	4/5/2018	12:55:03 PM	1	205 R	0.1	0	256
293	4/5/2018	12:55:15 PM	2	173 R	0.1	2	-17
294	4/5/2018	12:55:27 PM	1	177 R	0.1	0	17
295	4/5/2018	12:55:38 PM	2	195 R	0.1	2	170
296	4/5/2018	12:55:50 PM	3	174 R	0.1	3	-9
297	4/5/2018	12:56:01 PM	2	176 R	0.1	2	9
298	4/5/2018	12:56:13 PM	3	175 R	0.1	3	0
299	4/5/2018	12:56:25 PM	1	180 R	0.1	0	43
300	4/5/2018	12:56:36 PM	2	189 R	0.1	2	119
301	4/5/2018	12:56:48 PM	2	210 R	0.1	2	298
302	4/5/2018	12:57:00 PM	1	177 R	0.1	0	17
303	4/5/2018	12:57:11 PM	2	204 R	0.1	2	247
304	4/5/2018	12:57:23 PM	1	179 R	0.1	0	34
305	4/5/2018	12:57:35 PM	3	169 R	0.1	3	-51
306	4/5/2018	12:57:46 PM	2	176 R	0.1	2	9
307	4/5/2018	12:57:58 PM	5	198 R	0.1	6	196
308	4/5/2018	12:58:09 PM	2	205 R	0.1	2	256
309	4/5/2018	12:58:21 PM	1	179 R	0.1	0	34
310	4/5/2018	12:58:33 PM	1	180 R	0.1	0	43
311	4/5/2018	12:58:44 PM	3	172 R	0.1	3	-26
312	4/5/2018	12:58:56 PM	2	195 R	0.1	2	170
313	4/5/2018	12:59:08 PM	3	170 R	0.1	3	-43
314	4/5/2018	12:59:19 PM	1	212 R	0.1	0	315
315	4/5/2018	12:59:31 PM	2	201 R	0.1	2	222
316	4/5/2018	12:59:43 PM	3	176 R	0.1	3	9
317	4/5/2018	12:59:54 PM	3	177 R	0.1	3	17
318	4/5/2018	1:00:06 PM	2	166 R	0.1	2	-77
319	4/5/2018	1:00:17 PM	2	181 R	0.1	2	51
320	4/5/2018	1:04:33 PM	1	177 R	0.1 Grid 26	0	17
321	4/5/2018	1:04:44 PM	1	186 R	0.1	0	94

322	4/5/2018	1:04:56 PM	2	168 R	0.1	2	-60
323	4/5/2018	1:05:17 PM	3	170 R	0.1	3	-43
324	4/5/2018	1:05:28 PM	1	170 R	0.1	0	-43
325	4/5/2018	1:05:40 PM	4	169 R	0.1	5	-51
326	4/5/2018	1:05:51 PM	2	166 R	0.1	2	-77
327	4/5/2018	1:06:03 PM	3	173 R	0.1	3	-17
328	4/5/2018	1:06:15 PM	1	184 R	0.1	0	77
329	4/5/2018	1:06:26 PM	2	170 R	0.1	2	-43
330	4/5/2018	1:06:38 PM	1	181 R	0.1	0	51
331	4/5/2018	1:06:50 PM	1	177 R	0.1	0	17
332	4/5/2018	1:07:01 PM	3	200 R	0.1	3	213
333	4/5/2018	1:07:16 PM	2	182 R	0.1	2	60
334	4/5/2018	1:07:28 PM	1	177 R	0.1	0	17
335	4/5/2018	1:07:39 PM	1	167 R	0.1	0	-68
336	4/5/2018	1:07:51 PM	1	180 R	0.1	0	43
337	4/5/2018	1:08:03 PM	3	176 R	0.1	3	9
338	4/5/2018	1:08:14 PM	1	177 R	0.1	0	17
339	4/5/2018	1:08:26 PM	2	175 R	0.1	2	0
340	4/5/2018	1:08:38 PM	2	167 R	0.1	2	-68
341	4/5/2018	1:08:49 PM	1	178 R	0.1	0	26
342	4/5/2018	1:09:01 PM	1	168 R	0.1	0	-60
343	4/5/2018	1:09:12 PM	0	173 R	0.1	-2	-17
344	4/5/2018	1:09:24 PM	1	177 R	0.1	0	17
345	4/5/2018	1:09:36 PM	2	179 R	0.1	2	34
346	4/5/2018	1:09:47 PM	3	181 R	0.1	3	51
347	4/5/2018	1:09:59 PM	2	177 R	0.1	2	17
348	4/5/2018	1:10:11 PM	1	170 R	0.1	0	-43
349	4/5/2018	1:10:22 PM	2	172 R	0.1	2	-26
350	4/5/2018	1:10:34 PM	2	181 R	0.1	2	51
351	4/5/2018	1:10:46 PM	1	179 R	0.1	0	34
352	4/5/2018	1:10:57 PM	0	176 R	0.1	-2	9
353	4/5/2018	1:11:09 PM	4	182 R	0.1	5	60
354	4/5/2018	1:11:20 PM	2	186 R	0.1	2	94
355	4/5/2018	1:11:32 PM	1	180 R	0.1	0	43
356	4/5/2018	1:11:44 PM	0	178 R	0.1	-2	26
357	4/5/2018	1:11:55 PM	3	165 R	0.1	3	-85
358	4/5/2018	1:12:07 PM	2	175 R	0.1	2	0
359	4/5/2018	1:12:19 PM	0	225 R	0.1	-2	426
360	4/5/2018	1:15:13 PM	0	180 R	0.1 Grid 27	-2	43
361	4/5/2018	1:15:25 PM	2	172 R	0.1	2	-26
362	4/5/2018	1:15:37 PM	2	190 R	0.1	2	128
363	4/5/2018	1:15:48 PM	1	198 R	0.1	0	196
364	4/5/2018	1:16:00 PM	2	182 R	0.1	2	60
365	4/5/2018	1:16:11 PM	3	185 R	0.1	3	85
366	4/5/2018	1:16:23 PM	3	179 R	0.1	3	34
367	4/5/2018	1:16:35 PM	2	171 R	0.1	2	-34
368	4/5/2018	1:16:46 PM	1	242 R	0.1	0	571
369	4/5/2018	1:16:58 PM	1	224 R	0.1	0	417
370	4/5/2018	1:17:10 PM	2	165 R	0.1	2	-85
371	4/5/2018	1:17:21 PM	3	166 R	0.1	3	-77
372	4/5/2018	1:17:33 PM	1	180 R	0.1	0	43
373	4/5/2018	1:17:45 PM	4	181 R	0.1	5	51
374	4/5/2018	1:17:56 PM	5	178 R	0.1	6	26
375	4/5/2018	1:18:08 PM	2	179 R	0.1	2	34
376	4/5/2018	1:18:19 PM	1	169 R	0.1	0	-51
377	4/5/2018	1:18:31 PM	1	191 R	0.1	0	136

378	4/5/2018	1:18:43 PM	4	179 R	0.1	5	34
379	4/5/2018	1:18:54 PM	2	174 R	0.1	2	-9
380	4/5/2018	1:19:06 PM	1	180 R	0.1	0	43
381	4/5/2018	1:19:18 PM	3	181 R	0.1	3	51
382	4/5/2018	1:19:29 PM	2	206 R	0.1	2	264
383	4/5/2018	1:19:41 PM	2	174 R	0.1	2	-9
384	4/5/2018	1:19:53 PM	2	221 R	0.1	2	392
385	4/5/2018	1:20:04 PM	1	222 R	0.1	0	400
386	4/5/2018	1:20:16 PM	3	230 R	0.1	3	469
387	4/5/2018	1:20:27 PM	2	233 R	0.1	2	494
388	4/5/2018	1:20:39 PM	2	191 R	0.1	2	136
389	4/5/2018	1:20:51 PM	1	179 R	0.1	0	34
390	4/5/2018	1:21:02 PM	2	196 R	0.1	2	179
391	4/5/2018	1:21:14 PM	1	177 R	0.1	0	17
392	4/5/2018	1:21:26 PM	1	192 R	0.1	0	145
393	4/5/2018	1:21:37 PM	3	185 R	0.1	3	85
394	4/5/2018	1:21:49 PM	2	179 R	0.1	2	34
395	4/5/2018	1:22:01 PM	1	239 R	0.1	0	545
396	4/5/2018	1:22:12 PM	1	202 R	0.1	0	230
397	4/5/2018	1:22:24 PM	2	195 R	0.1	2	170
398	4/5/2018	1:22:35 PM	3	252 R	0.1	3	656
399	4/5/2018	1:22:47 PM	2	210 R	0.1	2	298
400	4/5/2018	1:22:59 PM	0	208 R	0.1	-2	281
401	4/5/2018	1:25:52 PM	7	184 R	0.1 Grid 28	9	77
402	4/5/2018	1:26:04 PM	4	166 R	0.1	5	-77
403	4/5/2018	1:26:15 PM	1	169 R	0.1	0	-51
404	4/5/2018	1:26:27 PM	1	179 R	0.1	0	34
405	4/5/2018	1:26:38 PM	2	185 R	0.1	2	85
406	4/5/2018	1:26:50 PM	2	183 R	0.1	2	68
407	4/5/2018	1:27:02 PM	1	187 R	0.1	0	102
408	4/5/2018	1:27:13 PM	2	186 R	0.1	2	94
409	4/5/2018	1:27:25 PM	1	181 R	0.1	0	51
410	4/5/2018	1:27:37 PM	1	168 R	0.1	0	-60
411	4/5/2018	1:27:48 PM	3	193 R	0.1	3	153
412	4/5/2018	1:28:00 PM	2	180 R	0.1	2	43
413	4/5/2018	1:28:12 PM	1	169 R	0.1	0	-51
414	4/5/2018	1:28:23 PM	4	175 R	0.1	5	0
415	4/5/2018	1:28:35 PM	1	169 R	0.1	0	-51
416	4/5/2018	1:28:46 PM	2	176 R	0.1	2	9
417	4/5/2018	1:28:58 PM	1	193 R	0.1	0	153
418	4/5/2018	1:29:10 PM	0	168 R	0.1	-2	-60
419	4/5/2018	1:29:21 PM	10	174 R	0.1	14	-9
420	4/5/2018	1:29:33 PM	2	179 R	0.1	2	34
421	4/5/2018	1:29:45 PM	2	180 R	0.1	2	43
422	4/5/2018	1:29:56 PM	1	181 R	0.1	0	51
423	4/5/2018	1:30:08 PM	2	180 R	0.1	2	43
424	4/5/2018	1:30:20 PM	0	188 R	0.1	-2	111
425	4/5/2018	1:30:31 PM	10	176 R	0.1	14	9
426	4/5/2018	1:30:43 PM	2	185 R	0.1	2	85
427	4/5/2018	1:30:54 PM	2	179 R	0.1	2	34
428	4/5/2018	1:31:06 PM	3	183 R	0.1	3	68
429	4/5/2018	1:31:18 PM	2	211 R	0.1	2	307
430	4/5/2018	1:31:29 PM	1	215 R	0.1	0	341
431	4/5/2018	1:31:41 PM	2	181 R	0.1	2	51
432	4/5/2018	1:31:53 PM	0	197 R	0.1	-2	187
433	4/5/2018	1:32:04 PM	15	217 R	0.1	22	358

434	4/5/2018	1:32:16 PM	3	219 R	0.1	3	375
435	4/5/2018	1:32:28 PM	1	182 R	0.1	0	60
436	4/5/2018	1:32:39 PM	2	172 R	0.1	2	-26
437	4/5/2018	1:32:51 PM	2	178 R	0.1	2	26
438	4/5/2018	1:33:02 PM	3	166 R	0.1	3	-77
439	4/5/2018	1:33:14 PM	2	191 R	0.1	2	136
440	4/5/2018	1:35:09 PM	3	179 R	0.1 Grid 29	3	34
441	4/5/2018	1:35:20 PM	6	181 R	0.1	8	51
442	4/5/2018	1:35:32 PM	1	181 R	0.1	0	51
443	4/5/2018	1:35:44 PM	0	192 R	0.1	-2	145
444	4/5/2018	1:35:55 PM	1	176 R	0.1	0	9
445	4/5/2018	1:36:07 PM	0	169 R	0.1	-2	-51
446	4/5/2018	1:36:19 PM	0	174 R	0.1	-2	-9
447	4/5/2018	1:36:30 PM	2	182 R	0.1	2	60
448	4/5/2018	1:36:42 PM	3	191 R	0.1	3	136
449	4/5/2018	1:36:54 PM	0	174 R	0.1	-2	-9
450	4/5/2018	1:37:05 PM	2	181 R	0.1	2	51
451	4/5/2018	1:37:17 PM	3	168 R	0.1	3	-60
452	4/5/2018	1:37:29 PM	0	169 R	0.1	-2	-51
453	4/5/2018	1:37:41 PM	2	175 R	0.1	2	0
454	4/5/2018	1:37:52 PM	0	174 R	0.1	-2	-9
455	4/5/2018	1:38:04 PM	1	167 R	0.1	0	-68
456	4/5/2018	1:38:16 PM	2	188 R	0.1	2	111
457	4/5/2018	1:38:27 PM	0	181 R	0.1	-2	51
458	4/5/2018	1:38:39 PM	2	179 R	0.1	2	34
459	4/5/2018	1:38:51 PM	2	169 R	0.1	2	-51
460	4/5/2018	1:41:22 PM	0	177 R	0.1 Grid 30	-2	17
461	4/5/2018	1:41:34 PM	8	180 R	0.1	11	43
462	4/5/2018	1:41:46 PM	2	166 R	0.1	2	-77
463	4/5/2018	1:41:57 PM	2	178 R	0.1	2	26
464	4/5/2018	1:42:09 PM	1	181 R	0.1	0	51
465	4/5/2018	1:42:21 PM	2	180 R	0.1	2	43
466	4/5/2018	1:42:33 PM	0	189 R	0.1	-2	119
467	4/5/2018	1:42:44 PM	1	184 R	0.1	0	77
468	4/5/2018	1:42:56 PM	2	171 R	0.1	2	-34
469	4/5/2018	1:43:08 PM	3	187 R	0.1	3	102
470	4/5/2018	1:43:19 PM	4	192 R	0.1	5	145
471	4/5/2018	1:43:31 PM	1	180 R	0.1	0	43
472	4/5/2018	1:43:43 PM	2	187 R	0.1	2	102
473	4/5/2018	1:43:54 PM	3	175 R	0.1	3	0
474	4/5/2018	1:44:06 PM	1	177 R	0.1	0	17
475	4/5/2018	1:44:18 PM	0	181 R	0.1	-2	51
476	4/5/2018	1:44:29 PM	2	177 R	0.1	2	17
477	4/5/2018	1:44:41 PM	1	183 R	0.1	0	68
478	4/5/2018	1:44:53 PM	1	177 R	0.1	0	17
479	4/5/2018	1:45:05 PM	0	227 R	0.1	-2	443
		Maximum:	18	345		26	1448
		Average:	2	209		2	290
		StDev:	2	40		4	339

2360 SN:297766

43-93# 323074

Cal Due Date:

12/20/2018

Surveyor:

Joan Cosgrove

Tunnel

Grids 21 thru 23

Alpha Efficiency: 0.404

Beta/Gamma Efficiency: 0.254

Alpha Background: 1

Beta/Gamma Background: 192

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count Time	Location	dpm/100cm ²	
								Alpha	Beta
1	4/5/2018	2:03:03 PM	10	188	R	0.1	Grid 21	15	-42
2	4/5/2018	2:03:15 PM	2	186	R	0.1		2	-63
3	4/5/2018	2:03:26 PM	0	221	R	0.1		-2	304
4	4/5/2018	2:03:38 PM	3	204	R	0.1		3	126
5	4/5/2018	2:03:50 PM	0	189	R	0.1		-2	-31
6	4/5/2018	2:04:01 PM	2	208	R	0.1		2	168
7	4/5/2018	2:04:13 PM	2	208	R	0.1		2	168
8	4/5/2018	2:04:25 PM	0	227	R	0.1		-2	367
9	4/5/2018	2:04:36 PM	3	210	R	0.1		3	189
10	4/5/2018	2:04:48 PM	2	240	R	0.1		2	504
11	4/5/2018	2:05:00 PM	3	213	R	0.1		3	220
12	4/5/2018	2:05:12 PM	1	242	R	0.1		0	525
13	4/5/2018	2:05:23 PM	1	208	R	0.1		0	168
14	4/5/2018	2:05:35 PM	2	231	R	0.1		2	409
15	4/5/2018	2:05:47 PM	3	238	R	0.1		3	483
16	4/5/2018	2:05:58 PM	2	207	R	0.1		2	157
17	4/5/2018	2:06:10 PM	0	231	R	0.1		-2	409
18	4/5/2018	2:06:22 PM	3	260	R	0.1		3	714
19	4/5/2018	2:06:33 PM	0	262	R	0.1		-2	735
20	4/5/2018	2:07:42 PM	2	197	R	0.1	Grid 22	2	52
21	4/5/2018	2:07:54 PM	1	188	R	0.1		0	-42
22	4/5/2018	2:08:05 PM	11	188	R	0.1		17	-42
23	4/5/2018	2:08:17 PM	2	188	R	0.1		2	-42
24	4/5/2018	2:08:29 PM	1	191	R	0.1		0	-10
25	4/5/2018	2:08:41 PM	2	188	R	0.1		2	-42
26	4/5/2018	2:08:52 PM	1	190	R	0.1		0	-21
27	4/5/2018	2:09:04 PM	0	192	R	0.1		-2	0
28	4/5/2018	2:09:16 PM	12	187	R	0.1		19	-52
29	4/5/2018	2:09:27 PM	3	186	R	0.1		3	-63
30	4/5/2018	2:09:39 PM	0	188	R	0.1		-2	-42
31	4/5/2018	2:09:51 PM	0	189	R	0.1		-2	-31
32	4/5/2018	2:10:02 PM	0	187	R	0.1		-2	-52
33	4/5/2018	2:10:14 PM	7	196	R	0.1		10	42
34	4/5/2018	2:10:26 PM	1	190	R	0.1		0	-21
35	4/5/2018	2:10:37 PM	5	188	R	0.1		7	-42
36	4/5/2018	2:10:49 PM	7	191	R	0.1		10	-10
37	4/5/2018	2:11:01 PM	1	186	R	0.1		0	-63
38	4/5/2018	2:11:12 PM	0	221	R	0.1		-2	304
39	4/5/2018	2:11:24 PM	0	193	R	0.1		-2	10
40	4/5/2018	2:11:36 PM	5	223	R	0.1		7	325

41	4/5/2018 2:11:48 PM	1	185 R	0.1	0	-73
42	4/5/2018 2:11:59 PM	0	190 R	0.1	-2	-21
43	4/5/2018 2:12:11 PM	4	191 R	0.1	5	-10
44	4/5/2018 2:12:23 PM	1	188 R	0.1	0	-42
45	4/5/2018 2:12:34 PM	0	181 R	0.1	-2	-115
46	4/5/2018 2:12:46 PM	0	225 R	0.1	-2	346
47	4/5/2018 2:12:58 PM	15	206 R	0.1	24	147
48	4/5/2018 2:13:09 PM	3	231 R	0.1	3	409
49	4/5/2018 2:13:21 PM	1	192 R	0.1	0	0
50	4/5/2018 2:15:46 PM	2	210 R	0.1 Grid 23	2	189
51	4/5/2018 2:15:57 PM	1	194 R	0.1	0	21
52	4/5/2018 2:16:09 PM	1	212 R	0.1	0	210
53	4/5/2018 2:16:21 PM	3	191 R	0.1	3	-10
54	4/5/2018 2:16:32 PM	2	187 R	0.1	2	-52
55	4/5/2018 2:16:44 PM	1	186 R	0.1	0	-63
56	4/5/2018 2:16:56 PM	2	187 R	0.1	2	-52
57	4/5/2018 2:17:07 PM	1	191 R	0.1	0	-10
58	4/5/2018 2:17:19 PM	2	185 R	0.1	2	-73
59	4/5/2018 2:17:31 PM	3	191 R	0.1	3	-10
60	4/5/2018 2:17:42 PM	0	185 R	0.1	-2	-73
61	4/5/2018 2:17:54 PM	5	193 R	0.1	7	10
62	4/5/2018 2:18:06 PM	1	190 R	0.1	0	-21
63	4/5/2018 2:18:17 PM	1	178 R	0.1	0	-147
64	4/5/2018 2:18:29 PM	2	202 R	0.1	2	105
65	4/5/2018 2:18:41 PM	4	189 R	0.1	5	-31
66	4/5/2018 2:18:53 PM	2	199 R	0.1	2	73
67	4/5/2018 2:19:04 PM	1	199 R	0.1	0	73
68	4/5/2018 2:19:16 PM	2	191 R	0.1	2	-10
69	4/5/2018 2:19:28 PM	1	191 R	0.1	0	-10
70	4/5/2018 2:19:39 PM	2	186 R	0.1	2	-63
71	4/5/2018 2:19:51 PM	2	187 R	0.1	2	-52
72	4/5/2018 2:20:03 PM	1	188 R	0.1	0	-42
73	4/5/2018 2:20:14 PM	2	183 R	0.1	2	-94
74	4/5/2018 2:20:26 PM	3	183 R	0.1	3	-94
75	4/5/2018 2:20:38 PM	1	199 R	0.1	0	73
76	4/5/2018 2:20:49 PM	2	191 R	0.1	2	-10
77	4/5/2018 2:21:01 PM	1	201 R	0.1	0	94
78	4/5/2018 2:21:13 PM	1	199 R	0.1	0	73
79	4/5/2018 2:21:24 PM	2	189 R	0.1	2	-31
	Maximum:	15	262		24	735
	Average:	2	200		2	79
	StDev:	3	18		5	191

Tunnel Overhead/Ceiling

2360 SN:297758

43-93# 299597

Cal Due Date: 2/14/2019

Surveyor: Richard Thatcher

Tunnel Overhead

Grids 1 thru 5

Alpha Efficiency: 0.444

Beta/Gamma Efficiency: 0.313

Alpha Background: 1

Beta/Gamma Background: 175

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²	
									Alpha	Beta
1	4/6/2018	9:38:48 AM	5	169	R	0.1	Grid 1	6	-51	
2	4/6/2018	9:39:00 AM	1	211	R	0.1		0	307	
3	4/6/2018	9:39:12 AM	3	172	R	0.1		3	-26	
4	4/6/2018	9:39:23 AM	4	181	R	0.1		5	51	
5	4/6/2018	9:39:35 AM	0	174	R	0.1		-2	-9	
6	4/6/2018	9:39:47 AM	0	171	R	0.1		-2	-34	
7	4/6/2018	9:39:58 AM	2	181	R	0.1		2	51	
8	4/6/2018	9:40:10 AM	0	178	R	0.1		-2	26	
9	4/6/2018	9:40:22 AM	3	175	R	0.1		3	0	
10	4/6/2018	9:40:34 AM	0	182	R	0.1		-2	60	
11	4/6/2018	9:40:45 AM	0	181	R	0.1		-2	51	
12	4/6/2018	9:40:57 AM	9	181	R	0.1		12	51	
13	4/6/2018	9:41:09 AM	2	183	R	0.1		2	68	
14	4/6/2018	9:41:20 AM	0	207	R	0.1		-2	273	
15	4/6/2018	9:41:32 AM	2	173	R	0.1		2	-17	
16	4/6/2018	9:41:44 AM	3	178	R	0.1		3	26	
17	4/6/2018	9:41:55 AM	2	168	R	0.1		2	-60	
18	4/6/2018	9:42:07 AM	0	194	R	0.1		-2	162	
19	4/6/2018	9:42:19 AM	3	180	R	0.1		3	43	
20	4/6/2018	9:42:31 AM	0	181	R	0.1		-2	51	
21	4/6/2018	9:42:42 AM	12	176	R	0.1		17	9	
22	4/6/2018	9:42:54 AM	3	191	R	0.1		3	136	
23	4/6/2018	9:43:06 AM	2	172	R	0.1		2	-26	
24	4/6/2018	9:43:17 AM	1	200	R	0.1		0	213	
25	4/6/2018	9:48:18 AM	3	213	R	0.1	Grid 2	3	324	
26	4/6/2018	9:48:29 AM	1	174	R	0.1		0	-9	
27	4/6/2018	9:48:41 AM	2	191	R	0.1		2	136	
28	4/6/2018	9:48:53 AM	3	165	R	0.1		3	-85	
29	4/6/2018	9:49:05 AM	1	165	R	0.1		0	-85	
30	4/6/2018	9:49:16 AM	1	179	R	0.1		0	34	
31	4/6/2018	9:49:28 AM	2	176	R	0.1		2	9	
32	4/6/2018	9:49:40 AM	2	233	R	0.1		2	494	
33	4/6/2018	9:49:51 AM	4	168	R	0.1		5	-60	
34	4/6/2018	9:50:03 AM	3	171	R	0.1		3	-34	
35	4/6/2018	9:50:15 AM	2	174	R	0.1		2	-9	
36	4/6/2018	9:50:26 AM	2	174	R	0.1		2	-9	
37	4/6/2018	9:50:38 AM	5	168	R	0.1		6	-60	
38	4/6/2018	9:50:50 AM	5	177	R	0.1		6	17	
39	4/6/2018	9:51:02 AM	6	169	R	0.1		8	-51	
40	4/6/2018	9:51:13 AM	3	182	R	0.1		3	60	
41	4/6/2018	9:51:25 AM	4	168	R	0.1		5	-60	

42	4/6/2018	9:51:37 AM	2	175 R	0.1	2	0
43	4/6/2018	9:51:48 AM	2	172 R	0.1	2	-26
44	4/6/2018	9:52:00 AM	0	184 R	0.1	-2	77
45	4/6/2018	9:52:12 AM	4	174 R	0.1	5	-9
46	4/6/2018	9:52:23 AM	1	193 R	0.1	0	153
47	4/6/2018	9:52:35 AM	0	177 R	0.1	-2	17
48	4/6/2018	9:52:47 AM	2	178 R	0.1	2	26
49	4/6/2018	9:52:59 AM	0	190 R	0.1	-2	128
50	4/6/2018	9:56:34 AM	4	171 R	0.1 Grid 3	5	-34
51	4/6/2018	9:56:45 AM	1	166 R	0.1	0	-77
52	4/6/2018	9:56:57 AM	0	214 R	0.1	-2	332
53	4/6/2018	9:57:09 AM	4	206 R	0.1	5	264
54	4/6/2018	9:57:20 AM	1	206 R	0.1	0	264
55	4/6/2018	9:57:32 AM	6	202 R	0.1	8	230
56	4/6/2018	9:57:44 AM	4	171 R	0.1	5	-34
57	4/6/2018	9:57:55 AM	1	187 R	0.1	0	102
58	4/6/2018	9:58:07 AM	5	179 R	0.1	6	34
59	4/6/2018	9:58:19 AM	1	179 R	0.1	0	34
60	4/6/2018	9:58:31 AM	11	181 R	0.1	15	51
61	4/6/2018	9:58:42 AM	2	190 R	0.1	2	128
62	4/6/2018	9:58:54 AM	4	210 R	0.1	5	298
63	4/6/2018	9:59:06 AM	1	172 R	0.1	0	-26
64	4/6/2018	9:59:17 AM	2	239 R	0.1	2	545
65	4/6/2018	9:59:29 AM	1	202 R	0.1	0	230
66	4/6/2018	9:59:41 AM	1	209 R	0.1	0	290
67	4/6/2018	9:59:52 AM	3	177 R	0.1	3	17
68	4/6/2018	10:00:04 AM	2	175 R	0.1	2	0
69	4/6/2018	10:00:16 AM	4	176 R	0.1	5	9
70	4/6/2018	10:00:28 AM	1	174 R	0.1	0	-9
71	4/6/2018	10:00:39 AM	2	182 R	0.1	2	60
72	4/6/2018	10:00:51 AM	2	173 R	0.1	2	-17
73	4/6/2018	10:01:03 AM	1	182 R	0.1	0	60
74	4/6/2018	10:01:14 AM	7	199 R	0.1	9	204
75	4/6/2018	10:06:20 AM	5	187 R	0.1 Grid 4	6	102
76	4/6/2018	10:06:32 AM	2	181 R	0.1	2	51
77	4/6/2018	10:06:44 AM	3	184 R	0.1	3	77
78	4/6/2018	10:06:55 AM	2	176 R	0.1	2	9
79	4/6/2018	10:07:07 AM	1	209 R	0.1	0	290
80	4/6/2018	10:07:19 AM	4	195 R	0.1	5	170
81	4/6/2018	10:07:30 AM	3	183 R	0.1	3	68
82	4/6/2018	10:07:42 AM	0	245 R	0.1	-2	596
83	4/6/2018	10:07:54 AM	11	215 R	0.1	15	341
84	4/6/2018	10:08:06 AM	2	183 R	0.1	2	68
85	4/6/2018	10:08:17 AM	2	167 R	0.1	2	-68
86	4/6/2018	10:08:29 AM	3	173 R	0.1	3	-17
87	4/6/2018	10:08:41 AM	1	194 R	0.1	0	162
88	4/6/2018	10:08:52 AM	4	256 R	0.1	5	690
89	4/6/2018	10:09:04 AM	2	191 R	0.1	2	136
90	4/6/2018	10:09:16 AM	2	164 R	0.1	2	-94
91	4/6/2018	10:09:27 AM	7	169 R	0.1	9	-51
92	4/6/2018	10:09:39 AM	1	181 R	0.1	0	51
93	4/6/2018	10:09:50 AM	1	172 R	0.1	0	-26
94	4/6/2018	10:10:02 AM	0	227 R	0.1	-2	443
95	4/6/2018	10:10:14 AM	11	177 R	0.1	15	17
96	4/6/2018	10:10:25 AM	2	189 R	0.1	2	119
97	4/6/2018	10:10:37 AM	0	211 R	0.1	-2	307

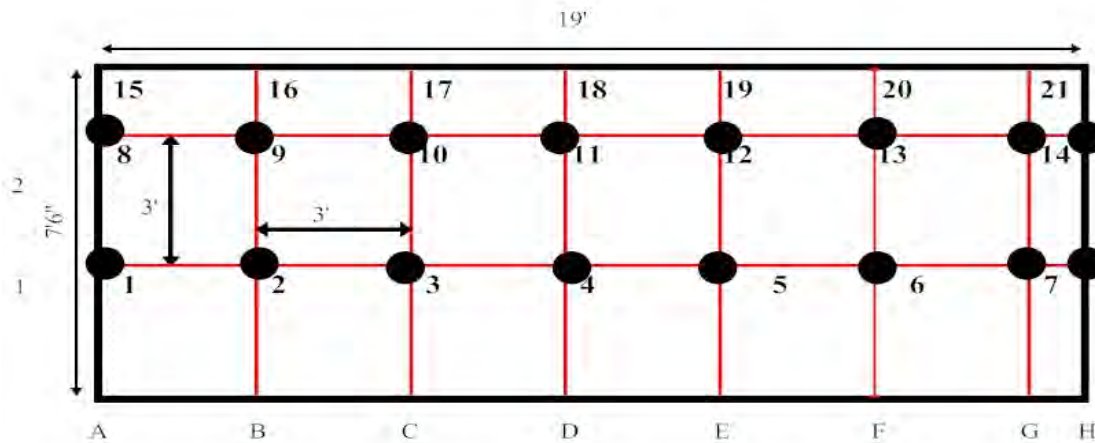
98	4/6/2018	10:10:49 AM	0	199 R	0.1	-2	204
99	4/6/2018	10:11:00 AM	10	221 R	0.1	14	392
100	4/6/2018	10:13:58 AM	3	167 R	0.1 Grid 5	3	-68
101	4/6/2018	10:14:10 AM	0	194 R	0.1	-2	162
102	4/6/2018	10:14:22 AM	0	170 R	0.1	-2	-43
103	4/6/2018	10:14:33 AM	10	168 R	0.1	14	-60
104	4/6/2018	10:14:45 AM	2	193 R	0.1	2	153
105	4/6/2018	10:14:57 AM	0	212 R	0.1	-2	315
106	4/6/2018	10:15:08 AM	0	228 R	0.1	-2	452
107	4/6/2018	10:15:20 AM	0	167 R	0.1	-2	-68
108	4/6/2018	10:15:32 AM	3	172 R	0.1	3	-26
109	4/6/2018	10:15:43 AM	1	197 R	0.1	0	187
110	4/6/2018	10:15:55 AM	1	184 R	0.1	0	77
111	4/6/2018	10:16:06 AM	2	180 R	0.1	2	43
112	4/6/2018	10:16:18 AM	5	242 R	0.1	6	571
113	4/6/2018	10:16:30 AM	3	178 R	0.1	3	26
114	4/6/2018	10:16:41 AM	2	186 R	0.1	2	94
115	4/6/2018	10:16:53 AM	1	203 R	0.1	0	239
116	4/6/2018	10:17:05 AM	2	171 R	0.1	2	-34
117	4/6/2018	10:17:16 AM	1	179 R	0.1	0	34
118	4/6/2018	10:17:28 AM	2	192 R	0.1	2	145
119	4/6/2018	10:17:40 AM	2	203 R	0.1	2	239
120	4/6/2018	10:17:51 AM	3	215 R	0.1	3	341
121	4/6/2018	10:18:03 AM	4	169 R	0.1	5	-51
122	4/6/2018	10:18:14 AM	2	180 R	0.1	2	43
123	4/6/2018	10:18:26 AM	3	166 R	0.1	3	-77
124	4/6/2018	10:18:38 AM	0	185 R	0.1	-2	85
		Maximum:	12	256		17	690
		Average:	3	186		2	98
		StDev:	3	19		4	160

Room 105 Floor

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018		TIME: 15:00		INSTRUMENTATION USED					
SURVEY NUMBER: N/A		Model Inst./Det.:	Serial Number:	Calibration Due Date:	Instrument Efficiency:	%:	Total % Efficiency:	MDC/MDA ⁺ (dpm/100cm ²):	Background ⁺ (dpm/100cm ²):
LOCATION: Room 105 Floor		2360	297758	2/14/2019	α	44.4%	α 11.1%	α 53.3	α 16.2
SURVEYOR: Thomas Hogan/Joan Cosgrove		43-93	299597		βγ	31.3%	βγ 11.7%	βγ 481.0	βγ 2377.0
DATE: 4/23/2018		2929	146870	6/17/2019	α	64.6%	α 16.2%	α 15.9	α 1.2
TIME: 15:05					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
Reviewed by: Daniel Spicuzza		Static Count Time: 2 Minutes							
Isotopes of Concern: DU		NRL Chesapeake Beach Detachment							

Room 105 Floor



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids

Comments:

The 3' by 3' area at each direct measurement location was 100% gross alpha/beta-gamma surveyed.
Scan results were: 0-5 CPM alpha, 250-300 cpm beta-gamma.

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

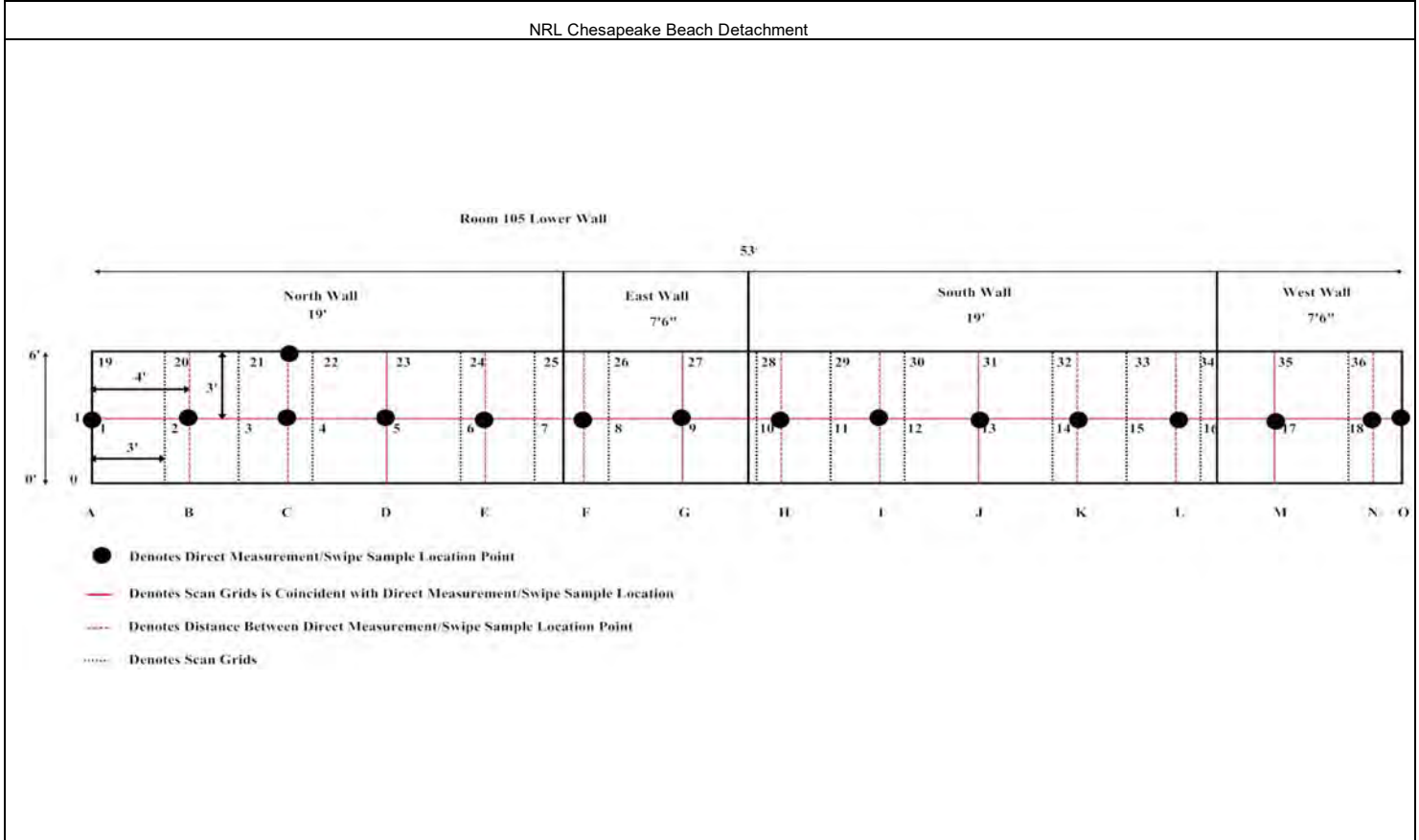
SURVEY NUMBER: N/A								
SURVEYOR: Thomas Hogan/Joan Cosgrove			LOCATION: Room 105 Floor					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
A1				19.8	106.5	1.9	-13.6	See Map For Location
B1				-2.7	-68.2	1.9	-8.6	See Map For Location
C1				10.8	-42.6	-1.2	-21.1	See Map For Location
D1				-2.7	-42.6	-1.2	-11.1	See Map For Location
E1				-7.2	-119.3	-1.2	-13.6	See Map For Location
F1				-2.7	-115.0	-1.2	-3.5	See Map For Location
G1				-2.7	-132.1	1.9	-16.1	See Map For Location
H1				-7.2	132.1	-1.2	4.0	See Map For Location
A2				24.3	-132.1	-1.2	-26.2	See Map For Location
B2				-2.7	-115.0	-1.2	-18.6	See Map For Location
C2				6.3	119.3	1.9	-16.1	See Map For Location
D2				1.8	29.8	-1.2	-31.2	See Map For Location
E2				-2.7	-115.0	-1.2	-11.1	See Map For Location
F2				-16.2	98.0	-1.2	-6.0	See Map For Location
G2				1.8	123.5	-1.2	-3.5	See Map For Location
H2				6.3	34.1	1.9	-23.6	See Map For Location
E1D						-1.2	-11.1	Duplicate Swipe
F2D						-1.2	-8.6	Duplicate Swipe
Maximum:				24.3	132.1	1.9	4.0	
Average:				1.5	-14.9	-0.4	-13.3	
StDev:				10.2	104.4	1.4	8.8	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
Reviewer Daniel Spicuzza			Date: 4/23/2018					
			Time: 15:05					

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Room 105 Lower/Upper Wall

RADIATION/CONTAMINATION SURVEY FORM

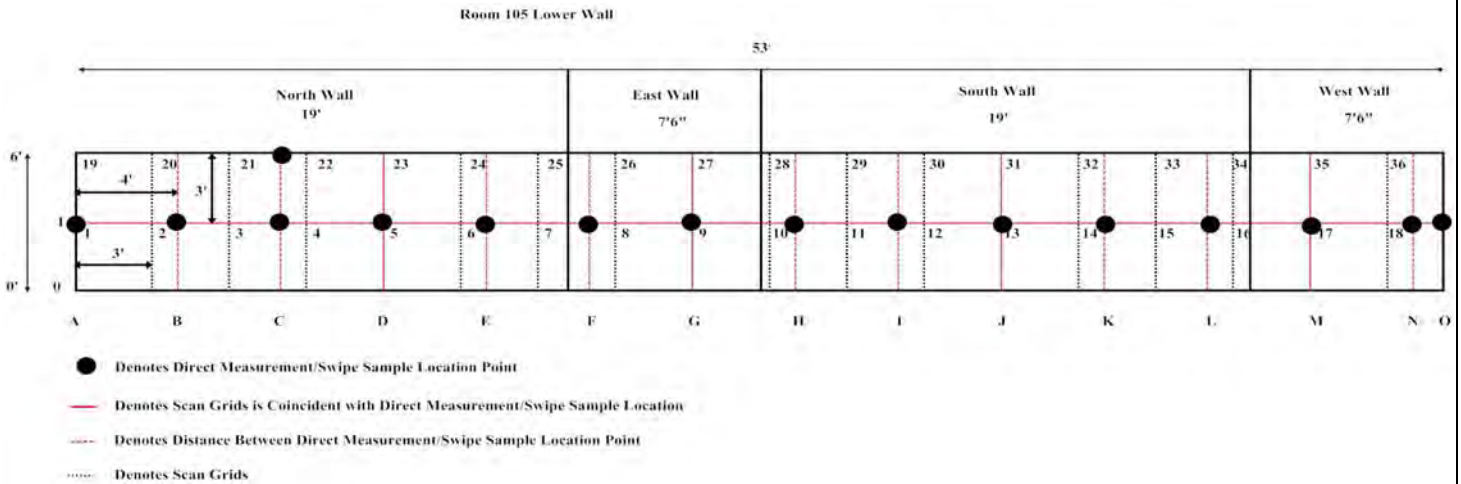
DATE: 4/23/2018	TIME: 13:22	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	% Efficiency	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
SURVEY NUMBER: N/A		2360	193668	8/15/2018	α	49.7%	α 12.4%	α 45.6	α 12.9
LOCATION: Room 105 Lower Walls		43-93	326725		βγ	32.7%	βγ 12.3%	βγ 364.1	βγ 1402.7
SURVEYOR: Thomas Hogan		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
DATE: 4/23/2018					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
TIME: 13:41		Reviewed by: Daniel Spicuzza		Static Count Time: 2 Minutes					
Isotopes of Concern: DU		NRL Chesapeake Beach Detachment							



<p>Comments:</p> <p>The 3' by 3' area at each direct measurement location was 100% gross alpha/beta-gamma surveyed.</p> <p>Scan results were: 0-4 CPM alpha, 150-200 cpm beta-gamma.</p> <p style="text-align: center;">Routine (Daily / Weekly / Monthly) <input type="checkbox"/> Non-routine <input checked="" type="checkbox"/></p>	<p>denotes swipe location and fixed α/β readings</p> <p># denotes G/A radiation readings</p> <p>#/# denotes contact / 1 meter radiation readings.</p> <p>* denotes highest radiation reading on contact</p> <p>LAW denotes large area masslinn wipe</p> <p>Δ denotes static location.</p> <p>+ Unless Otherwise Noted</p> <p>All readings in mri/hr unless otherwise noted</p> <p>K = 1000</p>
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RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018	TIME: 13:22	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	% Efficiency	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
SURVEY NUMBER: N/A		2360	193668	8/15/2018	α	49.7%	α 12.4%	α 45.6	α 12.9
LOCATION: Room 105 Lower Walls		43-93	326725		βγ	32.7%	βγ 12.3%	βγ 364.1	βγ 1402.7
SURVEYOR: Thomas Hogan		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
DATE: 4/23/2018					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
TIME: 13:41		Reviewed by: Daniel Spicuzza		Static Count Time: 2 Minutes					
Isotopes of Concern: DU		NRL Chesapeake Beach Detachment							



Comments:

The 3' by 3' area at each direct measurement location was 100% gross alpha/beta-gamma surveyed.

Scan results were: 0-4 CPM alpha, 150-200 cpm beta-gamma.

Routine (Daily / Weekly / Monthly)
 Non-routine

denotes swipe location and fixed α/β readings

denotes G/A radiation readings

#/# denotes contact / 1 meter radiation readings.

* denotes highest radiation reading on contact

LAW denotes large area masslinn wipe

Δ denotes static location.

+ Unless Otherwise Noted

All readings in mri/hr unless otherwise noted

K = 1000

Room 105A Floor

2360 SN:268488

43-37 #190672

Cal Due Date: 10/27/2018

Surveyor: Richard Thatcher

Bldg 218

Room 105A Floor Grids 1 thru 38

Alpha Efficiency: 0.302

Beta/Gamma Efficiency: 0.37

Alpha Background: 5.8

Beta/Gamma Background: 881

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count Time	Location	dpm/100cm ²	
								Alpha	Beta
1	4/16/2018	12:15:20 PM	9	830	R	0.1	Grid 1	7	-63
2	4/16/2018	12:15:32 PM	8	747	R	0.1		5	-166
3	4/16/2018	12:15:44 PM	14	896	R	0.1		19	19
4	4/16/2018	12:15:55 PM	12	845	R	0.1		14	-45
5	4/16/2018	12:16:07 PM	7	834	R	0.1		3	-58
6	4/16/2018	12:16:56 PM	0	838	R	0.1	Grid 2	-13	-53
7	4/16/2018	12:17:08 PM	8	904	R	0.1		5	28
8	4/16/2018	12:20:17 PM	9	860	R	0.1	Grid 3	7	-26
9	4/16/2018	12:20:28 PM	3	841	R	0.1		-6	-50
10	4/16/2018	12:20:40 PM	0	865	R	0.1		-13	-20
11	4/16/2018	12:20:52 PM	11	767	R	0.1		12	-141
12	4/16/2018	12:21:04 PM	2	813	R	0.1		-9	-84
13	4/16/2018	12:21:15 PM	0	845	R	0.1		-13	-45
14	4/16/2018	12:21:27 PM	3	925	R	0.1		-6	54
15	4/16/2018	12:21:39 PM	3	957	R	0.1		-6	94
16	4/16/2018	12:21:50 PM	6	955	R	0.1		0	92
17	4/16/2018	12:22:02 PM	1	986	R	0.1		-11	130
18	4/16/2018	12:24:10 PM	9	865	R	0.1	Grid 4	7	-20
19	4/16/2018	12:24:22 PM	2	994	R	0.1		-9	140
20	4/16/2018	12:24:33 PM	8	857	R	0.1		5	-30
21	4/16/2018	12:24:45 PM	12	852	R	0.1		14	-36
22	4/16/2018	12:24:57 PM	3	892	R	0.1		-6	14
23	4/16/2018	12:25:08 PM	0	957	R	0.1		-13	94
24	4/16/2018	12:25:20 PM	0	1045	R	0.1		-13	203
25	4/16/2018	12:25:32 PM	0	941	R	0.1		-13	74
26	4/16/2018	12:25:44 PM	15	1003	R	0.1		21	151
27	4/16/2018	12:25:55 PM	8	868	R	0.1		5	-16
28	4/16/2018	12:27:32 PM	0	864	R	0.1	Grid 5	-13	-21
29	4/16/2018	12:27:44 PM	6	850	R	0.1		0	-38
30	4/16/2018	12:27:55 PM	1	873	R	0.1		-11	-10
31	4/16/2018	12:28:07 PM	0	887	R	0.1		-13	7
32	4/16/2018	12:28:19 PM	0	857	R	0.1		-13	-30
33	4/16/2018	12:28:30 PM	11	871	R	0.1		12	-12
34	4/16/2018	12:28:42 PM	2	809	R	0.1		-9	-89
35	4/16/2018	12:28:54 PM	0	828	R	0.1		-13	-66
36	4/16/2018	12:29:05 PM	6	865	R	0.1		0	-20
37	4/16/2018	12:29:17 PM	10	823	R	0.1		10	-72
38	4/16/2018	12:29:29 PM	2	863	R	0.1		-9	-22
39	4/16/2018	12:29:41 PM	3	858	R	0.1		-6	-28
40	4/16/2018	12:32:23 PM	0	887	R	0.1	Grid 6	-13	7
41	4/16/2018	12:32:35 PM	3	801	R	0.1		-6	-99
42	4/16/2018	12:32:46 PM	0	866	R	0.1		-13	-19

43	4/16/2018	12:32:58 PM	7	937 R	0.1	3	69
44	4/16/2018	12:33:10 PM	0	1095 R	0.1	-13	265
45	4/16/2018	12:33:21 PM	6	987 R	0.1	0	131
46	4/16/2018	12:33:33 PM	7	992 R	0.1	3	137
47	4/16/2018	12:33:45 PM	1	960 R	0.1	-11	98
48	4/16/2018	12:33:56 PM	16	898 R	0.1	23	21
49	4/16/2018	12:34:08 PM	6	905 R	0.1	0	30
50	4/16/2018	12:36:17 PM	0	823 R	0.1 Grid 7	-13	-72
51	4/16/2018	12:36:29 PM	11	835 R	0.1	12	-57
52	4/16/2018	12:36:40 PM	5	826 R	0.1	-2	-68
53	4/16/2018	12:36:52 PM	18	1037 R	0.1	28	193
54	4/16/2018	12:37:04 PM	10	1097 R	0.1	10	267
55	4/16/2018	12:37:16 PM	2	1073 R	0.1	-9	238
56	4/16/2018	12:37:27 PM	11	979 R	0.1	12	121
57	4/16/2018	12:37:39 PM	2	1000 R	0.1	-9	147
58	4/16/2018	12:37:51 PM	0	939 R	0.1	-13	72
59	4/16/2018	12:38:02 PM	6	897 R	0.1	0	20
60	4/16/2018	12:41:34 PM	8	811 R	0.1 Grid 8	5	-87
61	4/16/2018	12:41:46 PM	6	828 R	0.1	0	-66
62	4/16/2018	12:41:57 PM	6	918 R	0.1	0	46
63	4/16/2018	12:42:09 PM	11	982 R	0.1	12	125
64	4/16/2018	12:42:21 PM	2	1016 R	0.1	-9	167
65	4/16/2018	12:42:32 PM	15	1076 R	0.1	21	241
66	4/16/2018	12:42:44 PM	8	1016 R	0.1	5	167
67	4/16/2018	12:42:56 PM	6	1108 R	0.1	0	281
68	4/16/2018	12:43:08 PM	14	1055 R	0.1	19	215
69	4/16/2018	12:43:19 PM	3	980 R	0.1	-6	123
70	4/16/2018	12:44:52 PM	0	802 R	0.1 Grid 9	-13	-98
71	4/16/2018	12:45:03 PM	3	1064 R	0.1	-6	227
72	4/16/2018	12:45:15 PM	0	1028 R	0.1	-13	182
73	4/16/2018	12:45:27 PM	4	1015 R	0.1	-4	166
74	4/16/2018	12:45:38 PM	4	1242 R	0.1	-4	447
75	4/16/2018	12:45:50 PM	4	1029 R	0.1	-4	183
76	4/16/2018	12:48:40 PM	8	834 R	0.1 Grid 10	5	-58
77	4/16/2018	12:48:51 PM	0	732 R	0.1	-13	-185
78	4/16/2018	12:49:03 PM	7	985 R	0.1	3	129
79	4/16/2018	12:49:15 PM	3	704 R	0.1	-6	-219
80	4/16/2018	12:49:26 PM	5	844 R	0.1	-2	-46
81	4/16/2018	12:49:38 PM	4	808 R	0.1	-4	-90
82	4/16/2018	12:49:50 PM	6	880 R	0.1	0	-1
83	4/16/2018	12:50:02 PM	1	737 R	0.1	-11	-178
84	4/16/2018	12:50:13 PM	4	938 R	0.1	-4	71
85	4/16/2018	12:50:25 PM	4	964 R	0.1	-4	103
86	4/16/2018	12:51:53 PM	0	812 R	0.1 Grid 11	-13	-85
87	4/16/2018	12:52:05 PM	7	848 R	0.1	3	-41
88	4/16/2018	12:52:17 PM	7	823 R	0.1	3	-72
89	4/16/2018	12:52:29 PM	1	865 R	0.1	-11	-20
90	4/16/2018	12:52:40 PM	10	816 R	0.1	10	-80
91	4/16/2018	12:52:52 PM	2	814 R	0.1	-9	-83
92	4/16/2018	12:53:04 PM	16	849 R	0.1	23	-40
93	4/16/2018	12:53:15 PM	3	805 R	0.1	-6	-94
94	4/16/2018	12:53:27 PM	8	875 R	0.1	5	-7
95	4/16/2018	12:54:51 PM	0	913 R	0.1 Grid 12	-13	40
96	4/16/2018	12:55:02 PM	11	799 R	0.1	12	-102
97	4/16/2018	12:55:14 PM	10	816 R	0.1	10	-80
98	4/16/2018	12:55:26 PM	2	846 R	0.1	-9	-43
99	4/16/2018	12:55:38 PM	0	823 R	0.1	-13	-72
100	4/16/2018	12:55:49 PM	12	777 R	0.1	14	-129

101	4/16/2018	12:56:01 PM	3	837 R	0.1	-6	-54
102	4/16/2018	12:56:13 PM	20	859 R	0.1	32	-27
103	4/16/2018	12:56:24 PM	4	922 R	0.1	-4	51
104	4/16/2018	12:58:14 PM	0	889 R	0.1 Grid 13	-13	10
105	4/16/2018	12:58:25 PM	3	921 R	0.1	-6	50
106	4/16/2018	12:58:37 PM	0	855 R	0.1	-13	-32
107	4/16/2018	12:58:49 PM	4	963 R	0.1	-4	102
108	4/16/2018	12:59:00 PM	10	1034 R	0.1	10	189
109	4/16/2018	12:59:12 PM	2	878 R	0.1	-9	-4
110	4/16/2018	12:59:24 PM	3	877 R	0.1	-6	-5
111	4/16/2018	12:59:36 PM	6	870 R	0.1	0	-14
112	4/16/2018	12:59:47 PM	0	1004 R	0.1	-13	152
113	4/16/2018	12:59:59 PM	5	944 R	0.1	-2	78
114	4/16/2018	1:00:11 PM	0	810 R	0.1	-13	-88
115	4/16/2018	1:02:21 PM	10	832 R	0.1 Grid 14	10	-61
116	4/16/2018	1:02:32 PM	11	861 R	0.1	12	-25
117	4/16/2018	1:02:44 PM	2	849 R	0.1	-9	-40
118	4/16/2018	1:02:56 PM	4	838 R	0.1	-4	-53
119	4/16/2018	1:03:07 PM	6	911 R	0.1	0	37
120	4/16/2018	1:03:19 PM	13	783 R	0.1	16	-121
121	4/16/2018	1:03:31 PM	9	822 R	0.1	7	-73
122	4/16/2018	1:03:43 PM	2	832 R	0.1	-9	-61
123	4/16/2018	1:03:54 PM	3	1020 R	0.1	-6	172
124	4/16/2018	1:04:06 PM	6	946 R	0.1	0	80
125	4/16/2018	1:07:09 PM	7	835 R	0.1 Grid 15	3	-57
126	4/16/2018	1:07:21 PM	7	834 R	0.1	3	-58
127	4/16/2018	1:07:33 PM	1	918 R	0.1	-11	46
128	4/16/2018	1:07:45 PM	0	868 R	0.1	-13	-16
129	4/16/2018	1:07:56 PM	0	943 R	0.1	-13	77
130	4/16/2018	1:09:21 PM	8	922 R	0.1 Grid 16	5	51
131	4/16/2018	1:09:33 PM	9	945 R	0.1	7	79
132	4/16/2018	1:09:44 PM	9	900 R	0.1	7	24
133	4/16/2018	1:09:56 PM	2	901 R	0.1	-9	25
134	4/16/2018	1:11:40 PM	0	881 R	0.1 Grid 17	-13	0
135	4/16/2018	1:11:52 PM	0	820 R	0.1	-13	-76
136	4/16/2018	1:12:03 PM	0	799 R	0.1	-13	-102
137	4/16/2018	1:12:15 PM	0	888 R	0.1	-13	9
138	4/16/2018	1:18:43 PM	3	784 R	0.1 Grid 18	-6	-120
139	4/16/2018	1:18:55 PM	4	847 R	0.1	-4	-42
140	4/16/2018	1:19:06 PM	1	807 R	0.1	-11	-92
141	4/16/2018	1:19:18 PM	7	741 R	0.1	3	-173
142	4/16/2018	1:19:30 PM	1	907 R	0.1	-11	32
143	4/16/2018	1:19:41 PM	5	868 R	0.1	-2	-16
144	4/16/2018	1:19:53 PM	1	851 R	0.1	-11	-37
145	4/16/2018	1:20:05 PM	0	905 R	0.1	-13	30
146	4/16/2018	1:20:17 PM	0	873 R	0.1	-13	-10
147	4/16/2018	1:20:28 PM	0	854 R	0.1	-13	-33
148	4/16/2018	1:20:40 PM	0	817 R	0.1	-13	-79
149	4/16/2018	1:23:07 PM	7	893 R	0.1 Grid 19	3	15
150	4/16/2018	1:23:19 PM	13	918 R	0.1	16	46
151	4/16/2018	1:23:30 PM	10	877 R	0.1	10	-5
152	4/16/2018	1:23:42 PM	2	836 R	0.1	-9	-56
153	4/16/2018	1:23:54 PM	3	873 R	0.1	-6	-10
154	4/16/2018	1:24:05 PM	7	875 R	0.1	3	-7
155	4/16/2018	1:24:17 PM	6	916 R	0.1	0	43
156	4/16/2018	1:24:29 PM	1	979 R	0.1	-11	121
157	4/16/2018	1:24:40 PM	0	841 R	0.1	-13	-50
158	4/16/2018	1:24:52 PM	11	932 R	0.1	12	63

159	4/16/2018	1:25:56 PM	3	832 R	0.1 Grid 20	-6	-61
160	4/16/2018	1:26:08 PM	0	863 R	0.1	-13	-22
161	4/16/2018	1:26:20 PM	0	843 R	0.1	-13	-47
162	4/16/2018	1:26:32 PM	0	846 R	0.1	-13	-43
163	4/16/2018	1:26:43 PM	0	899 R	0.1	-13	22
164	4/16/2018	1:26:55 PM	0	879 R	0.1	-13	-2
165	4/16/2018	1:27:07 PM	12	794 R	0.1	14	-108
166	4/16/2018	1:27:18 PM	16	903 R	0.1	23	27
167	4/16/2018	1:27:30 PM	11	881 R	0.1	12	0
168	4/16/2018	1:27:42 PM	10	978 R	0.1	10	120
169	4/16/2018	1:30:06 PM	5	866 R	0.1 Grid 21	-2	-19
170	4/16/2018	1:30:18 PM	15	869 R	0.1	21	-15
171	4/16/2018	1:30:30 PM	3	884 R	0.1	-6	4
172	4/16/2018	1:30:41 PM	0	901 R	0.1	-13	25
173	4/16/2018	1:32:46 PM	3	799 R	0.1 Grid 22	-6	-102
174	4/16/2018	1:32:58 PM	7	886 R	0.1	3	6
175	4/16/2018	1:33:09 PM	10	833 R	0.1	10	-59
176	4/16/2018	1:33:21 PM	14	852 R	0.1	19	-36
177	4/16/2018	1:33:33 PM	21	876 R	0.1	35	-6
178	4/16/2018	1:33:44 PM	5	936 R	0.1	-2	68
179	4/16/2018	1:33:56 PM	13	1023 R	0.1	16	176
180	4/16/2018	1:34:08 PM	7	911 R	0.1	3	37
181	4/16/2018	1:34:20 PM	16	855 R	0.1	23	-32
182	4/16/2018	1:34:31 PM	3	583 R	0.1	-6	-369
183	4/16/2018	1:34:43 PM	9	780 R	0.1	7	-125
184	4/16/2018	1:36:35 PM	7	828 R	0.1 Grid 23	3	-66
185	4/16/2018	1:36:47 PM	6	876 R	0.1	0	-6
186	4/16/2018	1:36:58 PM	0	817 R	0.1	-13	-79
187	4/16/2018	1:37:10 PM	10	893 R	0.1	10	15
188	4/16/2018	1:37:22 PM	10	836 R	0.1	10	-56
189	4/16/2018	1:37:34 PM	2	929 R	0.1	-9	59
190	4/16/2018	1:37:45 PM	0	992 R	0.1	-13	137
191	4/16/2018	1:37:57 PM	13	963 R	0.1	16	102
192	4/16/2018	1:38:09 PM	8	791 R	0.1	5	-111
193	4/16/2018	1:39:35 PM	0	869 R	0.1 Grid 24	-13	-15
194	4/16/2018	1:39:47 PM	3	871 R	0.1	-6	-12
195	4/16/2018	1:39:59 PM	0	911 R	0.1	-13	37
196	4/16/2018	1:40:10 PM	0	813 R	0.1	-13	-84
197	4/16/2018	1:40:22 PM	0	810 R	0.1	-13	-88
198	4/16/2018	1:40:34 PM	4	998 R	0.1	-4	145
199	4/16/2018	1:40:46 PM	1	852 R	0.1	-11	-36
200	4/16/2018	1:40:57 PM	20	977 R	0.1	32	119
201	4/16/2018	1:41:09 PM	16	933 R	0.1	23	64
202	4/16/2018	1:41:21 PM	14	972 R	0.1	19	113
203	4/16/2018	1:44:43 PM	0	799 R	0.1 Grid 25	-13	-102
204	4/16/2018	1:44:55 PM	3	768 R	0.1	-6	-140
205	4/16/2018	1:45:06 PM	0	913 R	0.1	-13	40
206	4/16/2018	1:45:18 PM	17	855 R	0.1	25	-32
207	4/16/2018	1:45:30 PM	4	833 R	0.1	-4	-59
208	4/16/2018	1:45:41 PM	0	932 R	0.1	-13	63
209	4/16/2018	1:45:53 PM	7	842 R	0.1	3	-48
210	4/16/2018	1:46:05 PM	0	869 R	0.1	-13	-15
211	4/16/2018	1:46:16 PM	6	845 R	0.1	0	-45
212	4/16/2018	1:46:28 PM	4	888 R	0.1	-4	9
213	4/16/2018	1:50:40 PM	3	841 R	0.1 Grid 26	-6	-50
214	4/16/2018	1:50:51 PM	5	893 R	0.1	-2	15
215	4/16/2018	1:51:03 PM	1	872 R	0.1	-11	-11
216	4/16/2018	1:51:15 PM	6	812 R	0.1	0	-85

217	4/16/2018	1:51:26 PM	0	907 R	0.1		-13	32
218	4/16/2018	1:51:38 PM	5	756 R	0.1		-2	-155
219	4/16/2018	1:51:50 PM	7	1112 R	0.1		3	286
220	4/16/2018	1:52:01 PM	1	868 R	0.1		-11	-16
221	4/16/2018	1:52:13 PM	7	892 R	0.1		3	14
222	4/16/2018	1:52:25 PM	6	1031 R	0.1		0	186
223	4/16/2018	1:54:21 PM	5	880 R	0.1	Grid 27	-2	-1
224	4/16/2018	1:54:33 PM	0	857 R	0.1		-13	-30
225	4/16/2018	1:54:45 PM	4	877 R	0.1		-4	-5
226	4/16/2018	1:54:56 PM	1	1001 R	0.1		-11	149
227	4/16/2018	1:55:08 PM	0	1120 R	0.1		-13	296
228	4/16/2018	1:55:20 PM	0	1184 R	0.1		-13	375
229	4/16/2018	1:55:32 PM	16	977 R	0.1		23	119
230	4/16/2018	1:55:43 PM	8	880 R	0.1		5	-1
231	4/16/2018	1:55:55 PM	13	747 R	0.1		16	-166
232	4/16/2018	1:56:07 PM	3	901 R	0.1		-6	25
233	4/16/2018	1:59:06 PM	0	805 R	0.1	Grid 28	-13	-94
234	4/16/2018	1:59:18 PM	8	788 R	0.1		5	-115
235	4/16/2018	1:59:29 PM	7	839 R	0.1		3	-52
236	4/16/2018	1:59:41 PM	12	866 R	0.1		14	-19
237	4/16/2018	1:59:53 PM	3	885 R	0.1		-6	5
238	4/16/2018	2:00:05 PM	10	760 R	0.1		10	-150
239	4/16/2018	2:00:16 PM	8	832 R	0.1		5	-61
240	4/16/2018	2:00:28 PM	19	822 R	0.1		30	-73
241	4/16/2018	2:00:40 PM	5	904 R	0.1		-2	28
242	4/16/2018	2:00:51 PM	1	902 R	0.1		-11	26
243	4/16/2018	2:03:34 PM	13	800 R	0.1	Grid 29	16	-100
244	4/16/2018	2:03:46 PM	3	823 R	0.1		-6	-72
245	4/16/2018	2:03:57 PM	0	827 R	0.1		-13	-67
246	4/16/2018	2:04:09 PM	0	802 R	0.1		-13	-98
247	4/16/2018	2:04:21 PM	8	780 R	0.1		5	-125
248	4/16/2018	2:04:32 PM	2	736 R	0.1		-9	-180
249	4/16/2018	2:04:44 PM	3	796 R	0.1		-6	-105
250	4/16/2018	2:04:56 PM	11	799 R	0.1		12	-102
251	4/16/2018	2:05:08 PM	9	849 R	0.1		7	-40
252	4/16/2018	2:05:19 PM	2	845 R	0.1		-9	-45
253	4/16/2018	2:08:13 PM	7	867 R	0.1	Grid 30	3	-17
254	4/16/2018	2:08:25 PM	1	791 R	0.1		-11	-111
255	4/16/2018	2:08:36 PM	8	992 R	0.1		5	137
256	4/16/2018	2:08:48 PM	9	894 R	0.1		7	16
257	4/16/2018	2:09:00 PM	2	952 R	0.1		-9	88
258	4/16/2018	2:09:11 PM	0	1021 R	0.1		-13	173
259	4/16/2018	2:09:23 PM	8	1037 R	0.1		5	193
260	4/16/2018	2:09:35 PM	2	922 R	0.1		-9	51
261	4/16/2018	2:09:47 PM	6	957 R	0.1		0	94
262	4/16/2018	2:09:58 PM	0	1031 R	0.1		-13	186
263	4/16/2018	2:12:48 PM	5	802 R	0.1	Grid 31	-2	-98
264	4/16/2018	2:12:59 PM	0	782 R	0.1		-13	-123
265	4/16/2018	2:13:11 PM	7	842 R	0.1		3	-48
266	4/16/2018	2:13:23 PM	6	782 R	0.1		0	-123
267	4/16/2018	2:13:35 PM	1	988 R	0.1		-11	133
268	4/16/2018	2:13:46 PM	0	884 R	0.1		-13	4
269	4/16/2018	2:13:58 PM	5	911 R	0.1		-2	37
270	4/16/2018	2:14:10 PM	0	935 R	0.1		-13	67
271	4/16/2018	2:14:21 PM	6	919 R	0.1		0	47
272	4/16/2018	2:14:33 PM	0	1135 R	0.1		-13	315
273	4/16/2018	2:17:09 PM	7	735 R	0.1	Grid 32	3	-181
274	4/16/2018	2:17:21 PM	0	933 R	0.1		-13	64

275	4/16/2018	2:17:32 PM	10	963 R	0.1	10	102
276	4/16/2018	2:17:44 PM	2	887 R	0.1	-9	7
277	4/16/2018	2:17:56 PM	0	766 R	0.1	-13	-142
278	4/16/2018	2:18:07 PM	4	711 R	0.1	-4	-211
279	4/16/2018	2:18:19 PM	9	786 R	0.1	7	-118
280	4/16/2018	2:18:31 PM	2	822 R	0.1	-9	-73
281	4/16/2018	2:18:43 PM	3	796 R	0.1	-6	-105
282	4/16/2018	2:18:54 PM	0	868 R	0.1	-13	-16
283	4/16/2018	2:22:20 PM	11	907 R	0.1 Grid 33	12	32
284	4/16/2018	2:22:32 PM	2	829 R	0.1	-9	-64
285	4/16/2018	2:22:44 PM	0	910 R	0.1	-13	36
286	4/16/2018	2:22:56 PM	8	946 R	0.1	5	80
287	4/16/2018	2:23:07 PM	8	997 R	0.1	5	144
288	4/16/2018	2:23:19 PM	2	824 R	0.1	-9	-71
289	4/16/2018	2:23:31 PM	5	795 R	0.1	-2	-106
290	4/16/2018	2:23:42 PM	1	746 R	0.1	-11	-167
291	4/16/2018	2:23:54 PM	0	818 R	0.1	-13	-78
292	4/16/2018	2:24:06 PM	0	880 R	0.1	-13	-1
293	4/16/2018	2:26:38 PM	15	824 R	0.1 Grid 34	21	-71
294	4/16/2018	2:26:50 PM	8	856 R	0.1	5	-31
295	4/16/2018	2:27:01 PM	17	847 R	0.1	25	-42
296	4/16/2018	2:27:13 PM	13	880 R	0.1	16	-1
297	4/16/2018	2:27:25 PM	3	847 R	0.1	-6	-42
298	4/16/2018	2:27:37 PM	4	799 R	0.1	-4	-102
299	4/16/2018	2:27:48 PM	1	833 R	0.1	-11	-59
300	4/16/2018	2:28:00 PM	23	843 R	0.1	39	-47
301	4/16/2018	2:28:12 PM	11	873 R	0.1	12	-10
302	4/16/2018	2:28:23 PM	2	929 R	0.1	-9	59
303	4/16/2018	2:32:41 PM	3	709 R	0.1 Grid 35	-6	-213
304	4/16/2018	2:32:52 PM	12	871 R	0.1	14	-12
305	4/16/2018	2:33:04 PM	3	835 R	0.1	-6	-57
306	4/16/2018	2:33:16 PM	0	892 R	0.1	-13	14
307	4/16/2018	2:33:27 PM	0	964 R	0.1	-13	103
308	4/16/2018	2:33:39 PM	0	836 R	0.1	-13	-56
309	4/16/2018	2:33:51 PM	0	873 R	0.1	-13	-10
310	4/16/2018	2:34:03 PM	0	904 R	0.1	-13	28
311	4/16/2018	2:34:14 PM	0	735 R	0.1	-13	-181
312	4/16/2018	2:34:26 PM	8	855 R	0.1	5	-32
313	4/16/2018	2:37:49 PM	3	818 R	0.1 Grid 36	-6	-78
314	4/16/2018	2:38:00 PM	0	855 R	0.1	-13	-32
315	4/16/2018	2:38:12 PM	0	798 R	0.1	-13	-103
316	4/16/2018	2:38:24 PM	0	821 R	0.1	-13	-74
317	4/16/2018	2:38:36 PM	13	786 R	0.1	16	-118
318	4/16/2018	2:38:47 PM	3	799 R	0.1	-6	-102
319	4/16/2018	2:42:40 PM	0	897 R	0.1 Grid 37	-13	20
320	4/16/2018	2:42:52 PM	5	794 R	0.1	-2	-108
321	4/16/2018	2:43:04 PM	11	790 R	0.1	12	-113
322	4/16/2018	2:43:15 PM	2	821 R	0.1	-9	-74
323	4/16/2018	2:43:27 PM	0	810 R	0.1	-13	-88
324	4/16/2018	2:43:39 PM	8	666 R	0.1	5	-266
325	4/16/2018	2:43:51 PM	2	733 R	0.1	-9	-183
326	4/16/2018	2:44:02 PM	11	819 R	0.1	12	-77
327	4/16/2018	2:44:14 PM	2	854 R	0.1	-9	-33
328	4/16/2018	2:44:26 PM	11	832 R	0.1	12	-61
329	4/16/2018	2:46:34 PM	7	843 R	0.1 Grid 38	3	-47
330	4/16/2018	2:46:45 PM	7	818 R	0.1	3	-78
331	4/16/2018	2:46:57 PM	0	812 R	0.1	-13	-85
332	4/16/2018	2:47:09 PM	6	809 R	0.1	0	-89

333	4/16/2018	2:47:20 PM	7	866 R	0.1	3	-19
334	4/16/2018	2:47:32 PM	11	749 R	0.1	12	-163
335	4/16/2018	2:47:44 PM	2	797 R	0.1	-9	-104
336	4/16/2018	2:47:56 PM	8	821 R	0.1	5	-74
337	4/16/2018	2:48:07 PM	5	795 R	0.1	-2	-106
338	4/16/2018	2:48:19 PM	6	800 R	0.1	0	-100
		Maximum:	23	1242		39	447
		Average:	5	876		-2	-6
		StDev:	5	85		11	105

Room 105A Lower\Upper Walls

2360 SN:268497

43-37 SN:093965

Cal Due Date: 10/10/2018

Surveyor: Thomas Hogan

Bldg 218

Room 105A East&West Lower Wall Grids 9 thru 17 27 thru 35 44 thru 52 62 thru 70

Alpha Efficiency: 0.31

Beta/Gamma Efficiency: 0.352

Alpha Background: 3.3

Beta/Gamma Background: 484

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count Time	Location	dpm/100cm ²	
								Alpha	Beta
1	4/18/2018	12:27:57 PM	8	481	R	0.1	Grid 9	10	-4
2	4/18/2018	12:28:09 PM	7	490	R	0.1		8	8
3	4/18/2018	12:28:21 PM	11	410	R	0.1		17	-96
4	4/18/2018	12:28:33 PM	2	469	R	0.1		-3	-20
5	4/18/2018	12:28:44 PM	0	429	R	0.1		-7	-72
6	4/18/2018	12:28:56 PM	0	504	R	0.1		-7	26
7	4/18/2018	12:29:08 PM	7	440	R	0.1		8	-57
8	4/18/2018	12:29:20 PM	12	475	R	0.1		19	-12
9	4/18/2018	12:29:31 PM	3	444	R	0.1		-1	-52
10	4/18/2018	12:53:56 PM	3	503	R	0.1	Grid 10	-1	25
11	4/18/2018	12:54:08 PM	3	489	R	0.1		-1	7
12	4/18/2018	12:54:19 PM	0	506	R	0.1		-7	29
13	4/18/2018	12:54:31 PM	0	520	R	0.1		-7	47
14	4/18/2018	12:54:43 PM	2	525	R	0.1		-3	53
15	4/18/2018	12:54:55 PM	0	521	R	0.1		-7	48
16	4/18/2018	12:55:06 PM	0	524	R	0.1		-7	52
17	4/18/2018	12:55:18 PM	3	437	R	0.1		-1	-61
18	4/18/2018	12:55:30 PM	4	536	R	0.1		2	68
19	4/18/2018	12:55:42 PM	11	513	R	0.1		17	38
20	4/18/2018	12:57:45 PM	0	537	R	0.1	Grid 11	-7	69
21	4/18/2018	12:57:56 PM	0	424	R	0.1		-7	-78
22	4/18/2018	12:58:08 PM	11	443	R	0.1		17	-53
23	4/18/2018	12:58:20 PM	9	456	R	0.1		13	-36
24	4/18/2018	12:58:32 PM	11	422	R	0.1		17	-81
25	4/18/2018	12:58:43 PM	2	552	R	0.1		-3	89
26	4/18/2018	12:58:55 PM	4	473	R	0.1		2	-14
27	4/18/2018	12:59:07 PM	4	476	R	0.1		2	-10
28	4/18/2018	12:59:19 PM	0	418	R	0.1		-7	-86
29	4/18/2018	12:59:30 PM	3	465	R	0.1		-1	-25
30	4/18/2018	1:05:36 PM	0	434	R	0.1	Grid 12	-7	-65
31	4/18/2018	1:05:47 PM	3	422	R	0.1		-1	-81
32	4/18/2018	1:05:59 PM	12	447	R	0.1		19	-48
33	4/18/2018	1:06:11 PM	3	471	R	0.1		-1	-17
34	4/18/2018	1:06:23 PM	0	434	R	0.1		-7	-65
35	4/18/2018	1:06:34 PM	15	455	R	0.1		26	-38
36	4/18/2018	1:06:46 PM	3	566	R	0.1		-1	107
37	4/18/2018	1:06:58 PM	0	442	R	0.1		-7	-55
38	4/18/2018	1:07:10 PM	0	453	R	0.1		-7	-40

39	4/18/2018	1:07:21 PM	3	434 R	0.1		-1	-65
40	4/18/2018	1:21:28 PM	11	535 R	0.1	Grid 13	17	66
41	4/18/2018	1:21:39 PM	2	554 R	0.1		-3	91
42	4/18/2018	1:21:51 PM	3	464 R	0.1		-1	-26
43	4/18/2018	1:22:03 PM	0	535 R	0.1		-7	66
44	4/18/2018	1:22:15 PM	0	428 R	0.1		-7	-73
45	4/18/2018	1:22:27 PM	12	532 R	0.1		19	62
46	4/18/2018	1:22:38 PM	12	550 R	0.1		19	86
47	4/18/2018	1:22:50 PM	3	580 R	0.1		-1	125
48	4/18/2018	1:23:02 PM	15	621 R	0.1		26	178
49	4/18/2018	1:23:14 PM	17	626 R	0.1		30	185
50	4/18/2018	1:25:35 PM	8	466 R	0.1	Grid 14	10	-23
51	4/18/2018	1:25:47 PM	5	529 R	0.1		4	59
52	4/18/2018	1:25:58 PM	1	501 R	0.1		-5	22
53	4/18/2018	1:26:10 PM	5	472 R	0.1		4	-16
54	4/18/2018	1:26:22 PM	1	530 R	0.1		-5	60
55	4/18/2018	1:26:34 PM	3	651 R	0.1		-1	217
56	4/18/2018	1:26:45 PM	0	604 R	0.1		-7	156
57	4/18/2018	1:26:57 PM	14	502 R	0.1		24	23
58	4/18/2018	1:27:09 PM	6	491 R	0.1		6	9
59	4/18/2018	1:27:21 PM	1	536 R	0.1		-5	68
60	4/18/2018	1:36:39 PM	0	577 R	0.1	Grid 15	-7	121
61	4/18/2018	1:36:51 PM	2	531 R	0.1		-3	61
62	4/18/2018	1:37:03 PM	3	567 R	0.1		-1	108
63	4/18/2018	1:37:14 PM	2	548 R	0.1		-3	83
64	4/18/2018	1:37:26 PM	3	510 R	0.1		-1	34
65	4/18/2018	1:37:38 PM	0	497 R	0.1		-7	17
66	4/18/2018	1:37:50 PM	4	550 R	0.1		2	86
67	4/18/2018	1:38:01 PM	0	574 R	0.1		-7	117
68	4/18/2018	1:38:13 PM	3	540 R	0.1		-1	73
69	4/18/2018	1:38:25 PM	9	519 R	0.1		13	46
70	4/18/2018	1:41:14 PM	0	551 R	0.1	Grid 16	-7	87
71	4/18/2018	1:41:26 PM	0	487 R	0.1		-7	4
72	4/18/2018	1:41:37 PM	3	430 R	0.1		-1	-70
73	4/18/2018	1:41:49 PM	0	442 R	0.1		-7	-55
74	4/18/2018	1:42:01 PM	0	425 R	0.1		-7	-77
75	4/18/2018	1:42:13 PM	3	468 R	0.1		-1	-21
76	4/18/2018	1:42:24 PM	0	498 R	0.1		-7	18
77	4/18/2018	1:42:36 PM	3	502 R	0.1		-1	23
78	4/18/2018	1:42:48 PM	0	508 R	0.1		-7	31
79	4/18/2018	1:43:00 PM	2	471 R	0.1		-3	-17
80	4/18/2018	1:48:34 PM	0	444 R	0.1	Grid 17	-7	-52
81	4/18/2018	1:48:46 PM	14	576 R	0.1		24	120
82	4/18/2018	1:48:57 PM	3	576 R	0.1		-1	120
83	4/18/2018	1:49:09 PM	0	569 R	0.1		-7	111
84	4/18/2018	1:49:21 PM	2	554 R	0.1		-3	91
85	4/18/2018	1:49:33 PM	1	622 R	0.1		-5	180
86	4/18/2018	1:49:44 PM	3	649 R	0.1		-1	215
87	4/18/2018	1:49:56 PM	4	566 R	0.1		2	107
88	4/18/2018	1:50:08 PM	2	551 R	0.1		-3	87
89	4/18/2018	1:50:20 PM	3	599 R	0.1		-1	150
90	4/18/2018	2:02:53 PM	4	498 R	0.1	Grid 27	2	18
91	4/18/2018	2:03:04 PM	0	510 R	0.1		-7	34

92	4/18/2018	2:03:16 PM	3	502 R	0.1	-1	23
93	4/18/2018	2:03:28 PM	4	608 R	0.1	2	161
94	4/18/2018	2:03:40 PM	1	563 R	0.1	-5	103
95	4/18/2018	2:03:51 PM	0	527 R	0.1	-7	56
96	4/18/2018	2:04:03 PM	6	585 R	0.1	6	131
97	4/18/2018	2:04:15 PM	1	539 R	0.1	-5	72
98	4/18/2018	2:04:27 PM	0	523 R	0.1	-7	51
99	4/18/2018	2:04:38 PM	4	527 R	0.1	2	56
100	4/18/2018	2:09:48 PM	3	415 R	0.1 Grid 28	-1	-90
101	4/18/2018	2:10:00 PM	7	488 R	0.1	8	5
102	4/18/2018	2:10:12 PM	1	499 R	0.1	-5	20
103	4/18/2018	2:10:24 PM	4	445 R	0.1	2	-51
104	4/18/2018	2:10:35 PM	4	433 R	0.1	2	-66
105	4/18/2018	2:10:47 PM	1	412 R	0.1	-5	-94
106	4/18/2018	2:10:59 PM	1	402 R	0.1	-5	-107
107	4/18/2018	2:11:11 PM	2	626 R	0.1	-3	185
108	4/18/2018	2:11:22 PM	4	479 R	0.1	2	-7
109	4/18/2018	2:11:34 PM	0	503 R	0.1	-7	25
110	4/18/2018	2:17:05 PM	3	463 R	0.1 Grid 29	-1	-27
111	4/18/2018	2:17:17 PM	0	465 R	0.1	-7	-25
112	4/18/2018	2:17:29 PM	3	414 R	0.1	-1	-91
113	4/18/2018	2:17:41 PM	0	451 R	0.1	-7	-43
114	4/18/2018	2:17:52 PM	0	544 R	0.1	-7	78
115	4/18/2018	2:18:04 PM	5	471 R	0.1	4	-17
116	4/18/2018	2:18:16 PM	1	448 R	0.1	-5	-47
117	4/18/2018	2:18:28 PM	0	487 R	0.1	-7	4
118	4/18/2018	2:18:39 PM	0	471 R	0.1	-7	-17
119	4/18/2018	2:18:51 PM	4	445 R	0.1	2	-51
120	4/18/2018	2:22:30 PM	0	478 R	0.1 Grid 30	-7	-8
121	4/18/2018	2:22:42 PM	3	412 R	0.1	-1	-94
122	4/18/2018	2:22:54 PM	0	423 R	0.1	-7	-79
123	4/18/2018	2:23:05 PM	4	502 R	0.1	2	23
124	4/18/2018	2:23:17 PM	3	580 R	0.1	-1	125
125	4/18/2018	2:23:29 PM	2	438 R	0.1	-3	-60
126	4/18/2018	2:23:41 PM	20	508 R	0.1	37	31
127	4/18/2018	2:23:52 PM	4	455 R	0.1	2	-38
128	4/18/2018	2:24:04 PM	9	542 R	0.1	13	75
129	4/18/2018	2:24:16 PM	2	504 R	0.1	-3	26
130	4/18/2018	2:28:07 PM	14	467 R	0.1 Grid 31	24	-22
131	4/18/2018	2:28:19 PM	3	505 R	0.1	-1	27
132	4/18/2018	2:28:31 PM	3	403 R	0.1	-1	-105
133	4/18/2018	2:28:42 PM	0	416 R	0.1	-7	-89
134	4/18/2018	2:28:54 PM	4	423 R	0.1	2	-79
135	4/18/2018	2:29:06 PM	5	385 R	0.1	4	-129
136	4/18/2018	2:29:18 PM	11	431 R	0.1	17	-69
137	4/18/2018	2:29:29 PM	2	429 R	0.1	-3	-72
138	4/18/2018	2:29:41 PM	0	443 R	0.1	-7	-53
139	4/18/2018	2:29:53 PM	0	478 R	0.1	-7	-8
140	4/18/2018	2:33:49 PM	0	473 R	0.1 Grid 32	-7	-14
141	4/18/2018	2:34:01 PM	0	456 R	0.1	-7	-36
142	4/18/2018	2:34:13 PM	8	498 R	0.1	10	18
143	4/18/2018	2:34:24 PM	2	587 R	0.1	-3	134
144	4/18/2018	2:34:36 PM	6	503 R	0.1	6	25

145	4/18/2018	2:34:48 PM	5	445 R	0.1	4	-51
146	4/18/2018	2:35:00 PM	4	443 R	0.1	2	-53
147	4/18/2018	2:35:11 PM	0	507 R	0.1	-7	30
148	4/18/2018	2:35:23 PM	3	432 R	0.1	-1	-68
149	4/18/2018	2:35:35 PM	7	433 R	0.1	8	-66
150	4/18/2018	2:40:08 PM	3	450 R	0.1 Grid 33	-1	-44
151	4/18/2018	2:40:20 PM	5	424 R	0.1	4	-78
152	4/18/2018	2:40:32 PM	7	430 R	0.1	8	-70
153	4/18/2018	2:40:43 PM	0	439 R	0.1	-7	-59
154	4/18/2018	2:40:55 PM	4	410 R	0.1	2	-96
155	4/18/2018	2:41:07 PM	1	412 R	0.1	-5	-94
156	4/18/2018	2:41:19 PM	9	467 R	0.1	13	-22
157	4/18/2018	2:41:30 PM	2	448 R	0.1	-3	-47
158	4/18/2018	2:41:42 PM	0	497 R	0.1	-7	17
159	4/18/2018	2:41:54 PM	0	434 R	0.1	-7	-65
160	4/18/2018	2:47:58 PM	0	488 R	0.1 Grid 34	-7	5
161	4/18/2018	2:48:09 PM	0	436 R	0.1	-7	-62
162	4/18/2018	2:48:21 PM	13	465 R	0.1	22	-25
163	4/18/2018	2:48:33 PM	12	457 R	0.1	19	-35
164	4/18/2018	2:48:45 PM	3	454 R	0.1	-1	-39
165	4/18/2018	2:48:57 PM	10	436 R	0.1	15	-62
166	4/18/2018	2:49:08 PM	2	410 R	0.1	-3	-96
167	4/18/2018	2:49:30 PM	4	453 R	0.1	2	-40
168	4/18/2018	2:49:42 PM	4	500 R	0.1	2	21
169	4/18/2018	2:49:54 PM	1	565 R	0.1	-5	105
170	4/18/2018	2:56:42 PM	0	475 R	0.1 Grid 35	-7	-12
171	4/18/2018	2:56:53 PM	6	453 R	0.1	6	-40
172	4/18/2018	2:57:05 PM	13	485 R	0.1	22	1
173	4/18/2018	2:57:17 PM	3	531 R	0.1	-1	61
174	4/18/2018	2:57:29 PM	4	509 R	0.1	2	33
175	4/18/2018	2:57:40 PM	6	474 R	0.1	6	-13
176	4/18/2018	2:57:52 PM	4	531 R	0.1	2	61
177	4/18/2018	2:58:04 PM	5	477 R	0.1	4	-9
178	4/18/2018	2:58:16 PM	3	437 R	0.1	-1	-61
179	4/18/2018	2:58:27 PM	4	475 R	0.1	2	-12
180	4/18/2018	3:30:53 PM	0	484 R	0.1 Grid 44	-7	0
181	4/18/2018	3:31:05 PM	3	501 R	0.1	-1	22
182	4/18/2018	3:31:17 PM	4	556 R	0.1	2	94
183	4/18/2018	3:31:29 PM	7	512 R	0.1	8	36
184	4/18/2018	3:31:40 PM	5	473 R	0.1	4	-14
185	4/18/2018	3:31:52 PM	3	531 R	0.1	-1	61
186	4/18/2018	3:32:04 PM	3	511 R	0.1	-1	35
187	4/18/2018	3:32:16 PM	4	414 R	0.1	2	-91
188	4/18/2018	3:32:27 PM	0	445 R	0.1	-7	-51
189	4/18/2018	3:32:39 PM	8	482 R	0.1	10	-3
190	4/18/2018	3:35:14 PM	7	459 R	0.1 Grid 45	8	-33
191	4/18/2018	3:35:26 PM	9	471 R	0.1	13	-17
192	4/18/2018	3:35:38 PM	5	452 R	0.1	4	-42
193	4/18/2018	3:35:50 PM	1	454 R	0.1	-5	-39
194	4/18/2018	3:36:01 PM	0	409 R	0.1	-7	-98
195	4/18/2018	3:36:13 PM	4	414 R	0.1	2	-91
196	4/18/2018	3:36:25 PM	1	487 R	0.1	-5	4
197	4/18/2018	3:36:37 PM	6	463 R	0.1	6	-27

198	4/18/2018	3:36:48 PM	1	472 R	0.1	-5	-16
199	4/18/2018	3:37:00 PM	4	437 R	0.1	2	-61
200	4/18/2018	3:42:05 PM	3	428 R	0.1 Grid 46	-1	-73
201	4/18/2018	3:42:17 PM	0	428 R	0.1	-7	-73
202	4/18/2018	3:42:29 PM	3	485 R	0.1	-1	1
203	4/18/2018	3:42:41 PM	0	465 R	0.1	-7	-25
204	4/18/2018	3:42:52 PM	0	452 R	0.1	-7	-42
205	4/18/2018	3:43:04 PM	9	427 R	0.1	13	-74
206	4/18/2018	3:43:16 PM	2	437 R	0.1	-3	-61
207	4/18/2018	3:43:28 PM	3	477 R	0.1	-1	-9
208	4/18/2018	3:43:39 PM	4	547 R	0.1	2	82
209	4/18/2018	3:43:51 PM	0	473 R	0.1	-7	-14
210	4/18/2018	3:50:21 PM	3	455 R	0.1 Grid 47	-1	-38
211	4/18/2018	3:50:33 PM	0	465 R	0.1	-7	-25
212	4/18/2018	3:50:45 PM	3	440 R	0.1	-1	-57
213	4/18/2018	3:50:57 PM	6	444 R	0.1	6	-52
214	4/18/2018	3:51:08 PM	5	450 R	0.1	4	-44
215	4/18/2018	3:51:20 PM	4	451 R	0.1	2	-43
216	4/18/2018	3:51:32 PM	0	449 R	0.1	-7	-46
217	4/18/2018	3:51:44 PM	3	456 R	0.1	-1	-36
218	4/18/2018	3:51:55 PM	0	577 R	0.1	-7	121
219	4/18/2018	3:52:07 PM	3	566 R	0.1	-1	107
220	4/19/2018	8:53:45 AM	11	461 R	0.1 Grid 48	17	-30
221	4/19/2018	8:53:57 AM	2	431 R	0.1	-3	-69
222	4/19/2018	8:54:08 AM	0	450 R	0.1	-7	-44
223	4/19/2018	8:54:21 AM	0	538 R	0.1	-7	70
224	4/19/2018	8:54:51 AM	4	420 R	0.1	2	-83
225	4/19/2018	8:55:15 AM	7	490 R	0.1	8	8
226	4/19/2018	8:55:27 AM	1	473 R	0.1	-5	-14
227	4/19/2018	8:55:39 AM	16	511 R	0.1	28	35
228	4/19/2018	8:55:50 AM	7	510 R	0.1	8	34
229	4/19/2018	8:56:02 AM	13	476 R	0.1	22	-10
230	4/19/2018	8:58:18 AM	0	436 R	0.1 Grid 49	-7	-62
231	4/19/2018	8:58:30 AM	8	493 R	0.1	10	12
232	4/19/2018	8:58:42 AM	2	566 R	0.1	-3	107
233	4/19/2018	8:58:53 AM	5	564 R	0.1	4	104
234	4/19/2018	8:59:05 AM	1	479 R	0.1	-5	-7
235	4/19/2018	8:59:17 AM	22	566 R	0.1	41	107
236	4/19/2018	8:59:29 AM	5	552 R	0.1	4	89
237	4/19/2018	8:59:40 AM	1	440 R	0.1	-5	-57
238	4/19/2018	8:59:52 AM	0	494 R	0.1	-7	13
239	4/19/2018	9:00:04 AM	5	537 R	0.1	4	69
240	4/19/2018	9:16:05 AM	0	364 R	0.1 Grid 50	-7	-156
241	4/19/2018	9:16:17 AM	10	423 R	0.1	15	-79
242	4/19/2018	9:16:28 AM	2	371 R	0.1	-3	-147
243	4/19/2018	9:16:40 AM	0	447 R	0.1	-7	-48
244	4/19/2018	9:16:52 AM	6	496 R	0.1	6	16
245	4/19/2018	9:17:04 AM	12	464 R	0.1	19	-26
246	4/19/2018	9:17:15 AM	2	481 R	0.1	-3	-4
247	4/19/2018	9:17:27 AM	3	554 R	0.1	-1	91
248	4/19/2018	9:17:39 AM	0	492 R	0.1	-7	10
249	4/19/2018	9:17:51 AM	4	698 R	0.1	2	279
250	4/19/2018	9:21:24 AM	3	765 R	0.1 Grid 51	-1	366

251	4/19/2018	9:21:36 AM	10	641 R	0.1	15	204
252	4/19/2018	9:21:48 AM	9	465 R	0.1	13	-25
253	4/19/2018	9:21:59 AM	2	480 R	0.1	-3	-5
254	4/19/2018	9:22:11 AM	4	458 R	0.1	2	-34
255	4/19/2018	9:22:23 AM	3	390 R	0.1	-1	-122
256	4/19/2018	9:22:35 AM	3	769 R	0.1	-1	371
257	4/19/2018	9:22:46 AM	2	588 R	0.1	-3	135
258	4/19/2018	9:22:58 AM	4	469 R	0.1	2	-20
259	4/19/2018	9:23:10 AM	3	469 R	0.1	-1	-20
260	4/19/2018	9:26:06 AM	7	555 R	0.1 Grid 52	8	92
261	4/19/2018	9:26:17 AM	1	549 R	0.1	-5	85
262	4/19/2018	9:26:29 AM	4	538 R	0.1	2	70
263	4/19/2018	9:26:41 AM	1	574 R	0.1	-5	117
264	4/19/2018	9:27:27 AM	0	455 R	0.1	-7	-38
265	4/19/2018	9:27:38 AM	20	562 R	0.1	37	102
266	4/19/2018	9:27:50 AM	4	498 R	0.1	2	18
267	4/19/2018	9:28:02 AM	13	620 R	0.1	22	177
268	4/19/2018	9:28:14 AM	3	562 R	0.1	-1	102
269	4/19/2018	9:28:25 AM	6	547 R	0.1	6	82
270	4/19/2018	9:35:06 AM	0	449 R	0.1 Grid 62	-7	-46
271	4/19/2018	9:35:18 AM	3	532 R	0.1	-1	62
272	4/19/2018	9:35:29 AM	4	662 R	0.1	2	232
273	4/19/2018	9:35:41 AM	3	648 R	0.1	-1	213
274	4/19/2018	9:35:53 AM	0	518 R	0.1	-7	44
275	4/19/2018	9:36:05 AM	3	545 R	0.1	-1	79
276	4/19/2018	9:36:16 AM	4	501 R	0.1	2	22
277	4/19/2018	9:36:28 AM	8	560 R	0.1	10	99
278	4/19/2018	9:36:40 AM	4	575 R	0.1	2	118
279	4/19/2018	9:36:52 AM	5	552 R	0.1	4	89
280	4/19/2018	9:40:44 AM	0	464 R	0.1 Grid 63	-7	-26
281	4/19/2018	9:40:56 AM	0	437 R	0.1	-7	-61
282	4/19/2018	9:41:08 AM	24	486 R	0.1	46	3
283	4/19/2018	9:41:20 AM	5	495 R	0.1	4	14
284	4/19/2018	9:41:31 AM	1	521 R	0.1	-5	48
285	4/19/2018	9:41:43 AM	0	463 R	0.1	-7	-27
286	4/19/2018	9:41:55 AM	12	494 R	0.1	19	13
287	4/19/2018	9:42:07 AM	18	441 R	0.1	33	-56
288	4/19/2018	9:42:18 AM	4	467 R	0.1	2	-22
289	4/19/2018	9:42:30 AM	1	431 R	0.1	-5	-69
290	4/19/2018	9:46:38 AM	11	490 R	0.1 Grid 64	17	8
291	4/19/2018	9:46:50 AM	2	410 R	0.1	-3	-96
292	4/19/2018	9:47:40 AM	4	411 R	0.1	2	-95
293	4/19/2018	9:47:51 AM	3	476 R	0.1	-1	-10
294	4/19/2018	9:48:03 AM	3	455 R	0.1	-1	-38
295	4/19/2018	9:48:15 AM	5	502 R	0.1	4	23
296	4/19/2018	9:48:27 AM	4	546 R	0.1	2	81
297	4/19/2018	9:48:38 AM	0	538 R	0.1	-7	70
298	4/19/2018	9:48:50 AM	3	474 R	0.1	-1	-13
299	4/19/2018	9:49:02 AM	9	533 R	0.1	13	64
300	4/19/2018	9:55:48 AM	4	467 R	0.1 Grid 65	2	-22
301	4/19/2018	9:55:59 AM	3	432 R	0.1	-1	-68
302	4/19/2018	9:56:11 AM	2	461 R	0.1	-3	-30
303	4/19/2018	9:56:23 AM	0	469 R	0.1	-7	-20

304	4/19/2018	9:56:35 AM	7	443 R	0.1		8	-53
305	4/19/2018	9:56:46 AM	1	516 R	0.1		-5	42
306	4/19/2018	9:56:58 AM	0	489 R	0.1		-7	7
307	4/19/2018	9:57:10 AM	7	533 R	0.1		8	64
308	4/19/2018	9:57:22 AM	1	497 R	0.1		-5	17
309	4/19/2018	9:57:33 AM	0	452 R	0.1		-7	-42
310	4/19/2018	9:59:28 AM	5	432 R	0.1	Grid 66	4	-68
311	4/19/2018	9:59:40 AM	12	437 R	0.1		19	-61
312	4/19/2018	9:59:52 AM	7	442 R	0.1		8	-55
313	4/19/2018	10:00:04 AM	1	524 R	0.1		-5	52
314	4/19/2018	10:00:15 AM	0	495 R	0.1		-7	14
315	4/19/2018	10:00:27 AM	9	511 R	0.1		13	35
316	4/19/2018	10:00:39 AM	2	485 R	0.1		-3	1
317	4/19/2018	10:00:51 AM	2	552 R	0.1		-3	89
318	4/19/2018	10:01:03 AM	3	540 R	0.1		-1	73
319	4/19/2018	10:01:14 AM	1	455 R	0.1		-5	-38
320	4/19/2018	10:03:48 AM	6	447 R	0.1	Grid 67	6	-48
321	4/19/2018	10:04:00 AM	4	435 R	0.1		2	-64
322	4/19/2018	10:04:11 AM	5	436 R	0.1		4	-62
323	4/19/2018	10:04:23 AM	0	513 R	0.1		-7	38
324	4/19/2018	10:04:35 AM	8	476 R	0.1		10	-10
325	4/19/2018	10:04:47 AM	18	451 R	0.1		33	-43
326	4/19/2018	10:04:58 AM	16	434 R	0.1		28	-65
327	4/19/2018	10:05:10 AM	7	497 R	0.1		8	17
328	4/19/2018	10:05:22 AM	1	487 R	0.1		-5	4
329	4/19/2018	10:05:34 AM	0	471 R	0.1		-7	-17
330	4/19/2018	10:07:16 AM	0	454 R	0.1	Grid 68	-7	-39
331	4/19/2018	10:07:28 AM	8	484 R	0.1		10	0
332	4/19/2018	10:07:39 AM	2	487 R	0.1		-3	4
333	4/19/2018	10:07:51 AM	6	485 R	0.1		6	1
334	4/19/2018	10:08:03 AM	1	458 R	0.1		-5	-34
335	4/19/2018	10:08:15 AM	0	438 R	0.1		-7	-60
336	4/19/2018	10:08:26 AM	12	505 R	0.1		19	27
337	4/19/2018	10:08:38 AM	3	445 R	0.1		-1	-51
338	4/19/2018	10:08:50 AM	0	478 R	0.1		-7	-8
339	4/19/2018	10:09:02 AM	5	430 R	0.1		4	-70
340	4/19/2018	10:12:28 AM	3	442 R	0.1	Grid 69	-1	-55
341	4/19/2018	10:12:40 AM	4	410 R	0.1		2	-96
342	4/19/2018	10:12:52 AM	2	487 R	0.1		-3	4
343	4/19/2018	10:13:04 AM	3	449 R	0.1		-1	-46
344	4/19/2018	10:13:15 AM	4	413 R	0.1		2	-92
345	4/19/2018	10:13:27 AM	4	418 R	0.1		2	-86
346	4/19/2018	10:13:39 AM	1	497 R	0.1		-5	17
347	4/19/2018	10:13:51 AM	0	458 R	0.1		-7	-34
348	4/19/2018	10:14:02 AM	12	454 R	0.1		19	-39
349	4/19/2018	10:14:14 AM	3	470 R	0.1		-1	-18
350	4/19/2018	10:22:08 AM	5	426 R	0.1	Grid 70	4	-75
351	4/19/2018	10:22:19 AM	1	456 R	0.1		-5	-36
352	4/19/2018	10:22:31 AM	0	569 R	0.1		-7	111
353	4/19/2018	10:22:43 AM	11	524 R	0.1		17	52
354	4/19/2018	10:22:55 AM	11	602 R	0.1		17	154
355	4/19/2018	10:23:06 AM	2	543 R	0.1		-3	77
356	4/19/2018	10:23:18 AM	0	508 R	0.1		-7	31

357	4/19/2018	10:23:30 AM	0	494 R	0.1	-7	13
358	4/19/2018	10:23:42 AM	9	470 R	0.1	13	-18
359	4/19/2018	10:23:53 AM	2	512 R	0.1	-3	36
		Maximum:	24	769		46	371
		Average:	4	490		2	7
		StDev:	4	59		10	77

2360 SN:297766

43-93# 323074

Cal Due Date: 12/20/2018

Surveyor: Richard Thatcher

Bldg 218

Room 105A North & South Lower Wall Grids 1 thru 8 18 thru 22

Alpha Efficiency: 0.404

Beta/Gamma Efficiency: 0.254 Concrete

Alpha Background: 1 1.9

Beta/Gamma Background: 192 207

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²		
									Alpha	Beta	
1	4/19/2018	8:08:48 AM	2	202	R	0.1	Grid 1	2	105		
2	4/19/2018	8:08:59 AM	3	187	R	0.1		3	-52		
3	4/19/2018	8:09:11 AM	0	228	R	0.1		-2	378		
4	4/19/2018	8:09:23 AM	2	187	R	0.1		2	-52		
5	4/19/2018	8:09:34 AM	3	186	R	0.1		3	-63		
6	4/19/2018	8:09:46 AM	0	193	R	0.1		-2	10		
7	4/19/2018	8:09:58 AM	21	244	R	0.1		34	546		
8	4/19/2018	8:10:09 AM	1	227	R	0.1		0	367		
9	4/19/2018	8:10:21 AM	2	225	R	0.1		2	346		
10	4/19/2018	8:10:33 AM	3	196	R	0.1		3	42		
11	4/19/2018	8:10:44 AM	1	190	R	0.1		0	-21		
12	4/19/2018	8:10:56 AM	4	241	R	0.1		5	514		
13	4/19/2018	8:11:08 AM	2	191	R	0.1		2	-10		
14	4/19/2018	8:11:20 AM	1	195	R	0.1		0	31		
15	4/19/2018	8:11:31 AM	2	188	R	0.1		2	-42		
16	4/19/2018	8:11:43 AM	3	188	R	0.1		3	-42		
17	4/19/2018	8:11:55 AM	0	244	R	0.1		-2	388	Concrete	
18	4/19/2018	8:12:06 AM	16	268	R	0.1		26	640	Concrete	
19	4/19/2018	8:12:18 AM	3	240	R	0.1		3	346	Concrete	
20	4/19/2018	8:12:30 AM	0	254	R	0.1		-2	493	Concrete	
21	4/19/2018	8:12:41 AM	0	207	R	0.1		-2	0	Concrete	
22	4/19/2018	8:12:53 AM	3	259	R	0.1		3	546	Concrete	
23	4/19/2018	8:13:05 AM	5	252	R	0.1		7	472	Concrete	
24	4/19/2018	8:13:16 AM	1	249	R	0.1		0	441	Concrete	
25	4/19/2018	8:13:28 AM	0	247	R	0.1		-2	420	Concrete	
26	4/19/2018	8:13:40 AM	0	231	R	0.1		-2	252	Concrete	
27	4/19/2018	8:13:51 AM	10	207	R	0.1		15	0	Concrete	
28	4/19/2018	8:14:03 AM	8	254	R	0.1		12	493	Concrete	
29	4/19/2018	8:16:10 AM	2	199	R	0.1	Grid 2	2	73		
30	4/19/2018	8:16:21 AM	1	187	R	0.1		0	-52		
31	4/19/2018	8:16:33 AM	3	190	R	0.1		3	-21		
32	4/19/2018	8:16:45 AM	4	187	R	0.1		5	-52		
33	4/19/2018	8:16:56 AM	3	191	R	0.1		3	-10		
34	4/19/2018	8:17:08 AM	0	198	R	0.1		-2	63		
35	4/19/2018	8:17:20 AM	0	191	R	0.1		-2	-10		
36	4/19/2018	8:17:31 AM	10	185	R	0.1		15	-73		
37	4/19/2018	8:17:43 AM	2	190	R	0.1		2	-21		
38	4/19/2018	8:17:55 AM	7	188	R	0.1		10	-42		
39	4/19/2018	8:18:07 AM	5	184	R	0.1		7	-84		
40	4/19/2018	8:18:18 AM	1	196	R	0.1		0	42		
41	4/19/2018	8:18:30 AM	2	233	R	0.1		2	430		
42	4/19/2018	8:18:42 AM	3	228	R	0.1		3	378		
43	4/19/2018	8:18:53 AM	1	228	R	0.1		0	378		
44	4/19/2018	8:19:05 AM	3	187	R	0.1		3	-52		
45	4/19/2018	8:19:17 AM	3	186	R	0.1		3	-63		

46	4/19/2018	8:19:28 AM	2	194 R	0.1	2	21	
47	4/19/2018	8:19:40 AM	2	191 R	0.1	2	-10	
48	4/19/2018	8:19:52 AM	4	266 R	0.1	5	777	
49	4/19/2018	8:20:03 AM	7	267 R	0.1	10	630	Concrete
50	4/19/2018	8:20:15 AM	1	248 R	0.1	0	430	Concrete
51	4/19/2018	8:20:27 AM	1	212 R	0.1	0	52	Concrete
52	4/19/2018	8:20:38 AM	2	203 R	0.1	2	-42	Concrete
53	4/19/2018	8:20:50 AM	1	236 R	0.1	0	304	Concrete
54	4/19/2018	8:21:02 AM	1	199 R	0.1	0	-84	Concrete
55	4/19/2018	8:21:13 AM	0	201 R	0.1	-2	-63	Concrete
56	4/19/2018	8:21:25 AM	1	221 R	0.1	0	147	Concrete
57	4/19/2018	8:21:37 AM	1	202 R	0.1	0	-52	Concrete
58	4/19/2018	8:21:48 AM	8	202 R	0.1	12	-52	Concrete
59	4/19/2018	8:22:00 AM	2	237 R	0.1	2	315	Concrete
60	4/19/2018	8:22:12 AM	8	206 R	0.1	12	-10	Concrete
61	4/19/2018	8:22:23 AM	2	211 R	0.1	2	42	Concrete
62	4/19/2018	8:22:35 AM	2	286 R	0.1	2	829	Concrete
63	4/19/2018	8:22:47 AM	3	262 R	0.1	3	577	Concrete
64	4/19/2018	8:22:58 AM	1	207 R	0.1	0	0	Concrete
65	4/19/2018	8:23:10 AM	0	211 R	0.1	-2	42	Concrete
66	4/19/2018	8:23:22 AM	9	203 R	0.1	14	-42	Concrete
67	4/19/2018	8:23:33 AM	2	217 R	0.1	2	105	Concrete
68	4/19/2018	8:23:45 AM	0	229 R	0.1	-2	231	Concrete
69	4/19/2018	8:25:52 AM	3	190 R	0.1 Grid 3	3	-21	
70	4/19/2018	8:26:04 AM	0	229 R	0.1	-2	388	
71	4/19/2018	8:26:15 AM	0	254 R	0.1	-2	651	
72	4/19/2018	8:26:27 AM	7	234 R	0.1	10	441	
73	4/19/2018	8:26:39 AM	1	222 R	0.1	0	315	
74	4/19/2018	8:26:50 AM	0	240 R	0.1	-2	504	
75	4/19/2018	8:27:02 AM	10	245 R	0.1	15	556	
76	4/19/2018	8:27:14 AM	2	252 R	0.1	2	630	
77	4/19/2018	8:27:26 AM	1	194 R	0.1	0	21	
78	4/19/2018	8:27:37 AM	2	197 R	0.1	2	52	
79	4/19/2018	8:27:49 AM	2	186 R	0.1	2	-63	
80	4/19/2018	8:28:01 AM	0	250 R	0.1	-2	609	
81	4/19/2018	8:28:12 AM	10	198 R	0.1	15	63	
82	4/19/2018	8:28:24 AM	13	189 R	0.1	20	-31	
83	4/19/2018	8:28:36 AM	3	235 R	0.1	3	451	
84	4/19/2018	8:28:47 AM	2	222 R	0.1	2	315	
85	4/19/2018	8:28:59 AM	1	289 R	0.1	0	1018	
86	4/19/2018	8:29:11 AM	0	235 R	0.1	-2	451	
87	4/19/2018	8:29:22 AM	2	161 R	0.1	2	-325	
88	4/19/2018	8:29:34 AM	1	209 R	0.1	0	178	
89	4/19/2018	8:29:46 AM	0	241 R	0.1	-2	357	Concrete
90	4/19/2018	8:29:57 AM	16	281 R	0.1	26	777	Concrete
91	4/19/2018	8:30:09 AM	7	293 R	0.1	10	903	Concrete
92	4/19/2018	8:30:21 AM	1	285 R	0.1	0	819	Concrete
93	4/19/2018	8:30:32 AM	1	239 R	0.1	0	336	Concrete
94	4/19/2018	8:30:44 AM	2	201 R	0.1	2	-63	Concrete
95	4/19/2018	8:30:56 AM	1	199 R	0.1	0	-84	Concrete
96	4/19/2018	8:31:07 AM	1	257 R	0.1	0	525	Concrete
97	4/19/2018	8:31:19 AM	2	240 R	0.1	2	346	Concrete
98	4/19/2018	8:31:31 AM	0	304 R	0.1	-2	1018	Concrete
99	4/19/2018	8:31:42 AM	14	202 R	0.1	22	-52	Concrete
100	4/19/2018	8:31:54 AM	9	209 R	0.1	14	21	Concrete
101	4/19/2018	8:32:06 AM	2	243 R	0.1	2	378	Concrete
102	4/19/2018	8:32:17 AM	0	237 R	0.1	-2	315	Concrete
103	4/19/2018	8:32:29 AM	4	279 R	0.1	5	756	Concrete
104	4/19/2018	8:32:41 AM	1	201 R	0.1	0	-63	Concrete
105	4/19/2018	8:32:52 AM	0	276 R	0.1	-2	724	Concrete

106	4/19/2018	8:33:04 AM	9	268 R	0.1	14	640	Concrete
107	4/19/2018	8:33:16 AM	2	220 R	0.1	2	136	Concrete
108	4/19/2018	8:33:27 AM	5	248 R	0.1	7	430	Concrete
109	4/19/2018	8:35:36 AM	1	181 R	0.1 Grid 4	0	-115	
110	4/19/2018	8:35:47 AM	2	191 R	0.1	2	-10	
111	4/19/2018	8:35:59 AM	3	189 R	0.1	3	-31	
112	4/19/2018	8:36:11 AM	2	192 R	0.1	2	0	
113	4/19/2018	8:36:22 AM	1	189 R	0.1	0	-31	
114	4/19/2018	8:36:34 AM	0	217 R	0.1	-2	262	
115	4/19/2018	8:36:46 AM	10	198 R	0.1	15	63	
116	4/19/2018	8:36:57 AM	2	188 R	0.1	2	-42	
117	4/19/2018	8:37:09 AM	0	191 R	0.1	-2	-10	
118	4/19/2018	8:37:21 AM	10	264 R	0.1	15	756	
119	4/19/2018	8:37:32 AM	2	271 R	0.1	2	829	
120	4/19/2018	8:37:44 AM	0	215 R	0.1	-2	241	
121	4/19/2018	8:37:56 AM	0	234 R	0.1	-2	441	
122	4/19/2018	8:38:07 AM	4	262 R	0.1	5	735	
123	4/19/2018	8:38:19 AM	11	265 R	0.1	17	766	
124	4/19/2018	8:38:31 AM	2	245 R	0.1	2	556	
125	4/19/2018	8:38:42 AM	2	271 R	0.1	2	829	
126	4/19/2018	8:38:54 AM	1	232 R	0.1	0	420	
127	4/19/2018	8:39:06 AM	2	211 R	0.1	2	199	
128	4/19/2018	8:39:17 AM	3	271 R	0.1	3	829	
129	4/19/2018	8:39:29 AM	1	206 R	0.1	0	-10	Concrete
130	4/19/2018	8:39:41 AM	0	320 R	0.1	-2	1186	Concrete
131	4/19/2018	8:39:52 AM	9	270 R	0.1	14	661	Concrete
132	4/19/2018	8:40:04 AM	2	374 R	0.1	2	1753	Concrete
133	4/19/2018	8:40:16 AM	0	402 R	0.1	-2	2047	Concrete
134	4/19/2018	8:40:27 AM	0	283 R	0.1	-2	798	Concrete
135	4/19/2018	8:40:39 AM	6	373 R	0.1	9	1743	Concrete
136	4/19/2018	8:40:51 AM	1	353 R	0.1	0	1533	Concrete
137	4/19/2018	8:41:02 AM	2	345 R	0.1	2	1449	Concrete
138	4/19/2018	8:41:14 AM	1	386 R	0.1	0	1879	Concrete
139	4/19/2018	8:41:26 AM	0	396 R	0.1	-2	1984	Concrete
140	4/19/2018	8:41:37 AM	3	378 R	0.1	3	1795	Concrete
141	4/19/2018	8:41:49 AM	0	281 R	0.1	-2	777	Concrete
142	4/19/2018	8:42:01 AM	0	251 R	0.1	-2	462	Concrete
143	4/19/2018	8:42:13 AM	4	204 R	0.1	5	-31	Concrete
144	4/19/2018	8:42:24 AM	1	255 R	0.1	0	504	Concrete
145	4/19/2018	8:42:36 AM	0	392 R	0.1	-2	1942	Concrete
146	4/19/2018	8:42:48 AM	2	494 R	0.1	2	3013	Concrete
147	4/19/2018	8:42:59 AM	2	300 R	0.1	2	976	Concrete
148	4/19/2018	8:43:11 AM	0	279 R	0.1	-2	756	Concrete
149	4/19/2018	8:46:45 AM	10	211 R	0.1 Grid 5	15	199	
150	4/19/2018	8:46:57 AM	2	187 R	0.1	2	-52	
151	4/19/2018	8:47:08 AM	9	265 R	0.1	14	766	
152	4/19/2018	8:47:20 AM	12	261 R	0.1	19	724	
153	4/19/2018	8:47:32 AM	6	185 R	0.1	9	-73	
154	4/19/2018	8:47:43 AM	1	223 R	0.1	0	325	
155	4/19/2018	8:47:55 AM	0	248 R	0.1	-2	588	
156	4/19/2018	8:48:07 AM	0	259 R	0.1	-2	703	
157	4/19/2018	8:48:18 AM	3	283 R	0.1	3	955	
158	4/19/2018	8:48:30 AM	3	206 R	0.1	3	147	
159	4/19/2018	8:48:42 AM	4	191 R	0.1	5	-10	
160	4/19/2018	8:48:53 AM	2	190 R	0.1	2	-21	
161	4/19/2018	8:49:05 AM	3	183 R	0.1	3	-94	
162	4/19/2018	8:49:17 AM	2	192 R	0.1	2	0	
163	4/19/2018	8:49:29 AM	3	198 R	0.1	3	63	
164	4/19/2018	8:49:40 AM	2	184 R	0.1	2	-84	
165	4/19/2018	8:49:52 AM	3	204 R	0.1	3	126	

166	4/19/2018	8:50:04 AM	0	194 R	0.1	-2	21	
167	4/19/2018	8:50:15 AM	4	191 R	0.1	5	-10	
168	4/19/2018	8:50:27 AM	1	184 R	0.1	0	-84	
169	4/19/2018	8:50:39 AM	0	189 R	0.1	-2	-31	
170	4/19/2018	8:50:50 AM	0	211 R	0.1	-2	199	
171	4/19/2018	8:51:02 AM	11	190 R	0.1	17	-21	
172	4/19/2018	8:51:14 AM	2	187 R	0.1	2	-52	
173	4/19/2018	8:51:25 AM	4	193 R	0.1	5	10	
174	4/19/2018	8:51:37 AM	0	197 R	0.1	-2	52	
175	4/19/2018	8:51:49 AM	0	188 R	0.1	-2	-42	
176	4/19/2018	8:52:00 AM	5	191 R	0.1	7	-10	
177	4/19/2018	8:52:12 AM	1	185 R	0.1	0	-73	
178	4/19/2018	8:52:24 AM	0	191 R	0.1	-2	-10	
179	4/19/2018	8:52:35 AM	4	189 R	0.1	5	-31	
180	4/19/2018	8:52:47 AM	1	227 R	0.1	0	367	
181	4/19/2018	8:52:59 AM	1	198 R	0.1	0	63	
182	4/19/2018	8:53:10 AM	2	195 R	0.1	2	31	
183	4/19/2018	8:53:22 AM	2	194 R	0.1	2	21	
184	4/19/2018	8:53:34 AM	1	222 R	0.1	0	315	
185	4/19/2018	8:53:45 AM	3	288 R	0.1	3	1008	
186	4/19/2018	8:53:57 AM	2	190 R	0.1	2	-21	
187	4/19/2018	8:54:09 AM	2	192 R	0.1	2	0	
188	4/19/2018	8:54:21 AM	0	186 R	0.1	-2	-63	
189	4/19/2018	8:57:16 AM	0	196 R	0.1 Grid 6	-2	42	
190	4/19/2018	8:57:28 AM	13	188 R	0.1	20	-42	
191	4/19/2018	8:57:40 AM	3	196 R	0.1	3	42	
192	4/19/2018	8:57:52 AM	0	198 R	0.1	-2	63	
193	4/19/2018	8:58:03 AM	4	188 R	0.1	5	-42	
194	4/19/2018	8:58:15 AM	1	185 R	0.1	0	-73	
195	4/19/2018	8:58:27 AM	3	191 R	0.1	3	-10	
196	4/19/2018	8:58:38 AM	2	187 R	0.1	2	-52	
197	4/19/2018	8:58:50 AM	1	233 R	0.1	0	430	
198	4/19/2018	8:59:02 AM	2	218 R	0.1	2	273	
199	4/19/2018	8:59:13 AM	3	192 R	0.1	3	0	
200	4/19/2018	8:59:25 AM	2	195 R	0.1	2	31	
201	4/19/2018	8:59:37 AM	1	186 R	0.1	0	-63	
202	4/19/2018	8:59:48 AM	2	204 R	0.1	2	126	
203	4/19/2018	9:00:00 AM	3	218 R	0.1	3	273	
204	4/19/2018	9:00:12 AM	3	254 R	0.1	3	651	
205	4/19/2018	9:00:23 AM	0	213 R	0.1	-2	220	
206	4/19/2018	9:00:35 AM	3	216 R	0.1	3	252	
207	4/19/2018	9:00:47 AM	2	304 R	0.1	2	1176	
208	4/19/2018	9:00:58 AM	4	301 R	0.1	5	1144	
209	4/19/2018	9:01:10 AM	3	289 R	0.1	3	861	Concrete
210	4/19/2018	9:01:22 AM	1	210 R	0.1	0	31	Concrete
211	4/19/2018	9:01:33 AM	2	201 R	0.1	2	-63	Concrete
212	4/19/2018	9:01:45 AM	3	208 R	0.1	3	10	Concrete
213	4/19/2018	9:01:57 AM	0	210 R	0.1	-2	31	Concrete
214	4/19/2018	9:02:08 AM	1	213 R	0.1	0	63	Concrete
215	4/19/2018	9:02:20 AM	2	202 R	0.1	2	-52	Concrete
216	4/19/2018	9:02:32 AM	2	221 R	0.1	2	147	Concrete
217	4/19/2018	9:02:44 AM	2	199 R	0.1	2	-84	Concrete
218	4/19/2018	9:02:55 AM	1	200 R	0.1	0	-73	Concrete
219	4/19/2018	9:03:07 AM	3	205 R	0.1	3	-21	Concrete
220	4/19/2018	9:03:19 AM	1	226 R	0.1	0	199	Concrete
221	4/19/2018	9:03:30 AM	2	213 R	0.1	2	63	Concrete
222	4/19/2018	9:03:42 AM	0	292 R	0.1	-2	892	Concrete
223	4/19/2018	9:03:54 AM	3	312 R	0.1	3	1102	Concrete
224	4/19/2018	9:04:05 AM	6	346 R	0.1	9	1459	Concrete
225	4/19/2018	9:04:17 AM	1	302 R	0.1	0	997	Concrete

226	4/19/2018	9:04:29 AM	0	284 R	0.1	-2	808	Concrete
227	4/19/2018	9:04:40 AM	8	236 R	0.1	12	304	Concrete
228	4/19/2018	9:04:52 AM	2	199 R	0.1	2	-84	Concrete
229	4/19/2018	9:10:08 AM	0	203 R	0.1 Grid 7	-2	115	
230	4/19/2018	9:10:20 AM	0	200 R	0.1	-2	84	
231	4/19/2018	9:10:31 AM	0	214 R	0.1	-2	231	
232	4/19/2018	9:10:43 AM	10	249 R	0.1	15	598	
233	4/19/2018	9:10:55 AM	7	185 R	0.1	10	-73	
234	4/19/2018	9:11:06 AM	6	199 R	0.1	9	73	
235	4/19/2018	9:11:18 AM	1	188 R	0.1	0	-42	
236	4/19/2018	9:11:30 AM	0	190 R	0.1	-2	-21	
237	4/19/2018	9:11:41 AM	0	184 R	0.1	-2	-84	
238	4/19/2018	9:11:53 AM	3	186 R	0.1	3	-63	
239	4/19/2018	9:12:05 AM	0	195 R	0.1	-2	31	
240	4/19/2018	9:12:16 AM	0	186 R	0.1	-2	-63	
241	4/19/2018	9:12:28 AM	4	189 R	0.1	5	-31	
242	4/19/2018	9:12:40 AM	8	215 R	0.1	12	241	
243	4/19/2018	9:12:51 AM	10	199 R	0.1	15	73	
244	4/19/2018	9:13:03 AM	17	199 R	0.1	27	73	
245	4/19/2018	9:13:15 AM	13	196 R	0.1	20	42	
246	4/19/2018	9:13:26 AM	3	205 R	0.1	3	136	
247	4/19/2018	9:13:38 AM	1	211 R	0.1	0	199	
248	4/19/2018	9:13:50 AM	2	189 R	0.1	2	-31	
249	4/19/2018	9:14:02 AM	1	194 R	0.1	0	21	
250	4/19/2018	9:14:13 AM	0	209 R	0.1	-2	178	
251	4/19/2018	9:14:25 AM	0	211 R	0.1	-2	199	
252	4/19/2018	9:14:37 AM	5	185 R	0.1	7	-73	
253	4/19/2018	9:14:48 AM	1	198 R	0.1	0	63	
254	4/19/2018	9:15:00 AM	1	202 R	0.1	0	105	
255	4/19/2018	9:15:12 AM	2	190 R	0.1	2	-21	
256	4/19/2018	9:15:23 AM	1	187 R	0.1	0	-52	
257	4/19/2018	9:15:35 AM	2	192 R	0.1	2	0	
258	4/19/2018	9:15:47 AM	0	222 R	0.1	-2	315	
259	4/19/2018	9:18:19 AM	8	221 R	0.1 Grid 8	12	304	
260	4/19/2018	9:18:31 AM	2	209 R	0.1	2	178	
261	4/19/2018	9:18:43 AM	0	203 R	0.1	-2	115	
262	4/19/2018	9:18:54 AM	0	199 R	0.1	-2	73	
263	4/19/2018	9:19:06 AM	4	220 R	0.1	5	294	
264	4/19/2018	9:19:18 AM	1	202 R	0.1	0	105	
265	4/19/2018	9:19:29 AM	1	195 R	0.1	0	31	
266	4/19/2018	9:19:41 AM	2	200 R	0.1	2	84	
267	4/19/2018	9:19:53 AM	0	222 R	0.1	-2	315	
268	4/19/2018	9:20:04 AM	1	202 R	0.1	0	105	
269	4/19/2018	9:20:16 AM	2	187 R	0.1	2	-52	
270	4/19/2018	9:20:28 AM	0	207 R	0.1	-2	157	
271	4/19/2018	9:20:39 AM	3	219 R	0.1	3	283	
272	4/19/2018	9:20:51 AM	0	234 R	0.1	-2	441	
273	4/19/2018	9:21:03 AM	12	187 R	0.1	19	-52	
274	4/19/2018	9:21:15 AM	3	186 R	0.1	3	-63	
275	4/19/2018	9:21:26 AM	0	190 R	0.1	-2	-21	
276	4/19/2018	9:21:38 AM	0	190 R	0.1	-2	-21	
277	4/19/2018	9:21:50 AM	7	231 R	0.1	10	409	
278	4/19/2018	9:22:01 AM	1	211 R	0.1	0	199	
279	4/19/2018	9:22:13 AM	0	226 R	0.1	-2	357	
280	4/19/2018	9:22:25 AM	3	200 R	0.1	3	84	
281	4/19/2018	9:22:36 AM	0	188 R	0.1	-2	-42	
282	4/19/2018	9:22:48 AM	7	199 R	0.1	10	73	
283	4/19/2018	9:23:00 AM	6	205 R	0.1	9	136	
284	4/19/2018	9:23:11 AM	1	209 R	0.1	0	178	
285	4/19/2018	9:23:23 AM	1	204 R	0.1	0	126	

286	4/19/2018	9:23:35 AM	2	185 R	0.1	2	-73	
287	4/19/2018	9:23:46 AM	1	257 R	0.1	0	682	
288	4/19/2018	9:23:58 AM	2	201 R	0.1	2	94	
289	4/19/2018	9:24:10 AM	0	247 R	0.1	-2	577	
290	4/19/2018	9:24:22 AM	0	207 R	0.1	-2	157	
291	4/19/2018	9:24:33 AM	3	189 R	0.1	3	-31	
292	4/19/2018	9:24:45 AM	3	248 R	0.1	3	588	
293	4/19/2018	9:24:57 AM	0	237 R	0.1	-2	472	
294	4/19/2018	9:25:08 AM	2	229 R	0.1	2	388	
295	4/19/2018	9:25:20 AM	0	186 R	0.1	-2	-63	
296	4/19/2018	9:25:32 AM	0	232 R	0.1	-2	420	
297	4/19/2018	9:25:43 AM	11	221 R	0.1	17	304	
298	4/19/2018	9:25:55 AM	2	244 R	0.1	2	546	
299	4/19/2018	9:37:43 AM	2	189 R	0.1 Grid 18	2	-31	
300	4/19/2018	9:37:55 AM	1	196 R	0.1	0	42	
301	4/19/2018	9:38:07 AM	0	212 R	0.1	-2	210	
302	4/19/2018	9:38:19 AM	2	220 R	0.1	2	294	
303	4/19/2018	9:38:30 AM	1	226 R	0.1	0	357	
304	4/19/2018	9:38:42 AM	2	219 R	0.1	2	283	
305	4/19/2018	9:38:54 AM	1	228 R	0.1	0	378	
306	4/19/2018	9:39:05 AM	2	186 R	0.1	2	-63	
307	4/19/2018	9:39:17 AM	4	191 R	0.1	5	-10	
308	4/19/2018	9:39:29 AM	3	205 R	0.1	3	136	
309	4/19/2018	9:39:40 AM	0	204 R	0.1	-2	126	
310	4/19/2018	9:39:52 AM	1	241 R	0.1	0	514	
311	4/19/2018	9:40:04 AM	0	207 R	0.1	-2	157	
312	4/19/2018	9:40:15 AM	3	286 R	0.1	3	987	
313	4/19/2018	9:40:27 AM	7	211 R	0.1	10	199	
314	4/19/2018	9:40:39 AM	1	241 R	0.1	0	514	
315	4/19/2018	9:40:50 AM	0	217 R	0.1	-2	262	
316	4/19/2018	9:41:02 AM	10	187 R	0.1	15	-52	
317	4/19/2018	9:41:14 AM	2	191 R	0.1	2	-10	
318	4/19/2018	9:41:26 AM	0	199 R	0.1	-2	73	
319	4/19/2018	9:41:37 AM	0	222 R	0.1	-2	157	Concrete
320	4/19/2018	9:41:49 AM	12	261 R	0.1	19	567	Concrete
321	4/19/2018	9:42:01 AM	3	233 R	0.1	3	273	Concrete
322	4/19/2018	9:42:12 AM	0	321 R	0.1	-2	1197	Concrete
323	4/19/2018	9:42:24 AM	0	248 R	0.1	-2	430	Concrete
324	4/19/2018	9:42:36 AM	6	274 R	0.1	9	703	Concrete
325	4/19/2018	9:42:47 AM	1	275 R	0.1	0	714	Concrete
326	4/19/2018	9:42:59 AM	0	254 R	0.1	-2	493	Concrete
327	4/19/2018	9:43:11 AM	9	304 R	0.1	14	1018	Concrete
328	4/19/2018	9:43:22 AM	2	218 R	0.1	2	115	Concrete
329	4/19/2018	9:43:34 AM	2	300 R	0.1	2	976	Concrete
330	4/19/2018	9:43:46 AM	3	270 R	0.1	3	661	Concrete
331	4/19/2018	9:43:57 AM	1	256 R	0.1	0	514	Concrete
332	4/19/2018	9:44:09 AM	0	227 R	0.1	-2	210	Concrete
333	4/19/2018	9:44:21 AM	2	237 R	0.1	2	315	Concrete
334	4/19/2018	9:44:32 AM	1	232 R	0.1	0	262	Concrete
335	4/19/2018	9:44:44 AM	2	221 R	0.1	2	147	Concrete
336	4/19/2018	9:44:56 AM	2	240 R	0.1	2	346	Concrete
337	4/19/2018	9:45:08 AM	1	201 R	0.1	0	-63	Concrete
338	4/19/2018	9:45:19 AM	2	242 R	0.1	2	367	Concrete
339	4/19/2018	9:52:15 AM	3	181 R	0.1 Grid 19	3	-115	
340	4/19/2018	9:52:27 AM	0	189 R	0.1	-2	-31	
341	4/19/2018	9:52:39 AM	4	198 R	0.1	5	63	
342	4/19/2018	9:52:51 AM	1	180 R	0.1	0	-126	
343	4/19/2018	9:53:02 AM	1	186 R	0.1	0	-63	
344	4/19/2018	9:53:14 AM	3	192 R	0.1	3	0	
345	4/19/2018	9:53:26 AM	2	190 R	0.1	2	-21	

346	4/19/2018	9:53:37 AM	0	185 R	0.1	-2	-73	
347	4/19/2018	9:53:49 AM	3	196 R	0.1	3	42	
348	4/19/2018	9:54:01 AM	1	187 R	0.1	0	-52	
349	4/19/2018	9:54:12 AM	2	191 R	0.1	2	-10	
350	4/19/2018	9:54:24 AM	1	192 R	0.1	0	0	
351	4/19/2018	9:54:36 AM	0	208 R	0.1	-2	168	
352	4/19/2018	9:54:47 AM	0	191 R	0.1	-2	-10	
353	4/19/2018	9:54:59 AM	11	209 R	0.1	17	178	
354	4/19/2018	9:55:11 AM	2	187 R	0.1	2	-52	
355	4/19/2018	9:55:22 AM	1	191 R	0.1	0	-10	
356	4/19/2018	9:55:34 AM	2	186 R	0.1	2	-63	
357	4/19/2018	9:55:46 AM	0	186 R	0.1	-2	-63	
358	4/19/2018	9:55:58 AM	1	187 R	0.1	0	-52	
359	4/19/2018	9:56:09 AM	2	255 R	0.1	2	504	Concrete
360	4/19/2018	9:56:21 AM	3	267 R	0.1	3	630	Concrete
361	4/19/2018	9:56:33 AM	2	250 R	0.1	2	451	Concrete
362	4/19/2018	9:56:44 AM	0	264 R	0.1	-2	598	Concrete
363	4/19/2018	9:56:56 AM	1	204 R	0.1	0	-31	Concrete
364	4/19/2018	9:57:08 AM	0	248 R	0.1	-2	430	Concrete
365	4/19/2018	9:57:19 AM	6	236 R	0.1	9	304	Concrete
366	4/19/2018	9:57:31 AM	1	209 R	0.1	0	21	Concrete
367	4/19/2018	9:57:43 AM	5	199 R	0.1	7	-84	Concrete
368	4/19/2018	9:57:54 AM	7	203 R	0.1	10	-42	Concrete
369	4/19/2018	9:58:06 AM	1	261 R	0.1	0	567	Concrete
370	4/19/2018	9:58:18 AM	2	222 R	0.1	2	157	Concrete
371	4/19/2018	9:58:29 AM	1	202 R	0.1	0	-52	Concrete
372	4/19/2018	9:58:41 AM	2	202 R	0.1	2	-52	Concrete
373	4/19/2018	9:58:53 AM	1	208 R	0.1	0	10	Concrete
374	4/19/2018	9:59:05 AM	2	214 R	0.1	2	73	Concrete
375	4/19/2018	9:59:16 AM	0	215 R	0.1	-2	84	Concrete
376	4/19/2018	9:59:28 AM	10	218 R	0.1	15	115	Concrete
377	4/19/2018	9:59:40 AM	2	210 R	0.1	2	31	Concrete
378	4/19/2018	9:59:51 AM	5	198 R	0.1	7	-94	Concrete
379	4/19/2018	10:03:59 AM	10	195 R	0.1 Grid 20	15	31	
380	4/19/2018	10:04:11 AM	2	185 R	0.1	2	-73	
381	4/19/2018	10:04:23 AM	1	195 R	0.1	0	31	
382	4/19/2018	10:04:34 AM	2	185 R	0.1	2	-73	
383	4/19/2018	10:04:46 AM	3	192 R	0.1	3	0	
384	4/19/2018	10:04:58 AM	1	221 R	0.1	0	304	
385	4/19/2018	10:05:10 AM	2	189 R	0.1	2	-31	
386	4/19/2018	10:05:21 AM	1	190 R	0.1	0	-21	
387	4/19/2018	10:05:33 AM	1	189 R	0.1	0	-31	
388	4/19/2018	10:05:45 AM	0	185 R	0.1	-2	-73	
389	4/19/2018	10:05:56 AM	0	194 R	0.1	-2	21	
390	4/19/2018	10:06:08 AM	5	197 R	0.1	7	52	
391	4/19/2018	10:06:20 AM	1	203 R	0.1	0	115	
392	4/19/2018	10:06:31 AM	0	221 R	0.1	-2	304	
393	4/19/2018	10:06:43 AM	1	228 R	0.1	0	378	
394	4/19/2018	10:06:55 AM	0	226 R	0.1	-2	357	
395	4/19/2018	10:07:07 AM	6	191 R	0.1	9	-10	
396	4/19/2018	10:07:18 AM	1	187 R	0.1	0	-52	
397	4/19/2018	10:07:30 AM	2	219 R	0.1	2	283	
398	4/19/2018	10:07:42 AM	1	199 R	0.1	0	73	
399	4/19/2018	10:07:53 AM	9	201 R	0.1	14	-63	Concrete
400	4/19/2018	10:08:05 AM	2	200 R	0.1	2	-73	Concrete
401	4/19/2018	10:08:17 AM	2	278 R	0.1	2	745	Concrete
402	4/19/2018	10:08:28 AM	1	217 R	0.1	0	105	Concrete
403	4/19/2018	10:08:40 AM	2	276 R	0.1	2	724	Concrete
404	4/19/2018	10:08:52 AM	0	261 R	0.1	-2	567	Concrete
405	4/19/2018	10:09:03 AM	4	256 R	0.1	5	514	Concrete

406	4/19/2018	10:09:15 AM	1	304 R	0.1	0	1018	Concrete
407	4/19/2018	10:09:27 AM	1	209 R	0.1	0	21	Concrete
408	4/19/2018	10:09:38 AM	2	201 R	0.1	2	-63	Concrete
409	4/19/2018	10:09:50 AM	1	201 R	0.1	0	-63	Concrete
410	4/19/2018	10:10:02 AM	2	200 R	0.1	2	-73	Concrete
411	4/19/2018	10:10:14 AM	2	242 R	0.1	2	367	Concrete
412	4/19/2018	10:10:25 AM	1	210 R	0.1	0	31	Concrete
413	4/19/2018	10:10:37 AM	1	232 R	0.1	0	262	Concrete
414	4/19/2018	10:10:49 AM	0	243 R	0.1	-2	378	Concrete
415	4/19/2018	10:11:00 AM	2	244 R	0.1	2	388	Concrete
416	4/19/2018	10:11:12 AM	2	289 R	0.1	2	861	Concrete
417	4/19/2018	10:11:24 AM	2	302 R	0.1	2	997	Concrete
418	4/19/2018	10:11:35 AM	1	299 R	0.1	0	966	Concrete
419	4/19/2018	10:19:58 AM	2	193 R	0.1 Grid 21	2	10	
420	4/19/2018	10:20:09 AM	0	188 R	0.1	-2	-42	
421	4/19/2018	10:20:21 AM	8	191 R	0.1	12	-10	
422	4/19/2018	10:20:33 AM	2	189 R	0.1	2	-31	
423	4/19/2018	10:20:44 AM	2	189 R	0.1	2	-31	
424	4/19/2018	10:20:56 AM	1	187 R	0.1	0	-52	
425	4/19/2018	10:21:08 AM	0	191 R	0.1	-2	-10	
426	4/19/2018	10:21:20 AM	0	188 R	0.1	-2	-42	
427	4/19/2018	10:21:31 AM	2	192 R	0.1	2	0	
428	4/19/2018	10:21:43 AM	1	197 R	0.1	0	52	
429	4/19/2018	10:21:55 AM	0	187 R	0.1	-2	-52	
430	4/19/2018	10:22:06 AM	8	188 R	0.1	12	-42	
431	4/19/2018	10:22:18 AM	2	188 R	0.1	2	-42	
432	4/19/2018	10:22:30 AM	0	198 R	0.1	-2	63	
433	4/19/2018	10:22:41 AM	0	221 R	0.1	-2	304	
434	4/19/2018	10:22:53 AM	7	193 R	0.1	10	10	
435	4/19/2018	10:23:05 AM	1	188 R	0.1	0	-42	
436	4/19/2018	10:23:16 AM	0	190 R	0.1	-2	-21	
437	4/19/2018	10:23:28 AM	0	191 R	0.1	-2	-10	
438	4/19/2018	10:23:40 AM	11	250 R	0.1	17	609	
439	4/19/2018	10:23:51 AM	2	194 R	0.1	2	21	
440	4/19/2018	10:24:03 AM	0	187 R	0.1	-2	-52	Concrete
441	4/19/2018	10:24:15 AM	13	191 R	0.1	20	-10	Concrete
442	4/19/2018	10:24:27 AM	3	184 R	0.1	3	-84	Concrete
443	4/19/2018	10:24:38 AM	2	190 R	0.1	2	-21	Concrete
444	4/19/2018	10:24:50 AM	1	221 R	0.1	0	304	Concrete
445	4/19/2018	10:25:02 AM	2	189 R	0.1	2	-31	Concrete
446	4/19/2018	10:25:13 AM	1	287 R	0.1	0	997	Concrete
447	4/19/2018	10:25:25 AM	0	277 R	0.1	-2	892	Concrete
448	4/19/2018	10:25:37 AM	10	276 R	0.1	15	882	Concrete
449	4/19/2018	10:25:48 AM	2	260 R	0.1	2	714	Concrete
450	4/19/2018	10:26:00 AM	2	233 R	0.1	2	430	Concrete
451	4/19/2018	10:26:12 AM	1	209 R	0.1	0	178	Concrete
452	4/19/2018	10:26:23 AM	2	188 R	0.1	2	-42	Concrete
453	4/19/2018	10:26:35 AM	3	191 R	0.1	3	-10	Concrete
454	4/19/2018	10:26:47 AM	1	188 R	0.1	0	-42	Concrete
455	4/19/2018	10:26:58 AM	2	187 R	0.1	2	-52	Concrete
456	4/19/2018	10:27:10 AM	0	194 R	0.1	-2	21	Concrete
457	4/19/2018	10:27:22 AM	7	203 R	0.1	10	115	Concrete
458	4/19/2018	10:27:33 AM	1	294 R	0.1	0	1071	Concrete
459	4/19/2018	10:27:45 AM	1	270 R	0.1	0	819	Concrete
460	4/19/2018	10:30:15 AM	2	191 R	0.1 Grid 22	2	-10	
461	4/19/2018	10:30:27 AM	3	201 R	0.1	3	94	
462	4/19/2018	10:30:39 AM	0	187 R	0.1	-2	-52	
463	4/19/2018	10:30:50 AM	10	186 R	0.1	15	-63	
464	4/19/2018	10:31:02 AM	5	192 R	0.1	7	0	
465	4/19/2018	10:31:14 AM	1	186 R	0.1	0	-63	

466	4/19/2018	10:31:25 AM	3	188 R	0.1	3	-42	
467	4/19/2018	10:31:37 AM	3	192 R	0.1	3	0	
468	4/19/2018	10:31:49 AM	0	199 R	0.1	-2	73	
469	4/19/2018	10:32:00 AM	2	221 R	0.1	2	147	Concrete
470	4/19/2018	10:32:12 AM	2	221 R	0.1	2	147	Concrete
471	4/19/2018	10:32:24 AM	1	227 R	0.1	0	210	Concrete
472	4/19/2018	10:32:35 AM	0	236 R	0.1	-2	304	Concrete
473	4/19/2018	10:32:47 AM	2	230 R	0.1	2	241	Concrete
474	4/19/2018	10:32:59 AM	0	221 R	0.1	-2	147	Concrete
475	4/19/2018	10:33:11 AM	7	190 R	0.1	10	-21	
476	4/19/2018	10:33:22 AM	1	187 R	0.1	0	-52	
477	4/19/2018	10:33:34 AM	3	188 R	0.1	3	-42	
478	4/19/2018	10:33:46 AM	2	186 R	0.1	2	-63	
479	4/19/2018	10:33:57 AM	1	191 R	0.1	0	-10	
480	4/19/2018	10:34:09 AM	0	200 R	0.1	-2	84	
481	4/19/2018	10:34:21 AM	2	188 R	0.1	2	-42	
482	4/19/2018	10:34:32 AM	7	191 R	0.1	10	-10	
483	4/19/2018	10:34:44 AM	13	186 R	0.1	20	-63	
484	4/19/2018	10:34:56 AM	3	184 R	0.1	3	-84	
485	4/19/2018	10:35:07 AM	0	191 R	0.1	-2	-10	
486	4/19/2018	10:35:19 AM	0	197 R	0.1	-2	52	
487	4/19/2018	10:35:31 AM	0	223 R	0.1	-2	325	
488	4/19/2018	10:35:42 AM	0	191 R	0.1	-2	-10	
489	4/19/2018	10:35:54 AM	0	189 R	0.1	-2	-31	
490	4/19/2018	10:36:06 AM	14	196 R	0.1	22	42	
491	4/19/2018	10:36:17 AM	3	203 R	0.1	3	115	
492	4/19/2018	10:36:29 AM	0	204 R	0.1	-2	126	
493	4/19/2018	10:36:41 AM	3	188 R	0.1	3	-42	
494	4/19/2018	10:36:53 AM	0	207 R	0.1	-2	157	
495	4/19/2018	10:37:04 AM	0	205 R	0.1	-2	136	
496	4/19/2018	10:37:16 AM	8	222 R	0.1	12	315	
497	4/19/2018	10:37:28 AM	2	195 R	0.1	2	31	
498	4/19/2018	10:37:39 AM	0	187 R	0.1	-2	-52	
		Maximum:	21	494		34	3013	
		Average:	3	220		3	241	
		StDev:	3	40		6	394	

2360 SN:297766

43-93# 323074

Cal Due Date: 12/20/2018

Surveyor: Richard Thatcher

Bldg 218

Room 105A North and South Lower Wall Grids 23 thru 26 36 thru 38

Alpha Efficiency: 0.404

Beta/Gamma Efficiency: 0.254 Concrete

Alpha Background: 1 1.4

Beta/Gamma Background: 192 207

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count Time	Location	dpm/100cm ²	
								Alpha	Beta
1	4/19/2018	12:35:57 PM	10	199	R	0.1	Grid 23	15	73
2	4/19/2018	12:36:09 PM	8	187	R	0.1		12	-52
3	4/19/2018	12:36:20 PM	5	188	R	0.1		7	-42
4	4/19/2018	12:36:32 PM	14	185	R	0.1		22	-73
5	4/19/2018	12:36:44 PM	10	191	R	0.1		15	-10
6	4/19/2018	12:36:56 PM	11	188	R	0.1		17	-42
7	4/19/2018	12:37:07 PM	8	197	R	0.1		12	52
8	4/19/2018	12:37:19 PM	9	200	R	0.1		14	84
9	4/19/2018	12:37:31 PM	11	186	R	0.1		17	-63
10	4/19/2018	12:37:42 PM	2	199	R	0.1		2	73
11	4/19/2018	12:37:54 PM	9	199	R	0.1		14	73
12	4/19/2018	12:38:06 PM	4	187	R	0.1		5	-52
13	4/19/2018	12:38:17 PM	11	197	R	0.1		17	52
14	4/19/2018	12:38:29 PM	2	190	R	0.1		2	-21
15	4/19/2018	12:38:41 PM	13	186	R	0.1		20	-63
16	4/19/2018	12:38:52 PM	1	193	R	0.1		0	10
17	4/19/2018	12:39:04 PM	11	190	R	0.1		17	-21
18	4/19/2018	12:39:16 PM	7	187	R	0.1		10	-52
19	4/19/2018	12:39:28 PM	7	191	R	0.1		10	-10
20	4/19/2018	12:39:39 PM	7	199	R	0.1		10	-84
21	4/19/2018	12:39:51 PM	3	199	R	0.1		3	-84
22	4/19/2018	12:40:03 PM	0	206	R	0.1		-2	-10
23	4/19/2018	12:40:14 PM	6	201	R	0.1		9	-63
24	4/19/2018	12:40:26 PM	5	209	R	0.1		7	21
25	4/19/2018	12:40:38 PM	0	211	R	0.1		-2	42
26	4/19/2018	12:40:49 PM	3	261	R	0.1		3	567
27	4/19/2018	12:41:01 PM	5	204	R	0.1		7	-31
28	4/19/2018	12:41:13 PM	11	221	R	0.1		17	147
29	4/19/2018	12:41:25 PM	1	205	R	0.1		0	-21
30	4/19/2018	12:41:36 PM	2	214	R	0.1		2	73
31	4/19/2018	12:41:48 PM	5	234	R	0.1		7	283
32	4/19/2018	12:42:00 PM	3	209	R	0.1		3	21
33	4/19/2018	12:42:11 PM	6	223	R	0.1		9	168
34	4/19/2018	12:42:23 PM	10	211	R	0.1		15	42
35	4/19/2018	12:42:35 PM	8	202	R	0.1		12	-52
36	4/19/2018	12:42:46 PM	0	201	R	0.1		-2	-63
37	4/19/2018	12:42:58 PM	6	202	R	0.1		9	-52
38	4/19/2018	12:43:10 PM	6	221	R	0.1		9	147
39	4/19/2018	12:43:21 PM	2	223	R	0.1		2	168
40	4/19/2018	12:45:54 PM	10	191	R	0.1	Grid 24	15	-10
41	4/19/2018	12:46:06 PM	7	187	R	0.1		10	-52
42	4/19/2018	12:46:17 PM	14	188	R	0.1		22	-42
43	4/19/2018	12:46:29 PM	8	184	R	0.1		12	-84
44	4/19/2018	12:46:41 PM	13	188	R	0.1		20	-42

45	4/19/2018	12:46:53 PM	3	190 R	0.1	3	-21	
46	4/19/2018	12:47:04 PM	11	190 R	0.1	17	-21	
47	4/19/2018	12:47:16 PM	10	187 R	0.1	15	-52	
48	4/19/2018	12:47:28 PM	12	187 R	0.1	19	-52	
49	4/19/2018	12:47:39 PM	12	197 R	0.1	19	52	
50	4/19/2018	12:47:51 PM	11	188 R	0.1	17	-42	
51	4/19/2018	12:48:03 PM	7	193 R	0.1	10	10	
52	4/19/2018	12:48:14 PM	5	188 R	0.1	7	-42	
53	4/19/2018	12:48:26 PM	11	191 R	0.1	17	-10	
54	4/19/2018	12:48:38 PM	12	189 R	0.1	19	-31	
55	4/19/2018	12:48:49 PM	9	198 R	0.1	14	63	
56	4/19/2018	12:49:01 PM	0	189 R	0.1	-2	-31	
57	4/19/2018	12:49:13 PM	5	200 R	0.1	7	84	
58	4/19/2018	12:49:24 PM	0	187 R	0.1	-2	-52	
59	4/19/2018	12:49:36 PM	13	190 R	0.1	20	-21	
60	4/19/2018	12:49:48 PM	1	186 R	0.1	0	-63	
61	4/19/2018	12:50:00 PM	3	223 R	0.1	3	168	Concrete
62	4/19/2018	12:50:11 PM	14	202 R	0.1	22	-52	Concrete
63	4/19/2018	12:50:23 PM	4	209 R	0.1	5	21	Concrete
64	4/19/2018	12:50:35 PM	4	205 R	0.1	5	-21	Concrete
65	4/19/2018	12:50:46 PM	8	222 R	0.1	12	157	Concrete
66	4/19/2018	12:50:58 PM	3	226 R	0.1	3	199	Concrete
67	4/19/2018	12:51:10 PM	10	219 R	0.1	15	126	Concrete
68	4/19/2018	12:51:21 PM	7	234 R	0.1	10	283	Concrete
69	4/19/2018	12:51:33 PM	6	207 R	0.1	9	0	Concrete
70	4/19/2018	12:51:45 PM	7	214 R	0.1	10	73	Concrete
71	4/19/2018	12:51:56 PM	2	216 R	0.1	2	94	Concrete
72	4/19/2018	12:52:08 PM	11	221 R	0.1	17	147	Concrete
73	4/19/2018	12:52:20 PM	7	211 R	0.1	10	42	Concrete
74	4/19/2018	12:52:31 PM	6	224 R	0.1	9	178	Concrete
75	4/19/2018	12:52:43 PM	4	223 R	0.1	5	168	Concrete
76	4/19/2018	12:52:55 PM	9	232 R	0.1	14	262	Concrete
77	4/19/2018	12:53:07 PM	6	221 R	0.1	9	147	Concrete
78	4/19/2018	12:53:18 PM	9	223 R	0.1	14	168	Concrete
79	4/19/2018	12:53:30 PM	0	217 R	0.1	-2	105	Concrete
80	4/19/2018	12:56:27 PM	11	192 R	0.1 Grid 25	17	0	
81	4/19/2018	12:56:39 PM	0	186 R	0.1	-2	-63	
82	4/19/2018	12:56:51 PM	0	201 R	0.1	-2	94	
83	4/19/2018	12:57:02 PM	0	197 R	0.1	-2	52	
84	4/19/2018	12:57:14 PM	3	191 R	0.1	3	-10	
85	4/19/2018	12:57:26 PM	1	185 R	0.1	0	-73	
86	4/19/2018	12:57:37 PM	4	187 R	0.1	5	-52	
87	4/19/2018	12:57:49 PM	14	198 R	0.1	22	63	
88	4/19/2018	12:58:01 PM	14	189 R	0.1	22	-31	
89	4/19/2018	12:58:12 PM	9	187 R	0.1	14	-52	
90	4/19/2018	12:58:24 PM	3	188 R	0.1	3	-42	
91	4/19/2018	12:58:36 PM	3	205 R	0.1	3	136	
92	4/19/2018	12:58:47 PM	0	184 R	0.1	-2	-84	
93	4/19/2018	12:58:59 PM	5	190 R	0.1	7	-21	
94	4/19/2018	12:59:11 PM	0	192 R	0.1	-2	0	
95	4/19/2018	12:59:22 PM	5	187 R	0.1	7	-52	
96	4/19/2018	12:59:34 PM	6	212 R	0.1	9	210	
97	4/19/2018	12:59:46 PM	8	200 R	0.1	12	84	
98	4/19/2018	12:59:58 PM	9	191 R	0.1	14	-10	
99	4/19/2018	1:00:09 PM	7	212 R	0.1	10	210	
100	4/19/2018	1:00:21 PM	12	211 R	0.1	19	42	Concrete
101	4/19/2018	1:00:33 PM	12	215 R	0.1	19	84	Concrete
102	4/19/2018	1:00:44 PM	14	204 R	0.1	22	-31	Concrete
103	4/19/2018	1:00:56 PM	0	225 R	0.1	-2	189	Concrete

104	4/19/2018	1:01:08 PM	0	201 R	0.1	-2	-63	Concrete
105	4/19/2018	1:01:19 PM	3	208 R	0.1	3	10	Concrete
106	4/19/2018	1:01:31 PM	2	243 R	0.1	2	378	Concrete
107	4/19/2018	1:01:43 PM	9	254 R	0.1	14	493	Concrete
108	4/19/2018	1:01:54 PM	10	227 R	0.1	15	210	Concrete
109	4/19/2018	1:02:06 PM	2	226 R	0.1	2	199	Concrete
110	4/19/2018	1:02:18 PM	8	221 R	0.1	12	147	Concrete
111	4/19/2018	1:02:30 PM	11	245 R	0.1	17	399	Concrete
112	4/19/2018	1:02:41 PM	8	251 R	0.1	12	462	Concrete
113	4/19/2018	1:02:53 PM	9	240 R	0.1	14	346	Concrete
114	4/19/2018	1:03:05 PM	7	260 R	0.1	10	556	Concrete
115	4/19/2018	1:03:16 PM	0	200 R	0.1	-2	-73	Concrete
116	4/19/2018	1:03:28 PM	7	256 R	0.1	10	514	Concrete
117	4/19/2018	1:03:40 PM	4	274 R	0.1	5	703	Concrete
118	4/19/2018	1:03:51 PM	4	209 R	0.1	5	21	Concrete
119	4/19/2018	1:04:03 PM	9	259 R	0.1	14	546	Concrete
120	4/19/2018	1:05:45 PM	2	170 R	0.1 Grid 26	2	-231	
121	4/19/2018	1:05:57 PM	13	188 R	0.1	20	-42	
122	4/19/2018	1:06:09 PM	6	199 R	0.1	9	73	
123	4/19/2018	1:06:20 PM	8	195 R	0.1	12	31	
124	4/19/2018	1:06:32 PM	2	190 R	0.1	2	-21	
125	4/19/2018	1:06:44 PM	13	187 R	0.1	20	-52	
126	4/19/2018	1:06:56 PM	14	191 R	0.1	22	-10	
127	4/19/2018	1:07:07 PM	0	187 R	0.1	-2	-52	
128	4/19/2018	1:07:19 PM	0	187 R	0.1	-2	-52	
129	4/19/2018	1:07:31 PM	8	192 R	0.1	12	0	
130	4/19/2018	1:07:42 PM	8	189 R	0.1	12	-31	
131	4/19/2018	1:07:54 PM	12	199 R	0.1	19	73	
132	4/19/2018	1:08:06 PM	7	188 R	0.1	10	-42	
133	4/19/2018	1:08:17 PM	11	198 R	0.1	17	63	
134	4/19/2018	1:08:29 PM	10	187 R	0.1	15	-52	
135	4/19/2018	1:08:41 PM	6	195 R	0.1	9	31	
136	4/19/2018	1:08:52 PM	9	213 R	0.1	14	220	
137	4/19/2018	1:09:04 PM	1	183 R	0.1	0	-94	
138	4/19/2018	1:09:16 PM	1	187 R	0.1	0	-52	
139	4/19/2018	1:09:28 PM	13	188 R	0.1	20	-42	
140	4/19/2018	1:09:39 PM	12	212 R	0.1	19	210	Concrete
141	4/19/2018	1:09:51 PM	12	222 R	0.1	19	315	Concrete
142	4/19/2018	1:10:03 PM	11	212 R	0.1	17	210	Concrete
143	4/19/2018	1:10:14 PM	9	257 R	0.1	14	682	Concrete
144	4/19/2018	1:10:26 PM	0	206 R	0.1	-2	147	Concrete
145	4/19/2018	1:10:38 PM	4	254 R	0.1	5	651	Concrete
146	4/19/2018	1:10:49 PM	12	211 R	0.1	19	199	Concrete
147	4/19/2018	1:11:01 PM	0	204 R	0.1	-2	126	Concrete
148	4/19/2018	1:11:13 PM	10	200 R	0.1	15	84	Concrete
149	4/19/2018	1:11:24 PM	6	197 R	0.1	9	52	Concrete
150	4/19/2018	1:11:36 PM	7	215 R	0.1	10	241	Concrete
151	4/19/2018	1:11:48 PM	4	199 R	0.1	5	73	Concrete
152	4/19/2018	1:11:59 PM	0	196 R	0.1	-2	42	Concrete
153	4/19/2018	1:12:11 PM	6	232 R	0.1	9	420	Concrete
154	4/19/2018	1:12:23 PM	8	188 R	0.1	12	-42	Concrete
155	4/19/2018	1:12:35 PM	9	194 R	0.1	14	21	Concrete
156	4/19/2018	1:12:46 PM	7	228 R	0.1	10	378	Concrete
157	4/19/2018	1:12:58 PM	5	221 R	0.1	7	304	Concrete
158	4/19/2018	1:13:10 PM	12	201 R	0.1	19	94	Concrete
159	4/19/2018	1:13:21 PM	5	189 R	0.1	7	-31	Concrete
160	4/19/2018	1:17:59 PM	1	187 R	0.1 Grid 36	0	-52	
161	4/19/2018	1:18:10 PM	14	197 R	0.1	22	52	
162	4/19/2018	1:18:22 PM	2	216 R	0.1	2	252	

163	4/19/2018	1:18:34 PM	9	205 R	0.1	14	136
164	4/19/2018	1:18:45 PM	10	214 R	0.1	15	231
165	4/19/2018	1:18:57 PM	10	183 R	0.1	15	-94
166	4/19/2018	1:19:09 PM	10	184 R	0.1	15	-84
167	4/19/2018	1:19:20 PM	8	195 R	0.1	12	31
168	4/19/2018	1:19:32 PM	10	191 R	0.1	15	-10
169	4/19/2018	1:19:44 PM	13	188 R	0.1	20	-42
170	4/19/2018	1:19:55 PM	0	187 R	0.1	-2	-52
171	4/19/2018	1:20:07 PM	8	215 R	0.1	12	241
172	4/19/2018	1:20:19 PM	0	188 R	0.1	-2	-42
173	4/19/2018	1:20:30 PM	6	215 R	0.1	9	241
174	4/19/2018	1:20:42 PM	10	189 R	0.1	15	-31
175	4/19/2018	1:20:54 PM	8	187 R	0.1	12	-52
176	4/19/2018	1:21:06 PM	7	195 R	0.1	10	31
177	4/19/2018	1:21:17 PM	12	191 R	0.1	19	-10
178	4/19/2018	1:21:29 PM	2	224 R	0.1	2	336
179	4/19/2018	1:21:41 PM	14	220 R	0.1	22	294
180	4/19/2018	1:21:52 PM	2	186 R	0.1	2	-63
181	4/19/2018	1:22:04 PM	12	204 R	0.1	19	126
182	4/19/2018	1:22:16 PM	0	205 R	0.1	-2	136
183	4/19/2018	1:22:27 PM	10	193 R	0.1	15	10
184	4/19/2018	1:22:39 PM	5	226 R	0.1	7	357
185	4/19/2018	1:22:51 PM	7	249 R	0.1	10	598
186	4/19/2018	1:23:02 PM	1	215 R	0.1	0	241
187	4/19/2018	1:23:14 PM	7	190 R	0.1	10	-21
188	4/19/2018	1:23:26 PM	0	188 R	0.1	-2	-42
189	4/19/2018	1:23:37 PM	12	182 R	0.1	19	-105
190	4/19/2018	1:23:49 PM	0	201 R	0.1	-2	94
191	4/19/2018	1:24:01 PM	3	199 R	0.1	3	73
192	4/19/2018	1:24:13 PM	5	210 R	0.1	7	189
193	4/19/2018	1:24:24 PM	4	194 R	0.1	5	21
194	4/19/2018	1:24:36 PM	4	197 R	0.1	5	52
195	4/19/2018	1:24:48 PM	0	199 R	0.1	-2	73
196	4/19/2018	1:24:59 PM	12	185 R	0.1	19	-73
197	4/19/2018	1:25:11 PM	5	222 R	0.1	7	315
198	4/19/2018	1:25:23 PM	4	212 R	0.1	5	210
199	4/19/2018	1:25:34 PM	2	206 R	0.1	2	147
200	4/19/2018	1:27:18 PM	6	191 R	0.1 Grid 37	9	-10
201	4/19/2018	1:27:30 PM	8	189 R	0.1	12	-31
202	4/19/2018	1:27:42 PM	0	208 R	0.1	-2	168
203	4/19/2018	1:27:53 PM	7	189 R	0.1	10	-31
204	4/19/2018	1:28:05 PM	3	181 R	0.1	3	-115
205	4/19/2018	1:28:17 PM	0	186 R	0.1	-2	-63
206	4/19/2018	1:28:29 PM	4	226 R	0.1	5	357
207	4/19/2018	1:28:40 PM	0	204 R	0.1	-2	126
208	4/19/2018	1:28:52 PM	9	185 R	0.1	14	-73
209	4/19/2018	1:29:04 PM	0	266 R	0.1	-2	777
210	4/19/2018	1:29:15 PM	7	202 R	0.1	10	105
211	4/19/2018	1:29:27 PM	2	211 R	0.1	2	199
212	4/19/2018	1:29:39 PM	4	239 R	0.1	5	493
213	4/19/2018	1:29:50 PM	1	184 R	0.1	0	-84
214	4/19/2018	1:30:02 PM	0	199 R	0.1	-2	73
215	4/19/2018	1:30:14 PM	10	210 R	0.1	15	189
216	4/19/2018	1:30:25 PM	10	194 R	0.1	15	21
217	4/19/2018	1:30:37 PM	0	185 R	0.1	-2	-73
218	4/19/2018	1:30:49 PM	3	200 R	0.1	3	84
219	4/19/2018	1:31:00 PM	13	221 R	0.1	20	304
220	4/19/2018	1:31:12 PM	2	209 R	0.1	2	178
221	4/19/2018	1:31:24 PM	7	189 R	0.1	10	-31

222	4/19/2018	1:31:35 PM	4	221 R	0.1	5	304
223	4/19/2018	1:31:47 PM	11	222 R	0.1	17	315
224	4/19/2018	1:31:59 PM	4	200 R	0.1	5	84
225	4/19/2018	1:32:11 PM	6	183 R	0.1	9	-94
226	4/19/2018	1:32:22 PM	4	221 R	0.1	5	304
227	4/19/2018	1:32:34 PM	4	208 R	0.1	5	168
228	4/19/2018	1:32:46 PM	0	197 R	0.1	-2	52
229	4/19/2018	1:32:57 PM	2	224 R	0.1	2	336
230	4/19/2018	1:33:09 PM	0	184 R	0.1	-2	-84
231	4/19/2018	1:33:21 PM	0	201 R	0.1	-2	94
232	4/19/2018	1:33:32 PM	1	235 R	0.1	0	451
233	4/19/2018	1:33:44 PM	13	230 R	0.1	20	399
234	4/19/2018	1:33:56 PM	13	239 R	0.1	20	493
235	4/19/2018	1:34:07 PM	10	189 R	0.1	15	-31
236	4/19/2018	1:34:19 PM	14	231 R	0.1	22	409
237	4/19/2018	1:34:31 PM	9	240 R	0.1	14	504
238	4/19/2018	1:34:42 PM	2	202 R	0.1	2	105
239	4/19/2018	1:34:54 PM	13	192 R	0.1	20	0
240	4/19/2018	1:36:52 PM	4	196 R	0.1 Grid 38	5	42
241	4/19/2018	1:37:04 PM	9	197 R	0.1	14	52
242	4/19/2018	1:37:15 PM	0	204 R	0.1	-2	126
243	4/19/2018	1:37:27 PM	8	223 R	0.1	12	325
244	4/19/2018	1:37:39 PM	0	190 R	0.1	-2	-21
245	4/19/2018	1:37:50 PM	0	211 R	0.1	-2	199
246	4/19/2018	1:38:02 PM	6	235 R	0.1	9	451
247	4/19/2018	1:38:14 PM	3	185 R	0.1	3	-73
248	4/19/2018	1:38:25 PM	4	259 R	0.1	5	703
249	4/19/2018	1:38:37 PM	8	188 R	0.1	12	-42
250	4/19/2018	1:38:49 PM	6	214 R	0.1	9	231
251	4/19/2018	1:39:00 PM	3	220 R	0.1	3	294
252	4/19/2018	1:39:12 PM	2	208 R	0.1	2	168
253	4/19/2018	1:39:24 PM	9	185 R	0.1	14	-73
254	4/19/2018	1:39:36 PM	13	198 R	0.1	20	63
255	4/19/2018	1:39:47 PM	1	202 R	0.1	0	105
256	4/19/2018	1:39:59 PM	7	204 R	0.1	10	126
257	4/19/2018	1:40:11 PM	0	200 R	0.1	-2	84
258	4/19/2018	1:40:22 PM	11	195 R	0.1	17	31
259	4/19/2018	1:40:34 PM	0	228 R	0.1	-2	378
260	4/19/2018	1:40:46 PM	0	195 R	0.1	-2	31
261	4/19/2018	1:40:57 PM	9	244 R	0.1	14	546
262	4/19/2018	1:41:09 PM	0	211 R	0.1	-2	199
263	4/19/2018	1:41:21 PM	6	186 R	0.1	9	-63
264	4/19/2018	1:41:32 PM	5	187 R	0.1	7	-52
265	4/19/2018	1:41:44 PM	8	228 R	0.1	12	378
266	4/19/2018	1:41:56 PM	6	202 R	0.1	9	105
267	4/19/2018	1:42:07 PM	4	234 R	0.1	5	441
268	4/19/2018	1:42:19 PM	0	219 R	0.1	-2	283
269	4/19/2018	1:42:31 PM	7	210 R	0.1	10	189
270	4/19/2018	1:42:43 PM	9	224 R	0.1	14	336
271	4/19/2018	1:42:54 PM	0	206 R	0.1	-2	147
272	4/19/2018	1:43:06 PM	0	245 R	0.1	-2	556
273	4/19/2018	1:43:18 PM	10	201 R	0.1	15	94
274	4/19/2018	1:43:29 PM	9	199 R	0.1	14	73
275	4/19/2018	1:43:41 PM	5	223 R	0.1	7	325
276	4/19/2018	1:43:53 PM	10	201 R	0.1	15	94
277	4/19/2018	1:44:04 PM	11	217 R	0.1	17	262
278	4/19/2018	1:44:16 PM	3	227 R	0.1	3	367
279	4/19/2018	1:44:28 PM	12	246 R	0.1	19	567
			Maximum:	14	274	22	777

Average:	6	206	9	109
StDev:	4	19	7	183

2360 SN:297766

43-93# 323074

Cal Due Date:

12/20/2018

Surveyor:

Richard Thatcher

Bldg 218

Room 105A North&South Lower Wall Grids 39 thru 43 53 thru 54

Alpha Efficiency: 0.404

Beta/Gamma Efficiency: 0.254

Alpha Background: 1

Beta/Gamma Background: 192

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²	
									Alpha	Beta
1	4/19/2018	2:49:59 PM	11	201	R		0.1	Grid 39	17	94
2	4/19/2018	2:50:11 PM	2	207	R		0.1		2	157
3	4/19/2018	2:50:23 PM	10	202	R		0.1		15	105
4	4/19/2018	2:50:35 PM	9	216	R		0.1		14	252
5	4/19/2018	2:50:46 PM	3	209	R		0.1		3	178
6	4/19/2018	2:50:58 PM	3	188	R		0.1		3	-42
7	4/19/2018	2:51:10 PM	5	193	R		0.1		7	10
8	4/19/2018	2:51:21 PM	10	210	R		0.1		15	189
9	4/19/2018	2:51:33 PM	9	207	R		0.1		14	157
10	4/19/2018	2:51:45 PM	3	209	R		0.1		3	178
11	4/19/2018	2:51:56 PM	7	208	R		0.1		10	168
12	4/19/2018	2:52:08 PM	3	197	R		0.1		3	52
13	4/19/2018	2:52:20 PM	3	212	R		0.1		3	210
14	4/19/2018	2:52:32 PM	9	198	R		0.1		14	63
15	4/19/2018	2:52:43 PM	10	223	R		0.1		15	325
16	4/19/2018	2:52:55 PM	5	226	R		0.1		7	357
17	4/19/2018	2:53:07 PM	6	202	R		0.1		9	105
18	4/19/2018	2:53:18 PM	2	201	R		0.1		2	94
19	4/19/2018	2:53:30 PM	6	220	R		0.1		9	294
20	4/19/2018	2:53:42 PM	6	224	R		0.1		9	336
21	4/19/2018	2:53:53 PM	9	198	R		0.1		14	63
22	4/19/2018	2:54:05 PM	11	211	R		0.1		17	199
23	4/19/2018	2:54:17 PM	12	220	R		0.1		19	294
24	4/19/2018	2:54:29 PM	2	189	R		0.1		2	-31
25	4/19/2018	2:54:40 PM	8	215	R		0.1		12	241
26	4/19/2018	2:54:52 PM	11	214	R		0.1		17	231
27	4/19/2018	2:55:04 PM	1	214	R		0.1		0	231
28	4/19/2018	2:55:15 PM	4	212	R		0.1		5	210
29	4/19/2018	2:55:27 PM	4	229	R		0.1		5	388
30	4/19/2018	2:55:39 PM	11	230	R		0.1		17	399
31	4/19/2018	2:55:50 PM	13	211	R		0.1		20	199
32	4/19/2018	2:56:02 PM	1	213	R		0.1		0	220
33	4/19/2018	2:56:14 PM	6	219	R		0.1		9	283
34	4/19/2018	2:56:26 PM	10	210	R		0.1		15	189
35	4/19/2018	2:56:37 PM	2	202	R		0.1		2	105
36	4/19/2018	2:56:49 PM	10	204	R		0.1		15	126
37	4/19/2018	2:57:01 PM	2	220	R		0.1		2	294
38	4/19/2018	2:57:12 PM	3	217	R		0.1		3	262
39	4/19/2018	2:57:24 PM	7	218	R		0.1		10	273
40	4/19/2018	2:59:07 PM	2	188	R		0.1	Grid 40	2	-42
41	4/19/2018	2:59:19 PM	4	231	R		0.1		5	409

42	4/19/2018	2:59:30 PM	2	197 R	0.1	2	52
43	4/19/2018	2:59:42 PM	10	192 R	0.1	15	0
44	4/19/2018	2:59:54 PM	3	200 R	0.1	3	84
45	4/19/2018	3:00:05 PM	6	187 R	0.1	9	-52
46	4/19/2018	3:00:17 PM	2	211 R	0.1	2	199
47	4/19/2018	3:00:29 PM	9	218 R	0.1	14	273
48	4/19/2018	3:00:40 PM	10	205 R	0.1	15	136
49	4/19/2018	3:00:52 PM	3	199 R	0.1	3	73
50	4/19/2018	3:01:04 PM	10	205 R	0.1	15	136
51	4/19/2018	3:01:15 PM	3	189 R	0.1	3	-31
52	4/19/2018	3:01:27 PM	13	195 R	0.1	20	31
53	4/19/2018	3:01:39 PM	4	189 R	0.1	5	-31
54	4/19/2018	3:01:51 PM	6	193 R	0.1	9	10
55	4/19/2018	3:02:02 PM	8	190 R	0.1	12	-21
56	4/19/2018	3:02:14 PM	8	199 R	0.1	12	73
57	4/19/2018	3:02:26 PM	13	210 R	0.1	20	189
58	4/19/2018	3:02:37 PM	4	212 R	0.1	5	210
59	4/19/2018	3:02:49 PM	6	190 R	0.1	9	-21
60	4/19/2018	3:03:01 PM	1	209 R	0.1	0	178
61	4/19/2018	3:03:12 PM	12	209 R	0.1	19	178
62	4/19/2018	3:03:24 PM	5	183 R	0.1	7	-94
63	4/19/2018	3:03:36 PM	8	219 R	0.1	12	283
64	4/19/2018	3:03:48 PM	2	207 R	0.1	2	157
65	4/19/2018	3:03:59 PM	4	232 R	0.1	5	420
66	4/19/2018	3:04:11 PM	6	208 R	0.1	9	168
67	4/19/2018	3:04:23 PM	10	213 R	0.1	15	220
68	4/19/2018	3:04:34 PM	7	218 R	0.1	10	273
69	4/19/2018	3:04:46 PM	10	206 R	0.1	15	147
70	4/19/2018	3:06:12 PM	10	211 R	0.1 Grid 41	15	199
71	4/19/2018	3:06:23 PM	9	211 R	0.1	14	199
72	4/19/2018	3:06:35 PM	11	232 R	0.1	17	420
73	4/19/2018	3:06:47 PM	6	202 R	0.1	9	105
74	4/19/2018	3:06:59 PM	7	210 R	0.1	10	189
75	4/19/2018	3:07:10 PM	6	230 R	0.1	9	399
76	4/19/2018	3:07:22 PM	12	219 R	0.1	19	283
77	4/19/2018	3:07:34 PM	2	184 R	0.1	2	-84
78	4/19/2018	3:07:45 PM	3	228 R	0.1	3	378
79	4/19/2018	3:07:57 PM	9	214 R	0.1	14	231
80	4/19/2018	3:08:09 PM	0	217 R	0.1	-2	262
81	4/19/2018	3:08:20 PM	1	229 R	0.1	0	388
82	4/19/2018	3:08:32 PM	0	210 R	0.1	-2	189
83	4/19/2018	3:08:44 PM	12	217 R	0.1	19	262
84	4/19/2018	3:08:55 PM	7	204 R	0.1	10	126
85	4/19/2018	3:09:07 PM	8	216 R	0.1	12	252
86	4/19/2018	3:09:19 PM	7	217 R	0.1	10	262
87	4/19/2018	3:09:31 PM	4	186 R	0.1	5	-63
88	4/19/2018	3:09:42 PM	10	187 R	0.1	15	-52
89	4/19/2018	3:09:54 PM	7	191 R	0.1	10	-10
90	4/19/2018	3:10:06 PM	13	228 R	0.1	20	378
91	4/19/2018	3:10:17 PM	3	215 R	0.1	3	241
92	4/19/2018	3:10:29 PM	2	192 R	0.1	2	0
93	4/19/2018	3:10:41 PM	0	233 R	0.1	-2	430
94	4/19/2018	3:10:52 PM	9	186 R	0.1	14	-63
95	4/19/2018	3:11:04 PM	5	232 R	0.1	7	420
96	4/19/2018	3:11:16 PM	7	191 R	0.1	10	-10
97	4/19/2018	3:11:28 PM	10	186 R	0.1	15	-63

98	4/19/2018	3:11:39 PM	1	188 R	0.1	0	-42
99	4/19/2018	3:11:51 PM	6	211 R	0.1	9	199
100	4/19/2018	3:12:03 PM	2	199 R	0.1	2	73
101	4/19/2018	3:12:14 PM	2	227 R	0.1	2	367
102	4/19/2018	3:12:26 PM	4	193 R	0.1	5	10
103	4/19/2018	3:12:38 PM	12	205 R	0.1	19	136
104	4/19/2018	3:12:49 PM	1	203 R	0.1	0	115
105	4/19/2018	3:13:01 PM	5	198 R	0.1	7	63
106	4/19/2018	3:13:13 PM	5	215 R	0.1	7	241
107	4/19/2018	3:13:24 PM	5	197 R	0.1	7	52
108	4/19/2018	3:13:36 PM	8	207 R	0.1	12	157
109	4/19/2018	3:13:48 PM	6	221 R	0.1	9	304
110	4/19/2018	3:15:19 PM	8	204 R	0.1 Grid 42	12	126
111	4/19/2018	3:15:31 PM	4	216 R	0.1	5	252
112	4/19/2018	3:15:42 PM	4	231 R	0.1	5	409
113	4/19/2018	3:15:54 PM	12	188 R	0.1	19	-42
114	4/19/2018	3:16:06 PM	8	233 R	0.1	12	430
115	4/19/2018	3:16:18 PM	8	214 R	0.1	12	231
116	4/19/2018	3:16:29 PM	0	192 R	0.1	-2	0
117	4/19/2018	3:16:41 PM	7	185 R	0.1	10	-73
118	4/19/2018	3:16:53 PM	11	209 R	0.1	17	178
119	4/19/2018	3:17:04 PM	0	197 R	0.1	-2	52
120	4/19/2018	3:17:16 PM	7	210 R	0.1	10	189
121	4/19/2018	3:17:28 PM	6	232 R	0.1	9	420
122	4/19/2018	3:17:39 PM	9	213 R	0.1	14	220
123	4/19/2018	3:17:51 PM	10	231 R	0.1	15	409
124	4/19/2018	3:18:03 PM	8	221 R	0.1	12	304
125	4/19/2018	3:18:14 PM	10	189 R	0.1	15	-31
126	4/19/2018	3:18:26 PM	6	232 R	0.1	9	420
127	4/19/2018	3:18:38 PM	5	191 R	0.1	7	-10
128	4/19/2018	3:18:50 PM	11	224 R	0.1	17	336
129	4/19/2018	3:19:01 PM	9	219 R	0.1	14	283
130	4/19/2018	3:19:13 PM	0	220 R	0.1	-2	294
131	4/19/2018	3:19:25 PM	9	202 R	0.1	14	105
132	4/19/2018	3:19:36 PM	7	229 R	0.1	10	388
133	4/19/2018	3:19:48 PM	4	205 R	0.1	5	136
134	4/19/2018	3:20:00 PM	5	215 R	0.1	7	241
135	4/19/2018	3:20:11 PM	5	196 R	0.1	7	42
136	4/19/2018	3:20:23 PM	10	209 R	0.1	15	178
137	4/19/2018	3:20:35 PM	7	213 R	0.1	10	220
138	4/19/2018	3:20:47 PM	8	206 R	0.1	12	147
139	4/19/2018	3:20:58 PM	9	218 R	0.1	14	273
140	4/19/2018	3:21:10 PM	10	209 R	0.1	15	178
141	4/19/2018	3:21:22 PM	8	195 R	0.1	12	31
142	4/19/2018	3:21:33 PM	4	231 R	0.1	5	409
143	4/19/2018	3:21:45 PM	5	226 R	0.1	7	357
144	4/19/2018	3:21:57 PM	9	215 R	0.1	14	241
145	4/19/2018	3:22:08 PM	2	198 R	0.1	2	63
146	4/19/2018	3:22:20 PM	7	217 R	0.1	10	262
147	4/19/2018	3:22:32 PM	7	185 R	0.1	10	-73
148	4/19/2018	3:22:43 PM	11	188 R	0.1	17	-42
149	4/19/2018	3:22:55 PM	2	205 R	0.1	2	136
150	4/19/2018	3:24:52 PM	6	193 R	0.1 Grid 43	9	10
151	4/19/2018	3:25:03 PM	5	208 R	0.1	7	168
152	4/19/2018	3:25:15 PM	11	216 R	0.1	17	252
153	4/19/2018	3:25:27 PM	1	228 R	0.1	0	378

154	4/19/2018	3:25:39 PM	5	205 R	0.1	7	136
155	4/19/2018	3:25:50 PM	4	187 R	0.1	5	-52
156	4/19/2018	3:26:02 PM	9	222 R	0.1	14	315
157	4/19/2018	3:26:14 PM	0	199 R	0.1	-2	73
158	4/19/2018	3:26:25 PM	0	192 R	0.1	-2	0
159	4/19/2018	3:26:37 PM	12	194 R	0.1	19	21
160	4/19/2018	3:26:49 PM	6	208 R	0.1	9	168
161	4/19/2018	3:27:00 PM	2	218 R	0.1	2	273
162	4/19/2018	3:27:12 PM	5	190 R	0.1	7	-21
163	4/19/2018	3:27:24 PM	13	190 R	0.1	20	-21
164	4/19/2018	3:27:35 PM	9	191 R	0.1	14	-10
165	4/19/2018	3:27:47 PM	7	186 R	0.1	10	-63
166	4/19/2018	3:27:59 PM	4	220 R	0.1	5	294
167	4/19/2018	3:28:10 PM	11	215 R	0.1	17	241
168	4/19/2018	3:28:22 PM	7	195 R	0.1	10	31
169	4/19/2018	3:28:34 PM	5	203 R	0.1	7	115
170	4/19/2018	3:28:46 PM	5	198 R	0.1	7	63
171	4/19/2018	3:28:57 PM	12	196 R	0.1	19	42
172	4/19/2018	3:29:09 PM	1	222 R	0.1	0	315
173	4/19/2018	3:29:21 PM	1	205 R	0.1	0	136
174	4/19/2018	3:29:32 PM	4	197 R	0.1	5	52
175	4/19/2018	3:29:44 PM	4	191 R	0.1	5	-10
176	4/19/2018	3:29:56 PM	4	203 R	0.1	5	115
177	4/19/2018	3:30:07 PM	10	197 R	0.1	15	52
178	4/19/2018	3:30:19 PM	9	220 R	0.1	14	294
179	4/19/2018	3:30:31 PM	7	225 R	0.1	10	346
180	4/19/2018	3:30:42 PM	0	193 R	0.1	-2	10
181	4/19/2018	3:30:54 PM	0	233 R	0.1	-2	430
182	4/19/2018	3:31:06 PM	2	184 R	0.1	2	-84
183	4/19/2018	3:31:18 PM	9	214 R	0.1	14	231
184	4/19/2018	3:31:29 PM	13	192 R	0.1	20	0
185	4/19/2018	3:31:41 PM	13	185 R	0.1	20	-73
186	4/19/2018	3:31:53 PM	5	215 R	0.1	7	241
187	4/19/2018	3:32:04 PM	6	218 R	0.1	9	273
188	4/19/2018	3:32:16 PM	9	190 R	0.1	14	-21
189	4/19/2018	3:32:28 PM	0	230 R	0.1	-2	399
190	4/19/2018	3:34:04 PM	6	225 R	0.1 Grid 53	9	346
191	4/19/2018	3:34:15 PM	0	224 R	0.1	-2	336
192	4/19/2018	3:34:27 PM	5	210 R	0.1	7	189
193	4/19/2018	3:34:39 PM	2	192 R	0.1	2	0
194	4/19/2018	3:34:50 PM	13	184 R	0.1	20	-84
195	4/19/2018	3:35:02 PM	9	188 R	0.1	14	-42
196	4/19/2018	3:35:14 PM	5	193 R	0.1	7	10
197	4/19/2018	3:35:25 PM	0	216 R	0.1	-2	252
198	4/19/2018	3:35:37 PM	11	204 R	0.1	17	126
199	4/19/2018	3:35:49 PM	0	219 R	0.1	-2	283
200	4/19/2018	3:36:00 PM	10	195 R	0.1	15	31
201	4/19/2018	3:36:12 PM	11	197 R	0.1	17	52
202	4/19/2018	3:36:24 PM	2	217 R	0.1	2	262
203	4/19/2018	3:36:36 PM	0	192 R	0.1	-2	0
204	4/19/2018	3:36:47 PM	1	205 R	0.1	0	136
205	4/19/2018	3:36:59 PM	11	196 R	0.1	17	42
206	4/19/2018	3:37:11 PM	11	185 R	0.1	17	-73
207	4/19/2018	3:37:22 PM	5	185 R	0.1	7	-73
208	4/19/2018	3:37:34 PM	13	196 R	0.1	20	42
209	4/19/2018	3:37:46 PM	0	196 R	0.1	-2	42

210	4/19/2018	3:37:57 PM	0	188 R	0.1	-2	-42
211	4/19/2018	3:38:09 PM	4	195 R	0.1	5	31
212	4/19/2018	3:38:21 PM	8	199 R	0.1	12	73
213	4/19/2018	3:38:32 PM	8	189 R	0.1	12	-31
214	4/19/2018	3:38:44 PM	4	211 R	0.1	5	199
215	4/19/2018	3:38:56 PM	5	196 R	0.1	7	42
216	4/19/2018	3:39:07 PM	12	194 R	0.1	19	21
217	4/19/2018	3:39:19 PM	10	220 R	0.1	15	294
218	4/19/2018	3:39:31 PM	2	214 R	0.1	2	231
219	4/19/2018	3:39:43 PM	4	195 R	0.1	5	31
220	4/19/2018	3:39:54 PM	13	214 R	0.1	20	231
221	4/19/2018	3:40:06 PM	1	225 R	0.1	0	346
222	4/19/2018	3:40:18 PM	1	209 R	0.1	0	178
223	4/19/2018	3:40:29 PM	0	194 R	0.1	-2	21
224	4/19/2018	3:40:41 PM	9	206 R	0.1	14	147
225	4/19/2018	3:40:53 PM	3	211 R	0.1	3	199
226	4/19/2018	3:41:04 PM	2	193 R	0.1	2	10
227	4/19/2018	3:41:16 PM	1	201 R	0.1	0	94
228	4/19/2018	3:41:28 PM	10	212 R	0.1	15	210
229	4/19/2018	3:41:39 PM	1	197 R	0.1	0	52
230	4/19/2018	3:43:26 PM	0	205 R	0.1 Grid 54	-2	136
231	4/19/2018	3:43:38 PM	0	204 R	0.1	-2	126
232	4/19/2018	3:43:50 PM	0	219 R	0.1	-2	283
233	4/19/2018	3:44:01 PM	9	214 R	0.1	14	231
234	4/19/2018	3:44:13 PM	5	223 R	0.1	7	325
235	4/19/2018	3:44:25 PM	6	218 R	0.1	9	273
236	4/19/2018	3:44:36 PM	6	208 R	0.1	9	168
237	4/19/2018	3:44:48 PM	7	224 R	0.1	10	336
238	4/19/2018	3:45:00 PM	9	222 R	0.1	14	315
239	4/19/2018	3:45:11 PM	0	230 R	0.1	-2	399
240	4/19/2018	3:45:23 PM	0	214 R	0.1	-2	231
241	4/19/2018	3:45:35 PM	1	216 R	0.1	0	252
242	4/19/2018	3:45:46 PM	3	222 R	0.1	3	315
243	4/19/2018	3:45:58 PM	6	208 R	0.1	9	168
244	4/19/2018	3:46:10 PM	0	208 R	0.1	-2	168
245	4/19/2018	3:46:22 PM	3	213 R	0.1	3	220
246	4/19/2018	3:46:33 PM	6	184 R	0.1	9	-84
247	4/19/2018	3:46:45 PM	9	225 R	0.1	14	346
248	4/19/2018	3:46:57 PM	10	214 R	0.1	15	231
249	4/19/2018	3:47:08 PM	8	206 R	0.1	12	147
250	4/19/2018	3:47:20 PM	0	193 R	0.1	-2	10
251	4/19/2018	3:47:32 PM	12	192 R	0.1	19	0
252	4/19/2018	3:47:43 PM	11	192 R	0.1	17	0
253	4/19/2018	3:47:55 PM	5	183 R	0.1	7	-94
254	4/19/2018	3:48:07 PM	1	212 R	0.1	0	210
255	4/19/2018	3:48:18 PM	5	221 R	0.1	7	304
256	4/19/2018	3:48:30 PM	1	203 R	0.1	0	115
257	4/19/2018	3:48:42 PM	7	201 R	0.1	10	94
258	4/19/2018	3:48:53 PM	5	184 R	0.1	7	-84
259	4/19/2018	3:49:05 PM	3	197 R	0.1	3	52
260	4/19/2018	3:49:17 PM	0	198 R	0.1	-2	63
261	4/19/2018	3:49:29 PM	3	198 R	0.1	3	63
262	4/19/2018	3:49:40 PM	5	200 R	0.1	7	84
263	4/19/2018	3:49:52 PM	7	187 R	0.1	10	-52
264	4/19/2018	3:50:04 PM	0	207 R	0.1	-2	157
265	4/19/2018	3:50:15 PM	4	188 R	0.1	5	-42

266	4/19/2018	3:50:27 PM	4	211 R	0.1	5	199
267	4/19/2018	3:50:39 PM	4	202 R	0.1	5	105
268	4/19/2018	3:50:50 PM	9	227 R	0.1	14	367
269	4/19/2018	3:51:02 PM	4	186 R	0.1	5	-63
		Maximum:	13	233		20	430
		Average:	6	207		8	153
		StDev:	4	14		6	142

2360 SN:297766

43-93# 323074

Cal Due Date: 12/20/2018

Surveyor: Richard Thatcher

Bldg 218

Room 105A North & South Lower Wall Grids 55 thru 61

Alpha Efficiency: 0.404

Beta/Gamma Efficiency: 0.254

Alpha Background: 1

Beta/Gamma Background: 192

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²	
									Alpha	Beta
1	4/20/2018	8:12:12 AM	5	210	R	0.1	Grid 55	7	189	
2	4/20/2018	8:12:24 AM	5	226	R	0.1		7	357	
3	4/20/2018	8:12:36 AM	9	196	R	0.1		14	42	
4	4/20/2018	8:12:47 AM	8	208	R	0.1		12	168	
5	4/20/2018	8:12:59 AM	4	242	R	0.1		5	525	
6	4/20/2018	8:13:11 AM	2	184	R	0.1		2	-84	
7	4/20/2018	8:13:22 AM	11	235	R	0.1		17	451	
8	4/20/2018	8:13:34 AM	6	203	R	0.1		9	115	
9	4/20/2018	8:13:46 AM	5	212	R	0.1		7	210	
10	4/20/2018	8:13:57 AM	1	222	R	0.1		0	315	
11	4/20/2018	8:14:09 AM	13	220	R	0.1		20	294	
12	4/20/2018	8:14:21 AM	3	211	R	0.1		3	199	
13	4/20/2018	8:14:32 AM	6	208	R	0.1		9	168	
14	4/20/2018	8:14:44 AM	10	195	R	0.1		15	31	
15	4/20/2018	8:14:56 AM	6	190	R	0.1		9	-21	
16	4/20/2018	8:15:07 AM	1	233	R	0.1		0	430	
17	4/20/2018	8:15:19 AM	1	224	R	0.1		0	336	
18	4/20/2018	8:15:31 AM	0	219	R	0.1		-2	283	
19	4/20/2018	8:15:42 AM	0	215	R	0.1		-2	241	
20	4/20/2018	8:15:54 AM	9	228	R	0.1		14	378	
21	4/20/2018	8:16:06 AM	7	204	R	0.1		10	126	
22	4/20/2018	8:16:17 AM	6	219	R	0.1		9	283	
23	4/20/2018	8:16:29 AM	4	192	R	0.1		5	0	
24	4/20/2018	8:16:41 AM	8	217	R	0.1		12	262	
25	4/20/2018	8:16:52 AM	11	201	R	0.1		17	94	
26	4/20/2018	8:17:04 AM	0	200	R	0.1		-2	84	
27	4/20/2018	8:17:16 AM	9	222	R	0.1		14	315	
28	4/20/2018	8:17:27 AM	9	217	R	0.1		14	262	
29	4/20/2018	8:17:39 AM	11	224	R	0.1		17	336	
30	4/20/2018	8:17:51 AM	10	218	R	0.1		15	273	
31	4/20/2018	8:18:02 AM	9	184	R	0.1		14	-84	
32	4/20/2018	8:18:14 AM	0	221	R	0.1		-2	304	
33	4/20/2018	8:18:26 AM	6	218	R	0.1		9	273	
34	4/20/2018	8:18:37 AM	4	214	R	0.1		5	231	
35	4/20/2018	8:18:49 AM	3	224	R	0.1		3	336	
36	4/20/2018	8:19:01 AM	5	196	R	0.1		7	42	
37	4/20/2018	8:19:12 AM	5	192	R	0.1		7	0	
38	4/20/2018	8:19:24 AM	5	194	R	0.1		7	21	
39	4/20/2018	8:19:36 AM	10	226	R	0.1		15	357	
40	4/20/2018	8:21:13 AM	3	210	R	0.1	Grid 56	3	189	
41	4/20/2018	8:21:25 AM	7	203	R	0.1		10	115	

42	4/20/2018	8:21:36 AM	2	238 R	0.1	2	483
43	4/20/2018	8:21:48 AM	1	194 R	0.1	0	21
44	4/20/2018	8:22:00 AM	13	230 R	0.1	20	399
45	4/20/2018	8:22:11 AM	9	242 R	0.1	14	525
46	4/20/2018	8:22:23 AM	9	215 R	0.1	14	241
47	4/20/2018	8:22:35 AM	5	205 R	0.1	7	136
48	4/20/2018	8:22:46 AM	4	188 R	0.1	5	-42
49	4/20/2018	8:22:58 AM	11	229 R	0.1	17	388
50	4/20/2018	8:23:10 AM	4	182 R	0.1	5	-105
51	4/20/2018	8:23:21 AM	5	184 R	0.1	7	-84
52	4/20/2018	8:23:33 AM	11	183 R	0.1	17	-94
53	4/20/2018	8:23:45 AM	7	206 R	0.1	10	147
54	4/20/2018	8:23:56 AM	9	200 R	0.1	14	84
55	4/20/2018	8:24:08 AM	7	224 R	0.1	10	336
56	4/20/2018	8:24:20 AM	5	184 R	0.1	7	-84
57	4/20/2018	8:24:31 AM	4	209 R	0.1	5	178
58	4/20/2018	8:24:43 AM	11	205 R	0.1	17	136
59	4/20/2018	8:24:54 AM	1	235 R	0.1	0	451
60	4/20/2018	8:25:06 AM	12	195 R	0.1	19	31
61	4/20/2018	8:25:18 AM	2	219 R	0.1	2	283
62	4/20/2018	8:25:29 AM	2	216 R	0.1	2	252
63	4/20/2018	8:25:41 AM	2	217 R	0.1	2	262
64	4/20/2018	8:25:53 AM	11	199 R	0.1	17	73
65	4/20/2018	8:26:04 AM	4	190 R	0.1	5	-21
66	4/20/2018	8:26:16 AM	9	242 R	0.1	14	525
67	4/20/2018	8:26:28 AM	6	209 R	0.1	9	178
68	4/20/2018	8:26:39 AM	1	218 R	0.1	0	273
69	4/20/2018	8:26:51 AM	7	219 R	0.1	10	283
70	4/20/2018	8:27:03 AM	3	189 R	0.1	3	-31
71	4/20/2018	8:27:14 AM	10	185 R	0.1	15	-73
72	4/20/2018	8:27:26 AM	6	195 R	0.1	9	31
73	4/20/2018	8:27:38 AM	10	193 R	0.1	15	10
74	4/20/2018	8:27:49 AM	9	198 R	0.1	14	63
75	4/20/2018	8:28:01 AM	10	234 R	0.1	15	441
76	4/20/2018	8:28:13 AM	4	181 R	0.1	5	-115
77	4/20/2018	8:28:24 AM	3	180 R	0.1	3	-126
78	4/20/2018	8:28:36 AM	10	183 R	0.1	15	-94
79	4/20/2018	8:28:48 AM	3	230 R	0.1	3	399
80	4/20/2018	8:30:05 AM	10	232 R	0.1 Grid 57	15	420
81	4/20/2018	8:30:17 AM	9	191 R	0.1	14	-10
82	4/20/2018	8:30:28 AM	4	201 R	0.1	5	94
83	4/20/2018	8:30:40 AM	10	208 R	0.1	15	168
84	4/20/2018	8:30:52 AM	3	224 R	0.1	3	336
85	4/20/2018	8:31:03 AM	9	239 R	0.1	14	493
86	4/20/2018	8:31:15 AM	4	242 R	0.1	5	525
87	4/20/2018	8:31:27 AM	11	188 R	0.1	17	-42
88	4/20/2018	8:31:38 AM	8	209 R	0.1	12	178
89	4/20/2018	8:31:50 AM	12	203 R	0.1	19	115
90	4/20/2018	8:32:02 AM	11	184 R	0.1	17	-84
91	4/20/2018	8:32:13 AM	10	211 R	0.1	15	199
92	4/20/2018	8:32:25 AM	6	209 R	0.1	9	178
93	4/20/2018	8:32:37 AM	9	225 R	0.1	14	346
94	4/20/2018	8:32:48 AM	4	196 R	0.1	5	42
95	4/20/2018	8:33:00 AM	12	195 R	0.1	19	31
96	4/20/2018	8:33:12 AM	7	238 R	0.1	10	483
97	4/20/2018	8:33:23 AM	9	196 R	0.1	14	42

98	4/20/2018 8:33:35 AM	9	194 R	0.1	14	21
99	4/20/2018 8:33:47 AM	2	199 R	0.1	2	73
100	4/20/2018 8:33:58 AM	2	182 R	0.1	2	-105
101	4/20/2018 8:34:10 AM	3	199 R	0.1	3	73
102	4/20/2018 8:34:21 AM	12	195 R	0.1	19	31
103	4/20/2018 8:34:33 AM	6	187 R	0.1	9	-52
104	4/20/2018 8:34:45 AM	8	218 R	0.1	12	273
105	4/20/2018 8:34:56 AM	6	230 R	0.1	9	399
106	4/20/2018 8:35:08 AM	4	185 R	0.1	5	-73
107	4/20/2018 8:35:20 AM	4	188 R	0.1	5	-42
108	4/20/2018 8:35:31 AM	5	186 R	0.1	7	-63
109	4/20/2018 8:35:43 AM	5	216 R	0.1	7	252
110	4/20/2018 8:35:55 AM	6	185 R	0.1	9	-73
111	4/20/2018 8:36:06 AM	4	181 R	0.1	5	-115
112	4/20/2018 8:36:18 AM	12	188 R	0.1	19	-42
113	4/20/2018 8:36:30 AM	8	203 R	0.1	12	115
114	4/20/2018 8:36:41 AM	9	216 R	0.1	14	252
115	4/20/2018 8:36:53 AM	8	190 R	0.1	12	-21
116	4/20/2018 8:37:05 AM	7	217 R	0.1	10	262
117	4/20/2018 8:37:16 AM	4	185 R	0.1	5	-73
118	4/20/2018 8:37:28 AM	6	209 R	0.1	9	178
119	4/20/2018 8:37:40 AM	8	189 R	0.1	12	-31
120	4/20/2018 8:39:09 AM	6	218 R	0.1 Grid 58	9	273
121	4/20/2018 8:39:20 AM	7	226 R	0.1	10	357
122	4/20/2018 8:39:32 AM	4	185 R	0.1	5	-73
123	4/20/2018 8:39:44 AM	6	219 R	0.1	9	283
124	4/20/2018 8:39:55 AM	6	189 R	0.1	9	-31
125	4/20/2018 8:40:07 AM	2	200 R	0.1	2	84
126	4/20/2018 8:40:19 AM	11	205 R	0.1	17	136
127	4/20/2018 8:40:30 AM	9	200 R	0.1	14	84
128	4/20/2018 8:40:42 AM	6	218 R	0.1	9	273
129	4/20/2018 8:40:54 AM	4	234 R	0.1	5	441
130	4/20/2018 8:41:05 AM	7	221 R	0.1	10	304
131	4/20/2018 8:41:17 AM	9	203 R	0.1	14	115
132	4/20/2018 8:41:29 AM	13	216 R	0.1	20	252
133	4/20/2018 8:41:40 AM	10	180 R	0.1	15	-126
134	4/20/2018 8:41:52 AM	11	201 R	0.1	17	94
135	4/20/2018 8:42:03 AM	3	213 R	0.1	3	220
136	4/20/2018 8:42:15 AM	7	200 R	0.1	10	84
137	4/20/2018 8:42:27 AM	12	207 R	0.1	19	157
138	4/20/2018 8:42:38 AM	9	227 R	0.1	14	367
139	4/20/2018 8:42:50 AM	8	197 R	0.1	12	52
140	4/20/2018 8:43:02 AM	9	196 R	0.1	14	42
141	4/20/2018 8:43:13 AM	1	224 R	0.1	0	336
142	4/20/2018 8:43:25 AM	10	210 R	0.1	15	189
143	4/20/2018 8:43:37 AM	5	217 R	0.1	7	262
144	4/20/2018 8:43:48 AM	11	214 R	0.1	17	231
145	4/20/2018 8:44:00 AM	4	182 R	0.1	5	-105
146	4/20/2018 8:44:12 AM	10	193 R	0.1	15	10
147	4/20/2018 8:44:23 AM	2	207 R	0.1	2	157
148	4/20/2018 8:44:35 AM	11	193 R	0.1	17	10
149	4/20/2018 8:44:47 AM	4	202 R	0.1	5	105
150	4/20/2018 8:44:58 AM	5	225 R	0.1	7	346
151	4/20/2018 8:45:10 AM	8	212 R	0.1	12	210
152	4/20/2018 8:45:22 AM	2	218 R	0.1	2	273
153	4/20/2018 8:45:33 AM	4	190 R	0.1	5	-21

154	4/20/2018	8:45:45 AM	10	211 R	0.1	15	199
155	4/20/2018	8:45:57 AM	7	187 R	0.1	10	-52
156	4/20/2018	8:46:08 AM	4	184 R	0.1	5	-84
157	4/20/2018	8:46:20 AM	3	201 R	0.1	3	94
158	4/20/2018	8:46:32 AM	5	200 R	0.1	7	84
159	4/20/2018	8:46:43 AM	8	213 R	0.1	12	220
160	4/20/2018	8:48:23 AM	4	221 R	0.1 Grid 59	5	304
161	4/20/2018	8:48:34 AM	12	209 R	0.1	19	178
162	4/20/2018	8:48:46 AM	4	183 R	0.1	5	-94
163	4/20/2018	8:48:58 AM	2	201 R	0.1	2	94
164	4/20/2018	8:49:09 AM	3	203 R	0.1	3	115
165	4/20/2018	8:49:21 AM	3	184 R	0.1	3	-84
166	4/20/2018	8:49:33 AM	7	222 R	0.1	10	315
167	4/20/2018	8:49:44 AM	4	189 R	0.1	5	-31
168	4/20/2018	8:49:56 AM	9	233 R	0.1	14	430
169	4/20/2018	8:50:08 AM	6	192 R	0.1	9	0
170	4/20/2018	8:50:19 AM	4	193 R	0.1	5	10
171	4/20/2018	8:50:31 AM	9	223 R	0.1	14	325
172	4/20/2018	8:50:43 AM	12	224 R	0.1	19	336
173	4/20/2018	8:50:54 AM	3	212 R	0.1	3	210
174	4/20/2018	8:51:06 AM	4	225 R	0.1	5	346
175	4/20/2018	8:51:18 AM	12	201 R	0.1	19	94
176	4/20/2018	8:51:29 AM	7	197 R	0.1	10	52
177	4/20/2018	8:51:41 AM	5	209 R	0.1	7	178
178	4/20/2018	8:51:53 AM	4	184 R	0.1	5	-84
179	4/20/2018	8:52:04 AM	12	239 R	0.1	19	493
180	4/20/2018	8:52:16 AM	13	226 R	0.1	20	357
181	4/20/2018	8:52:28 AM	5	182 R	0.1	7	-105
182	4/20/2018	8:52:39 AM	5	198 R	0.1	7	63
183	4/20/2018	8:52:51 AM	7	206 R	0.1	10	147
184	4/20/2018	8:53:03 AM	10	213 R	0.1	15	220
185	4/20/2018	8:53:14 AM	9	238 R	0.1	14	483
186	4/20/2018	8:53:26 AM	10	223 R	0.1	15	325
187	4/20/2018	8:53:38 AM	10	229 R	0.1	15	388
188	4/20/2018	8:53:49 AM	6	229 R	0.1	9	388
189	4/20/2018	8:54:01 AM	11	217 R	0.1	17	262
190	4/20/2018	8:54:13 AM	10	224 R	0.1	15	336
191	4/20/2018	8:54:24 AM	2	227 R	0.1	2	367
192	4/20/2018	8:54:36 AM	2	185 R	0.1	2	-73
193	4/20/2018	8:54:48 AM	11	215 R	0.1	17	241
194	4/20/2018	8:54:59 AM	9	201 R	0.1	14	94
195	4/20/2018	8:55:11 AM	3	193 R	0.1	3	10
196	4/20/2018	8:55:23 AM	3	201 R	0.1	3	94
197	4/20/2018	8:55:34 AM	1	211 R	0.1	0	199
198	4/20/2018	8:55:46 AM	11	196 R	0.1	17	42
199	4/20/2018	8:55:58 AM	2	216 R	0.1	2	252
200	4/20/2018	8:57:33 AM	10	206 R	0.1 Grid 60	15	147
201	4/20/2018	8:57:45 AM	5	204 R	0.1	7	126
202	4/20/2018	8:57:57 AM	11	208 R	0.1	17	168
203	4/20/2018	8:58:08 AM	6	207 R	0.1	9	157
204	4/20/2018	8:58:20 AM	12	193 R	0.1	19	10
205	4/20/2018	8:58:32 AM	7	238 R	0.1	10	483
206	4/20/2018	8:58:43 AM	1	194 R	0.1	0	21
207	4/20/2018	8:58:55 AM	7	207 R	0.1	10	157
208	4/20/2018	8:59:07 AM	4	184 R	0.1	5	-84
209	4/20/2018	8:59:18 AM	0	208 R	0.1	-2	168

210	4/20/2018	8:59:30 AM	2	194 R	0.1	2	21
211	4/20/2018	8:59:42 AM	3	225 R	0.1	3	346
212	4/20/2018	8:59:53 AM	13	195 R	0.1	20	31
213	4/20/2018	9:00:05 AM	7	204 R	0.1	10	126
214	4/20/2018	9:00:17 AM	11	203 R	0.1	17	115
215	4/20/2018	9:00:28 AM	3	205 R	0.1	3	136
216	4/20/2018	9:00:40 AM	2	226 R	0.1	2	357
217	4/20/2018	9:00:52 AM	11	226 R	0.1	17	357
218	4/20/2018	9:01:03 AM	0	196 R	0.1	-2	42
219	4/20/2018	9:01:15 AM	0	202 R	0.1	-2	105
220	4/20/2018	9:01:27 AM	2	216 R	0.1	2	252
221	4/20/2018	9:01:38 AM	3	218 R	0.1	3	273
222	4/20/2018	9:01:50 AM	5	239 R	0.1	7	493
223	4/20/2018	9:02:02 AM	1	192 R	0.1	0	0
224	4/20/2018	9:02:13 AM	4	210 R	0.1	5	189
225	4/20/2018	9:02:25 AM	7	223 R	0.1	10	325
226	4/20/2018	9:02:37 AM	3	182 R	0.1	3	-105
227	4/20/2018	9:02:48 AM	11	211 R	0.1	17	199
228	4/20/2018	9:03:00 AM	3	184 R	0.1	3	-84
229	4/20/2018	9:03:12 AM	2	205 R	0.1	2	136
230	4/20/2018	9:03:23 AM	8	231 R	0.1	12	409
231	4/20/2018	9:03:35 AM	8	204 R	0.1	12	126
232	4/20/2018	9:03:47 AM	6	184 R	0.1	9	-84
233	4/20/2018	9:03:58 AM	11	225 R	0.1	17	346
234	4/20/2018	9:04:10 AM	5	218 R	0.1	7	273
235	4/20/2018	9:04:22 AM	4	222 R	0.1	5	315
236	4/20/2018	9:04:33 AM	10	232 R	0.1	15	420
237	4/20/2018	9:04:45 AM	2	221 R	0.1	2	304
238	4/20/2018	9:04:57 AM	3	194 R	0.1	3	21
239	4/20/2018	9:05:08 AM	7	238 R	0.1	10	483
240	4/20/2018	9:06:59 AM	9	220 R	0.1 Grid 61	14	294
241	4/20/2018	9:07:11 AM	0	214 R	0.1	-2	231
242	4/20/2018	9:07:23 AM	7	214 R	0.1	10	231
243	4/20/2018	9:07:34 AM	0	190 R	0.1	-2	-21
244	4/20/2018	9:07:46 AM	2	216 R	0.1	2	252
245	4/20/2018	9:07:58 AM	9	219 R	0.1	14	283
246	4/20/2018	9:08:09 AM	7	240 R	0.1	10	504
247	4/20/2018	9:08:21 AM	5	236 R	0.1	7	462
248	4/20/2018	9:08:33 AM	9	214 R	0.1	14	231
249	4/20/2018	9:08:44 AM	2	188 R	0.1	2	-42
250	4/20/2018	9:08:56 AM	9	186 R	0.1	14	-63
251	4/20/2018	9:09:08 AM	12	198 R	0.1	19	63
252	4/20/2018	9:09:19 AM	3	196 R	0.1	3	42
253	4/20/2018	9:09:31 AM	7	211 R	0.1	10	199
254	4/20/2018	9:09:43 AM	6	213 R	0.1	9	220
255	4/20/2018	9:09:54 AM	8	222 R	0.1	12	315
256	4/20/2018	9:10:06 AM	8	193 R	0.1	12	10
257	4/20/2018	9:10:18 AM	5	187 R	0.1	7	-52
258	4/20/2018	9:10:29 AM	0	189 R	0.1	-2	-31
259	4/20/2018	9:10:41 AM	2	186 R	0.1	2	-63
260	4/20/2018	9:10:53 AM	4	186 R	0.1	5	-63
261	4/20/2018	9:11:04 AM	1	209 R	0.1	0	178
262	4/20/2018	9:11:16 AM	2	209 R	0.1	2	178
263	4/20/2018	9:11:28 AM	7	237 R	0.1	10	472
264	4/20/2018	9:11:39 AM	0	203 R	0.1	-2	115
265	4/20/2018	9:11:51 AM	0	215 R	0.1	-2	241

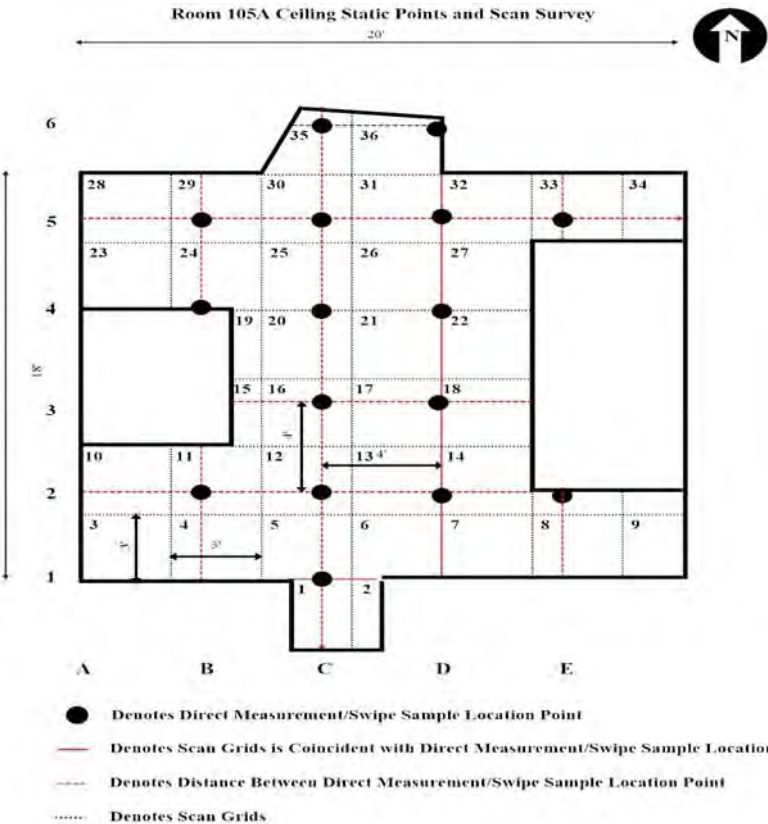
266	4/20/2018 9:12:03 AM	6	223 R	0.1	9	325
267	4/20/2018 9:12:14 AM	4	214 R	0.1	5	231
268	4/20/2018 9:12:26 AM	5	189 R	0.1	7	-31
269	4/20/2018 9:12:38 AM	2	213 R	0.1	2	220
270	4/20/2018 9:12:49 AM	3	193 R	0.1	3	10
271	4/20/2018 9:13:01 AM	4	202 R	0.1	5	105
272	4/20/2018 9:13:13 AM	1	208 R	0.1	0	168
273	4/20/2018 9:13:24 AM	2	198 R	0.1	2	63
274	4/20/2018 9:13:36 AM	10	201 R	0.1	15	94
275	4/20/2018 9:13:48 AM	5	229 R	0.1	7	388
276	4/20/2018 9:13:59 AM	8	213 R	0.1	12	220
277	4/20/2018 9:14:11 AM	7	192 R	0.1	10	0
278	4/20/2018 9:14:23 AM	9	205 R	0.1	14	136
279	4/20/2018 9:14:34 AM	6	214 R	0.1	9	231
	Maximum:	13	242		20	525
	Average:	6	208		9	164
	StDev:	3	16		6	169

Room 105A Ceiling/Overhead

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018		TIME: 13:45		INSTRUMENTATION USED					
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	297758	2/14/2019	α	44.4%	α 11.1%	α 43.2	α 9.0
		43-93	299597		βγ	31.3%	βγ 15.7%	βγ 287.7	βγ 1118.2
LOCATION: Room 105A Ceiling		2929	146870	6/17/2019	α	64.6%	α 16.2%	α 15.9	α 1.2
					βγ	53.0%	βγ 26.5%	βγ 62.8	βγ 149.8
SURVEYOR: Adolfo Matus									
DATE: 4/23/2018	TIME: 14:04	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Beach Detachment



Comments:

The 3' by 3' area at each direct measurement location was 100% gross alpha/beta-gamma surveyed.
 Scan results were: 0-5 CPM alpha, 160-200 cpm beta-gamma.

denotes swipe location and fixed α/β readings
 # denotes G/A radiation readings
 #/# denotes contact / 1 meter radiation readings.
 * denotes highest radiation reading on contact
 LAW denotes large area masslinn wipe
 Δ denotes static location.
 + Unless Otherwise Noted
 All readings in mri/hr unless otherwise noted
 K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Adolfo Matus			LOCATION: Room 105A Ceiling					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
C1				13.5	169.3	-1.2	-14.0	See Map For Location
B2				9.0	220.4	-1.2	-15.8	See Map For Location
C2				4.5	182.1	-1.2	-0.8	See Map For Location
D2				-4.5	293.9	-1.2	-19.6	See Map For Location
E2				4.5	162.9	-1.2	3.0	See Map For Location
C3				-4.5	159.7	-1.2	-4.5	See Map For Location
D3				4.5	198.1	-1.2	-21.5	See Map For Location
B4				0.0	121.4	1.9	8.7	See Map For Location
C4				0.0	150.2	1.9	-19.6	See Map For Location
D4				0.0	16.0	-1.2	-8.3	See Map For Location
B5				-4.5	162.9	-1.2	-14.0	See Map For Location
C5				-4.5	150.2	-1.2	-10.2	See Map For Location
D5				4.5	156.5	-1.2	-2.6	See Map For Location
E5				13.5	115.0	1.9	-19.6	See Map For Location
C6				-9.0	38.3	-1.2	-6.4	See Map For Location
D6				0.0	124.6	-1.2	-15.8	See Map For Location
D2D						-1.2	-23.4	Duplicate Swipe
C5D						-1.2	-12.1	Duplicate Swipe
Maximum:				13.5	293.9	1.9	8.7	
Average:				1.7	151.4	-0.7	-10.9	
StDev:				6.6	64.8	1.2	9.0	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
Reviewer	Date: 4/23/2018							
Daniel Spicuzza	Time: 14:04							

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Building 227
Room 100 Floor

2360 SN:268488

43-37 #190672

Cal Due Date: 10/27/2018

Surveyor: Josefina Matus

Bldg 227

Room 100 Floor Grids 1 thru 30

Alpha Efficiency: 0.302

Beta/Gamma Efficiency: 0.37

Alpha Background: 5.8

Beta/Gamma Background: 881

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count Time	Location	dpm/100cm ²	
								Alpha	Beta
1	4/11/2018	12:55:08 PM	9	850	R	0.1	Grid 1	7	-38
2	4/11/2018	12:55:20 PM	7	884	R	0.1		3	4
3	4/11/2018	12:55:31 PM	10	842	R	0.1		10	-48
4	4/11/2018	12:55:43 PM	2	921	R	0.1		-9	50
5	4/11/2018	12:55:55 PM	3	907	R	0.1		-6	32
6	4/11/2018	12:56:06 PM	0	897	R	0.1		-13	20
7	4/11/2018	12:56:18 PM	3	799	R	0.1		-6	-102
8	4/11/2018	12:56:30 PM	3	826	R	0.1		-6	-68
9	4/11/2018	12:56:42 PM	7	860	R	0.1		3	-26
10	4/11/2018	12:58:16 PM	5	822	R	0.1	Grid 2	-2	-73
11	4/11/2018	12:58:28 PM	0	895	R	0.1		-13	17
12	4/11/2018	12:58:40 PM	10	843	R	0.1		10	-47
13	4/11/2018	12:58:51 PM	2	843	R	0.1		-9	-47
14	4/11/2018	12:59:03 PM	0	920	R	0.1		-13	48
15	4/11/2018	12:59:15 PM	4	865	R	0.1		-4	-20
16	4/11/2018	12:59:26 PM	1	898	R	0.1		-11	21
17	4/11/2018	12:59:38 PM	0	795	R	0.1		-13	-106
18	4/11/2018	12:59:50 PM	0	812	R	0.1		-13	-85
19	4/11/2018	1:00:02 PM	8	923	R	0.1		5	52
20	4/11/2018	1:01:01 PM	18	899	R	0.1	Grid 3	28	22
21	4/11/2018	1:01:12 PM	4	786	R	0.1		-4	-118
22	4/11/2018	1:01:24 PM	7	810	R	0.1		3	-88
23	4/11/2018	1:01:36 PM	8	823	R	0.1		5	-72
24	4/11/2018	1:01:48 PM	2	958	R	0.1		-9	95
25	4/11/2018	1:01:59 PM	10	968	R	0.1		10	108
26	4/11/2018	1:02:11 PM	2	980	R	0.1		-9	123
27	4/11/2018	1:02:23 PM	0	934	R	0.1		-13	66
28	4/11/2018	1:02:34 PM	5	860	R	0.1		-2	-26
29	4/11/2018	1:02:46 PM	3	853	R	0.1		-6	-35
30	4/11/2018	1:04:22 PM	3	838	R	0.1	Grid 4	-6	-53
31	4/11/2018	1:04:34 PM	6	726	R	0.1		0	-192
32	4/11/2018	1:04:45 PM	0	741	R	0.1		-13	-173
33	4/11/2018	1:04:57 PM	8	758	R	0.1		5	-152
34	4/11/2018	1:05:09 PM	0	790	R	0.1		-13	-113
35	4/11/2018	1:05:21 PM	7	735	R	0.1		3	-181
36	4/11/2018	1:05:32 PM	0	739	R	0.1		-13	-176
37	4/11/2018	1:05:44 PM	15	780	R	0.1		21	-125
38	4/11/2018	1:05:56 PM	3	848	R	0.1		-6	-41
39	4/11/2018	1:06:07 PM	16	799	R	0.1		23	-102
40	4/11/2018	1:09:35 PM	0	831	R	0.1	Grid 5	-13	-62

41	4/11/2018	1:09:46 PM	5	780 R	0.1	-2	-125
42	4/11/2018	1:09:58 PM	1	826 R	0.1	-11	-68
43	4/11/2018	1:10:10 PM	6	691 R	0.1	0	-235
44	4/11/2018	1:10:21 PM	0	761 R	0.1	-13	-149
45	4/11/2018	1:10:33 PM	8	926 R	0.1	5	56
46	4/11/2018	1:10:45 PM	2	911 R	0.1	-9	37
47	4/11/2018	1:10:56 PM	0	907 R	0.1	-13	32
48	4/11/2018	1:11:08 PM	9	793 R	0.1	7	-109
49	4/11/2018	1:11:20 PM	2	841 R	0.1	-9	-50
50	4/11/2018	1:12:29 PM	6	878 R	0.1 Grid 6	0	-4
51	4/11/2018	1:12:41 PM	1	975 R	0.1	-11	116
52	4/11/2018	1:12:52 PM	4	935 R	0.1	-4	67
53	4/11/2018	1:13:04 PM	1	965 R	0.1	-11	104
54	4/11/2018	1:13:16 PM	0	888 R	0.1	-13	9
55	4/11/2018	1:13:28 PM	7	966 R	0.1	3	105
56	4/11/2018	1:13:39 PM	6	1015 R	0.1	0	166
57	4/11/2018	1:13:51 PM	1	905 R	0.1	-11	30
58	4/11/2018	1:14:03 PM	0	888 R	0.1	-13	9
59	4/11/2018	1:14:14 PM	6	811 R	0.1	0	-87
60	4/11/2018	1:16:18 PM	6	817 R	0.1 Grid 7	0	-79
61	4/11/2018	1:16:29 PM	12	746 R	0.1	14	-167
62	4/11/2018	1:16:41 PM	3	774 R	0.1	-6	-133
63	4/11/2018	1:16:53 PM	0	806 R	0.1	-13	-93
64	4/11/2018	1:17:04 PM	0	874 R	0.1	-13	-9
65	4/11/2018	1:17:16 PM	0	826 R	0.1	-13	-68
66	4/11/2018	1:17:28 PM	13	799 R	0.1	16	-102
67	4/11/2018	1:17:39 PM	6	856 R	0.1	0	-31
68	4/11/2018	1:17:51 PM	1	758 R	0.1	-11	-152
69	4/11/2018	1:18:03 PM	5	765 R	0.1	-2	-144
70	4/11/2018	1:19:01 PM	0	823 R	0.1 Grid 8	-13	-72
71	4/11/2018	1:19:12 PM	3	741 R	0.1	-6	-173
72	4/11/2018	1:19:24 PM	4	756 R	0.1	-4	-155
73	4/11/2018	1:19:36 PM	5	800 R	0.1	-2	-100
74	4/11/2018	1:19:48 PM	0	850 R	0.1	-13	-38
75	4/11/2018	1:19:59 PM	3	862 R	0.1	-6	-24
76	4/11/2018	1:20:11 PM	0	853 R	0.1	-13	-35
77	4/11/2018	1:20:23 PM	3	787 R	0.1	-6	-116
78	4/11/2018	1:20:34 PM	7	845 R	0.1	3	-45
79	4/11/2018	1:20:46 PM	1	832 R	0.1	-11	-61
80	4/11/2018	1:21:47 PM	7	882 R	0.1 Grid 9	3	1
81	4/11/2018	1:21:59 PM	1	770 R	0.1	-11	-137
82	4/11/2018	1:22:10 PM	6	844 R	0.1	0	-46
83	4/11/2018	1:22:22 PM	5	848 R	0.1	-2	-41
84	4/11/2018	1:22:34 PM	7	740 R	0.1	3	-175
85	4/11/2018	1:22:45 PM	0	878 R	0.1	-13	-4
86	4/11/2018	1:22:57 PM	0	803 R	0.1	-13	-97
87	4/11/2018	1:23:09 PM	12	809 R	0.1	14	-89
88	4/11/2018	1:23:20 PM	3	816 R	0.1	-6	-80
89	4/11/2018	1:23:32 PM	11	804 R	0.1	12	-95
90	4/11/2018	1:24:33 PM	3	799 R	0.1 Grid 10	-6	-102
91	4/11/2018	1:24:45 PM	0	823 R	0.1	-13	-72
92	4/11/2018	1:24:57 PM	0	865 R	0.1	-13	-20
93	4/11/2018	1:25:09 PM	4	768 R	0.1	-4	-140
94	4/11/2018	1:25:20 PM	1	821 R	0.1	-11	-74
95	4/11/2018	1:25:32 PM	5	897 R	0.1	-2	20

96	4/11/2018	1:25:44 PM	5	925 R	0.1	-2	54
97	4/11/2018	1:25:55 PM	0	949 R	0.1	-13	84
98	4/11/2018	1:26:07 PM	7	871 R	0.1	3	-12
99	4/11/2018	1:26:19 PM	1	915 R	0.1	-11	42
100	4/11/2018	1:28:03 PM	0	845 R	0.1 Grid 11	-13	-45
101	4/11/2018	1:28:15 PM	8	830 R	0.1	5	-63
102	4/11/2018	1:28:27 PM	6	901 R	0.1	0	25
103	4/11/2018	1:28:38 PM	5	804 R	0.1	-2	-95
104	4/11/2018	1:28:50 PM	0	877 R	0.1	-13	-5
105	4/11/2018	1:29:02 PM	8	833 R	0.1	5	-59
106	4/11/2018	1:29:13 PM	7	848 R	0.1	3	-41
107	4/11/2018	1:29:25 PM	0	843 R	0.1	-13	-47
108	4/11/2018	1:29:37 PM	6	876 R	0.1	0	-6
109	4/11/2018	1:29:48 PM	3	875 R	0.1	-6	-7
110	4/11/2018	1:30:57 PM	4	838 R	0.1 Grid 12	-4	-53
111	4/11/2018	1:31:09 PM	6	962 R	0.1	0	100
112	4/11/2018	1:31:21 PM	1	956 R	0.1	-11	93
113	4/11/2018	1:31:32 PM	0	936 R	0.1	-13	68
114	4/11/2018	1:31:44 PM	0	1003 R	0.1	-13	151
115	4/11/2018	1:31:56 PM	4	1023 R	0.1	-4	176
116	4/11/2018	1:32:07 PM	1	982 R	0.1	-11	125
117	4/11/2018	1:32:19 PM	0	950 R	0.1	-13	85
118	4/11/2018	1:32:31 PM	4	1070 R	0.1	-4	234
119	4/11/2018	1:32:43 PM	1	1053 R	0.1	-11	213
120	4/11/2018	1:34:27 PM	0	895 R	0.1 Grid 13	-13	17
121	4/11/2018	1:34:39 PM	5	811 R	0.1	-2	-87
122	4/11/2018	1:34:50 PM	1	886 R	0.1	-11	6
123	4/11/2018	1:35:02 PM	0	869 R	0.1	-13	-15
124	4/11/2018	1:35:14 PM	8	912 R	0.1	5	38
125	4/11/2018	1:35:26 PM	7	790 R	0.1	3	-113
126	4/11/2018	1:35:37 PM	1	838 R	0.1	-11	-53
127	4/11/2018	1:35:49 PM	6	817 R	0.1	0	-79
128	4/11/2018	1:36:01 PM	8	809 R	0.1	5	-89
129	4/11/2018	1:36:12 PM	5	842 R	0.1	-2	-48
130	4/11/2018	1:37:13 PM	7	862 R	0.1 Grid 14	3	-24
131	4/11/2018	1:37:25 PM	0	815 R	0.1	-13	-82
132	4/11/2018	1:37:36 PM	6	821 R	0.1	0	-74
133	4/11/2018	1:37:48 PM	0	939 R	0.1	-13	72
134	4/11/2018	1:38:00 PM	3	838 R	0.1	-6	-53
135	4/11/2018	1:38:11 PM	9	843 R	0.1	7	-47
136	4/11/2018	1:38:23 PM	2	958 R	0.1	-9	95
137	4/11/2018	1:38:35 PM	0	872 R	0.1	-13	-11
138	4/11/2018	1:38:47 PM	0	885 R	0.1	-13	5
139	4/11/2018	1:38:58 PM	0	846 R	0.1	-13	-43
140	4/11/2018	1:39:48 PM	0	796 R	0.1 Grid 15	-13	-105
141	4/11/2018	1:40:00 PM	13	849 R	0.1	16	-40
142	4/11/2018	1:40:11 PM	7	821 R	0.1	3	-74
143	4/11/2018	1:40:23 PM	9	805 R	0.1	7	-94
144	4/11/2018	1:40:35 PM	10	833 R	0.1	10	-59
145	4/11/2018	1:40:46 PM	2	837 R	0.1	-9	-54
146	4/11/2018	1:40:58 PM	0	874 R	0.1	-13	-9
147	4/11/2018	1:41:10 PM	0	958 R	0.1	-13	95
148	4/11/2018	1:41:21 PM	4	811 R	0.1	-4	-87
149	4/11/2018	1:41:33 PM	1	827 R	0.1	-11	-67
150	4/11/2018	1:42:25 PM	0	524 R	0.1 Grid 16	-13	-442

151	4/11/2018	1:42:37 PM	0	841 R	0.1	-13	-50
152	4/11/2018	1:42:49 PM	0	785 R	0.1	-13	-119
153	4/11/2018	1:43:00 PM	11	906 R	0.1	12	31
154	4/11/2018	1:43:12 PM	2	879 R	0.1	-9	-2
155	4/11/2018	1:43:24 PM	0	867 R	0.1	-13	-17
156	4/11/2018	1:43:36 PM	22	831 R	0.1	37	-62
157	4/11/2018	1:43:47 PM	5	805 R	0.1	-2	-94
158	4/11/2018	1:43:59 PM	1	867 R	0.1	-11	-17
159	4/11/2018	1:44:11 PM	4	854 R	0.1	-4	-33
160	4/11/2018	1:49:53 PM	5	911 R	0.1 Grid 17	-2	37
161	4/11/2018	1:50:04 PM	9	792 R	0.1	7	-110
162	4/11/2018	1:50:16 PM	7	826 R	0.1	3	-68
163	4/11/2018	1:50:28 PM	0	834 R	0.1	-13	-58
164	4/11/2018	1:50:40 PM	8	830 R	0.1	5	-63
165	4/11/2018	1:58:13 PM	0	866 R	0.1 Grid 19	-13	-19
166	4/11/2018	1:58:25 PM	9	953 R	0.1	7	89
167	4/11/2018	1:58:37 PM	2	926 R	0.1	-9	56
168	4/11/2018	1:58:49 PM	0	1022 R	0.1	-13	175
169	4/11/2018	1:59:00 PM	7	1064 R	0.1	3	227
170	4/11/2018	1:59:12 PM	1	828 R	0.1	-11	-66
171	4/11/2018	1:59:24 PM	3	799 R	0.1	-6	-102
172	4/11/2018	1:59:35 PM	7	763 R	0.1	3	-146
173	4/11/2018	1:59:47 PM	1	773 R	0.1	-11	-134
174	4/11/2018	1:59:59 PM	6	954 R	0.1	0	90
175	4/11/2018	2:00:55 PM	0	677 R	0.1 Grid 20	-13	-253
176	4/11/2018	2:01:06 PM	7	834 R	0.1	3	-58
177	4/11/2018	2:01:18 PM	9	798 R	0.1	7	-103
178	4/11/2018	2:01:30 PM	6	858 R	0.1	0	-28
179	4/11/2018	2:01:41 PM	8	785 R	0.1	5	-119
180	4/11/2018	2:01:53 PM	0	771 R	0.1	-13	-136
181	4/11/2018	2:02:05 PM	7	747 R	0.1	3	-166
182	4/11/2018	2:02:16 PM	11	807 R	0.1	12	-92
183	4/11/2018	2:02:28 PM	2	799 R	0.1	-9	-102
184	4/11/2018	2:02:40 PM	0	876 R	0.1	-13	-6
185	4/11/2018	2:03:37 PM	0	811 R	0.1 Grid 21	-13	-87
186	4/11/2018	2:03:49 PM	4	784 R	0.1	-4	-120
187	4/11/2018	2:04:01 PM	1	845 R	0.1	-11	-45
188	4/11/2018	2:04:12 PM	12	843 R	0.1	14	-47
189	4/11/2018	2:04:24 PM	3	838 R	0.1	-6	-53
190	4/11/2018	2:04:36 PM	4	822 R	0.1	-4	-73
191	4/11/2018	2:04:48 PM	1	856 R	0.1	-11	-31
192	4/11/2018	2:04:59 PM	0	844 R	0.1	-13	-46
193	4/11/2018	2:05:11 PM	3	847 R	0.1	-6	-42
194	4/11/2018	2:05:23 PM	9	824 R	0.1	7	-71
195	4/11/2018	2:06:32 PM	7	875 R	0.1 Grid 22	3	-7
196	4/11/2018	2:06:43 PM	0	735 R	0.1	-13	-181
197	4/11/2018	2:06:55 PM	8	663 R	0.1	5	-270
198	4/11/2018	2:07:07 PM	8	772 R	0.1	5	-135
199	4/11/2018	2:07:18 PM	6	819 R	0.1	0	-77
200	4/11/2018	2:07:30 PM	1	799 R	0.1	-11	-102
201	4/11/2018	2:07:42 PM	10	823 R	0.1	10	-72
202	4/11/2018	2:07:53 PM	2	795 R	0.1	-9	-106
203	4/11/2018	2:08:05 PM	8	844 R	0.1	5	-46
204	4/11/2018	2:08:17 PM	0	788 R	0.1	-13	-115
205	4/11/2018	2:09:54 PM	7	796 R	0.1 Grid 23	3	-105

206	4/11/2018	2:10:06 PM	3	864 R	0.1	-6	-21
207	4/11/2018	2:10:17 PM	0	907 R	0.1	-13	32
208	4/11/2018	2:10:29 PM	4	874 R	0.1	-4	-9
209	4/11/2018	2:10:41 PM	5	842 R	0.1	-2	-48
210	4/11/2018	2:10:53 PM	0	802 R	0.1	-13	-98
211	4/11/2018	2:11:04 PM	3	851 R	0.1	-6	-37
212	4/11/2018	2:11:16 PM	5	848 R	0.1	-2	-41
213	4/11/2018	2:11:28 PM	0	853 R	0.1	-13	-35
214	4/11/2018	2:11:39 PM	4	818 R	0.1	-4	-78
215	4/11/2018	2:15:01 PM	0	802 R	0.1 Grid 24	-13	-98
216	4/11/2018	2:15:12 PM	0	802 R	0.1	-13	-98
217	4/11/2018	2:15:24 PM	4	844 R	0.1	-4	-46
218	4/11/2018	2:15:36 PM	9	872 R	0.1	7	-11
219	4/11/2018	2:15:47 PM	2	907 R	0.1	-9	32
220	4/11/2018	2:15:59 PM	0	813 R	0.1	-13	-84
221	4/11/2018	2:16:11 PM	0	953 R	0.1	-13	89
222	4/11/2018	2:16:22 PM	0	1027 R	0.1	-13	181
223	4/11/2018	2:16:34 PM	7	869 R	0.1	3	-15
224	4/11/2018	2:16:46 PM	1	872 R	0.1	-11	-11
225	4/11/2018	2:20:17 PM	16	888 R	0.1 Grid 25	23	9
226	4/11/2018	2:20:28 PM	3	940 R	0.1	-6	73
227	4/11/2018	2:20:40 PM	4	896 R	0.1	-4	19
228	4/11/2018	2:20:52 PM	6	845 R	0.1	0	-45
229	4/11/2018	2:21:03 PM	7	891 R	0.1	3	12
230	4/11/2018	2:21:15 PM	1	1088 R	0.1	-11	256
231	4/11/2018	2:21:27 PM	0	1010 R	0.1	-13	160
232	4/11/2018	2:21:38 PM	5	917 R	0.1	-2	45
233	4/11/2018	2:21:50 PM	0	973 R	0.1	-13	114
234	4/11/2018	2:22:02 PM	4	1071 R	0.1	-4	235
235	4/11/2018	2:23:04 PM	0	825 R	0.1 Grid 26	-13	-69
236	4/11/2018	2:23:15 PM	8	841 R	0.1	5	-50
237	4/11/2018	2:23:27 PM	0	933 R	0.1	-13	64
238	4/11/2018	2:23:39 PM	7	894 R	0.1	3	16
239	4/11/2018	2:23:51 PM	7	1021 R	0.1	3	173
240	4/11/2018	2:24:02 PM	5	932 R	0.1	-2	63
241	4/11/2018	2:24:14 PM	9	895 R	0.1	7	17
242	4/11/2018	2:24:26 PM	2	895 R	0.1	-9	17
243	4/11/2018	2:24:37 PM	0	924 R	0.1	-13	53
244	4/11/2018	2:24:49 PM	8	821 R	0.1	5	-74
245	4/11/2018	2:25:46 PM	15	812 R	0.1 Grid 27	21	-85
246	4/11/2018	2:25:57 PM	3	981 R	0.1	-6	124
247	4/11/2018	2:26:09 PM	3	913 R	0.1	-6	40
248	4/11/2018	2:26:21 PM	4	838 R	0.1	-4	-53
249	4/11/2018	2:26:32 PM	1	899 R	0.1	-11	22
250	4/11/2018	2:26:44 PM	0	833 R	0.1	-13	-59
251	4/11/2018	2:26:56 PM	0	966 R	0.1	-13	105
252	4/11/2018	2:27:07 PM	3	1021 R	0.1	-6	173
253	4/11/2018	2:27:19 PM	10	860 R	0.1	10	-26
254	4/11/2018	2:27:31 PM	14	788 R	0.1	19	-115
255	4/11/2018	2:28:25 PM	6	895 R	0.1 Grid 28	0	17
256	4/11/2018	2:28:37 PM	0	831 R	0.1	-13	-62
257	4/11/2018	2:28:48 PM	7	829 R	0.1	3	-64
258	4/11/2018	2:29:00 PM	5	874 R	0.1	-2	-9
259	4/11/2018	2:29:12 PM	0	834 R	0.1	-13	-58
260	4/11/2018	2:29:23 PM	3	839 R	0.1	-6	-52

261	4/11/2018	2:29:35 PM	0	851 R	0.1	-13	-37
262	4/11/2018	2:29:47 PM	3	956 R	0.1	-6	93
263	4/11/2018	2:29:59 PM	0	805 R	0.1	-13	-94
264	4/11/2018	2:30:10 PM	9	912 R	0.1	7	38
265	4/11/2018	2:31:33 PM	0	820 R	0.1 Grid 29	-13	-76
266	4/11/2018	2:31:45 PM	6	835 R	0.1	0	-57
267	4/11/2018	2:31:57 PM	5	913 R	0.1	-2	40
268	4/11/2018	2:32:08 PM	0	957 R	0.1	-13	94
269	4/11/2018	2:32:20 PM	6	1085 R	0.1	0	253
270	4/11/2018	2:32:32 PM	0	888 R	0.1	-13	9
271	4/11/2018	2:32:43 PM	7	921 R	0.1	3	50
272	4/11/2018	2:32:55 PM	1	1022 R	0.1	-11	175
273	4/11/2018	2:33:07 PM	0	989 R	0.1	-13	134
274	4/11/2018	2:33:19 PM	4	833 R	0.1	-4	-59
275	4/11/2018	2:34:28 PM	5	901 R	0.1 Grid 30	-2	25
276	4/11/2018	2:34:39 PM	1	864 R	0.1	-11	-21
277	4/11/2018	2:34:51 PM	4	1036 R	0.1	-4	192
278	4/11/2018	2:35:03 PM	3	1031 R	0.1	-6	186
279	4/11/2018	2:35:14 PM	6	970 R	0.1	0	110
		Maximum:	22	1088		37	256
		Average:	4	861		-4	-25
		StDev:	4	77		9	95

Building 227
Room 100 Lower Walls

2360 SN:268497

43-37 SN:093965

Cal Due Date: 10/10/2018

Surveyor: Thomas Hogan

Bldg 227

Room 100 Lower Wall Grids 1 thru 28 34 thru 38

Alpha Efficiency: 0.31

Beta/Gamma Efficiency: 0.352 Metal

Alpha Background: 4.2 3.3

Beta/Gamma Background: 551 483

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²	
									Alpha	Beta
1	4/11/2018	10:16:43 AM	0	560	R	0.1	Grid 1	-9	12	
2	4/11/2018	10:16:55 AM	0	557	R	0.1		-9	8	
3	4/11/2018	10:17:06 AM	14	520	R	0.1		22	-40	
4	4/11/2018	10:17:18 AM	11	521	R	0.1		15	-39	
5	4/11/2018	10:17:30 AM	11	502	R	0.1		15	-64	
6	4/11/2018	10:17:42 AM	6	593	R	0.1		4	55	
7	4/11/2018	10:17:53 AM	1	535	R	0.1		-7	-21	
8	4/11/2018	10:18:05 AM	0	598	R	0.1		-9	61	
9	4/11/2018	10:18:17 AM	0	503	R	0.1		-9	-62	
10	4/11/2018	10:27:39 AM	5	572	R	0.1	Grid 2	2	27	
11	4/11/2018	10:27:51 AM	1	490	R	0.1		-7	-79	
12	4/11/2018	10:28:02 AM	2	515	R	0.1		-5	-47	
13	4/11/2018	10:28:14 AM	1	530	R	0.1		-7	-27	
14	4/11/2018	10:28:26 AM	2	543	R	0.1		-5	-10	
15	4/11/2018	10:28:38 AM	2	521	R	0.1		-5	-39	
16	4/11/2018	10:28:49 AM	1	585	R	0.1		-7	44	
17	4/11/2018	10:29:01 AM	3	565	R	0.1		-3	18	
18	4/11/2018	10:29:13 AM	0	502	R	0.1		-9	-64	
19	4/11/2018	10:29:25 AM	0	550	R	0.1		-9	-1	
20	4/11/2018	10:32:23 AM	11	501	R	0.1	Grid 3	15	-65	
21	4/11/2018	10:32:34 AM	13	543	R	0.1		20	-10	
22	4/11/2018	10:32:46 AM	11	578	R	0.1		15	35	
23	4/11/2018	10:32:58 AM	6	544	R	0.1		4	-9	
24	4/11/2018	10:33:10 AM	1	562	R	0.1		-7	14	
25	4/11/2018	10:33:21 AM	0	569	R	0.1		-9	23	
26	4/11/2018	10:33:33 AM	2	545	R	0.1		-5	-8	
27	4/11/2018	10:33:45 AM	1	524	R	0.1		-7	-35	
28	4/11/2018	10:33:57 AM	3	524	R	0.1		-3	-35	
29	4/11/2018	10:34:08 AM	0	508	R	0.1		-9	-56	
30	4/11/2018	10:37:42 AM	0	506	R	0.1	Grid 4	-9	-59	
31	4/11/2018	10:37:53 AM	0	530	R	0.1		-9	-27	
32	4/11/2018	10:38:05 AM	5	557	R	0.1		2	8	
33	4/11/2018	10:38:17 AM	7	557	R	0.1		6	8	
34	4/11/2018	10:38:29 AM	1	528	R	0.1		-7	-30	
35	4/11/2018	10:38:40 AM	2	551	R	0.1		-5	0	
36	4/11/2018	10:38:52 AM	2	631	R	0.1		-5	104	
37	4/11/2018	10:39:04 AM	1	591	R	0.1		-7	52	
38	4/11/2018	10:39:16 AM	1	536	R	0.1		-7	-20	

39	4/11/2018	10:39:27 AM	2	535 R	0.1	-5	-21
40	4/11/2018	10:44:56 AM	0	558 R	0.1 Grid 5	-9	9
41	4/11/2018	10:45:08 AM	15	566 R	0.1	24	20
42	4/11/2018	10:45:20 AM	3	570 R	0.1	-3	25
43	4/11/2018	10:45:31 AM	0	551 R	0.1	-9	0
44	4/11/2018	10:45:43 AM	11	620 R	0.1	15	90
45	4/11/2018	10:46:09 AM	5	534 R	0.1	2	-22
46	4/11/2018	10:46:21 AM	1	585 R	0.1	-7	44
47	4/11/2018	10:46:32 AM	9	551 R	0.1	11	0
48	4/11/2018	10:46:44 AM	2	507 R	0.1	-5	-57
49	4/11/2018	10:46:56 AM	0	562 R	0.1	-9	14
50	4/11/2018	10:48:54 AM	3	521 R	0.1 Grid 6	-3	-39
51	4/11/2018	10:49:05 AM	2	542 R	0.1	-5	-12
52	4/11/2018	10:49:17 AM	1	586 R	0.1	-7	46
53	4/11/2018	10:49:29 AM	1	548 R	0.1	-7	-4
54	4/11/2018	10:49:41 AM	2	517 R	0.1	-5	-44
55	4/11/2018	10:49:52 AM	3	550 R	0.1	-3	-1
56	4/11/2018	10:50:04 AM	0	759 R	0.1	-9	271
57	4/11/2018	10:50:16 AM	12	670 R	0.1	17	155
58	4/11/2018	10:50:28 AM	8	598 R	0.1	8	61
59	4/11/2018	10:50:39 AM	7	563 R	0.1	6	16
60	4/11/2018	10:52:19 AM	0	512 R	0.1 Grid 7	-9	-51
61	4/11/2018	10:52:31 AM	5	528 R	0.1	2	-30
62	4/11/2018	10:52:42 AM	1	588 R	0.1	-7	48
63	4/11/2018	10:52:54 AM	0	650 R	0.1	-9	129
64	4/11/2018	10:53:06 AM	3	671 R	0.1	-3	156
65	4/11/2018	10:53:18 AM	0	1059 R	0.1	-9	661
66	4/11/2018	10:53:29 AM	0	1322 R	0.1	-9	1004
67	4/11/2018	10:53:41 AM	5	1460 R	0.1	2	1183
68	4/11/2018	10:53:53 AM	9	1000 R	0.1	11	584
69	4/11/2018	10:54:05 AM	2	684 R	0.1	-5	173
70	4/11/2018	10:57:02 AM	0	540 R	0.1 Grid 8	-9	-14
71	4/11/2018	10:57:14 AM	0	784 R	0.1	-9	303
72	4/11/2018	10:57:25 AM	4	1087 R	0.1	0	698
73	4/11/2018	10:57:37 AM	1	1043 R	0.1	-7	640
74	4/11/2018	10:57:49 AM	0	1222 R	0.1	-9	873
75	4/11/2018	10:58:01 AM	0	1104 R	0.1	-9	720
76	4/11/2018	10:58:12 AM	11	1346 R	0.1	15	1035
77	4/11/2018	10:58:24 AM	2	1324 R	0.1	-5	1006
78	4/11/2018	10:58:36 AM	0	1126 R	0.1	-9	748
79	4/11/2018	10:58:48 AM	4	978 R	0.1	0	556
80	4/11/2018	12:49:38 PM	2	1120 R	0.1 Grid 9	-5	741
81	4/11/2018	12:49:50 PM	3	1356 R	0.1	-3	1048
82	4/11/2018	12:50:02 PM	2	927 R	0.1	-5	489
83	4/11/2018	12:50:14 PM	9	913 R	0.1	11	471
84	4/11/2018	12:50:25 PM	2	826 R	0.1	-5	358
85	4/11/2018	1:05:40 PM	2	533 R	0.1 Grid 10	-5	-23
86	4/11/2018	1:05:52 PM	1	637 R	0.1	-7	112
87	4/11/2018	1:06:04 PM	0	581 R	0.1	-9	39
88	4/11/2018	1:06:15 PM	16	713 R	0.1	26	211
89	4/11/2018	1:06:27 PM	7	842 R	0.1	6	379
90	4/11/2018	1:06:39 PM	1	760 R	0.1	-7	272
91	4/11/2018	1:06:51 PM	0	756 R	0.1	-9	267

92	4/11/2018	1:07:02 PM	1	615 R	0.1	-7	83
93	4/11/2018	1:07:14 PM	2	555 R	0.1	-5	5
94	4/11/2018	1:07:26 PM	2	618 R	0.1	-5	87
95	4/11/2018	1:10:41 PM	0	628 R	0.1 Grid 11	-9	100
96	4/11/2018	1:10:53 PM	4	752 R	0.1	0	262
97	4/11/2018	1:11:05 PM	1	738 R	0.1	-7	243
98	4/11/2018	1:11:16 PM	4	895 R	0.1	0	448
99	4/11/2018	1:11:28 PM	0	872 R	0.1	-9	418
100	4/11/2018	1:23:12 PM	3	578 R	0.1 Grid 12	-3	35
101	4/11/2018	1:23:24 PM	0	567 R	0.1	-9	21
102	4/11/2018	1:23:36 PM	0	534 R	0.1	-9	-22
103	4/11/2018	1:23:47 PM	2	526 R	0.1	-5	-33
104	4/11/2018	1:23:59 PM	0	538 R	0.1	-9	-17
105	4/11/2018	1:26:13 PM	8	535 R	0.1 Grid 13	8	-21
106	4/11/2018	1:26:25 PM	2	581 R	0.1	-5	39
107	4/11/2018	1:26:37 PM	0	557 R	0.1	-9	8
108	4/11/2018	1:26:49 PM	0	557 R	0.1	-9	8
109	4/11/2018	1:27:00 PM	0	561 R	0.1	-9	13
110	4/11/2018	1:27:12 PM	13	601 R	0.1	20	65
111	4/11/2018	1:27:24 PM	12	533 R	0.1	17	-23
112	4/11/2018	1:27:36 PM	6	525 R	0.1	4	-34
113	4/11/2018	1:27:47 PM	1	580 R	0.1	-7	38
114	4/11/2018	1:27:59 PM	5	550 R	0.1	2	-1
115	4/11/2018	1:29:43 PM	0	499 R	0.1 Grid 14	-9	-68
116	4/11/2018	1:29:55 PM	6	502 R	0.1	4	-64
117	4/11/2018	1:30:06 PM	1	544 R	0.1	-7	-9
118	4/11/2018	1:30:18 PM	10	523 R	0.1	13	-36
119	4/11/2018	1:30:30 PM	7	543 R	0.1	6	-10
120	4/11/2018	1:30:42 PM	1	514 R	0.1	-7	-48
121	4/11/2018	1:30:53 PM	0	499 R	0.1	-9	-68
122	4/11/2018	1:31:05 PM	0	489 R	0.1	-9	-81
123	4/11/2018	1:31:17 PM	8	523 R	0.1	8	-36
124	4/11/2018	1:31:29 PM	2	506 R	0.1	-5	-59
125	4/11/2018	1:34:44 PM	0	509 R	0.1 Grid 15	-9	-55
126	4/11/2018	1:34:56 PM	0	565 R	0.1	-9	18
127	4/11/2018	1:35:08 PM	11	552 R	0.1	15	1
128	4/11/2018	1:35:19 PM	2	494 R	0.1	-5	-74
129	4/11/2018	1:35:31 PM	2	547 R	0.1	-5	-5
130	4/11/2018	1:35:43 PM	0	556 R	0.1	-9	7
131	4/11/2018	1:35:55 PM	1	545 R	0.1	-7	-8
132	4/11/2018	1:36:06 PM	2	502 R	0.1	-5	-64
133	4/11/2018	1:36:18 PM	3	507 R	0.1	-3	-57
134	4/11/2018	1:36:30 PM	1	497 R	0.1	-7	-70
135	4/11/2018	1:38:48 PM	2	524 R	0.1 Grid 16	-5	-35
136	4/11/2018	1:39:00 PM	0	688 R	0.1	-9	178
137	4/11/2018	1:39:12 PM	10	729 R	0.1	13	232
138	4/11/2018	1:39:23 PM	2	628 R	0.1	-5	100
139	4/11/2018	1:39:35 PM	3	766 R	0.1	-3	280
140	4/11/2018	1:39:47 PM	2	665 R	0.1	-5	148
141	4/11/2018	1:39:59 PM	1	630 R	0.1	-7	103
142	4/11/2018	1:40:10 PM	0	648 R	0.1	-9	126
143	4/11/2018	1:40:22 PM	8	802 R	0.1	8	327
144	4/11/2018	1:40:34 PM	7	943 R	0.1	6	510

145	4/11/2018	1:42:20 PM	0	568 R	0.1 Grid 17	-9	22
146	4/11/2018	1:42:32 PM	0	726 R	0.1	-9	228
147	4/11/2018	1:42:44 PM	7	782 R	0.1	6	301
148	4/11/2018	1:42:56 PM	1	672 R	0.1	-7	158
149	4/11/2018	1:43:07 PM	2	734 R	0.1	-5	238
150	4/11/2018	1:43:19 PM	1	1085 R	0.1	-7	695
151	4/11/2018	1:43:31 PM	1	1180 R	0.1	-7	819
152	4/11/2018	1:43:43 PM	3	1236 R	0.1	-3	892
153	4/11/2018	1:43:54 PM	2	915 R	0.1	-5	474
154	4/11/2018	1:44:06 PM	2	676 R	0.1	-5	163
155	4/11/2018	1:53:40 PM	1	585 R	0.1 Grid 18	-7	44
156	4/11/2018	1:53:51 PM	1	860 R	0.1	-7	402
157	4/11/2018	1:54:03 PM	11	881 R	0.1	15	430
158	4/11/2018	1:54:15 PM	14	902 R	0.1	22	457
159	4/11/2018	1:54:27 PM	14	896 R	0.1	22	449
160	4/11/2018	1:54:38 PM	3	922 R	0.1	-3	483
161	4/11/2018	1:54:50 PM	0	847 R	0.1	-9	385
162	4/11/2018	1:55:02 PM	0	817 R	0.1	-9	346
163	4/11/2018	1:55:14 PM	5	683 R	0.1	2	172
164	4/11/2018	1:55:25 PM	8	626 R	0.1	8	98
165	4/11/2018	1:57:44 PM	13	529 R	0.1 Grid 19	20	-29
166	4/11/2018	1:57:56 PM	3	550 R	0.1	-3	-1
167	4/11/2018	1:58:08 PM	0	675 R	0.1	-9	161
168	4/11/2018	1:58:20 PM	10	560 R	0.1	13	12
169	4/11/2018	1:58:31 PM	14	592 R	0.1	22	53
170	4/11/2018	1:58:43 PM	3	499 R	0.1	-3	-68
171	4/11/2018	1:58:55 PM	3	488 R	0.1	-3	-82
172	4/11/2018	1:59:07 PM	19	531 R	0.1	33	-26
173	4/11/2018	1:59:18 PM	4	594 R	0.1	0	56
174	4/11/2018	1:59:30 PM	10	585 R	0.1	13	44
175	4/11/2018	2:01:43 PM	0	555 R	0.1 Grid 20	-9	5
176	4/11/2018	2:01:55 PM	3	589 R	0.1	-3	49
177	4/11/2018	2:02:06 PM	2	527 R	0.1	-5	-31
178	4/11/2018	2:02:18 PM	1	512 R	0.1	-7	-51
179	4/11/2018	2:02:30 PM	2	546 R	0.1	-5	-7
180	4/11/2018	2:02:42 PM	4	513 R	0.1	0	-49
181	4/11/2018	2:02:53 PM	1	491 R	0.1	-7	-78
182	4/11/2018	2:03:05 PM	0	508 R	0.1	-9	-56
183	4/11/2018	2:03:17 PM	0	532 R	0.1	-9	-25
184	4/11/2018	2:03:29 PM	0	564 R	0.1	-9	17
185	4/11/2018	2:04:52 PM	0	499 R	0.1 Grid 21	-9	-68
186	4/11/2018	2:05:04 PM	15	480 R	0.1	24	-92
187	4/11/2018	2:05:16 PM	3	510 R	0.1	-3	-53
188	4/11/2018	2:05:27 PM	3	525 R	0.1	-3	-34
189	4/11/2018	2:05:39 PM	2	498 R	0.1	-5	-69
190	4/11/2018	2:05:51 PM	2	552 R	0.1	-5	1
191	4/11/2018	2:06:03 PM	2	551 R	0.1	-5	0
192	4/11/2018	2:06:14 PM	1	526 R	0.1	-7	-33
193	4/11/2018	2:06:26 PM	2	510 R	0.1	-5	-53
194	4/11/2018	2:06:38 PM	10	572 R	0.1	13	27
195	4/11/2018	2:08:12 PM	13	588 R	0.1 Grid 22	20	48
196	4/11/2018	2:08:24 PM	3	535 R	0.1	-3	-21
197	4/11/2018	2:08:36 PM	8	483 R	0.1	8	-89

198	4/11/2018	2:08:47 PM	2	517 R	0.1	-5	-44
199	4/11/2018	2:08:59 PM	0	502 R	0.1	-9	-64
200	4/11/2018	2:11:07 PM	0	528 R	0.1 Grid 23	-9	-30
201	4/11/2018	2:11:19 PM	10	507 R	0.1	13	-57
202	4/11/2018	2:11:31 PM	2	533 R	0.1	-5	-23
203	4/11/2018	2:11:42 PM	0	532 R	0.1	-9	-25
204	4/11/2018	2:11:54 PM	3	529 R	0.1	-3	-29
205	4/11/2018	2:12:06 PM	2	562 R	0.1	-5	14
206	4/11/2018	2:12:18 PM	1	571 R	0.1	-7	26
207	4/11/2018	2:12:29 PM	2	523 R	0.1	-5	-36
208	4/11/2018	2:12:41 PM	1	498 R	0.1	-7	-69
209	4/11/2018	2:12:53 PM	1	499 R	0.1	-7	-68
210	4/11/2018	2:15:59 PM	8	536 R	0.1 Grid 24	8	-20
211	4/11/2018	2:16:10 PM	7	568 R	0.1	6	22
212	4/11/2018	2:16:22 PM	1	521 R	0.1	-7	-39
213	4/11/2018	2:16:34 PM	0	506 R	0.1	-9	-59
214	4/11/2018	2:16:46 PM	9	504 R	0.1	11	-61
215	4/11/2018	2:16:57 PM	5	504 R	0.1	2	-61
216	4/11/2018	2:17:09 PM	1	508 R	0.1	-7	-56
217	4/11/2018	2:17:21 PM	2	501 R	0.1	-5	-65
218	4/11/2018	2:17:33 PM	2	551 R	0.1	-5	0
219	4/11/2018	2:17:44 PM	3	505 R	0.1	-3	-60
220	4/11/2018	2:19:30 PM	12	498 R	0.1 Grid 25	17	-69
221	4/11/2018	2:19:42 PM	4	521 R	0.1	0	-39
222	4/11/2018	2:19:54 PM	1	544 R	0.1	-7	-9
223	4/11/2018	2:20:05 PM	0	530 R	0.1	-9	-27
224	4/11/2018	2:20:17 PM	0	554 R	0.1	-9	4
225	4/11/2018	2:20:29 PM	6	528 R	0.1	4	-30
226	4/11/2018	2:20:41 PM	1	507 R	0.1	-7	-57
227	4/11/2018	2:20:52 PM	2	511 R	0.1	-5	-52
228	4/11/2018	2:21:04 PM	1	564 R	0.1	-7	17
229	4/11/2018	2:21:16 PM	2	526 R	0.1	-5	-33
230	4/11/2018	2:23:40 PM	2	487 R	0.1 Grid 26	-5	-83
231	4/11/2018	2:23:52 PM	3	562 R	0.1	-3	14
232	4/11/2018	2:24:04 PM	1	522 R	0.1	-7	-38
233	4/11/2018	2:24:15 PM	2	511 R	0.1	-5	-52
234	4/11/2018	2:24:27 PM	8	502 R	0.1	8	-64
235	4/11/2018	2:24:39 PM	2	477 R	0.1	-5	-96
236	4/11/2018	2:24:51 PM	0	626 R	0.1	-9	98
237	4/11/2018	2:25:02 PM	0	520 R	0.1	-9	-40
238	4/11/2018	2:25:14 PM	11	496 R	0.1	15	-72
239	4/11/2018	2:25:26 PM	2	502 R	0.1	-5	-64
240	4/11/2018	2:27:33 PM	2	565 R	0.1 Grid 27	-5	18
241	4/11/2018	2:27:45 PM	1	502 R	0.1	-7	-64
242	4/11/2018	2:27:57 PM	0	560 R	0.1	-9	12
243	4/11/2018	2:28:08 PM	5	535 R	0.1	2	-21
244	4/11/2018	2:28:20 PM	1	603 R	0.1	-7	68
245	4/11/2018	2:28:32 PM	0	614 R	0.1	-9	82
246	4/11/2018	2:28:44 PM	0	603 R	0.1	-9	68
247	4/11/2018	2:28:55 PM	8	617 R	0.1	8	86
248	4/11/2018	2:29:07 PM	2	493 R	0.1	-5	-75
249	4/11/2018	2:29:19 PM	7	483 R	0.1	6	-89
250	4/11/2018	2:42:15 PM	2	556 R	0.1 Grid 28	-5	7

251	4/11/2018	2:42:27 PM	1	524 R	0.1	-7	-35
252	4/11/2018	2:42:39 PM	2	481 R	0.1	-5	-91
253	4/11/2018	2:42:51 PM	0	550 R	0.1	-9	-1
254	4/11/2018	2:43:02 PM	5	551 R	0.1	2	0
255	4/12/2018	10:29:06 AM	7	482 R	0.1 Grid 34	6	-90
256	4/12/2018	10:29:18 AM	5	722 R	0.1	2	223
257	4/12/2018	10:29:30 AM	1	636 R	0.1	-7	111
258	4/12/2018	10:29:42 AM	0	784 R	0.1	-9	303
259	4/12/2018	10:29:53 AM	0	819 R	0.1	-9	349
260	4/12/2018	10:30:49 AM	9	523 R	0.1	11	-36
261	4/12/2018	10:31:01 AM	2	589 R	0.1	-5	49
262	4/12/2018	10:31:13 AM	2	502 R	0.1	-5	-64
263	4/12/2018	10:31:25 AM	1	499 R	0.1	-7	-68
264	4/12/2018	10:31:36 AM	2	533 R	0.1	-5	-23
265	4/12/2018	10:36:23 AM	1	498 R	0.1 Grid 35	-7	-69
266	4/12/2018	10:36:35 AM	2	557 R	0.1	-5	8
267	4/12/2018	10:36:47 AM	2	487 R	0.1	-5	-83
268	4/12/2018	10:36:58 AM	1	523 R	0.1	-7	-36
269	4/12/2018	10:37:10 AM	6	498 R	0.1	4	-69
270	4/12/2018	10:37:22 AM	1	507 R	0.1	-7	-57
271	4/12/2018	10:37:34 AM	12	523 R	0.1	17	-36
272	4/12/2018	10:37:45 AM	3	487 R	0.1	-3	-83
273	4/12/2018	10:37:57 AM	2	517 R	0.1	-5	-44
274	4/12/2018	10:38:09 AM	1	508 R	0.1	-7	-56
275	4/12/2018	10:41:49 AM	2	495 R	0.1 Grid 36	-5	-73
276	4/12/2018	10:42:01 AM	2	530 R	0.1	-5	-27
277	4/12/2018	10:42:13 AM	7	507 R	0.1	6	-57
278	4/12/2018	10:42:24 AM	6	554 R	0.1	4	4
279	4/12/2018	10:42:36 AM	1	514 R	0.1	-7	-48
280	4/12/2018	10:42:48 AM	5	551 R	0.1	2	0
281	4/12/2018	10:43:00 AM	1	520 R	0.1	-7	-40
282	4/12/2018	10:43:11 AM	0	522 R	0.1	-9	-38
283	4/12/2018	10:43:23 AM	11	480 R	0.1	15	-92
284	4/12/2018	10:43:35 AM	2	499 R	0.1	-5	-68
285	4/12/2018	10:46:25 AM	1	517 R	0.1 Grid 37	-7	-44
286	4/12/2018	10:46:37 AM	2	527 R	0.1	-5	-31
287	4/12/2018	10:46:48 AM	1	569 R	0.1	-7	23
288	4/12/2018	10:47:00 AM	0	563 R	0.1	-9	16
289	4/12/2018	10:47:12 AM	11	556 R	0.1	15	7
290	4/12/2018	10:47:24 AM	2	523 R	0.1	-5	-36
291	4/12/2018	10:47:35 AM	0	513 R	0.1	-9	-49
292	4/12/2018	10:47:47 AM	0	528 R	0.1	-9	-30
293	4/12/2018	10:47:59 AM	10	493 R	0.1	13	-75
294	4/12/2018	10:48:11 AM	2	488 R	0.1	-5	-82
295	4/12/2018	10:49:50 AM	0	498 R	0.1 Grid 38	-9	-69
296	4/12/2018	10:50:02 AM	10	517 R	0.1	13	-44
297	4/12/2018	10:50:14 AM	11	581 R	0.1	15	39
298	4/12/2018	10:50:26 AM	2	636 R	0.1	-5	111
299	4/12/2018	10:50:38 AM	12	516 R	0.1	17	-46
300	4/12/2018	10:50:49 AM	3	610 R	0.1	-3	77
301	4/12/2018	10:51:01 AM	2	523 R	0.1	-5	-36
302	4/12/2018	10:51:13 AM	1	616 R	0.1	-7	85
303	4/12/2018	10:51:25 AM	2	570 R	0.1	-5	25

304	4/12/2018 10:51:36 AM	0	502 R	0.1	-9	-64
	Maximum:	19	1460		33	1183
	Average:	3	608		-2	74
	StDev:	4	172		9	224

2360 SN:297766

43-93# 323074

Cal Due Date: 12/20/2018

Surveyor: Thomas Hogan

Bldg 227

Room 100 Lower Wall Grids 28 thru 33 39 thru 44

Alpha Efficiency: 0.404

Beta/Gamma Efficiency: 0.254

Alpha Background: 1.9

Beta/Gamma Background: 207

S=Scaler,

R=Rateometer

Sample #	Date	Time	Alpha	Beta	S/R	Count	Time	Location	dpm/100cm ²	
									Alpha	Beta
1	4/12/2018	8:46:37 AM	2	202	R	0.1	Grid 28	0	-52	
2	4/12/2018	8:46:49 AM	0	208	R	0.1		-3	10	
3	4/12/2018	8:47:01 AM	1	202	R	0.1		-2	-52	
4	4/12/2018	8:47:12 AM	2	211	R	0.1		0	42	
5	4/12/2018	8:47:24 AM	1	200	R	0.1		-2	-73	
6	4/12/2018	8:47:36 AM	2	212	R	0.1		0	52	
7	4/12/2018	8:47:47 AM	2	207	R	0.1		0	0	
8	4/12/2018	8:47:59 AM	1	195	R	0.1		-2	-126	
9	4/12/2018	8:48:11 AM	1	200	R	0.1		-2	-73	
10	4/12/2018	8:48:22 AM	3	198	R	0.1		2	-94	
11	4/12/2018	8:48:34 AM	0	199	R	0.1		-3	-84	
12	4/12/2018	8:48:46 AM	1	199	R	0.1		-2	-84	
13	4/12/2018	8:48:57 AM	2	206	R	0.1		0	-10	
14	4/12/2018	8:49:09 AM	2	207	R	0.1		0	0	
15	4/12/2018	8:49:21 AM	0	201	R	0.1		-3	-63	
16	4/12/2018	8:49:32 AM	0	221	R	0.1		-3	147	
17	4/12/2018	8:49:44 AM	19	230	R	0.1		29	241	
18	4/12/2018	8:49:56 AM	4	198	R	0.1		4	-94	
19	4/12/2018	8:50:07 AM	1	206	R	0.1		-2	-10	
20	4/12/2018	8:50:19 AM	2	238	R	0.1		0	325	
21	4/12/2018	8:50:31 AM	0	200	R	0.1		-3	-73	
22	4/12/2018	8:50:42 AM	1	198	R	0.1		-2	-94	
23	4/12/2018	8:50:54 AM	2	201	R	0.1		0	-63	
24	4/12/2018	8:51:06 AM	3	207	R	0.1		2	0	
25	4/12/2018	8:51:17 AM	2	199	R	0.1		0	-84	
26	4/12/2018	8:51:29 AM	2	270	R	0.1		0	661	
27	4/12/2018	8:51:41 AM	1	272	R	0.1		-2	682	
28	4/12/2018	8:51:52 AM	1	207	R	0.1		-2	0	
29	4/12/2018	8:52:04 AM	5	199	R	0.1		5	-84	
30	4/12/2018	8:52:16 AM	2	201	R	0.1		0	-63	
31	4/12/2018	8:52:27 AM	1	204	R	0.1		-2	-31	
32	4/12/2018	8:52:39 AM	2	198	R	0.1		0	-94	
33	4/12/2018	8:52:51 AM	1	210	R	0.1		-2	31	
34	4/12/2018	8:53:02 AM	1	198	R	0.1		-2	-94	
35	4/12/2018	8:53:14 AM	0	201	R	0.1		-3	-63	
36	4/12/2018	8:53:26 AM	0	264	R	0.1		-3	598	
37	4/12/2018	8:53:37 AM	11	271	R	0.1		15	672	
38	4/12/2018	8:53:49 AM	2	270	R	0.1		0	661	
39	4/12/2018	8:54:00 AM	0	276	R	0.1		-3	724	
40	4/12/2018	9:00:59 AM	3	198	R	0.1	Grid 29	2	-94	

41	4/12/2018	9:01:11 AM	2	203 R	0.1	0	-42
42	4/12/2018	9:01:22 AM	1	226 R	0.1	-2	199
43	4/12/2018	9:01:34 AM	1	220 R	0.1	-2	136
44	4/12/2018	9:01:46 AM	2	198 R	0.1	0	-94
45	4/12/2018	9:01:57 AM	1	208 R	0.1	-2	10
46	4/12/2018	9:02:09 AM	2	201 R	0.1	0	-63
47	4/12/2018	9:02:21 AM	2	202 R	0.1	0	-52
48	4/12/2018	9:02:32 AM	1	200 R	0.1	-2	-73
49	4/12/2018	9:02:44 AM	1	200 R	0.1	-2	-73
50	4/12/2018	9:02:56 AM	3	249 R	0.1	2	441
51	4/12/2018	9:03:07 AM	0	201 R	0.1	-3	-63
52	4/12/2018	9:03:19 AM	6	226 R	0.1	7	199
53	4/12/2018	9:03:31 AM	1	199 R	0.1	-2	-84
54	4/12/2018	9:03:42 AM	0	201 R	0.1	-3	-63
55	4/12/2018	9:03:54 AM	0	209 R	0.1	-3	21
56	4/12/2018	9:04:06 AM	6	198 R	0.1	7	-94
57	4/12/2018	9:04:17 AM	1	198 R	0.1	-2	-94
58	4/12/2018	9:04:29 AM	2	199 R	0.1	0	-84
59	4/12/2018	9:04:41 AM	0	204 R	0.1	-3	-31
60	4/12/2018	9:04:52 AM	3	201 R	0.1	2	-63
61	4/12/2018	9:05:04 AM	0	224 R	0.1	-3	178
62	4/12/2018	9:05:16 AM	0	205 R	0.1	-3	-21
63	4/12/2018	9:05:27 AM	10	206 R	0.1	14	-10
64	4/12/2018	9:05:39 AM	2	239 R	0.1	0	336
65	4/12/2018	9:05:51 AM	2	332 R	0.1	0	1312
66	4/12/2018	9:06:02 AM	1	399 R	0.1	-2	2016
67	4/12/2018	9:06:14 AM	2	295 R	0.1	0	924
68	4/12/2018	9:06:26 AM	2	211 R	0.1	0	42
69	4/12/2018	9:06:37 AM	1	235 R	0.1	-2	294
70	4/12/2018	9:06:49 AM	1	207 R	0.1	-2	0
71	4/12/2018	9:07:01 AM	3	226 R	0.1	2	199
72	4/12/2018	9:07:12 AM	1	284 R	0.1	-2	808
73	4/12/2018	9:07:24 AM	0	296 R	0.1	-3	934
74	4/12/2018	9:07:36 AM	0	406 R	0.1	-3	2089
75	4/12/2018	9:07:47 AM	0	329 R	0.1	-3	1281
76	4/12/2018	9:07:59 AM	4	356 R	0.1	4	1564
77	4/12/2018	9:08:11 AM	1	302 R	0.1	-2	997
78	4/12/2018	9:08:22 AM	0	297 R	0.1	-3	945
79	4/12/2018	9:08:34 AM	0	390 R	0.1	-3	1921
80	4/12/2018	9:21:01 AM	0	209 R	0.1 Grid 30	-3	21
81	4/12/2018	9:21:13 AM	0	195 R	0.1	-3	-126
82	4/12/2018	9:21:25 AM	0	267 R	0.1	-3	630
83	4/12/2018	9:21:36 AM	5	287 R	0.1	5	840
84	4/12/2018	9:21:48 AM	1	200 R	0.1	-2	-73
85	4/12/2018	9:22:00 AM	1	198 R	0.1	-2	-94
86	4/12/2018	9:22:11 AM	1	203 R	0.1	-2	-42
87	4/12/2018	9:22:23 AM	2	242 R	0.1	0	367
88	4/12/2018	9:22:35 AM	2	198 R	0.1	0	-94
89	4/12/2018	9:22:46 AM	3	211 R	0.1	2	42
90	4/12/2018	9:22:58 AM	1	198 R	0.1	-2	-94
91	4/12/2018	9:23:10 AM	2	198 R	0.1	0	-94
92	4/12/2018	9:23:21 AM	2	208 R	0.1	0	10
93	4/12/2018	9:23:33 AM	1	200 R	0.1	-2	-73
94	4/12/2018	9:23:45 AM	1	208 R	0.1	-2	10
95	4/12/2018	9:23:56 AM	2	201 R	0.1	0	-63

96	4/12/2018	9:24:08 AM	2	222 R	0.1	0	157
97	4/12/2018	9:24:20 AM	1	203 R	0.1	-2	-42
98	4/12/2018	9:24:31 AM	1	211 R	0.1	-2	42
99	4/12/2018	9:24:43 AM	3	202 R	0.1	2	-52
100	4/12/2018	9:24:55 AM	2	199 R	0.1	0	-84
101	4/12/2018	9:25:06 AM	2	201 R	0.1	0	-63
102	4/12/2018	9:25:18 AM	1	213 R	0.1	-2	63
103	4/12/2018	9:25:30 AM	2	200 R	0.1	0	-73
104	4/12/2018	9:25:41 AM	2	233 R	0.1	0	273
105	4/12/2018	9:25:53 AM	1	268 R	0.1	-2	640
106	4/12/2018	9:26:05 AM	1	319 R	0.1	-2	1176
107	4/12/2018	9:26:16 AM	2	422 R	0.1	0	2257
108	4/12/2018	9:26:28 AM	3	422 R	0.1	2	2257
109	4/12/2018	9:26:40 AM	2	242 R	0.1	0	367
110	4/12/2018	9:26:51 AM	1	259 R	0.1	-2	546
111	4/12/2018	9:27:03 AM	2	245 R	0.1	0	399
112	4/12/2018	9:27:15 AM	1	324 R	0.1	-2	1228
113	4/12/2018	9:27:26 AM	2	283 R	0.1	0	798
114	4/12/2018	9:27:38 AM	4	239 R	0.1	4	336
115	4/12/2018	9:27:50 AM	6	244 R	0.1	7	388
116	4/12/2018	9:28:01 AM	1	292 R	0.1	-2	892
117	4/12/2018	9:28:13 AM	0	289 R	0.1	-3	861
118	4/12/2018	9:28:25 AM	0	229 R	0.1	-3	231
119	4/12/2018	9:28:36 AM	0	284 R	0.1	-3	808
120	4/12/2018	9:35:44 AM	10	198 R	0.1 Grid 31	14	-94
121	4/12/2018	9:35:55 AM	5	202 R	0.1	5	-52
122	4/12/2018	9:36:07 AM	8	199 R	0.1	10	-84
123	4/12/2018	9:36:19 AM	2	201 R	0.1	0	-63
124	4/12/2018	9:36:30 AM	0	198 R	0.1	-3	-94
125	4/12/2018	9:36:42 AM	5	209 R	0.1	5	21
126	4/12/2018	9:36:54 AM	7	200 R	0.1	9	-73
127	4/12/2018	9:37:05 AM	1	211 R	0.1	-2	42
128	4/12/2018	9:37:17 AM	0	279 R	0.1	-3	756
129	4/12/2018	9:37:29 AM	0	277 R	0.1	-3	735
130	4/12/2018	9:37:40 AM	0	203 R	0.1	-3	-42
131	4/12/2018	9:37:52 AM	12	401 R	0.1	17	2037
132	4/12/2018	9:38:04 AM	2	368 R	0.1	0	1690
133	4/12/2018	9:38:16 AM	7	327 R	0.1	9	1260
134	4/12/2018	9:38:27 AM	8	434 R	0.1	10	2383
135	4/12/2018	9:38:39 AM	11	280 R	0.1	15	766
136	4/12/2018	9:38:51 AM	2	341 R	0.1	0	1407
137	4/12/2018	9:39:02 AM	10	522 R	0.1	14	3307
138	4/12/2018	9:39:14 AM	2	444 R	0.1	0	2488
139	4/12/2018	9:39:26 AM	2	213 R	0.1	0	63
140	4/12/2018	9:45:11 AM	1	199 R	0.1	-2	-84
141	4/12/2018	9:45:22 AM	1	202 R	0.1	-2	-52
142	4/12/2018	9:45:34 AM	2	232 R	0.1	0	262
143	4/12/2018	9:45:46 AM	3	203 R	0.1	2	-42
144	4/12/2018	9:45:57 AM	1	201 R	0.1	-2	-63
145	4/12/2018	9:46:09 AM	2	212 R	0.1	0	52
146	4/12/2018	9:46:21 AM	0	198 R	0.1	-3	-94
147	4/12/2018	9:46:32 AM	7	200 R	0.1	9	-73
148	4/12/2018	9:46:44 AM	1	202 R	0.1	-2	-52
149	4/12/2018	9:46:56 AM	0	198 R	0.1	-3	-94
150	4/12/2018	9:47:07 AM	3	258 R	0.1	2	535

151	4/12/2018	9:47:19 AM	0	216 R	0.1	-3	94
152	4/12/2018	9:47:31 AM	4	273 R	0.1	4	693
153	4/12/2018	9:47:42 AM	1	199 R	0.1	-2	-84
154	4/12/2018	9:47:54 AM	0	225 R	0.1	-3	189
155	4/12/2018	9:48:06 AM	0	309 R	0.1	-3	1071
156	4/12/2018	9:48:17 AM	0	198 R	0.1	-3	-94
157	4/12/2018	9:48:29 AM	8	198 R	0.1	10	-94
158	4/12/2018	9:48:41 AM	2	288 R	0.1	0	850
159	4/12/2018	9:48:52 AM	2	316 R	0.1	0	1144
160	4/12/2018	9:53:06 AM	1	196 R	0.1 Grid 32	-2	-115
161	4/12/2018	9:53:17 AM	1	199 R	0.1	-2	-84
162	4/12/2018	9:53:29 AM	1	200 R	0.1	-2	-73
163	4/12/2018	9:53:41 AM	3	230 R	0.1	2	241
164	4/12/2018	9:53:52 AM	4	198 R	0.1	4	-94
165	4/12/2018	9:54:04 AM	2	229 R	0.1	0	231
166	4/12/2018	9:54:16 AM	3	225 R	0.1	2	189
167	4/12/2018	9:54:27 AM	2	202 R	0.1	0	-52
168	4/12/2018	9:54:39 AM	2	224 R	0.1	0	178
169	4/12/2018	9:54:51 AM	3	207 R	0.1	2	0
170	4/12/2018	9:55:02 AM	2	201 R	0.1	0	-63
171	4/12/2018	9:55:14 AM	2	206 R	0.1	0	-10
172	4/12/2018	9:55:26 AM	1	206 R	0.1	-2	-10
173	4/12/2018	9:55:37 AM	1	205 R	0.1	-2	-21
174	4/12/2018	9:55:49 AM	0	211 R	0.1	-3	42
175	4/12/2018	9:56:01 AM	2	200 R	0.1	0	-73
176	4/12/2018	9:56:12 AM	1	208 R	0.1	-2	10
177	4/12/2018	9:56:24 AM	5	214 R	0.1	5	73
178	4/12/2018	9:56:36 AM	1	200 R	0.1	-2	-73
179	4/12/2018	9:56:47 AM	12	201 R	0.1	17	-63
180	4/12/2018	9:56:59 AM	3	206 R	0.1	2	-10
181	4/12/2018	9:57:11 AM	2	232 R	0.1	0	262
182	4/12/2018	9:57:23 AM	1	206 R	0.1	-2	-10
183	4/12/2018	9:57:34 AM	2	227 R	0.1	0	210
184	4/12/2018	9:57:46 AM	0	347 R	0.1	-3	1470
185	4/12/2018	9:57:58 AM	2	322 R	0.1	0	1207
186	4/12/2018	9:58:09 AM	4	244 R	0.1	4	388
187	4/12/2018	9:58:21 AM	1	225 R	0.1	-2	189
188	4/12/2018	9:58:33 AM	0	240 R	0.1	-3	346
189	4/12/2018	9:58:44 AM	3	198 R	0.1	2	-94
190	4/12/2018	9:58:56 AM	5	209 R	0.1	5	21
191	4/12/2018	9:59:08 AM	1	268 R	0.1	-2	640
192	4/12/2018	9:59:19 AM	1	358 R	0.1	-2	1585
193	4/12/2018	9:59:31 AM	2	273 R	0.1	0	693
194	4/12/2018	9:59:43 AM	2	245 R	0.1	0	399
195	4/12/2018	9:59:54 AM	1	313 R	0.1	-2	1113
196	4/12/2018	10:00:06 AM	1	280 R	0.1	-2	766
197	4/12/2018	10:00:18 AM	3	198 R	0.1	2	-94
198	4/12/2018	10:00:29 AM	2	189 R	0.1	0	-189
199	4/12/2018	10:00:41 AM	3	222 R	0.1	2	157
200	4/12/2018	10:07:46 AM	0	208 R	0.1 Grid 33	-3	10
201	4/12/2018	10:07:58 AM	0	202 R	0.1	-3	-52
202	4/12/2018	10:08:09 AM	0	210 R	0.1	-3	31
203	4/12/2018	10:08:21 AM	3	227 R	0.1	2	210
204	4/12/2018	10:08:33 AM	8	303 R	0.1	10	1008
205	4/12/2018	10:08:44 AM	2	244 R	0.1	0	388

206	4/12/2018	10:08:56 AM	16	208 R	0.1	24	10
207	4/12/2018	10:09:08 AM	3	256 R	0.1	2	514
208	4/12/2018	10:09:19 AM	6	216 R	0.1	7	94
209	4/12/2018	10:09:31 AM	12	200 R	0.1	17	-73
210	4/12/2018	10:09:43 AM	3	213 R	0.1	2	63
211	4/12/2018	10:09:54 AM	2	256 R	0.1	0	514
212	4/12/2018	10:10:06 AM	1	212 R	0.1	-2	52
213	4/12/2018	10:10:18 AM	1	191 R	0.1	-2	-168
214	4/12/2018	10:10:29 AM	2	279 R	0.1	0	756
215	4/12/2018	10:10:41 AM	2	287 R	0.1	0	840
216	4/12/2018	10:10:53 AM	1	221 R	0.1	-2	147
217	4/12/2018	10:11:04 AM	1	191 R	0.1	-2	-168
218	4/12/2018	10:11:16 AM	2	208 R	0.1	0	10
219	4/12/2018	10:11:28 AM	3	257 R	0.1	2	525
220	4/12/2018	10:11:39 AM	1	268 R	0.1	-2	640
221	4/12/2018	10:11:51 AM	3	386 R	0.1	2	1879
222	4/12/2018	10:12:03 AM	2	228 R	0.1	0	220
223	4/12/2018	10:12:15 AM	1	222 R	0.1	-2	157
224	4/12/2018	10:12:26 AM	2	229 R	0.1	0	231
225	4/12/2018	10:12:38 AM	1	217 R	0.1	-2	105
226	4/12/2018	10:12:50 AM	2	255 R	0.1	0	504
227	4/12/2018	10:13:01 AM	3	296 R	0.1	2	934
228	4/12/2018	10:13:13 AM	1	266 R	0.1	-2	619
229	4/12/2018	10:13:25 AM	0	208 R	0.1	-3	10
230	4/12/2018	10:13:36 AM	7	265 R	0.1	9	609
231	4/12/2018	10:13:48 AM	1	197 R	0.1	-2	-105
232	4/12/2018	10:14:00 AM	1	244 R	0.1	-2	388
233	4/12/2018	10:14:11 AM	2	279 R	0.1	0	756
234	4/12/2018	10:14:23 AM	2	284 R	0.1	0	808
235	4/12/2018	10:14:35 AM	1	226 R	0.1	-2	199
236	4/12/2018	10:14:46 AM	1	253 R	0.1	-2	483
237	4/12/2018	10:14:58 AM	2	247 R	0.1	0	420
238	4/12/2018	10:15:10 AM	3	372 R	0.1	2	1732
239	4/12/2018	10:15:21 AM	1	273 R	0.1	-2	693
240	4/12/2018	12:11:30 PM	2	206 R	0.1 Grid 39	0	-10
241	4/12/2018	12:11:42 PM	2	201 R	0.1	0	-63
242	4/12/2018	12:11:54 PM	1	245 R	0.1	-2	399
243	4/12/2018	12:12:05 PM	1	209 R	0.1	-2	21
244	4/12/2018	12:12:17 PM	2	201 R	0.1	0	-63
245	4/12/2018	12:12:29 PM	0	205 R	0.1	-3	-21
246	4/12/2018	12:12:40 PM	0	198 R	0.1	-3	-94
247	4/12/2018	12:12:52 PM	0	218 R	0.1	-3	115
248	4/12/2018	12:13:04 PM	3	207 R	0.1	2	0
249	4/12/2018	12:13:15 PM	2	198 R	0.1	0	-94
250	4/12/2018	12:13:27 PM	1	201 R	0.1	-2	-63
251	4/12/2018	12:13:39 PM	1	199 R	0.1	-2	-84
252	4/12/2018	12:13:50 PM	2	200 R	0.1	0	-73
253	4/12/2018	12:14:02 PM	3	199 R	0.1	2	-84
254	4/12/2018	12:14:14 PM	1	278 R	0.1	-2	745
255	4/12/2018	12:14:25 PM	2	209 R	0.1	0	21
256	4/12/2018	12:14:37 PM	1	203 R	0.1	-2	-42
257	4/12/2018	12:14:49 PM	0	199 R	0.1	-3	-84
258	4/12/2018	12:15:00 PM	1	241 R	0.1	-2	357
259	4/12/2018	12:15:12 PM	1	201 R	0.1	-2	-63
260	4/12/2018	12:15:24 PM	2	206 R	0.1	0	-10

261	4/12/2018	12:15:35 PM	1	257 R	0.1	-2	525
262	4/12/2018	12:15:47 PM	0	209 R	0.1	-3	21
263	4/12/2018	12:15:59 PM	1	198 R	0.1	-2	-94
264	4/12/2018	12:16:10 PM	2	233 R	0.1	0	273
265	4/12/2018	12:16:22 PM	4	293 R	0.1	4	903
266	4/12/2018	12:16:34 PM	1	413 R	0.1	-2	2163
267	4/12/2018	12:16:45 PM	3	300 R	0.1	2	976
268	4/12/2018	12:16:57 PM	0	254 R	0.1	-3	493
269	4/12/2018	12:17:09 PM	1	198 R	0.1	-2	-94
270	4/12/2018	12:17:20 PM	1	202 R	0.1	-2	-52
271	4/12/2018	12:17:32 PM	0	225 R	0.1	-3	189
272	4/12/2018	12:17:44 PM	3	278 R	0.1	2	745
273	4/12/2018	12:17:55 PM	2	193 R	0.1	0	-147
274	4/12/2018	12:18:07 PM	1	199 R	0.1	-2	-84
275	4/12/2018	12:18:19 PM	3	283 R	0.1	2	798
276	4/12/2018	12:18:30 PM	0	336 R	0.1	-3	1354
277	4/12/2018	12:18:42 PM	1	375 R	0.1	-2	1764
278	4/12/2018	12:18:54 PM	1	413 R	0.1	-2	2163
279	4/12/2018	12:19:05 PM	4	299 R	0.1	4	966
280	4/12/2018	12:26:18 PM	2	226 R	0.1 Grid 40	0	199
281	4/12/2018	12:26:30 PM	1	205 R	0.1	-2	-21
282	4/12/2018	12:26:41 PM	2	220 R	0.1	0	136
283	4/12/2018	12:26:53 PM	2	197 R	0.1	0	-105
284	4/12/2018	12:27:05 PM	1	209 R	0.1	-2	21
285	4/12/2018	12:27:16 PM	0	197 R	0.1	-3	-105
286	4/12/2018	12:27:28 PM	14	199 R	0.1	21	-84
287	4/12/2018	12:27:40 PM	3	203 R	0.1	2	-42
288	4/12/2018	12:27:51 PM	1	202 R	0.1	-2	-52
289	4/12/2018	12:28:03 PM	2	197 R	0.1	0	-105
290	4/12/2018	12:28:15 PM	1	194 R	0.1	-2	-136
291	4/12/2018	12:28:26 PM	1	201 R	0.1	-2	-63
292	4/12/2018	12:28:38 PM	2	198 R	0.1	0	-94
293	4/12/2018	12:28:50 PM	2	195 R	0.1	0	-126
294	4/12/2018	12:29:01 PM	3	197 R	0.1	2	-105
295	4/12/2018	12:29:13 PM	1	204 R	0.1	-2	-31
296	4/12/2018	12:29:25 PM	2	197 R	0.1	0	-105
297	4/12/2018	12:29:36 PM	3	202 R	0.1	2	-52
298	4/12/2018	12:29:48 PM	1	259 R	0.1	-2	546
299	4/12/2018	12:30:00 PM	2	207 R	0.1	0	0
300	4/12/2018	12:30:12 PM	3	197 R	0.1	2	-105
301	4/12/2018	12:30:23 PM	2	198 R	0.1	0	-94
302	4/12/2018	12:30:35 PM	3	203 R	0.1	2	-42
303	4/12/2018	12:30:47 PM	0	194 R	0.1	-3	-136
304	4/12/2018	12:30:58 PM	10	230 R	0.1	14	241
305	4/12/2018	12:31:10 PM	2	203 R	0.1	0	-42
306	4/12/2018	12:31:22 PM	1	299 R	0.1	-2	966
307	4/12/2018	12:31:33 PM	2	335 R	0.1	0	1344
308	4/12/2018	12:31:45 PM	3	251 R	0.1	2	462
309	4/12/2018	12:31:57 PM	2	205 R	0.1	0	-21
310	4/12/2018	12:32:08 PM	1	232 R	0.1	-2	262
311	4/12/2018	12:32:20 PM	2	204 R	0.1	0	-31
312	4/12/2018	12:32:32 PM	3	213 R	0.1	2	63
313	4/12/2018	12:32:43 PM	1	230 R	0.1	-2	241
314	4/12/2018	12:32:55 PM	2	301 R	0.1	0	987
315	4/12/2018	12:33:07 PM	7	315 R	0.1	9	1134

316	4/12/2018	12:33:18 PM	4	203 R	0.1	4	-42
317	4/12/2018	12:33:30 PM	1	299 R	0.1	-2	966
318	4/12/2018	12:33:42 PM	10	268 R	0.1	14	640
319	4/12/2018	12:33:54 PM	2	248 R	0.1	0	430
320	4/12/2018	12:38:38 PM	2	198 R	0.1 Grid 41	0	-94
321	4/12/2018	12:38:49 PM	1	201 R	0.1	-2	-63
322	4/12/2018	12:39:01 PM	1	242 R	0.1	-2	367
323	4/12/2018	12:39:13 PM	2	243 R	0.1	0	378
324	4/12/2018	12:39:25 PM	1	203 R	0.1	-2	-42
325	4/12/2018	12:39:36 PM	1	204 R	0.1	-2	-31
326	4/12/2018	12:39:48 PM	2	208 R	0.1	0	10
327	4/12/2018	12:40:00 PM	2	199 R	0.1	0	-84
328	4/12/2018	12:40:11 PM	1	228 R	0.1	-2	220
329	4/12/2018	12:40:23 PM	8	208 R	0.1	10	10
330	4/12/2018	12:40:35 PM	2	201 R	0.1	0	-63
331	4/12/2018	12:40:46 PM	11	200 R	0.1	15	-73
332	4/12/2018	12:40:58 PM	2	206 R	0.1	0	-10
333	4/12/2018	12:41:10 PM	2	201 R	0.1	0	-63
334	4/12/2018	12:41:21 PM	1	209 R	0.1	-2	21
335	4/12/2018	12:41:33 PM	1	202 R	0.1	-2	-52
336	4/12/2018	12:41:45 PM	2	204 R	0.1	0	-31
337	4/12/2018	12:41:56 PM	0	211 R	0.1	-3	42
338	4/12/2018	12:42:08 PM	2	206 R	0.1	0	-10
339	4/12/2018	12:42:20 PM	1	200 R	0.1	-2	-73
340	4/12/2018	12:42:31 PM	1	206 R	0.1	-2	-10
341	4/12/2018	12:42:43 PM	2	196 R	0.1	0	-115
342	4/12/2018	12:42:55 PM	0	217 R	0.1	-3	105
343	4/12/2018	12:43:07 PM	0	213 R	0.1	-3	63
344	4/12/2018	12:43:18 PM	5	207 R	0.1	5	0
345	4/12/2018	12:43:30 PM	1	216 R	0.1	-2	94
346	4/12/2018	12:43:42 PM	2	199 R	0.1	0	-84
347	4/12/2018	12:43:53 PM	1	205 R	0.1	-2	-21
348	4/12/2018	12:44:05 PM	2	208 R	0.1	0	10
349	4/12/2018	12:44:17 PM	2	203 R	0.1	0	-42
350	4/12/2018	12:44:28 PM	3	209 R	0.1	2	21
351	4/12/2018	12:44:40 PM	0	212 R	0.1	-3	52
352	4/12/2018	12:44:52 PM	0	212 R	0.1	-3	52
353	4/12/2018	12:45:03 PM	3	310 R	0.1	2	1081
354	4/12/2018	12:45:15 PM	2	302 R	0.1	0	997
355	4/12/2018	12:45:27 PM	1	214 R	0.1	-2	73
356	4/12/2018	12:45:38 PM	2	196 R	0.1	0	-115
357	4/12/2018	12:45:50 PM	1	198 R	0.1	-2	-94
358	4/12/2018	12:46:02 PM	2	199 R	0.1	0	-84
359	4/12/2018	12:46:14 PM	6	221 R	0.1	7	147
360	4/12/2018	12:50:38 PM	3	200 R	0.1 Grid 42	2	-73
361	4/12/2018	12:50:49 PM	4	211 R	0.1	4	42
362	4/12/2018	12:51:01 PM	1	199 R	0.1	-2	-84
363	4/12/2018	12:51:13 PM	3	203 R	0.1	2	-42
364	4/12/2018	12:51:24 PM	2	207 R	0.1	0	0
365	4/12/2018	12:51:36 PM	0	201 R	0.1	-3	-63
366	4/12/2018	12:51:48 PM	0	198 R	0.1	-3	-94
367	4/12/2018	12:51:59 PM	10	203 R	0.1	14	-42
368	4/12/2018	12:52:11 PM	2	199 R	0.1	0	-84
369	4/12/2018	12:52:23 PM	2	206 R	0.1	0	-10
370	4/12/2018	12:52:35 PM	3	198 R	0.1	2	-94

371	4/12/2018	12:52:46 PM	1	204 R	0.1	-2	-31
372	4/12/2018	12:52:58 PM	2	200 R	0.1	0	-73
373	4/12/2018	12:53:10 PM	2	198 R	0.1	0	-94
374	4/12/2018	12:53:21 PM	4	205 R	0.1	4	-21
375	4/12/2018	12:53:33 PM	3	201 R	0.1	2	-63
376	4/12/2018	12:53:45 PM	0	199 R	0.1	-3	-84
377	4/12/2018	12:53:56 PM	9	200 R	0.1	12	-73
378	4/12/2018	12:54:08 PM	2	203 R	0.1	0	-42
379	4/12/2018	12:54:20 PM	1	201 R	0.1	-2	-63
380	4/12/2018	12:54:31 PM	2	204 R	0.1	0	-31
381	4/12/2018	12:54:43 PM	0	198 R	0.1	-3	-94
382	4/12/2018	12:54:55 PM	0	206 R	0.1	-3	-10
383	4/12/2018	12:55:07 PM	10	213 R	0.1	14	63
384	4/12/2018	12:55:18 PM	2	281 R	0.1	0	777
385	4/12/2018	12:55:30 PM	0	208 R	0.1	-3	10
386	4/12/2018	12:55:42 PM	15	198 R	0.1	22	-94
387	4/12/2018	12:55:53 PM	3	200 R	0.1	2	-73
388	4/12/2018	12:56:05 PM	2	298 R	0.1	0	955
389	4/12/2018	12:56:17 PM	1	201 R	0.1	-2	-63
390	4/12/2018	12:56:28 PM	1	200 R	0.1	-2	-73
391	4/12/2018	12:56:40 PM	2	194 R	0.1	0	-136
392	4/12/2018	12:56:52 PM	0	201 R	0.1	-3	-63
393	4/12/2018	12:57:04 PM	2	229 R	0.1	0	231
394	4/12/2018	12:57:15 PM	3	205 R	0.1	2	-21
395	4/12/2018	12:57:27 PM	2	198 R	0.1	0	-94
396	4/12/2018	12:57:39 PM	0	206 R	0.1	-3	-10
397	4/12/2018	12:57:50 PM	0	214 R	0.1	-3	73
398	4/12/2018	12:58:02 PM	0	197 R	0.1	-3	-105
399	4/12/2018	12:58:14 PM	15	201 R	0.1	22	-63
400	4/12/2018	1:04:46 PM	1	201 R	0.1 Grid 43	-2	-63
401	4/12/2018	1:04:58 PM	2	207 R	0.1	0	0
402	4/12/2018	1:05:10 PM	1	199 R	0.1	-2	-84
403	4/12/2018	1:05:22 PM	1	198 R	0.1	-2	-94
404	4/12/2018	1:05:33 PM	3	199 R	0.1	2	-84
405	4/12/2018	1:05:45 PM	4	273 R	0.1	4	693
406	4/12/2018	1:05:57 PM	2	280 R	0.1	0	766
407	4/12/2018	1:06:08 PM	2	211 R	0.1	0	42
408	4/12/2018	1:06:20 PM	1	209 R	0.1	-2	21
409	4/12/2018	1:06:32 PM	3	218 R	0.1	2	115
410	4/12/2018	1:06:43 PM	4	201 R	0.1	4	-63
411	4/12/2018	1:06:55 PM	2	202 R	0.1	0	-52
412	4/12/2018	1:07:07 PM	3	196 R	0.1	2	-115
413	4/12/2018	1:07:19 PM	2	200 R	0.1	0	-73
414	4/12/2018	1:07:30 PM	1	204 R	0.1	-2	-31
415	4/12/2018	1:07:42 PM	0	198 R	0.1	-3	-94
416	4/12/2018	1:07:54 PM	3	195 R	0.1	2	-126
417	4/12/2018	1:08:05 PM	2	198 R	0.1	0	-94
418	4/12/2018	1:08:17 PM	1	202 R	0.1	-2	-52
419	4/12/2018	1:08:29 PM	0	198 R	0.1	-3	-94
420	4/12/2018	1:08:40 PM	3	197 R	0.1	2	-105
421	4/12/2018	1:08:52 PM	0	198 R	0.1	-3	-94
422	4/12/2018	1:09:04 PM	0	227 R	0.1	-3	210
423	4/12/2018	1:09:15 PM	0	201 R	0.1	-3	-63
424	4/12/2018	1:09:27 PM	4	207 R	0.1	4	0
425	4/12/2018	1:09:39 PM	1	206 R	0.1	-2	-10

426	4/12/2018	1:09:51 PM	2	214 R	0.1	0	73	
427	4/12/2018	1:10:02 PM	1	198 R	0.1	-2	-94	
428	4/12/2018	1:10:14 PM	2	207 R	0.1	0	0	
429	4/12/2018	1:10:26 PM	3	203 R	0.1	2	-42	
430	4/12/2018	1:10:37 PM	0	197 R	0.1	-3	-105	
431	4/12/2018	1:10:49 PM	2	202 R	0.1	0	-52	
432	4/12/2018	1:11:01 PM	3	207 R	0.1	2	0	
433	4/12/2018	1:11:12 PM	2	198 R	0.1	0	-94	
434	4/12/2018	1:11:24 PM	0	211 R	0.1	-3	42	
435	4/12/2018	1:11:36 PM	11	212 R	0.1	15	52	
436	4/12/2018	1:11:48 PM	2	213 R	0.1	0	63	
437	4/12/2018	1:11:59 PM	0	197 R	0.1	-3	-105	
438	4/12/2018	1:12:11 PM	0	199 R	0.1	-3	-84	
439	4/12/2018	1:12:23 PM	9	200 R	0.1	12	-73	
440	4/12/2018	1:16:10 PM	0	193 R	0.1 Grid 44	-3	-147	
441	4/12/2018	1:16:21 PM	7	206 R	0.1	9	-10	
442	4/12/2018	1:16:33 PM	11	202 R	0.1	15	-52	
443	4/12/2018	1:16:45 PM	2	251 R	0.1	0	462	
444	4/12/2018	1:16:56 PM	0	198 R	0.1	-3	-94	
445	4/12/2018	1:17:08 PM	7	199 R	0.1	9	-84	
446	4/12/2018	1:17:20 PM	1	198 R	0.1	-2	-94	
447	4/12/2018	1:17:31 PM	0	201 R	0.1	-3	-63	
448	4/12/2018	1:17:43 PM	5	200 R	0.1	5	-73	
449	4/12/2018	1:17:55 PM	1	210 R	0.1	-2	31	
450	4/12/2018	1:18:07 PM	2	208 R	0.1	0	10	
451	4/12/2018	1:18:18 PM	1	252 R	0.1	-2	472	
452	4/12/2018	1:18:30 PM	1	222 R	0.1	-2	157	
453	4/12/2018	1:18:42 PM	2	203 R	0.1	0	-42	
454	4/12/2018	1:18:53 PM	2	205 R	0.1	0	-21	
455	4/12/2018	1:19:05 PM	1	210 R	0.1	-2	31	
456	4/12/2018	1:19:17 PM	3	205 R	0.1	2	-21	
457	4/12/2018	1:19:28 PM	6	209 R	0.1	7	21	
458	4/12/2018	1:19:40 PM	1	197 R	0.1	-2	-105	
459	4/12/2018	1:19:52 PM	0	199 R	0.1	-3	-84	
			Maximum:	19	522		29	3307
			Average:	2	228		1	224
			StDev:	3	48		5	509

Appendix I
Building 218/227 Rooms Direct Measurement
Data

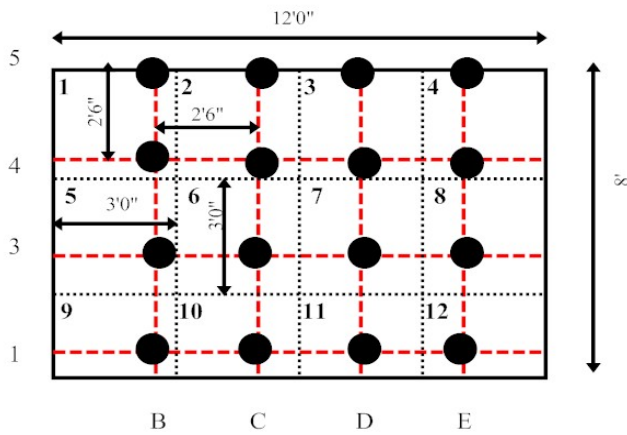
Room 100 Floor

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/20/2018		TIME: 08:30		INSTRUMENTATION USED					
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
		2360	184949	3/6/2019	α	42.3%	α 10.6%	α 55.9	α 17.0
SURVEY NUMBER: N/A		43-93	268605		βγ	26.8%	βγ 10.1%	βγ 521.0	βγ 2378.1
LOCATION: Bldg. 218 Room 100 Floor		2929	146870	6/17/2019	α	64.6%	α 16.2%	α 15.9	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
SURVEYOR: Joan Cosgrove									
DATE: 4/20/2018	TIME: 09:14	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Beach Detachment

Room-100 Floor Static Points and Scan Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- - - Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids

Comments:

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Joan Cosgrove			LOCATION: Bldg. 218 Room 100 Floor					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
B1				1.9	-84.6	-1.2	-26.2	See Map For Location
C1				30.3	94.5	-1.2	-21.1	See Map For Location
D1				1.9	268.7	-1.2	-26.2	See Map For Location
E1				1.9	34.8	-1.2	-8.6	See Map For Location
B2				-17.0	-94.5	-1.2	-23.6	See Map For Location
C2				-7.6	0.0	1.9	-18.6	See Map For Location
D2				-7.6	-124.4	1.9	-28.7	See Map For Location
E2				6.6	-44.8	-1.2	-8.6	See Map For Location
B3				6.6	-109.5	-1.2	-18.6	See Map For Location
C3				-2.8	-49.8	-1.2	-16.1	See Map For Location
D3				1.9	253.7	1.9	-3.5	See Map For Location
E3				1.9	159.2	-1.2	-18.6	See Map For Location
B4				6.6	10.0	-1.2	-28.7	See Map For Location
C4				20.8	-99.5	1.9	-31.2	See Map For Location
D4				-2.8	-29.9	-1.2	-18.6	See Map For Location
E4				1.9	124.4	-1.2	-1.0	See Map For Location
B1D						-1.2	-28.7	Duplicate Swipe
D3D						1.9	-8.6	Duplicate Swipe
Maximum:				30.3	268.7	1.9	-1.0	
Average:				2.8	19.3	-0.4	-18.6	
StDev:				10.9	126.6	1.4	9.3	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
Reviewer	Date: 4/20/2018							
Daniel Spicuzza	Time: 9:14							

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Room 100 Lower Walls

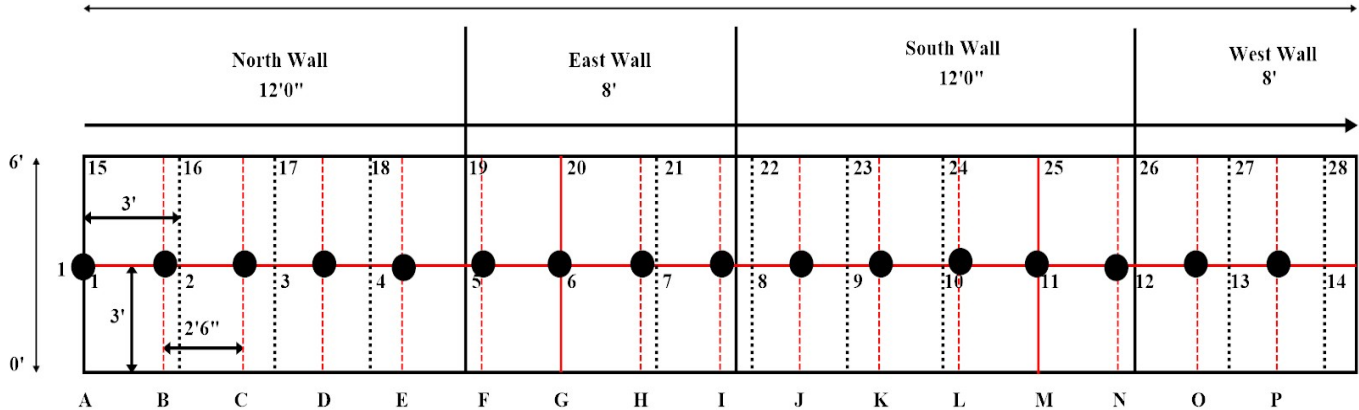
RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/20/2018	TIME: 09:15	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	% Efficiency	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
		2360	184949	3/6/2019	α	42.3%	α 10.6%	α 83.1	α 46.3
SURVEY NUMBER: N/A		43-93	268605		βγ	26.8%	βγ 10.1%	βγ 629.1	βγ 3502.5
LOCATION: Bldg. 218 Room 100 Lower Walls		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
SURVEYOR: Joan Cosgrove									
DATE: 4/20/2018	TIME: 09:34	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Beach Detachment

R-100 Lower Walls

40'



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- - - Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids

Comments:

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

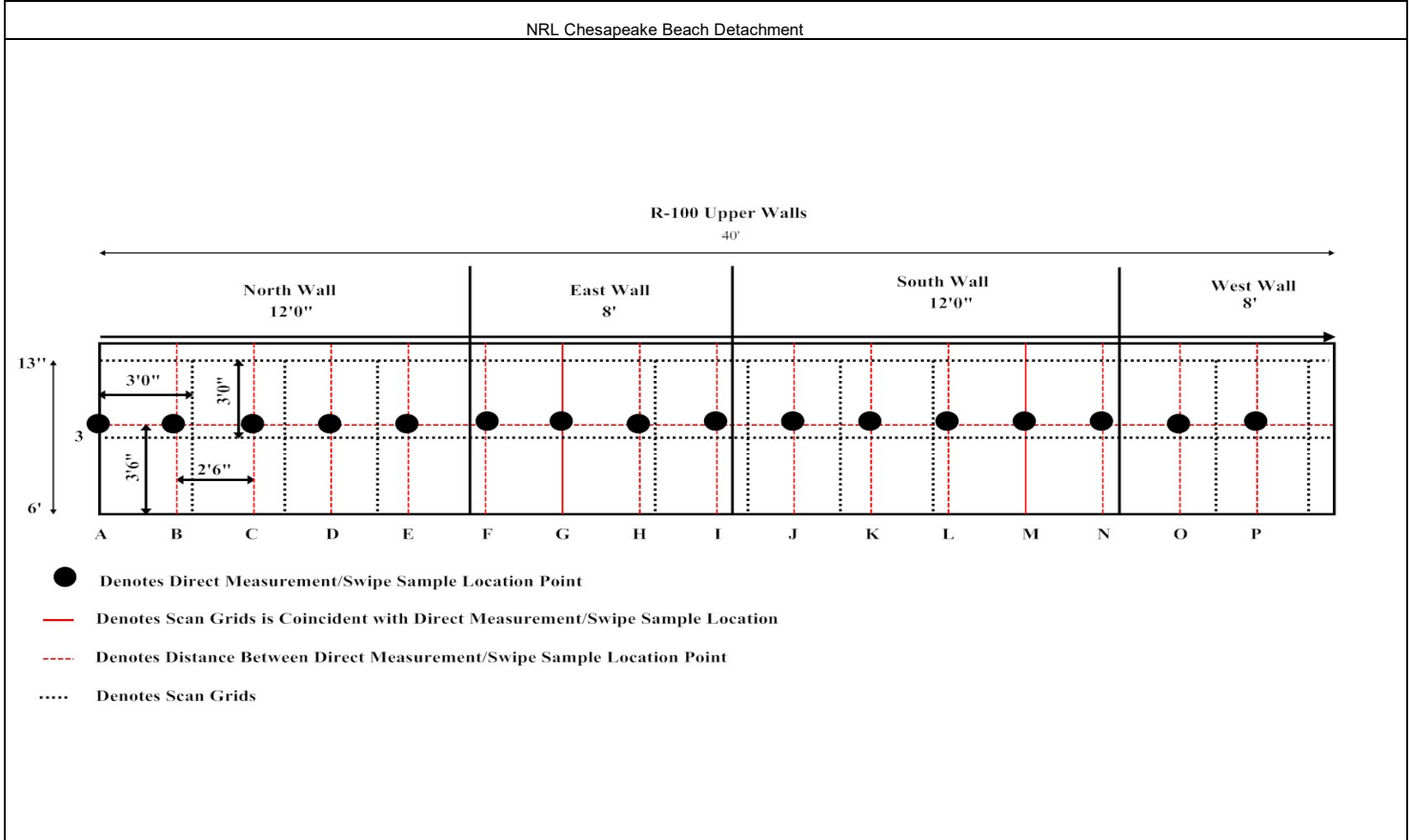
Routine (Daily / Weekly / Monthly)

Non-routine

Room 100 Upper Walls

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/20/2018	TIME: 10:00	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	184949	3/6/2019	α	42.3%	α 10.6%	α 83.1	α 46.3
LOCATION: Bldg. 218 Room 100 Upper Walls		43-93	268605		βγ	26.8%	βγ 10.1%	βγ 629.1	βγ 3502.5
SURVEYOR: Joan Cosgrove		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
DATE: 4/20/2018					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
TIME: 10:12		Reviewed by: Daniel Spicuzza		Static Count Time: 2 Minutes					
Isotopes of Concern: DU		NRL Chesapeake Beach Detachment							



Comments:

Routine (Daily / Weekly / Monthly) Non-routine

denotes swipe location and fixed α/β readings

denotes G/A radiation readings

#/# denotes contact / 1 meter radiation readings.

* denotes highest radiation reading on contact

LAW denotes large area masslinn wipe

Δ denotes static location.

+ Unless Otherwise Noted

All readings in mri/hr unless otherwise noted

K = 1000

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Joan Cosgrove			LOCATION: Bldg. 218 Room 100 Upper Walls					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
A3				-41.6	611.9	-1.2	-33.7	See Map For Location
B3				-27.4	79.6	1.9	-31.2	See Map For Location
C3				-18.0	144.3	5.0	4.0	See Map For Location
D3				-46.3	422.9	1.9	-58.9	See Map For Location
E3				-8.5	64.7	-1.2	-11.1	See Map For Location
F3				-32.2	-79.6	-1.2	-6.0	See Map For Location
G3				-46.3	233.8	1.9	-13.6	See Map For Location
H3				-41.6	-79.6	-1.2	-8.6	See Map For Location
I3				-13.2	39.8	-1.2	-3.5	See Map For Location
J3				-8.5	213.9	-1.2	-6.0	See Map For Location
K3				-36.9	149.3	1.9	-26.2	See Map For Location
L3				-22.7	114.4	5.0	-8.6	See Map For Location
M3				-3.8	-54.7	-1.2	-11.1	See Map For Location
N3				-36.9	144.3	-1.2	-18.6	See Map For Location
O3				-27.4	194.0	-1.2	-6.0	See Map For Location
P3				-27.4	149.3	-1.2	-26.2	See Map For Location
E3D						-1.2	-13.6	Duplicate Swipe
J3D						-1.2	-11.1	Duplicate Swipe
Maximum:				-3.8	611.9	5.0	4.0	
Average:				-27.4	146.8	0.1	-16.1	
StDev:				13.9	177.7	2.2	14.6	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
Reviewer Daniel Spicuzza			Date: 4/20/2018					
			Time: 10:12					

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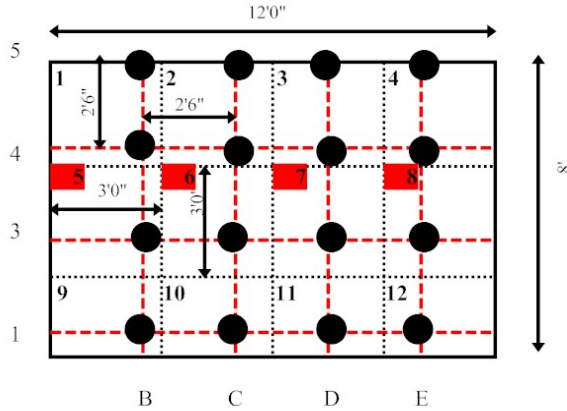
Room 100 Ceiling/Overhead

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018		TIME: 10:40		INSTRUMENTATION USED				
SURVEY NUMBER: N/A		Model Inst./Det.:	Serial Number:	Calibration Due Date:	Instrument Efficiency %:	Total % Efficiency:	MDC/MDA ⁺ (dpm/100cm ²):	Background ⁺ (dpm/100cm ²):
LOCATION: Bldg. 218 Room 100 Ceiling		2360	297758	2/14/2019	α 44.4%	α 11.1%	α 44.6	α 9.9
SURVEYOR: Adolfo Matus		43-93	299597		βγ 31.3%	βγ 11.7%	βγ 358.4	βγ 1295.0
DATE: 4/23/2018		2929	146780	6/17/2018	α 64.6%	α 16.2%	α 15.9	α 1.2
TIME: 10:53		Reviewed by: Daniel Spicuzza			βγ 53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
Isotopes of Concern: DU		Static Count Time: 2 Minutes						

NRL Chesapeake Beach Detachment

Room-100 Ceiling Static Points and Scan Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids
- Denotes Locations of Scanned Areas, 25%

Comments:

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Adolfo Matus			LOCATION: Bldg. 218 Room 100 Ceiling					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
B1				12.6	379.1	-1.2	-16.1	See Map For Location
C1				8.1	447.3	-1.2	-21.1	See Map For Location
D1				3.6	400.4	-1.2	-1.0	See Map For Location
E1				-5.4	383.4	-1.2	-26.2	See Map For Location
B2				3.6	391.9	-1.2	-18.6	See Map For Location
C2				-5.4	370.6	-1.2	-6.0	See Map For Location
D2				3.6	421.7	-1.2	-13.6	See Map For Location
E2				-0.9	302.4	1.9	1.5	See Map For Location
B3				-0.9	370.6	1.9	-16.1	See Map For Location
C3				-0.9	311.0	-1.2	-11.1	See Map For Location
D3				-5.4	387.6	-1.2	-18.6	See Map For Location
E3				-5.4	417.5	-1.2	-13.6	See Map For Location
B4				3.6	443.0	-1.2	-3.5	See Map For Location
C4				12.6	519.7	1.9	-8.6	See Map For Location
D4				-9.9	545.3	5.0	-3.5	See Map For Location
E4				-0.9	421.7	-1.2	-18.6	See Map For Location
B2D						-1.2	-13.6	Duplicate Swipe
E3D						-1.2	-8.6	Duplicate Swipe
Maximum:				12.6	545.3	5.0	1.5	
Average:				0.8	407.1	-0.4	-12.0	
StDev:				6.6	63.3	1.8	7.5	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
Reviewer Daniel Spicuzza			Date: 4/23/2018					
			Time: 10:53					

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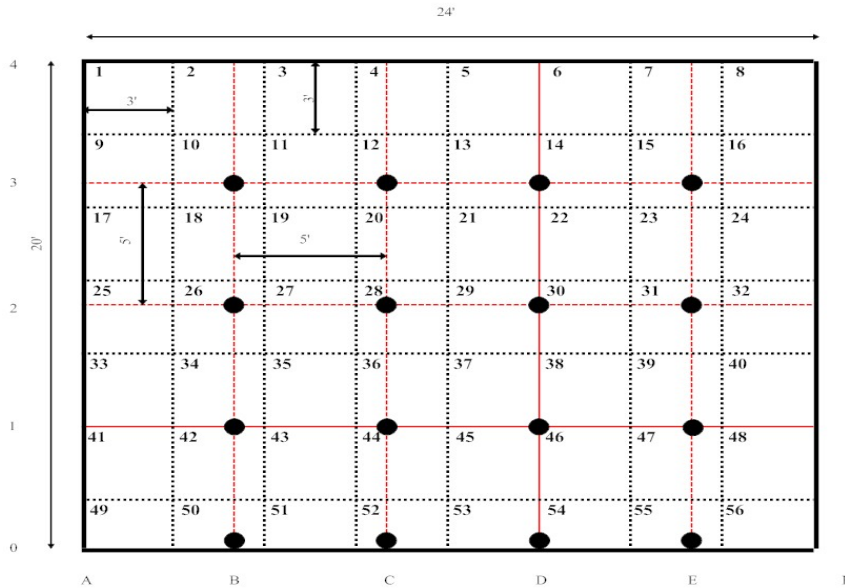
Room 103 Floor

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/20/2018	TIME: 08:30	INSTRUMENTATION USED						
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	% Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
SURVEY NUMBER: N/A		2360 43-93	297758 299597	2/14/2019	α 44.4% βγ 31.3%	α 11.1% βγ 11.7%	α 53.3 βγ 481.0	α 16.2 βγ 2377.0
LOCATION: Room 103 Floor		2929	146870	6/17/2019	α 64.6% βγ 53.0%	α 16.2% βγ 19.9%	α 15.9 βγ 83.7	α 1.2 βγ 199.7
SURVEYOR: Josefina Matus								
DATE: 4/20/2018	TIME: 08:51	Reviewed by: Daniel Spicuzza						
Isotopes of Concern: DU		Static Count Time: 2 Minutes						

NRL Chesapeake Beach Detachment

Room 103 FLOOR Static Point and Scan Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- - - Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids

Comments:

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

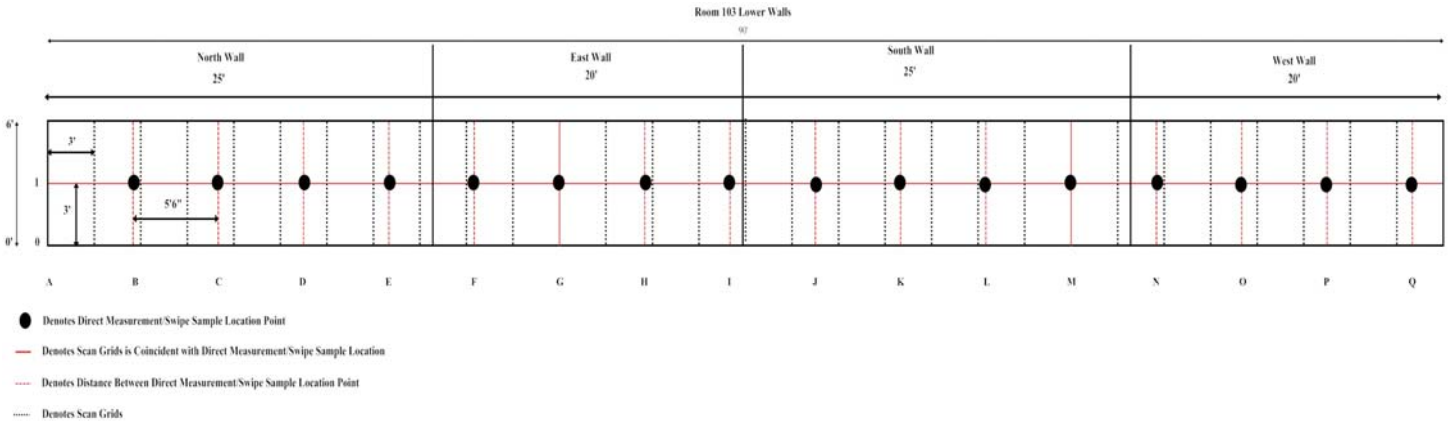
SURVEY NUMBER: N/A								
SURVEYOR: Josefina Matus			LOCATION: Room 103 Floor					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
B0				15.3	-72.4	1.9	-8.6	See Map For Location
C0				10.8	-34.1	-1.2	-16.1	See Map For Location
D0				-2.7	89.5	5.0	-1.0	See Map For Location
E0				15.3	230.0	-1.2	1.5	See Map For Location
B1				19.8	8.5	5.0	4.0	See Map For Location
C1				-2.7	-200.2	-1.2	-11.1	See Map For Location
D1				6.3	-8.5	8.0	-18.6	See Map For Location
E1				-7.2	42.6	5.0	1.5	See Map For Location
B2				24.3	8.5	1.9	-13.6	See Map For Location
C2				1.8	-25.6	1.9	-23.6	See Map For Location
D2				-2.7	-106.5	5.0	-1.0	See Map For Location
E2				1.8	89.5	-1.2	-13.6	See Map For Location
B3				10.8	34.1	8.0	-23.6	See Map For Location
C3				24.3	-8.5	11.1	-26.2	See Map For Location
D3				19.8	-63.9	1.9	-8.6	See Map For Location
E3				6.3	-38.3	-1.2	-13.6	See Map For Location
DOD						5.0	-6.0	Duplicate Swipe
C2D						1.9	-18.6	Duplicate Swipe
Maximum:				24.3	230.0	11.1	4.0	
Average:				8.8	-3.5	3.1	-10.9	
StDev:				10.3	95.2	3.7	9.4	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
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N/A								
N/A								
Reviewer Daniel Spicuzza			Date: 4/20/2018					
			Time: 8:51					

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Room 103 Lower Wall

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/20/2018	TIME: 09:21	INSTRUMENTATION USED							
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	297758	2/14/2019	α	44.4%	α 11.1%	α 90.2	α 60.4
LOCATION: Room 103 Lower Walls		43-93	299597		βγ	31.3%	βγ 11.7%	βγ 622.4	βγ 4029.8
SURVEYOR: Josefina Matus		2929	146870	6/17/2019	α	64.6%	α 16.2%	α 15.9	α 1.2
DATE: 4/20/2018					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
TIME: 09:34		Reviewed by: Daniel Spicuzza		Static Count Time: 2 Minutes					
Isotopes of Concern: DU		NRL Chesapeake Beach Detachment							



Comments:

denotes swipe location and fixed α/β readings
 # denotes G/A radiation readings
 #/# denotes contact / 1 meter radiation readings.
 * denotes highest radiation reading on contact
 LAW denotes large area masslinn wipe
 Δ denotes static location.
 + Unless Otherwise Noted
 All readings in mri/hr unless otherwise noted
 K = 1000

Routine (Daily / Weekly / Monthly)

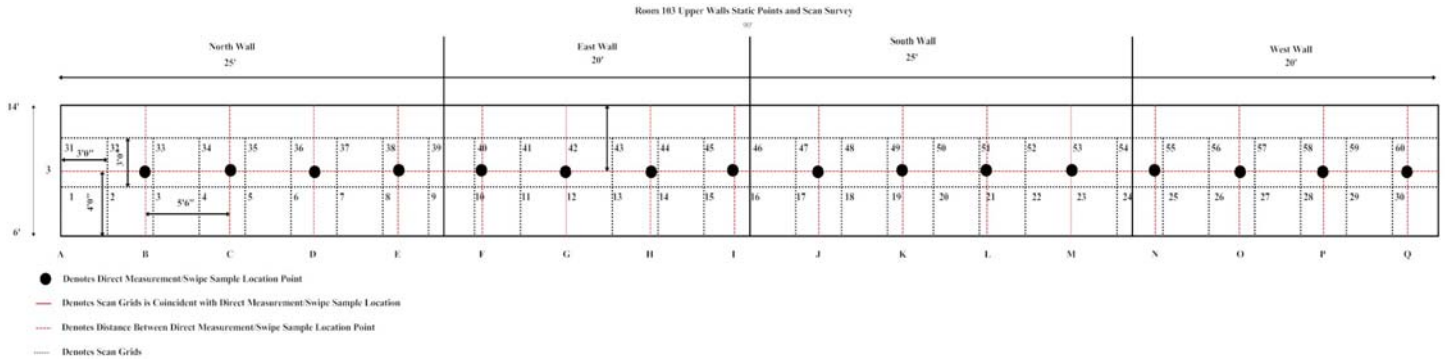
Non-routine

Room 103 Upper Wall

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/20/2018	TIME: 14:12	INSTRUMENTATION USED						
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	% Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
SURVEY NUMBER: N/A		2360	297758	2/14/2019	α	44.4%	α 11.1%	α 60.4
		43-93	299597		βγ	31.3%	βγ 15.7%	βγ 3022.4
LOCATION: Room 103 Upper Walls		2929	146870	6/17/2019	α	64.6%	α 15.9	α 1.2
					βγ	53.0%	βγ 26.5%	βγ 149.8
SURVEYOR: Josefina Matus								
DATE: 4/20/2018	TIME: 14:32	Reviewed by: Daniel Spicuzza						
Isotopes of Concern: DU		Static Count Time: 2 Minutes						

NRL Chesapeake Beach Detachment



Comments:

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Josefina Matus			LOCATION: Room 103 Upper Walls					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
B3								N/A No Access
C3								N/A No Access
D3								N/A No Access
E3								N/A No Access
F3				-28.8	0.0	-1.2	-8.3	See Map For Location
G3				-51.4	54.3	-1.2	-10.2	See Map For Location
H3				-1.8	60.7	1.9	-4.5	See Map For Location
I3				2.7	-79.9	-1.2	-2.6	See Map For Location
J3				-28.8	-12.8	1.9	-14.0	See Map For Location
K3				-33.3	115.0	1.9	-4.5	See Map For Location
L3				-6.3	-6.4	-1.2	-4.5	See Map For Location
M3				-1.8	-38.3	-1.2	-6.4	See Map For Location
N3				-6.3	57.5	5.0	-8.3	See Map For Location
O3				-10.8	-35.1	8.0	-19.6	See Map For Location
P3				7.2	-79.9	5.0	-4.5	See Map For Location
Q3				-1.8	28.8	8.0	-6.4	See Map For Location
I3D						-1.2	-4.5	Duplicate Swipe
O3D						5.0	-15.8	Duplicate Swipe
Maximum:				7.2	115.0	8.0	-2.6	
Average:				-13.4	5.3	2.1	-8.2	
StDev:				17.9	59.8	3.5	5.0	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
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N/A								
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N/A								
Reviewer Daniel Spicuzza			Date: 4/20/2018					
			Time: 14:32					

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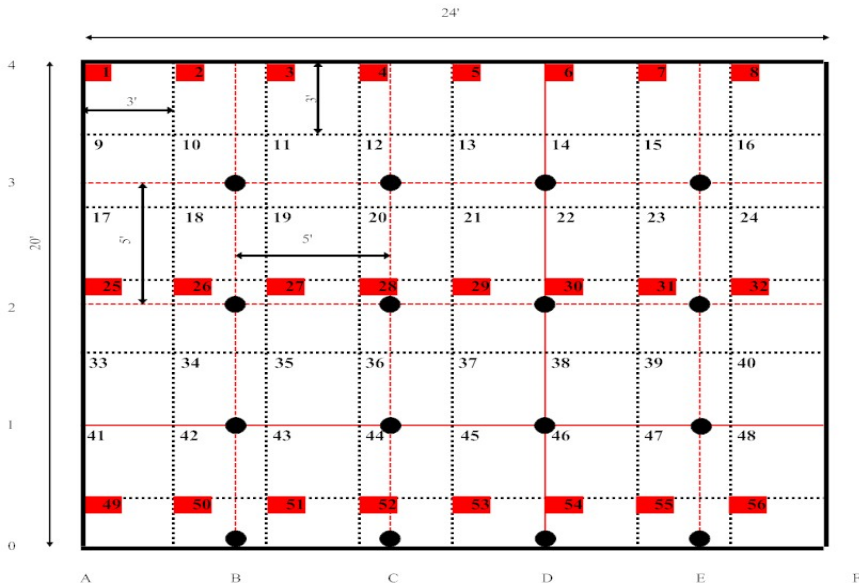
Room 103 Ceiling/Overhead

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018	TIME: 09:28	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	193668	8/15/2018	α	49.7%	α 12.4%	α 37.3	α 7.3
LOCATION: Room 103 Ceiling		43-93	326725		βγ	32.7%	βγ 12.3%	βγ 329.7	βγ 1141.7
SURVEYOR: Thomas Hogan/ Adolfo Matus		2929	146870	6/17/2019	α	64.6%	α 16.2%	α 15.9	α 1.2
DATE: 4/23/2018					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
TIME: 09:41		Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Beach Detachment

Room 103 Ceiling Static Point and Scan Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- - - Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids
- Denotes Locations of Scanned Areas, 25% or Better.

Comments:

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Thomas Hogan/ Adolfo Matus			LOCATION: Room 103 Ceiling					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
B0				12.8	415.9	-1.2	-3.5	See Map For Location
C0				0.7	407.7	-1.2	-21.1	See Map For Location
D0				12.8	473.0	1.9	-26.2	See Map For Location
E0				4.7	517.8	-1.2	-46.3	See Map For Location
B1				8.8	256.9	-1.2	-13.6	See Map For Location
C1				-7.3	154.9	-1.2	-48.8	See Map For Location
D1				4.7	191.6	-1.2	-28.7	See Map For Location
E1				20.8	411.8	-1.2	24.2	See Map For Location
B2				0.7	256.9	-1.2	-8.6	See Map For Location
C2				-3.3	159.0	-1.2	-23.6	See Map For Location
D2				4.7	199.8	1.9	-8.6	See Map For Location
E2				-3.3	212.0	1.9	-6.0	See Map For Location
B3				-3.3	232.4	1.9	-13.6	See Map For Location
C3				-7.3	118.2	-1.2	-31.2	See Map For Location
D3				-7.3	269.1	-1.2	-11.1	See Map For Location
E3				0.7	126.4	-1.2	-21.1	See Map For Location
D0D						1.9	-31.2	Duplicate Swipe
C2D						-1.2	-21.1	Duplicate Swipe
Maximum:				20.8	517.8	1.9	24.2	
Average:				2.5	275.2	-0.4	-18.9	
StDev:				8.2	128.6	1.4	16.7	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
Reviewer Daniel Spicuzza			Date: 4/23/2018					
			Time: 9:41					

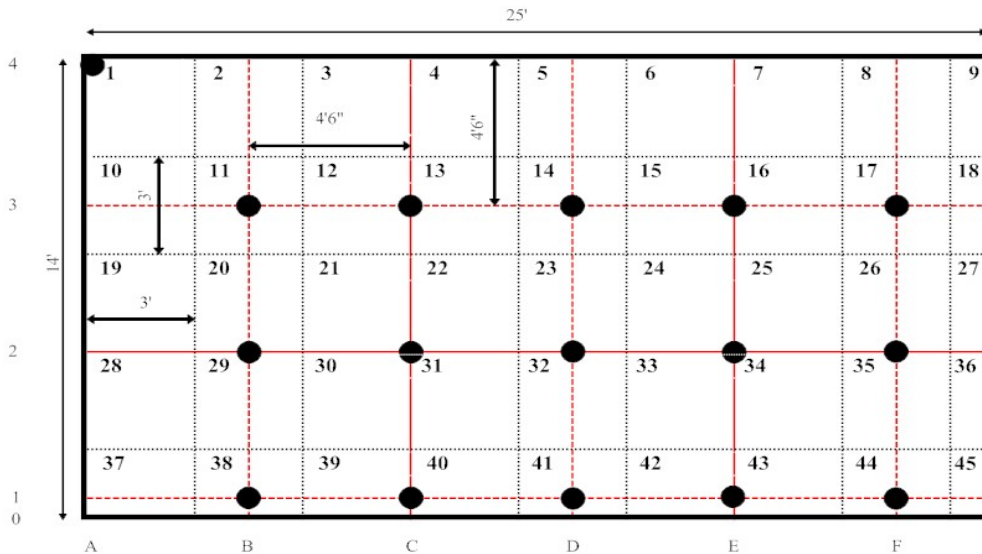
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Room 103A Floor

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/20/2018	TIME: 13:50	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	297766	12/20/2018	α	40.4%	α 10.1%	α 49.0	α 10.9
LOCATION: Room 103A Floor		43-93	323074		βγ	25.4%	βγ 9.5%	βγ 459.4	βγ 1732.3
SURVEYOR: Richard Thatcher		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
DATE: 4/20/2018					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
TIME: 13:58		Reviewed by: Daniel Spicuzza		Static Count Time: 2 Minutes					
Isotopes of Concern: DU		NRL Chesapeake Beach Detachment							

Room 103A Floor Static Points and Scan Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- - - Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids

Comments:

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mR/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Richard Thatcher				LOCATION: Room 103A Floor				
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
B1				4.0	220.5	-1.2	-23.6	See Map For Location
C1				13.9	467.2	-1.2	-11.1	See Map For Location
D1				8.9	278.2	-1.2	-18.6	See Map For Location
E1				18.8	540.7	-1.2	-11.1	See Map For Location
F1				4.0	267.7	1.9	-3.5	See Map For Location
B2				13.9	294.0	-1.2	4.0	See Map For Location
C2				8.9	2026.2	1.9	6.5	See Map For Location
D2				23.8	892.4	-1.2	-11.1	See Map For Location
E2				-1.0	986.9	-1.2	-6.0	See Map For Location
F2				13.9	341.2	-1.2	-16.1	See Map For Location
B3				23.8	246.7	-1.2	-18.6	See Map For Location
C3				-1.0	1149.6	1.9	-8.6	See Map For Location
D3				-1.0	194.2	-1.2	1.5	See Map For Location
E3				8.9	598.4	5.0	-3.5	See Map For Location
F3				-1.0	446.2	-1.2	-11.1	See Map For Location
A4				8.9	593.2	-1.2	-13.6	See Map For Location
E1D				N/A	N/A	-1.2	-6.0	Duplicate Swipe
C3D					N/A	1.9	-11.1	Duplicate Swipe
Maximum:				23.8	2026.2	5.0	6.5	
Average:				9.2	596.5	-0.2	-9.0	
StDev:				8.4	477.8	1.8	8.0	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
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Reviewer Daniel Spicuzza			Date:	4/20/2018				
			Time:	13:58				

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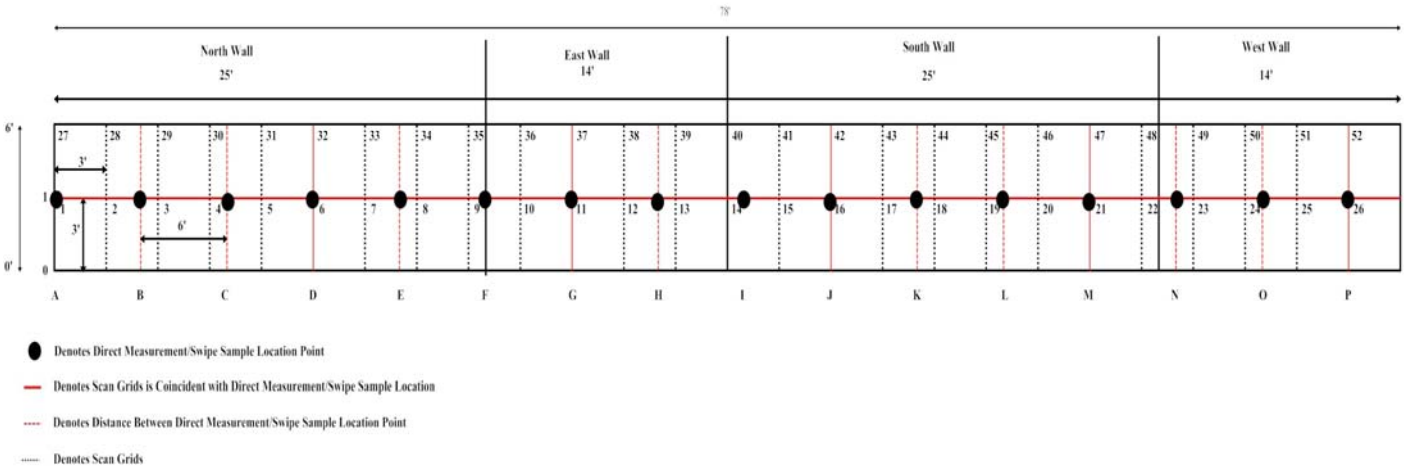
Room 103A Lower Wall

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/20/2018	TIME: 09:50	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	% Efficiency	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
SURVEY NUMBER: N/A		2360	297766	12/20/2018	α	40.4%	α 10.1%	α 47.4	α 9.9
LOCATION: Room103A Lower Walls		43-93	323074		βγ	25.4%	βγ 9.5%	βγ 459.4	βγ 1732.3
SURVEYOR: Richard Thatcher		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
DATE: 4/20/2018					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
TIME: 09:58		Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Beach Detachment

Room 103A Lower Walls Static Points and Scan Survey



Comments:

denotes swipe location and fixed α/β readings

denotes G/A radiation readings

#/# denotes contact / 1 meter radiation readings.

* denotes highest radiation reading on contact

LAW denotes large area masslinn wipe

Δ denotes static location.

+ Unless Otherwise Noted

All readings in mri/hr unless otherwise noted

K = 1000

Routine (Daily / Weekly / Monthly)

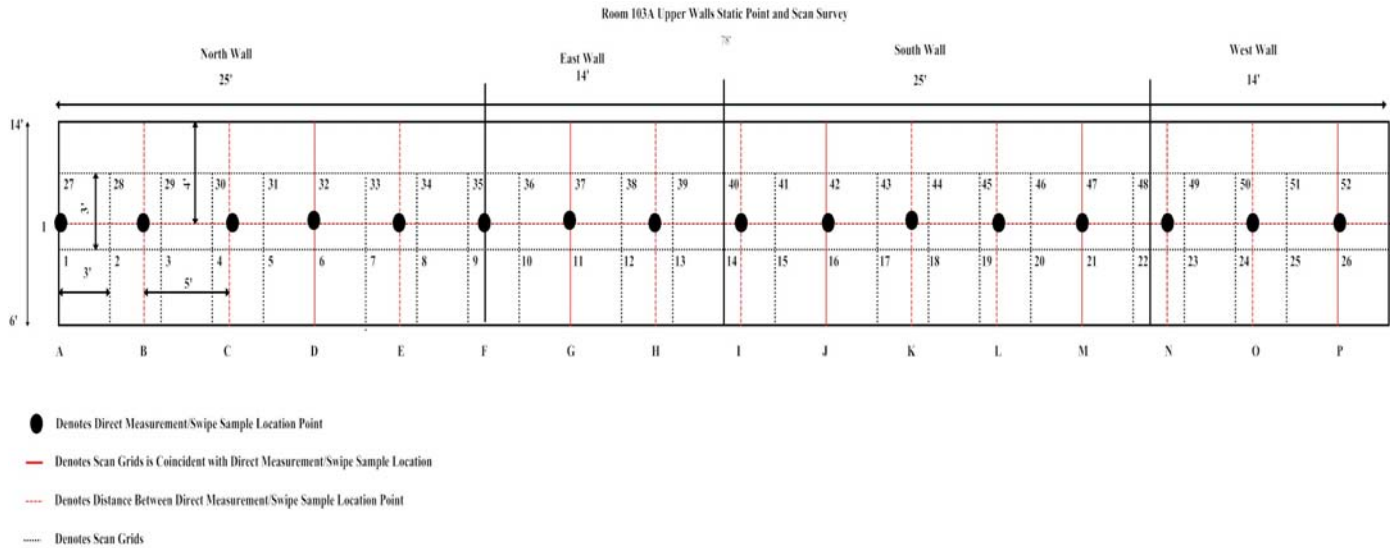
Non-routine

Room 103A Upper Wall

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018	TIME: 12:54	INSTRUMENTATION USED						
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	Total % Efficiency	MDC/MDA * (dpm/100cm ²)	Background * (dpm/100cm ²)
		2360	297758	2/14/2019	α 44.4%	α 11.1%	α 44.6	α 9.9
SURVEY NUMBER: N/A		43-93	299597		βγ 31.3%	βγ 11.7%	βγ 358.4	βγ 1295.0
LOCATION: Room 103A Upper Walls		2929	146780	6/17/2018	α 64.6%	α 16.2%	α 15.9	α 1.2
					βγ 53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
SURVEYOR: Adolfo Matus								
DATE: 4/23/2018	TIME: 13:06	Reviewed by: Daniel Spicuzza						
Isotopes of Concern: DU		Static Count Time: 2 Minutes						

NRL Chesapeake Beach Detachment



Comments:

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Adolfo Matus				LOCATION: Room 103A Upper Walls				
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
A1				-9.9	85.2	-1.2	-21.1	See Map For Location
B1				12.6	-72.4	-1.2	-3.5	See Map For Location
C1				8.1	690.1	1.9	-13.6	See Map For Location
D1				3.6	1870.1	-1.2	1.5	See Map For Location
E1				3.6	1482.4	-1.2	9.1	See Map For Location
F1				-0.9	1026.6	-1.2	-23.6	See Map For Location
G1				-5.4	1295.0	-1.2	-8.6	See Map For Location
H1				-0.9	1857.3	1.9	4.0	See Map For Location
I1				8.1	800.9	-1.2	-3.5	See Map For Location
J1				-0.9	613.4	-1.2	-18.6	See Map For Location
K1				-0.9	2645.4	-1.2	4.0	See Map For Location
L1				-5.4	447.3	1.9	-3.5	See Map For Location
M1				12.6	779.6	1.9	-1.0	See Map For Location
N1				12.6	38.3	-1.2	-26.2	See Map For Location
O1				-5.4	25.6	1.9	-28.7	See Map For Location
P1				-0.9	110.8	-1.2	-6.0	See Map For Location
E1D						-1.2	1.5	Duplicate Swipe
L1D						1.9	-8.6	Duplicate Swipe
Maximum:				12.6	2645.4	1.9	9.1	
Average:				1.9	856.0	-0.2	-8.1	
StDev:				7.1	794.9	1.5	11.4	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
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Reviewer			Date:	4/23/2018				
Daniel Spicuzza			Time:	13:06				

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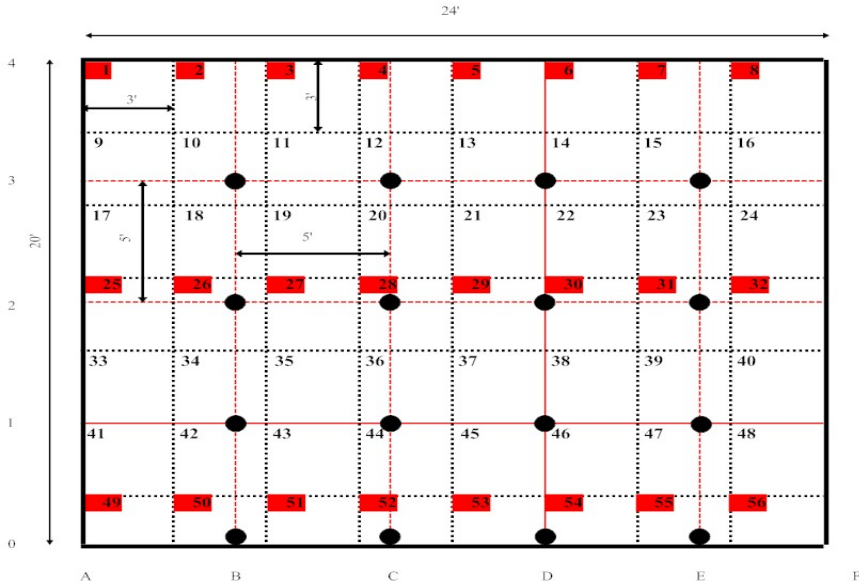
Room 103A Ceiling/Overhead

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018	TIME: 09:28	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	193668	8/15/2018	α	49.7%	α 12.4%	α 37.3	α 7.3
LOCATION: Room 103 Ceiling		43-93	326725		βγ	32.7%	βγ 12.3%	βγ 329.7	βγ 1141.7
SURVEYOR: Thomas Hogan/ Adolfo Matus		2929	146870	6/17/2019	α	64.6%	α 16.2%	α 15.9	α 1.2
DATE: 4/23/2018					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
TIME: 09:41		Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Beach Detachment

Room 103 Ceiling Static Point and Scan Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- - - Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids
- Denotes Locations of Scanned Areas, 25% or Better.

Comments:

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER:		N/A						
SURVEYOR:			Thomas Hogan/ Adolfo Matus			LOCATION: Room 103 Ceiling		
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
B0				12.8	415.9	-1.2	-3.5	See Map For Location
C0				0.7	407.7	-1.2	-21.1	See Map For Location
D0				12.8	473.0	1.9	-26.2	See Map For Location
E0				4.7	517.8	-1.2	-46.3	See Map For Location
B1				8.8	256.9	-1.2	-13.6	See Map For Location
C1				-7.3	154.9	-1.2	-48.8	See Map For Location
D1				4.7	191.6	-1.2	-28.7	See Map For Location
E1				20.8	411.8	-1.2	24.2	See Map For Location
B2				0.7	256.9	-1.2	-8.6	See Map For Location
C2				-3.3	159.0	-1.2	-23.6	See Map For Location
D2				4.7	199.8	1.9	-8.6	See Map For Location
E2				-3.3	212.0	1.9	-6.0	See Map For Location
B3				-3.3	232.4	1.9	-13.6	See Map For Location
C3				-7.3	118.2	-1.2	-31.2	See Map For Location
D3				-7.3	269.1	-1.2	-11.1	See Map For Location
E3				0.7	126.4	-1.2	-21.1	See Map For Location
D0D						1.9	-31.2	Duplicate Swipe
C2D						-1.2	-21.1	Duplicate Swipe
Maximum:				20.8	517.8	1.9	24.2	
Average:				2.5	275.2	-0.4	-18.9	
StDev:				8.2	128.6	1.4	16.7	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
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Reviewer	Daniel Spicuzza		Date:	4/23/2018				
			Time:	9:41				

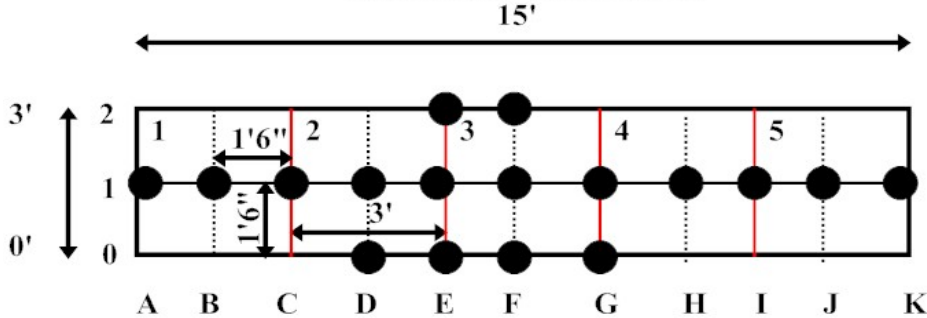
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Tunnel Floor

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018	TIME: 14:30	INSTRUMENTATION USED							
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	297766	12/20/2018	α	40.4%	α 10.1%	α 62.1	α 20.8
LOCATION: Tunnel Floor		43-93	323074		βγ	25.4%	βγ 9.5%	βγ 584.4	βγ 2845.1
SURVEYOR: Richard Thatcher		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
DATE: 4/23/2018					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
TIME: 14:39		Reviewed by: Daniel Spicuzza		Static Count Time: 2 Minutes					
Isotopes of Concern: DU		NRL Chesapeake Beach Detachment							

Tunnel Floor Static Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- - - Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids

Comments:

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

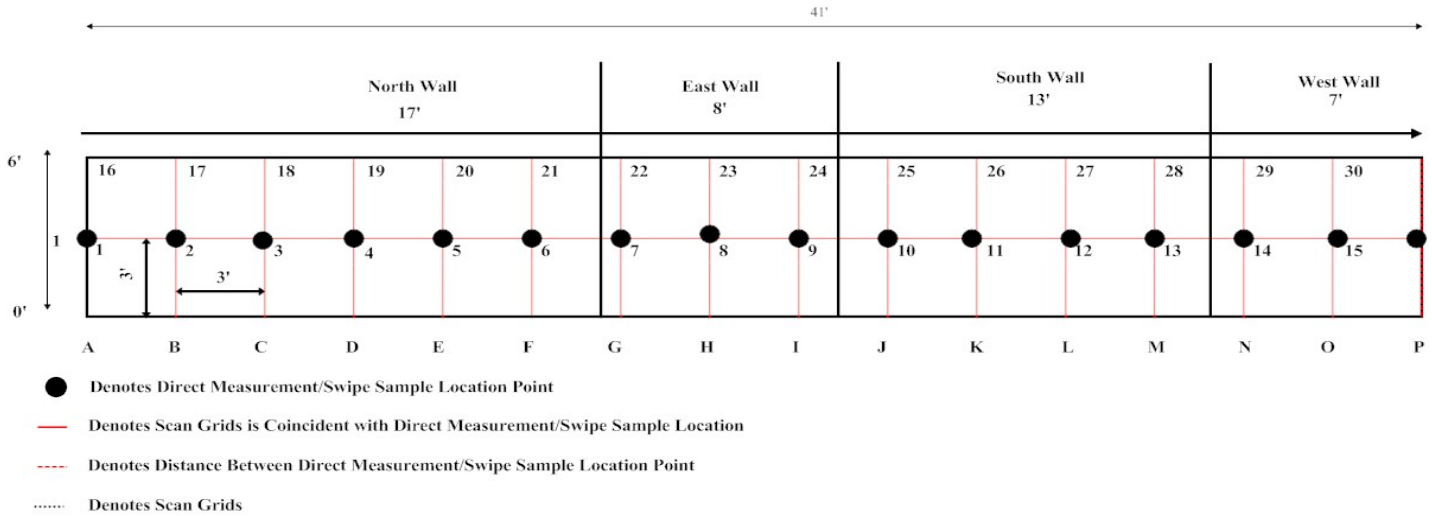
Tunnel Lower/Upper Walls

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018	TIME: 13:37	INSTRUMENTATION USED						
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
		2360	184949	3/6/2019	α 42.3%	α 10.6%	α 40.2	α 6.6
SURVEY NUMBER: N/A		43-93	268605		βγ 26.8%	βγ 10.1%	βγ 436.7	βγ 1651.7
LOCATION: Tunnel Lower Walls		2929	146780	6/17/2018	α 64.6%	α 16.2%	α 15.9	α 1.2
					βγ 53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
SURVEYOR: Joan Cosgrove								
DATE: 4/23/2018	TIME: 14:16	Reviewed by: Daniel Spicuzza						
Isotopes of Concern: DU		Static Count Time: 2 Minutes						

NRL Chesapeake Beach Detachment

Tunnel Wall Static Point and Scan Survey



Comments:

denotes swipe location and fixed α/β readings
denotes G/A radiation readings
#/# denotes contact / 1 meter radiation readings.
 * denotes highest radiation reading on contact
 LAW denotes large area masslinn wipe
 Δ denotes static location.
 + Unless Otherwise Noted
 All readings in mR/hr unless otherwise noted
 K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Joan Cosgrove			LOCATION: Tunnel Lower Walls					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
A1				12.3	328.4	-1.2	-6.0	See Map For Location
B1				12.3	253.7	1.9	-1.0	See Map For Location
C1				2.8	278.6	-1.2	-26.2	See Map For Location
D1				17.0	233.8	-1.2	-1.0	See Map For Location
E1				7.6	363.2	-1.2	-36.2	See Map For Location
F1				7.6	268.7	1.9	-31.2	See Map For Location
G1				12.3	263.7	-1.2	-23.6	See Map For Location
H1				-1.9	-24.9	-1.2	-3.5	See Map For Location
I1				17.0	283.6	-1.2	-28.7	See Map For Location
J1				2.8	363.2	1.9	-16.1	See Map For Location
K1				7.6	482.6	1.9	-16.1	See Map For Location
L1				-1.9	223.9	-1.2	-23.6	See Map For Location
M1				7.6	462.7	-1.2	-1.0	See Map For Location
N1				12.3	213.9	-1.2	-26.2	See Map For Location
O1				-6.6	218.9	-1.2	-23.6	See Map For Location
P1				92.7	164.2	-1.2	-21.1	See Map For Location
G1D						-1.2	-28.7	Duplicate Swipe
M1D						-1.2	-3.5	Duplicate Swipe
Maximum:				92.7	482.6	1.9	-1.0	
Average:				12.6	273.6	-0.6	-17.6	
StDev:				22.4	118.5	1.3	11.9	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
Reviewer Daniel Spicuzza			Date: 4/23/2018					
			Time: 14:16					

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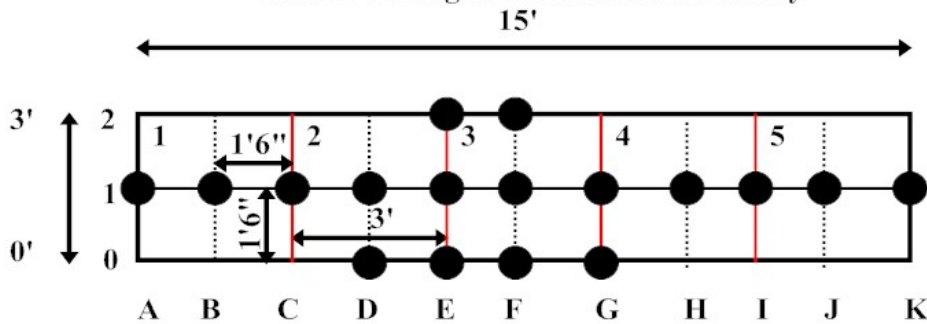
Tunnel Overhead/Ceiling

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018	TIME: 14:52	INSTRUMENTATION USED							
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	184949	3/6/2019	α	42.3%	α 10.6%	α 40.2	α 6.6
LOCATION: Tunnel Ceiling		43-93	268605		βγ	26.8%	βγ 10.1%	βγ 436.7	βγ 1651.7
SURVEYOR: Joan Cosgrove		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
DATE: 4/23/2018		TIME: 14:55		Reviewed by: Daniel Spicuzza					
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Beach Detachment

Tunnel Ceiling Static Point Scan Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- - - Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids

Comments:

denotes swipe location and fixed α/β readings
denotes G/A radiation readings
#/# denotes contact / 1 meter radiation readings.
 * denotes highest radiation reading on contact
 LAW denotes large area masslinn wipe
 Δ denotes static location.
 + Unless Otherwise Noted
 All readings in mri/hr unless otherwise noted
 K = 1000

Routine (Daily / Weekly / Monthly)

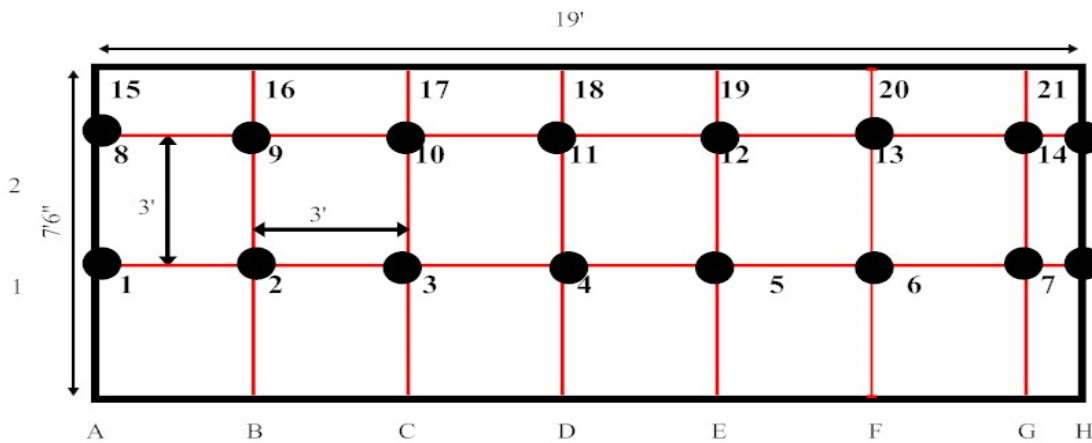
Non-routine

Room 105 Floor

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018		TIME: 15:00		INSTRUMENTATION USED					
SURVEY NUMBER: N/A		Model Inst./Det.:	Serial Number:	Calibration Due Date:	Instrument Efficiency:	%:	Total % Efficiency:	MDC/MDA ⁺ (dpm/100cm ²):	Background ⁺ (dpm/100cm ²):
LOCATION: Room 105 Floor		2360	297758	2/14/2019	α	44.4%	α 11.1%	α 53.3	α 16.2
SURVEYOR: Thomas Hogan/Joan Cosgrove		43-93	299597		βγ	31.3%	βγ 11.7%	βγ 481.0	βγ 2377.0
DATE: 4/23/2018		2929	146870	6/17/2019	α	64.6%	α 16.2%	α 15.9	α 1.2
TIME: 15:05					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
Reviewed by: Daniel Spicuzza		Static Count Time: 2 Minutes							
Isotopes of Concern: DU		NRL Chesapeake Beach Detachment							

Room 105 Floor



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- - - Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids

Comments:

The 3' by 3' area at each direct measurement location was 100% gross alpha/beta-gamma surveyed.
Scan results were: 0-5 CPM alpha, 250-300 cpm beta-gamma.

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Thomas Hogan/Joan Cosgrove			LOCATION: Room 105 Floor					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
A1				19.8	106.5	1.9	-13.6	See Map For Location
B1				-2.7	-68.2	1.9	-8.6	See Map For Location
C1				10.8	-42.6	-1.2	-21.1	See Map For Location
D1				-2.7	-42.6	-1.2	-11.1	See Map For Location
E1				-7.2	-119.3	-1.2	-13.6	See Map For Location
F1				-2.7	-115.0	-1.2	-3.5	See Map For Location
G1				-2.7	-132.1	1.9	-16.1	See Map For Location
H1				-7.2	132.1	-1.2	4.0	See Map For Location
A2				24.3	-132.1	-1.2	-26.2	See Map For Location
B2				-2.7	-115.0	-1.2	-18.6	See Map For Location
C2				6.3	119.3	1.9	-16.1	See Map For Location
D2				1.8	29.8	-1.2	-31.2	See Map For Location
E2				-2.7	-115.0	-1.2	-11.1	See Map For Location
F2				-16.2	98.0	-1.2	-6.0	See Map For Location
G2				1.8	123.5	-1.2	-3.5	See Map For Location
H2				6.3	34.1	1.9	-23.6	See Map For Location
E1D						-1.2	-11.1	Duplicate Swipe
F2D						-1.2	-8.6	Duplicate Swipe
Maximum:				24.3	132.1	1.9	4.0	
Average:				1.5	-14.9	-0.4	-13.3	
StDev:				10.2	104.4	1.4	8.8	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
Reviewer Daniel Spicuzza			Date: 4/23/2018					
			Time: 15:05					

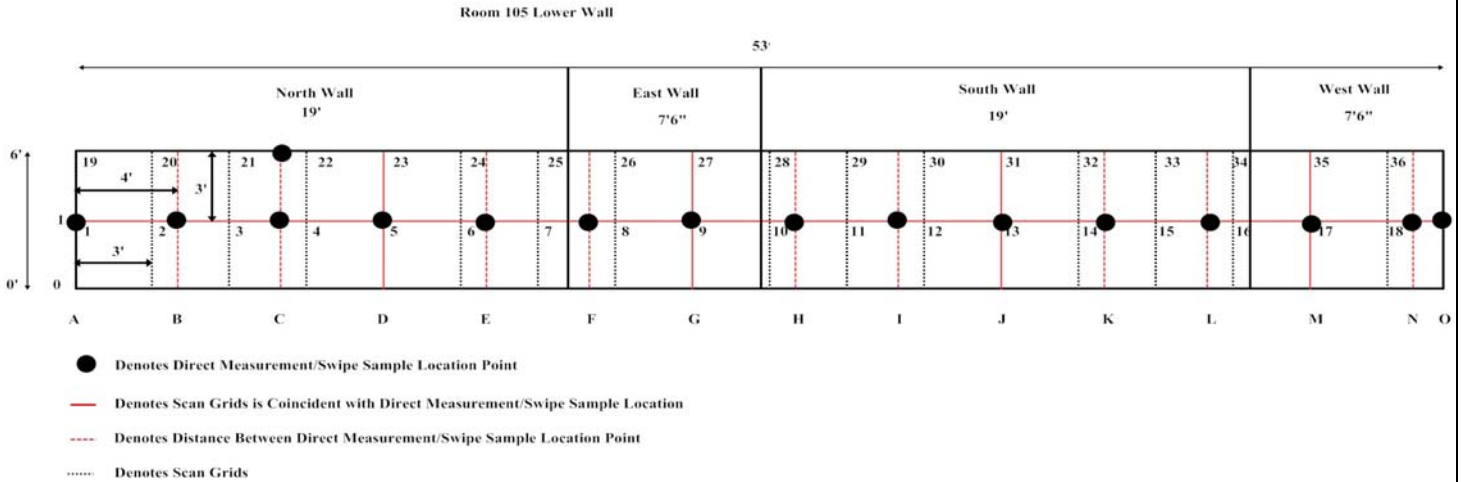
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Room 105 Lower/Upper Walls

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018	TIME: 13:22	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	% Efficiency	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
		2360	193668	8/15/2018	α	49.7%	α 12.4%	α 45.6	α 12.9
SURVEY NUMBER: N/A		43-93	326725		βγ	32.7%	βγ 12.3%	βγ 364.1	βγ 1402.7
LOCATION: Room 105 Lower Walls		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
SURVEYOR: Thomas Hogan									
DATE: 4/23/2018	TIME: 13:41	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Beach Detachment



Comments:

The 3' by 3' area at each direct measurement location was 100% gross alpha/beta-gamma surveyed.
 Scan results were: 0-4 CPM alpha, 150-200 cpm beta-gamma.

denotes swipe location and fixed α/β readings
 # denotes G/A radiation readings
 #/# denotes contact / 1 meter radiation readings.
 * denotes highest radiation reading on contact
 LAW denotes large area masslinn wipe
 Δ denotes static location.
 + Unless Otherwise Noted
 All readings in mri/hr unless otherwise noted
 K = 1000

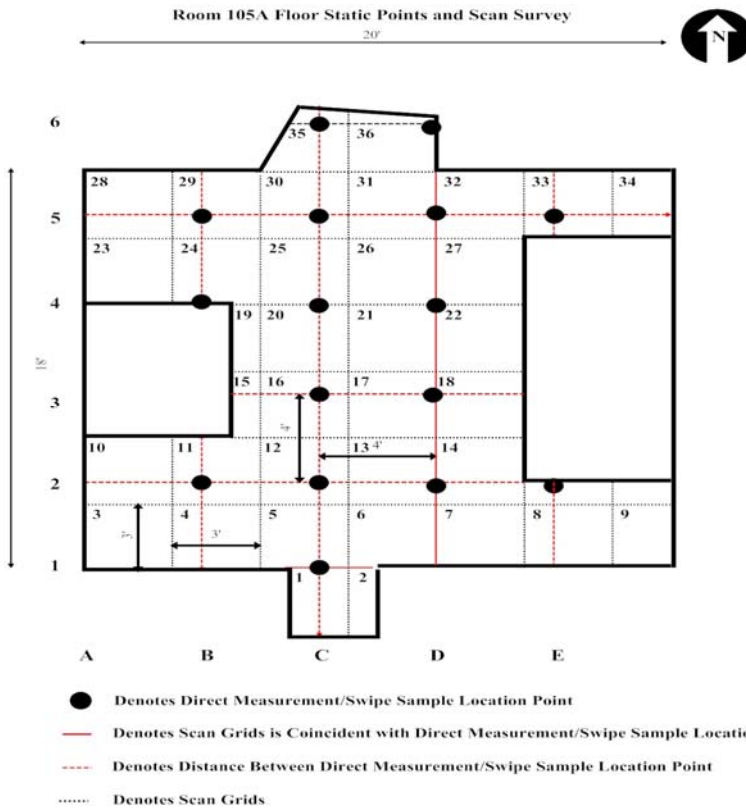
Routine (Daily / Weekly / Monthly) Non-routine

Room 105A Floor

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018	TIME: 08:30	INSTRUMENTATION USED							
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
		2360	297766	12/20/2018	α	40.4%	α 10.1%	α 62.1	α 20.8
SURVEY NUMBER: N/A		43-93	323074		βγ	25.4%	βγ 9.5%	βγ 584.4	βγ 2845.1
LOCATION: Room 105A Floor		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
SURVEYOR: Richard Thatcher									
DATE: 4/23/2018	TIME: 08:47	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Beach Detachment



Comments:

denotes swipe location and fixed α/β readings

denotes G/A radiation readings

#/# denotes contact / 1 meter radiation readings.

* denotes highest radiation reading on contact

LAW denotes large area masslinn wipe

Δ denotes static location.

+ Unless Otherwise Noted

All readings in mri/hr unless otherwise noted

K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Richard Thatcher			LOCATION: Room 105A Floor					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
C1				-1.0	246.7	-1.2	-6.0	See Map For Location
B2				28.7	73.5	-1.2	-21.1	See Map For Location
C2				-5.9	178.5	-1.2	-3.5	See Map For Location
D2				4.0	425.2	1.9	1.5	See Map For Location
E2				-10.9	-89.2	5.0	4.0	See Map For Location
C3				-1.0	68.2	-1.2	-3.5	See Map For Location
D3				-5.9	199.5	1.9	-26.2	See Map For Location
B4				-1.0	21.0	1.9	-13.6	See Map For Location
C4				13.9	378.0	-1.2	-8.6	See Map For Location
D4				-15.8	183.7	-1.2	-11.1	See Map For Location
B5				-1.0	110.2	-1.2	-31.2	See Map For Location
C5				23.8	-157.5	-1.2	-1.0	See Map For Location
D5				13.9	68.2	1.9	-3.5	See Map For Location
E5				-1.0	262.5	-1.2	-18.6	See Map For Location
C6				33.7	540.7	-1.2	-11.1	See Map For Location
D6				4.0	-89.2	1.9	-26.2	See Map For Location
C3D						-1.2	-6.0	Duplicate Swipe
E5D						1.9	-23.6	Duplicate Swipe
Maximum:				33.7	540.7	5.0	4.0	
Average:				4.9	151.2	0.1	-11.6	
StDev:				14.1	192.0	1.9	10.6	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
Reviewer Daniel Spicuzza			Date: 4/23/2018					
			Time: 8:47					

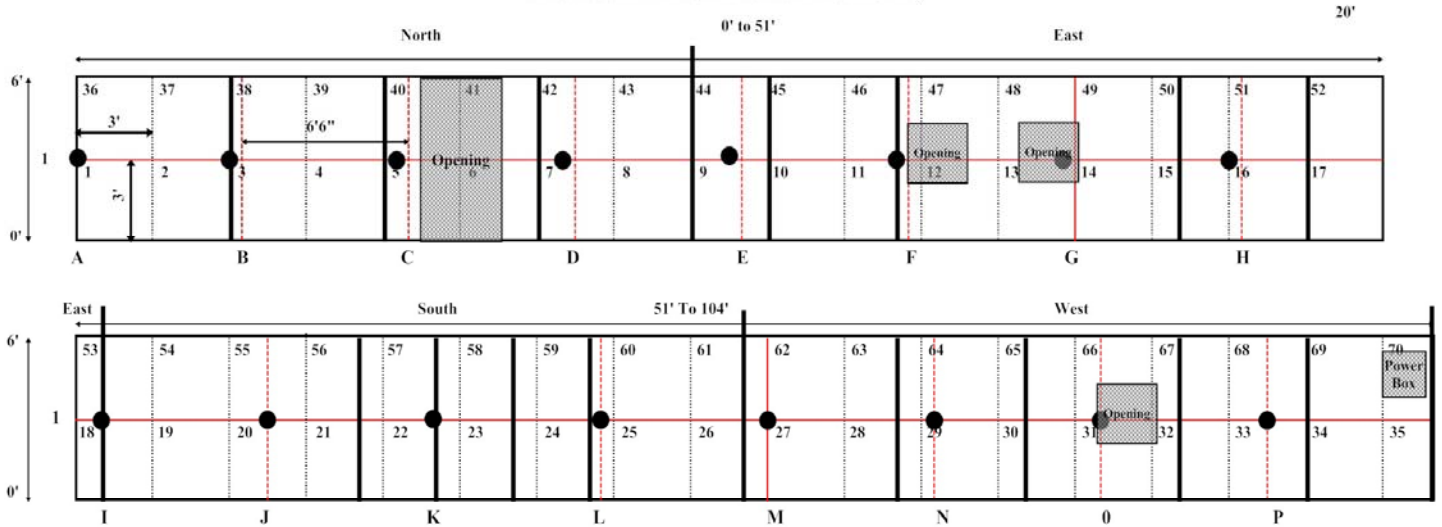
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Room 105A Lower\Upper Walls

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018	TIME: 13:00	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	% Efficiency	Total % Efficiency	MDC/MDA * (dpm/100cm ²)	Background + (dpm/100cm ²)
		2360	297766	12/20/2018	α	40.4%	α 10.1%	α 47.4	α 9.9
SURVEY NUMBER: N/A		43-93	323074		βγ	25.4%	βγ 9.5%	βγ 494.4	βγ 2015.7
LOCATION: Room 105A Lower/Upper Walls		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
SURVEYOR: Richard Thatcher									
DATE: 4/23/2018	TIME: 13:17	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: Ra-226, Sr-90		Static Count Time: 2 Minutes							
NRL Chesapeake Beach Detachment									

R-105A Lower Wall Static Points and Scan Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids
- Denotes Obstructions

Comments:

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

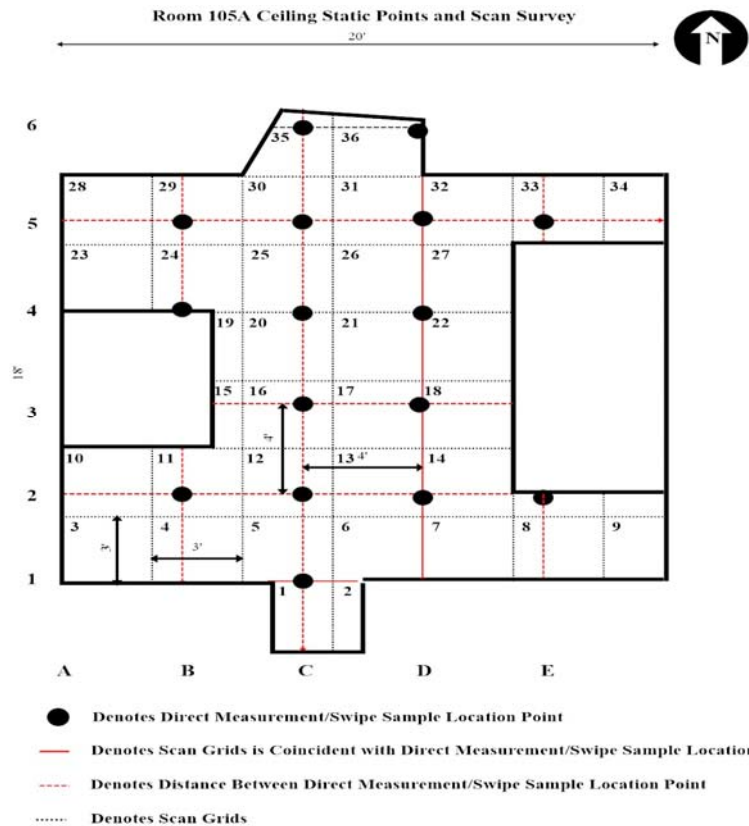
SURVEY NUMBER: N/A								
SURVEYOR: Richard Thatcher			LOCATION: Room 105A Lower/Upper Walls					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
A1				-5.0	246.7	-1.2	-3.5	See Map For Location
B1				9.9	430.4	5.0	-6.0	See Map For Location
C1				5.0	252.0	-1.2	-11.1	See Map For Location
D1				9.9	362.2	5.0	-16.1	See Map For Location
E1				9.9	257.2	-1.2	-1.0	See Map For Location
F1				9.9	78.7	1.9	-16.1	See Map For Location
G1				19.8	351.7	5.0	-23.6	See Map For Location
H1				5.0	73.5	-1.2	-23.6	See Map For Location
I1				14.9	115.5	5.0	4.0	See Map For Location
J1				14.9	63.0	-1.2	-13.6	See Map For Location
K1				5.0	21.0	1.9	4.0	See Map For Location
L1				5.0	68.2	1.9	-1.0	See Map For Location
M1				0.0	0.0	1.9	-11.1	See Map For Location
N1				9.9	-15.7	5.0	-3.5	See Map For Location
O1				24.8	-89.2	-1.2	-16.1	See Map For Location
P1				5.0	-68.2	-1.2	-26.2	See Map For Location
C1D						-1.2	-6.0	Duplicate Swipe
N1D						5.0	-6.0	Duplicate Swipe
Maximum:				24.8	430.4	5.0	4.0	
Average:				9.0	134.2	1.5	-9.8	
StDev:				7.3	161.1	2.8	9.2	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
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Reviewer Daniel Spicuzza			Date: 4/23/2018					
			Time: 13:17					

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Room 105A Ceiling/Overhead

RADIATION/CONTAMINATION SURVEY FORM

DATE: TIME:			INSTRUMENTATION USED										
			Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)			
4/23/2018 13:45			2360 43-93	297758 299597	2/14/2019	α	44.4%	α	11.1%	α	43.2	α	9.0
SURVEY NUMBER: N/A						βγ	31.3%	βγ	15.7%	βγ	287.7	βγ	1118.2
LOCATION: Room 105A Ceiling			2929	146870	6/17/2019	α	64.6%	α	16.2%	α	15.9	α	1.2
SURVEYOR: Adolfo Matus						βγ	53.0%	βγ	26.5%	βγ	62.8	βγ	149.8
DATE: TIME: Reviewed by:			Static Count Time: 2 Minutes										
4/23/2018 14:04 Daniel Spicuzza													
Isotopes of Concern: DU			NRL Chesapeake Beach Detachment										



Comments:

The 3' by 3' area at each direct measurement location was 100% gross alpha/beta-gamma surveyed.
Scan results were: 0-5 CPM alpha, 160-200 cpm beta-gamma.

denotes swipe location and fixed α/β readings
denotes G/A radiation readings
#/# denotes contact / 1 meter radiation readings.
* denotes highest radiation reading on contact
LAW denotes large area masslinn wipe
Δ denotes static location.
+ Unless Otherwise Noted
All readings in mri/hr unless otherwise noted
K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Adolfo Matus			LOCATION: Room 105A Ceiling					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
C1				13.5	169.3	-1.2	-14.0	See Map For Location
B2				9.0	220.4	-1.2	-15.8	See Map For Location
C2				4.5	182.1	-1.2	-0.8	See Map For Location
D2				-4.5	293.9	-1.2	-19.6	See Map For Location
E2				4.5	162.9	-1.2	3.0	See Map For Location
C3				-4.5	159.7	-1.2	-4.5	See Map For Location
D3				4.5	198.1	-1.2	-21.5	See Map For Location
B4				0.0	121.4	1.9	8.7	See Map For Location
C4				0.0	150.2	1.9	-19.6	See Map For Location
D4				0.0	16.0	-1.2	-8.3	See Map For Location
B5				-4.5	162.9	-1.2	-14.0	See Map For Location
C5				-4.5	150.2	-1.2	-10.2	See Map For Location
D5				4.5	156.5	-1.2	-2.6	See Map For Location
E5				13.5	115.0	1.9	-19.6	See Map For Location
C6				-9.0	38.3	-1.2	-6.4	See Map For Location
D6				0.0	124.6	-1.2	-15.8	See Map For Location
D2D						-1.2	-23.4	Duplicate Swipe
C5D						-1.2	-12.1	Duplicate Swipe
Maximum:				13.5	293.9	1.9	8.7	
Average:				1.7	151.4	-0.7	-10.9	
StDev:				6.6	64.8	1.2	9.0	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
Reviewer Daniel Spicuzza	Date: 4/23/2018							
	Time: 14:04							

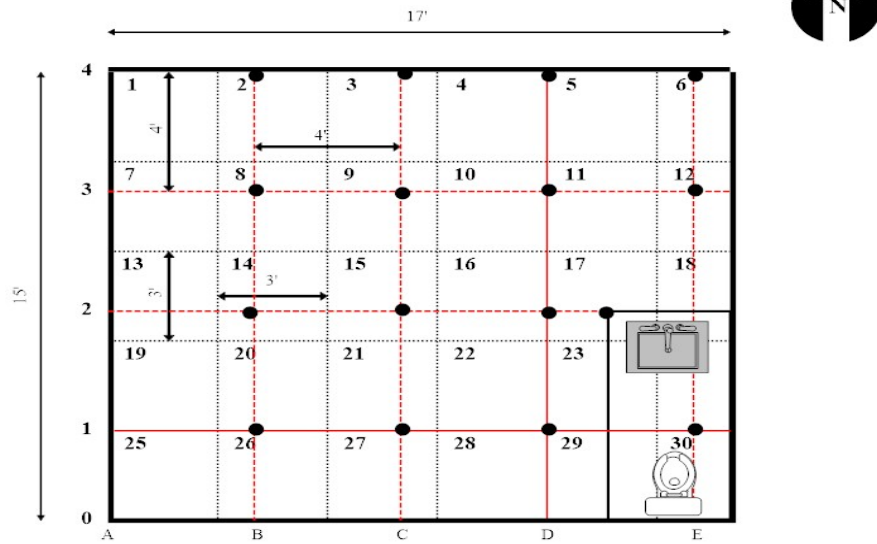
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Building 227
Room 100 Floor

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018	TIME: 08:51	INSTRUMENTATION USED							
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	297758	2/14/2019	α	44.4%	α 11.1%	α 53.3	α 16.2
LOCATION: Bldg 227 Room 100 Floor		43-93	299597		βγ	31.3%	βγ 11.7%	βγ 481.0	βγ 2377.0
SURVEYOR: Josefina Matus		2929	146870	6/17/2019	α	64.6%	α 16.2%	α 15.9	α 1.2
DATE: 4/23/2018					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
TIME: 09:09		Reviewed by: Daniel Spicuzza		Static Count Time: 2 Minutes					
Isotopes of Concern: DU		NRL Chesapeake Beach Detachment							

Bldg 227 Room 100 Floor Static Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- - - Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids

Comments:

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Josefina Matus			LOCATION: Bldg 227 Room 100 Floor					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
B1				6.3	-51.1	1.9	-13.6	See Map For Location
C1				-11.7	-38.3	1.9	-1.0	See Map For Location
D1				19.8	-123.5	-1.2	-3.5	See Map For Location
E1				1.8	187.4	1.9	11.6	See Map For Location
B2				10.8	-8.5	-1.2	-8.6	See Map For Location
C2				6.3	76.7	-1.2	-26.2	See Map For Location
D2				6.3	119.3	-1.2	-13.6	See Map For Location
E2				19.8	276.9	1.9	-18.6	See Map For Location
B3				10.8	38.3	-1.2	-3.5	See Map For Location
C3				10.8	149.1	-1.2	-6.0	See Map For Location
D3				1.8	80.9	-1.2	21.6	See Map For Location
E3				24.3	178.9	1.9	4.0	See Map For Location
B4				1.8	217.3	-1.2	-18.6	See Map For Location
C4				10.8	89.5	-1.2	-13.6	See Map For Location
D4				15.3	-68.2	1.9	-11.1	See Map For Location
E4				10.8	136.3	-1.2	-6.0	See Map For Location
B2D						-1.2	-11.1	Duplicate Swipe
E3D						1.9	-1.0	Duplicate Swipe
Maximum:				24.3	276.9	1.9	21.6	
Average:				9.1	78.8	0.0	-6.6	
StDev:				8.7	113.3	1.6	11.3	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
Reviewer Daniel Spicuzza			Date: 4/23/2018					
			Time: 9:09					

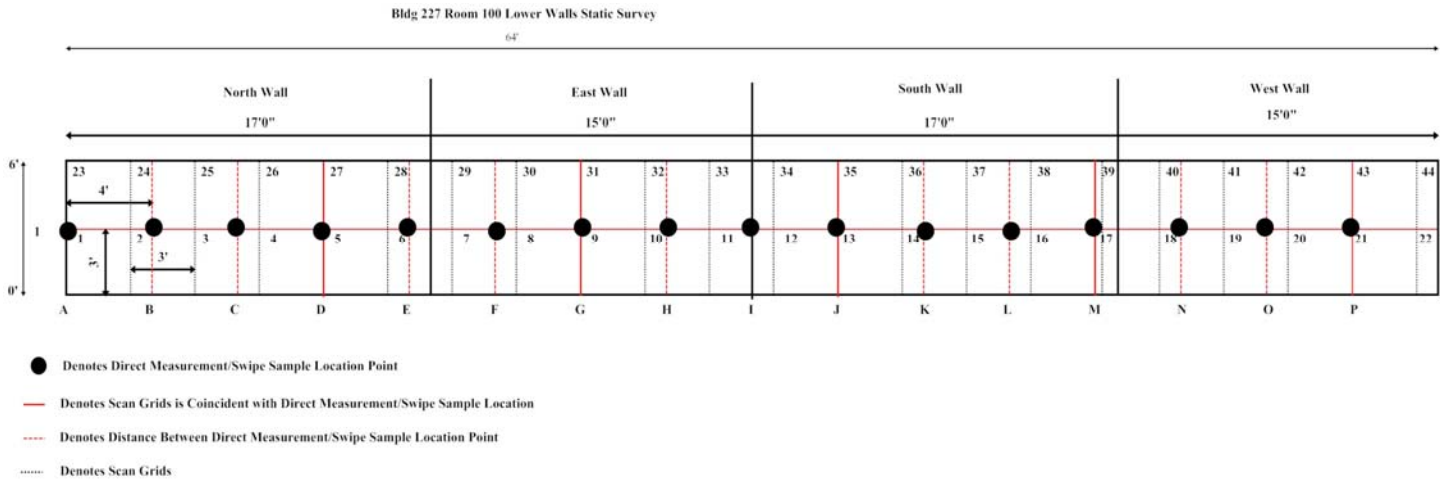
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Building 227
Room 100 Lower Walls

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018	TIME: 08:10	INSTRUMENTATION USED						
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	% Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
		2360	184949	3/6/2019	α 42.3%	α 10.6%	α 46.8	α 10.4
SURVEY NUMBER: N/A		43-93	268605		βγ 26.8%	βγ 10.1%	βγ 441.8	βγ 1691.5
LOCATION: Bldg 227 Room 100 Lower Walls		2929	146870	6/17/2019	α 64.6%	α 16.2%	α 15.9	α 1.2
					βγ 53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
SURVEYOR: Joan Cosgrove								
DATE: 4/23/2018	TIME: 08:22	Reviewed by: Daniel Spicuzza						
Isotopes of Concern: DU		Static Count Time: 2 Minutes						

NRL Chesapeake Beach Detachment



Comments:

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

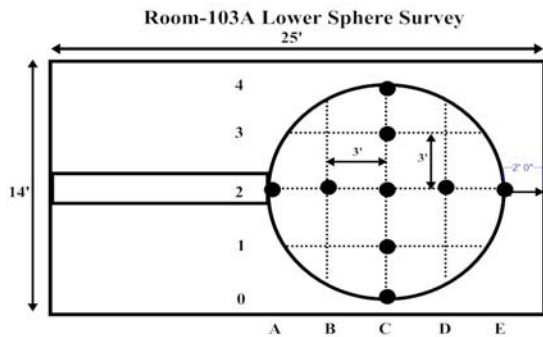
Non-routine

Target Sphere

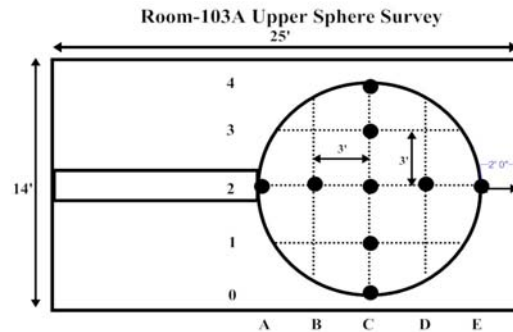
RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/25/2018		TIME: 14:27		INSTRUMENTATION USED					
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	184949	3/6/2019	α	42.3%	α 10.6%	α 42.0	α 7.6
LOCATION: Bldg. 218 Target Sphere Interior		43-93	268605		βγ	26.8%	βγ 10.1%	βγ 396.7	βγ 1353.2
		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
SURVEYOR: Adolfo Matus									
DATE: 4/25/2018	TIME: 14:42	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU				Static Count Time: 2 Minutes					

NRL Chesapeake Beach Detachment Bldg. 218 Target Sphere



● Denotes Direct Measurement/Swipe Sample Location Point



● Denotes Direct Measurement/Swipe Sample Location Point

Comments:

denotes swipe location and fixed α/β readings

denotes G/A radiation readings

#/# denotes contact / 1 meter radiation readings.

* denotes highest radiation reading on contact

LAW denotes large area masslinn wipe

Δ denotes static location.

+ Unless Otherwise Noted

All readings in mri/hr unless otherwise noted

K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Adolfo Matus			LOCATION: Bldg. 218 Target Sphere Interior					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
C0				-2.8	-19.9	1.9	-23.6	Sphere Top/See Map For Location
C1				1.9	-5.0	5.0	-26.2	Sphere Top/See Map For Location
C2				6.6	-64.7	1.9	-18.6	Sphere Top/See Map For Location
C3				6.6	-29.9	8.0	-23.6	Sphere Top/See Map For Location
C4				1.9	29.9	1.9	-16.1	Sphere Top/See Map For Location
A2				11.3	273.6	1.9	-28.7	Sphere Top/See Map For Location
B2				1.9	84.6	-1.2	-11.1	Sphere Top/See Map For Location
D2				-2.8	-14.9	1.9	-21.1	Sphere Top/See Map For Location
E2				1.9	547.3	1.9	-31.2	Sphere Top/See Map For Location
C0				6.6	-34.8	-1.2	-3.5	Sphere Bottom/See Map For Location
C1				-2.8	497.5	1.9	1.5	Sphere Bottom/See Map For Location
C2				1.9	-24.9	5.0	-16.1	Sphere Bottom/See Map For Location
C3				6.6	14.9	1.9	-26.2	Sphere Bottom/See Map For Location
C4				1.9	-10.0	-1.2	-23.6	Sphere Bottom/See Map For Location
A2				-2.8	3447.8	1.9	-11.1	Sphere Bottom/See Map For Location
B2				6.6	184.1	1.9	-16.1	Sphere Bottom/See Map For Location
D2				-2.8	-19.9	-1.2	-13.6	Sphere Bottom/See Map For Location
E2				1.9	527.4	-1.2	-8.6	Sphere Bottom/See Map For Location
Maximum:				11.3	3447.8	8.0	1.5	Duplicate Swipe
Average:				2.4	299.1	1.7	-17.6	Duplicate Swipe
StDev:				4.3	812.7	2.5	8.8	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
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N/A								
N/A								
Reviewer Daniel Spicuzza			Date: 4/25/2018					
			Time: 14:42					

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Appendix J

Building 218/227 Rooms Biased Survey Data

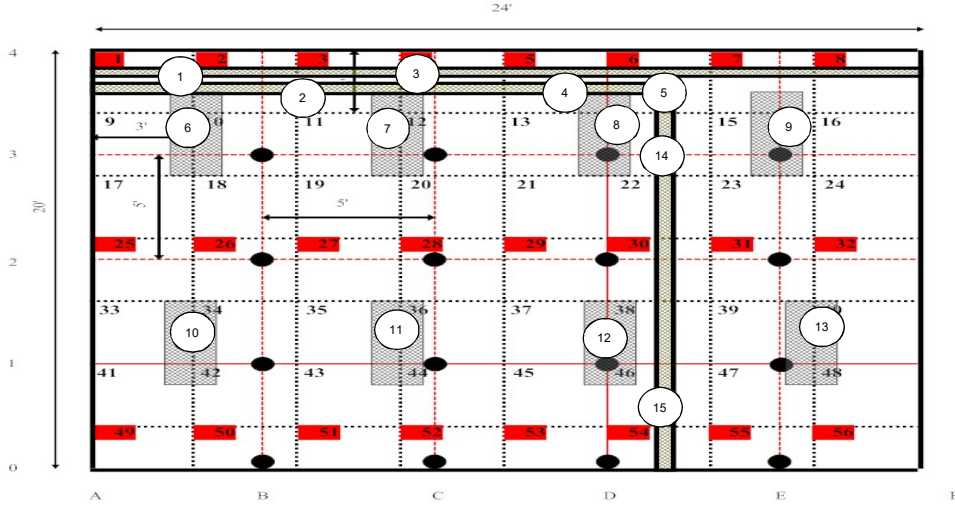
Room 103 Ceiling/Overhead

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/9/2018	TIME: 08:30	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
SURVEY NUMBER: N/A		2360	297766	12/20/2018	α	49.7%	α 12.4%	α 58.2	α 8.9
LOCATION: Room 103 Ceiling/Overhead Biased Readings		43-93	323074		βγ	32.7%	βγ 12.3%	βγ 446.6	βγ 1345.6
SURVEYOR: Thomas Hogan/Adolfo Matus		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 27.8	α 1.2
DATE: 4/9/2018		TIME: 08:47	Reviewed by: Daniel Spicuzza		βγ	53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
Isotopes of Concern: DU				Static Count Time: 1 Minutes					

NRL Chesapeake Building 218 Room 103

Room 103 Ceiling Static Point and Scan Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids
- Denotes Locations of Scanned Areas, 25% or Better.
- ▬ Denotes Conduit
- ▨ Denotes Light Fixtures

Comments:

- ⊙ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Thomas Hogan/Josefina Matus/Adolfo Matus					LOCATION: Room 103 Ceiling/Overhead Biased Readings			
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1				7.2	1924.6	11.1	12.5	See Map For Location
2				15.3	2625.9	5.0	4.9	See Map For Location
3				23.3	2177.4	17.3	-6.4	See Map For Location
4				7.2	3441.4	11.1	-10.2	See Map For Location
5				47.5	3033.6	17.3	-2.6	See Map For Location
6				47.5	4893.0	5.0	4.9	See Map For Location
7				23.3	3995.9	-1.2	8.7	See Map For Location
8				31.4	3522.9	-1.2	16.2	See Map For Location
9				55.5	4216.1	5.0	-10.2	See Map For Location
10				15.3	3498.5	11.1	-29.1	See Map For Location
11				23.3	2911.3	11.1	-21.5	See Map For Location
12				23.3	2992.9	5.0	-14.0	See Map For Location
13				39.4	3310.9	11.1	-6.4	See Map For Location
14				31.4	3082.6	5.0	31.3	See Map For Location
15				15.3	3392.5	5.0	16.2	See Map For Location
Maximum:				55.5	4893.0	17.3	31.3	
Average:				27.1	3268.0	7.8	-0.4	
Reviewer Daniel Spicuzza			Date: 4/9/2018					
			Time: 8:47					

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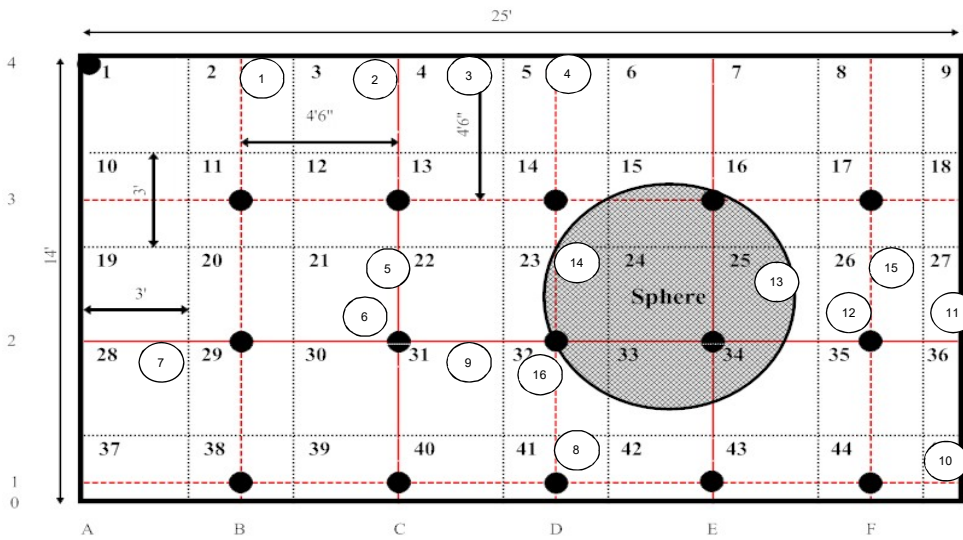
Room 103A Floor

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/12/2018	TIME: 08:30	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	193668	8/15/2018	α	49.7%	α 12.4%	α 56.6	α 8.0
LOCATION: Room 103A Floor Biased Readings		43-93	326725		βγ	32.7%	βγ 12.3%	βγ 413.3	βγ 1141.7
		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
SURVEYOR: Ricjard Thatcher/Joan Cosgrove					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
DATE: 4/12/2018	TIME: 08:46	Reviewed by: Daniel Spicuzza		Static Count Time: 1 Minutes					
Isotopes of Concern: DU									

NRL Chesapeake Building 218 Room 103A

Room 103A Floor Static Points and Scan Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- - - Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids
- ⊘ Denotes Obstruction

Comments:

Cross hatched areas are elevated areas.

- ⊘ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Adolfo Matus					LOCATION: Room 103A Floor Biased Readings			
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1				8.0	2389.4	11.1	-10.2	See Map For Location
2				8.0	4191.6	11.1	12.5	See Map For Location
3				24.1	3368.0	5.0	-2.6	See Map For Location
4				8.0	2577.0	5.0	12.5	See Map For Location
5				0.0	2479.1	17.3	20.0	See Map For Location
6				8.0	2952.1	11.1	8.7	See Map For Location
7				8.0	2307.8	11.1	-2.6	See Map For Location
8				0.0	2373.1	5.0	1.1	See Map For Location
9				16.1	2356.8	11.1	-6.4	See Map For Location
10				0.0	3123.3	17.3	-17.7	See Map For Location
11				8.0	2519.9	5.0	-6.4	See Map For Location
12				16.1	2218.1	11.1	-10.2	See Map For Location
13				0.0	2340.5	17.3	4.9	See Map For Location
14				8.0	2470.9	5.0	4.9	See Map For Location
15				8.0	1843.0	5.0	-6.4	See Map For Location
16				8.0	2519.9	-1.2	8.7	See Map For Location
Maximum:				24.1	4191.6	17.3	20.0	
Average:				8.0	2626.9	9.2	0.7	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
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N/A								
N/A								
Reviewer Daniel Spicuzza			Date:	4/12/2018				
			Time:	8:46				

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Room 103A Lower Wall

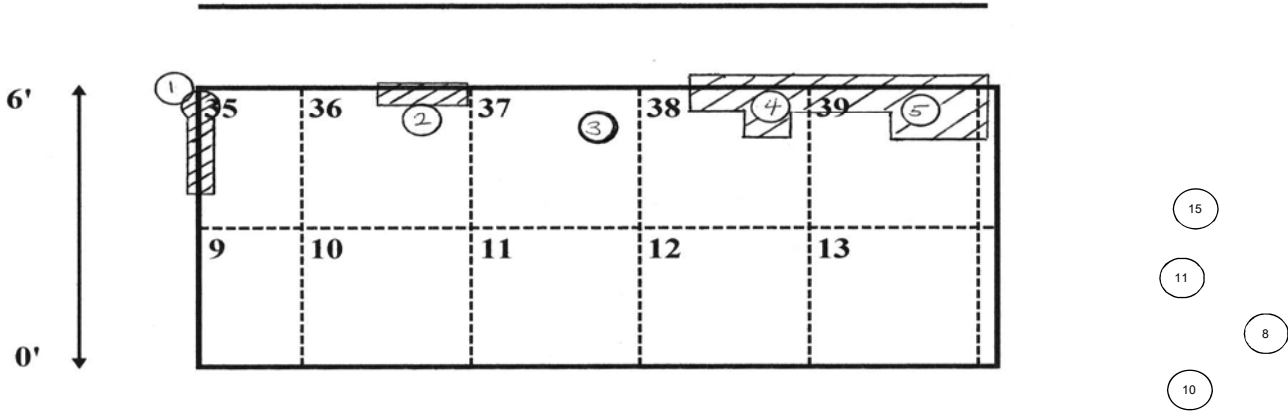
RADIATION/CONTAMINATION SURVEY FORM

DATE: TIME:			INSTRUMENTATION USED										
			Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA * (dpm/100cm ²)	Background * (dpm/100cm ²)			
4/13/2018 12:30			2360	193668	8/15/2018	α	49.7%	α	12.4%	α	56.6	α	8.0
SURVEY NUMBER: N/A			43-93	326725		βγ	32.7%	βγ	12.3%	βγ	413.3	βγ	1141.7
LOCATION: Room 103A Lower Walls Biased Readings			2929	146780	6/17/2018	α	64.6%	α	16.2%	α	27.8	α	1.2
						βγ	53.0%	βγ	19.9%	βγ	121.1	βγ	199.7
SURVEYOR: Thomas Hogan/Josefina Matus													
DATE:	TIME:	Reviewed by:											
4/13/2018	12:54	Daniel Spicuzza											

R-103A East Lower Wall Scan Survey

East Wall

14'



Comments:

Cross hatched areas are elevated areas.

- ⊙ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

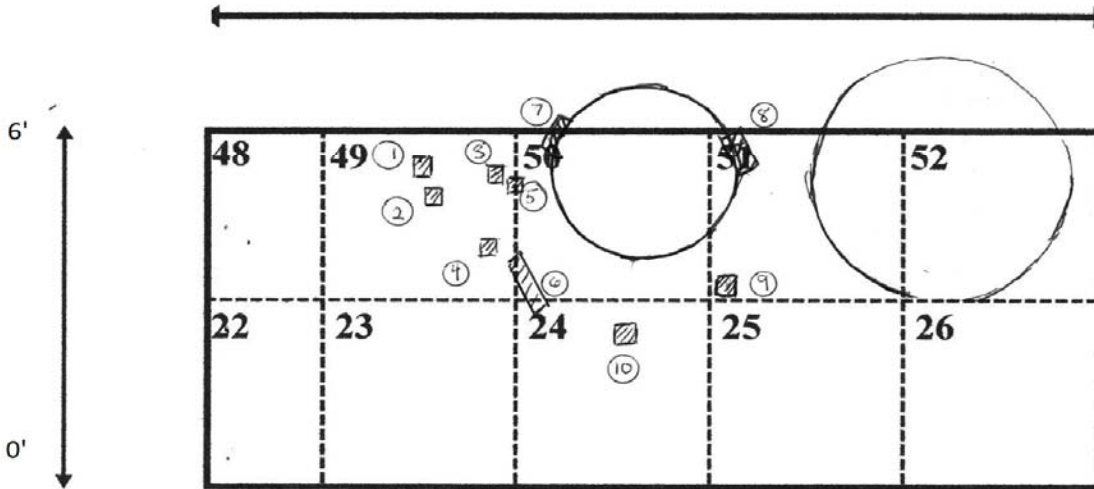
RADIATION/CONTAMINATION SURVEY FORM

DATE:	TIME:	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
4/12/2018	08:30	2360	193668	8/15/2018	α	49.7%	α 12.4%	α 56.6	α 8.0
SURVEY NUMBER:	N/A	43-93	326725		βγ	32.7%	βγ 12.3%	βγ 413.3	βγ 1141.7
LOCATION:	Bldg. 218 Room 103A Lower Walls Biased Readings	2929	146780	6/17/2018	α	64.6%	α 16.2%	α 27.8	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
SURVEYOR:		Richard Thatcher/Joan Cosgrove							
DATE:	TIME:	Reviewed by:							
4/13/2018	12:54	Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 1 Minutes							

NRL Chesapeake Building 218 Room 103A

R-103A West Lower Wall Scan Survey

West Wall 14'



Comments:

Cross hatched areas are elevated.

- ⊙ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mR/hr unless otherwise noted
- K = 1000

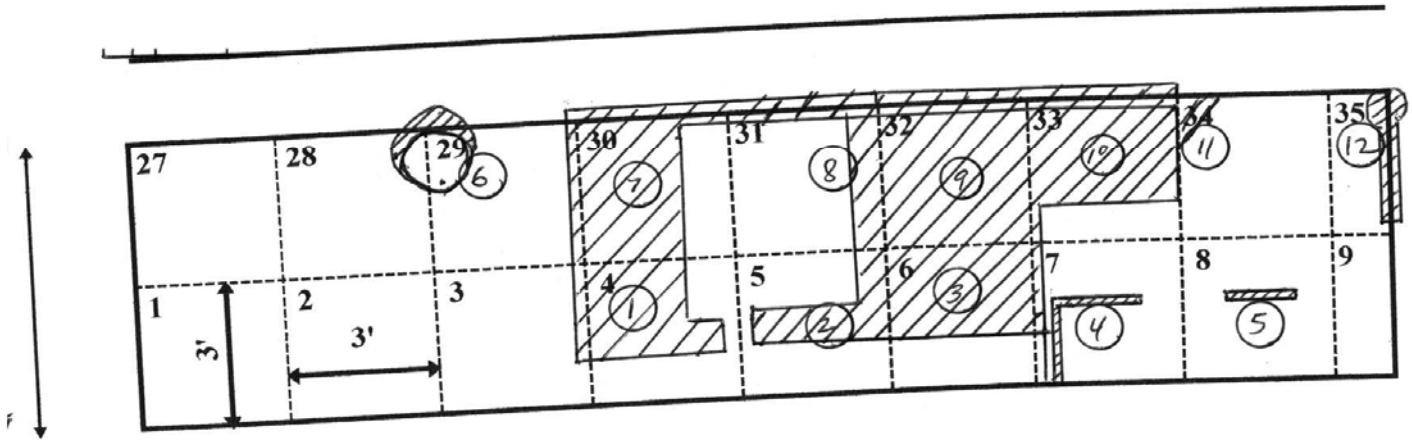
Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/13/2018	TIME: 12:30	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	193668	8/15/2018	α	49.7%	α 12.4%	α 56.6	α 8.0
LOCATION: Room 103A Lower Walls Biased Readings		43-93	326725		βγ	32.7%	βγ 12.3%	βγ 413.3	βγ 1141.7
SURVEYOR: Thomas Hogan/Josefina Matus		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 27.8	α 1.2
DATE: 4/13/2018					βγ	53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
TIME: 12:54		Reviewed by: Daniel Spicuzza		Static Count Time: 1 Minutes					
Isotopes of Concern: Cs-137		NRL Chesapeake Building 218 Room 103A							

R-103A Lower Wall Scan Survey
North Wall
25'



Comments:

Cross hatched areas are elevated.

- ⊙ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

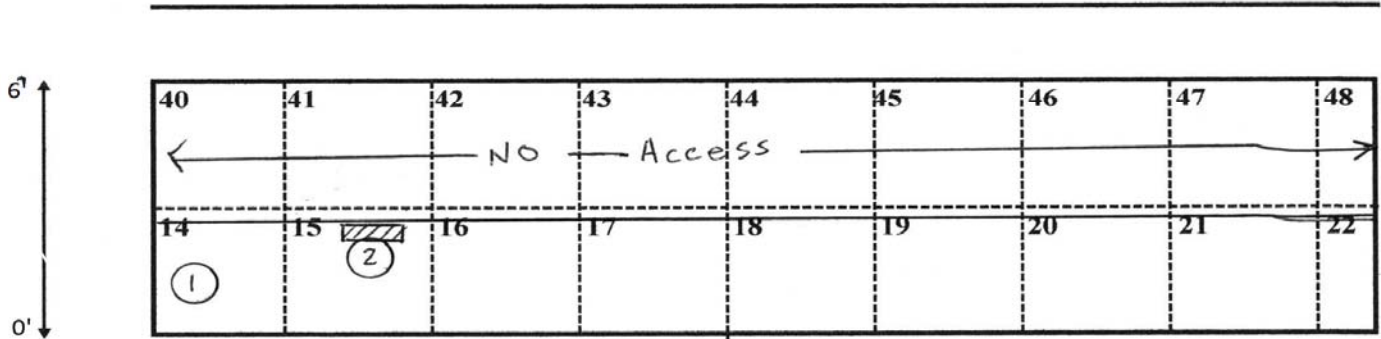
Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY FORM

DATE: TIME:			INSTRUMENTATION USED						
			Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)
4/13/2018 12:30			2360	193668	8/15/2018	α 49.7%	α 12.4%	α 56.6	α 8.0
SURVEY NUMBER: N/A			43-93	326725		βγ 32.7%	βγ 12.3%	βγ 413.3	βγ 1141.7
LOCATION: Room 103A Lower Walls Biased Readings			2929	146780	6/17/2018	α 64.6%	α 16.2%	α 27.8	α 1.2
						βγ 53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
SURVEYOR: Thomas Hogan/Josefina Matus									
DATE:	TIME:	Reviewed by:							
4/13/2018	12:54	Daniel Spicuzza							
Isotopes of Concern: DU			Static Count Time: 1 Minutes						
NRL Chesapeake Building 218 Room 103A									

R-103A South Lower Wall Scan Survey
South Wall
25'



Comments:

Cross hatched areas are elevated.

- Ⓝ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Thomas Hogan/Josefina Matus			LOCATION: Room 103A Lower Walls Biased Readings					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1				8.0	1981.7	11.1	12.5	East Lower Wall/See Map For Location
2				8.0	1476.0	5.0	16.2	East Lower Wall/See Map For Location
3				8.0	2846.1	5.0	27.5	East Lower Wall/See Map For Location
4				8.0	1908.3	5.0	-14.0	East Lower Wall/See Map For Location
5				8.0	2943.9	-1.2	-2.6	East Lower Wall/See Map For Location
1				16.1	415.9	11.1	-21.5	West Lower Wall/See Map For Location
2				0.0	815.5	11.1	12.5	West Lower Wall/See Map For Location
3				0.0	1027.5	5.0	1.1	West Lower Wall/See Map For Location
4				24.1	554.5	11.1	4.9	West Lower Wall/See Map For Location
5				0.0	709.5	5.0	-10.2	West Lower Wall/See Map For Location
6				8.0	65.2	5.0	-17.7	West Lower Wall/See Map For Location
7				16.1	840.0	11.1	-6.4	West Lower Wall/See Map For Location
8				0.0	986.7	5.0	-21.5	West Lower Wall/See Map For Location
9				8.0	807.3	5.0	1.1	West Lower Wall/See Map For Location
10				8.0	448.5	11.1	12.5	West Lower Wall/See Map For Location
1				8.0	2756.4	-1.2	-2.6	North Lower Wall/See Map For Location
2				8.0	2577.0	5.0	-10.2	North Lower Wall/See Map For Location
3				8.0	4420.0	5.0	-6.4	North Lower Wall/See Map For Location
4				16.1	3302.8	-1.2	12.5	North Lower Wall/See Map For Location
5				8.0	1924.6	11.1	4.9	North Lower Wall/See Map For Location
6				8.0	3392.5	-1.2	1.1	North Lower Wall/See Map For Location
7				0.0	2095.8	5.0	-6.4	North Lower Wall/See Map For Location
8				8.0	3482.2	11.1	-6.4	North Lower Wall/See Map For Location
9				0.0	2136.6	-1.2	4.9	North Lower Wall/See Map For Location
10				8.0	2112.1	-1.2	8.7	North Lower Wall/See Map For Location
11				8.0	2136.6	-1.2	1.1	North Lower Wall/See Map For Location
12				0.0	2030.6	-1.2	16.2	North Lower Wall/See Map For Location
1				16.1	2756.4	-1.2	12.5	South Lower Wall/See Map For Location
2				0.0	4101.9	-1.2	1.1	South Lower Wall/See Map For Location
Maximum:				24.1	4420.0	11.1	27.5	
Average:				7.5	1967.3	4.5	0.9	
N/A								
N/A								
N/A								
N/A								
Reviewer Daniel Spicuzza	Date: 4/13/2018							
	Time: 12:54							

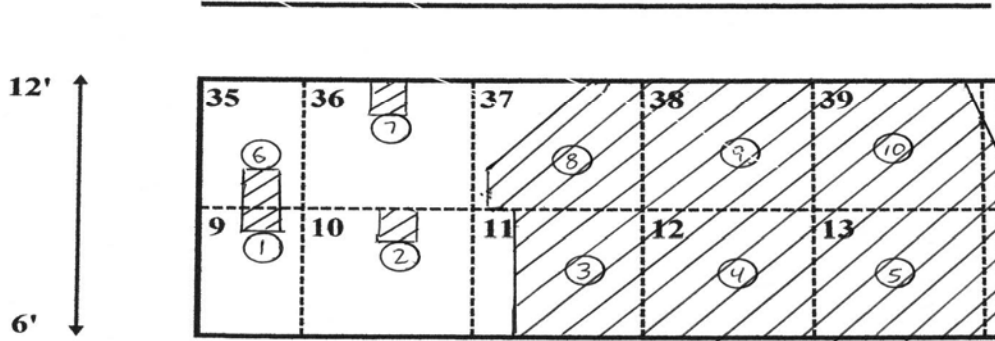
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Room 103A Upper Wall

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/26/2018	TIME: 13:00	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	193668	8/15/2018	α	49.7%	α 12.4%	α 56.6	α 8.0
LOCATION: Room 103A Upper Walls Biased Readings		43-93	326725		βγ	32.7%	βγ 12.3%	βγ 413.3	βγ 1141.7
SURVEYOR: Thomas Hogan/Josefina Matus/Adolfo Matus		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 27.8	α 1.2
DATE: 4/26/2018					βγ	53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
TIME: 13:29	Reviewed by: Daniel Spicuzza	Static Count Time: 1 Minutes							
Isotopes of Concern: DU		NRL Chesapeake Building 218 Room 103A							

R-103A East Upper Wall Scan Survey
East Wall
14'



Comments:

Cross hatched areas are elevated areas.

- ⊙ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

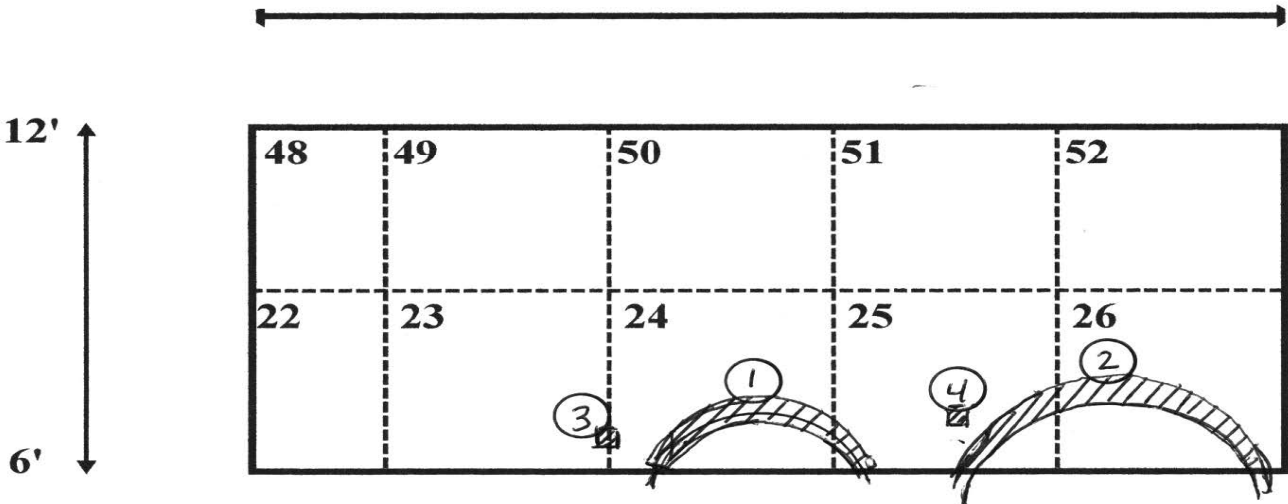
Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/12/2018		TIME: 08:30		INSTRUMENTATION USED					
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	193668	8/15/2018	α	49.7%	α 12.4%	α 56.6	α 8.0
LOCATION: Bldg. 218 Room 103A Floor		43-93	326725		βγ	32.7%	βγ 12.3%	βγ 413.3	βγ 1141.7
SURVEYOR: Richard Thatcher/Joan Cosgrove		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 27.8	α 1.2
DATE: 4/26/2018		TIME: 13:29			βγ	53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
Reviewed by: Daniel Spicuzza		Static Count Time: 1 Minutes							
Isotopes of Concern: DU		NRL Chesapeake Building 218 Room 103A							

R-103A West Upper Wall Scan Survey
West Wall
14'



Comments:

Cross hatched areas are elevated.

- ⊙ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

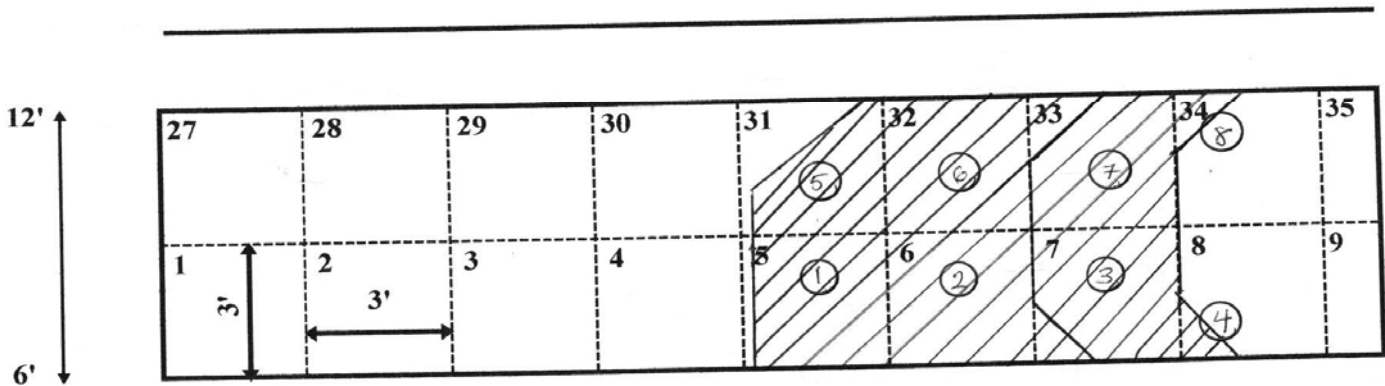
Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/26/2018		TIME: 13:00		INSTRUMENTATION USED					
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	193668	8/15/2018	α	49.7%	α 12.4%	α 56.6	α 8.0
LOCATION: Room 103A Upper Walls Biased Readings		43-93	326725		βγ	32.7%	βγ 12.3%	βγ 413.3	βγ 1141.7
SURVEYOR: Thomas Hogan/Josefina Matus/Adolfo Matus		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 27.8	α 1.2
DATE: 4/26/2018		TIME: 13:29			βγ	53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
Reviewed by: Daniel Spicuzza		Static Count Time: 1 Minutes							
Isotopes of Concern: Cs-137		NRL Chesapeake Building 218 Room 103A							

R-103A North Upper Wall Scan Survey
North Wall
25'



Comments:

Cross hatched areas are elevated.

- ⊙ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

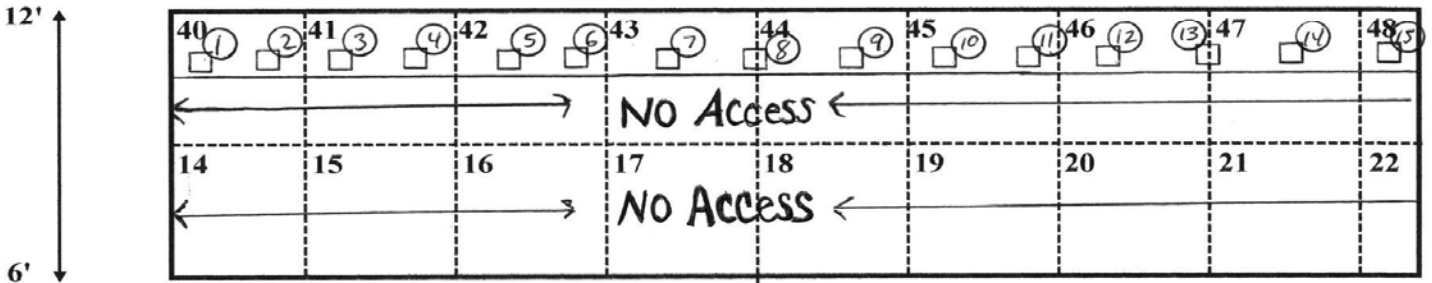
RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/26/2018	TIME: 13:00	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	193668	8/15/2018	α	49.7%	α 12.4%	α 56.6	α 8.0
LOCATION: Room 103A Upper Walls Biased Readings		43-93	326725		βγ	32.7%	βγ 12.3%	βγ 413.3	βγ 1141.7
SURVEYOR: Thomas Hogan/Josefina Matus/Adolfo Matus		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 27.8	α 1.2
DATE: 4/26/2018					βγ	53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
TIME: 13:29		Reviewed by: Daniel Spicuzza		Static Count Time: 1 Minutes					
Isotopes of Concern: DU		NRL Chesapeake Building 218 Room 103A							

R-103A South Upper Wall Scan Survey

South Wall

25'



Comments:

Cross hatched areas are elevated.

- Ⓝ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Thomas Hogan/Josefina Matus/Adolfo Matus			LOCATION: Room 103A Upper Walls Biased Readings					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1				8.0	1321.1	11.1	16.2	East Upper Wall/See Map For Location
2				8.0	3767.6	5.0	8.7	East Upper Wall/See Map For Location
3				8.0	2552.5	5.0	35.1	East Upper Wall/See Map For Location
4				8.0	2756.4	5.0	16.2	East Upper Wall/See Map For Location
5				8.0	2136.6	-1.2	4.9	East Upper Wall/See Map For Location
6				16.1	2030.6	11.1	-2.6	East Upper Wall/See Map For Location
7				0.0	2144.8	11.1	12.5	East Upper Wall/See Map For Location
8				0.0	5838.9	5.0	1.1	East Upper Wall/See Map For Location
9				24.1	4542.3	11.1	4.9	East Upper Wall/See Map For Location
10				0.0	4583.1	5.0	-6.4	East Upper Wall/See Map For Location
1				8.0	5268.1	5.0	4.9	West Upper Wall/See Map For Location
2				16.1	3767.6	11.1	-2.6	West Upper Wall/See Map For Location
3				0.0	1492.4	5.0	16.2	West Upper Wall/See Map For Location
4				8.0	1296.6	5.0	12.5	West Upper Wall/See Map For Location
1				16.1	4012.2	11.1	20.0	North Upper Wall/See Map For Location
2				0.0	2976.6	-1.2	-2.6	North Upper Wall/See Map For Location
3				8.0	2593.3	5.0	8.7	North Upper Wall/See Map For Location
4				8.0	1745.2	5.0	1.1	North Upper Wall/See Map For Location
5				16.1	2911.3	-1.2	-17.7	North Upper Wall/See Map For Location
6				8.0	2577.0	11.1	-10.2	North Upper Wall/See Map For Location
7				8.0	2397.6	-1.2	-2.6	North Upper Wall/See Map For Location
8				0.0	1834.9	5.0	4.9	North Upper Wall/See Map For Location
1				8.0	5268.1	11.1	20.0	South Upper Wall/See Map For Location
2				0.0	3743.1	-1.2	31.3	North Upper Wall/See Map For Location
3				8.0	8375.1	-1.2	12.5	North Upper Wall/See Map For Location
4				8.0	5912.3	-1.2	-2.6	North Upper Wall/See Map For Location
5				0.0	4738.0	-1.2	12.5	North Upper Wall/See Map For Location
6				16.1	3302.8	-1.2	20.0	South Upper Wall/See Map For Location
7				0.0	4917.4	-1.2	12.5	South Upper Wall/See Map For Location
8				16.1	6222.2	5.0	35.1	South Upper Wall/See Map For Location
9				8.0	5553.5	-1.2	12.5	South Upper Wall/See Map For Location
10				16.1	6369.0	11.1	-6.4	South Upper Wall/See Map For Location
11				24.1	4550.5	-1.2	4.9	South Upper Wall/See Map For Location
12				0.0	1720.7	5.0	-6.4	South Upper Wall/See Map For Location
13				8.0	4012.2	-1.2	12.5	South Upper Wall/See Map For Location
14				16.1	8619.8	5.0	1.1	South Upper Wall/See Map For Location
15				8.0	2911.3	5.0	12.5	South Upper Wall/See Map For Location
Maximum:				24.1	8619.8	11.1	35.1	
Average:				8.5	3804.4	4.3	8.0	
Reviewer Daniel Spicuzza			Date:	4/26/2018				
			Time:	13:29				

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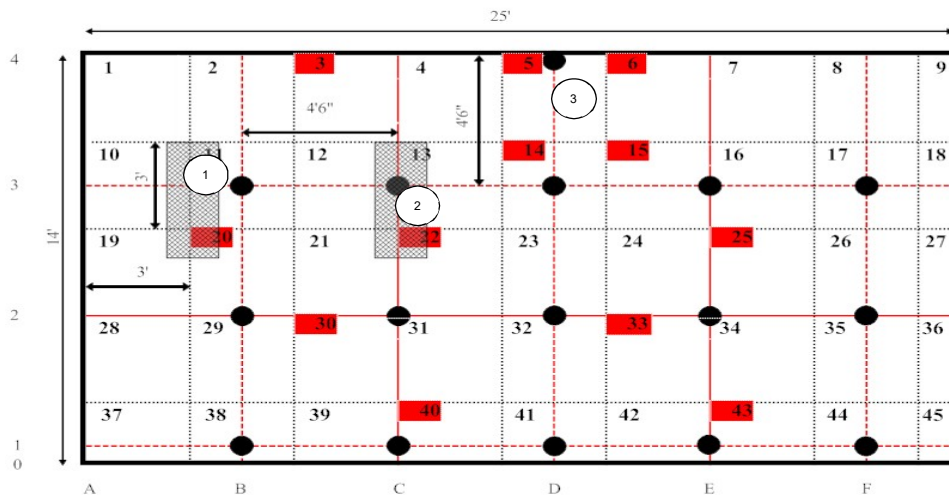
Room 103A Ceiling/Overhead

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/12/2018	TIME: 14:22	INSTRUMENTATION USED						
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency %	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
		2360	184949	3/6/2019	α 42.3%	α 10.6%	α 62.4	α 7.6
SURVEY NUMBER: N/A		43-93	268605		βγ 26.8%	βγ 10.1%	βγ 499.1	βγ 1363.2
LOCATION: Room 103A Ceiling/Overhead Biased Readings		2929	146780	6/17/2018	α 64.6%	α 16.2%	α 27.8	α 1.2
					βγ 53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
SURVEYOR: Adolfo Matus								
DATE: 4/12/2018	TIME: 14:33	Reviewed by: Daniel Spicuzza						
Isotopes of Concern: DU		Static Count Time: 1 Minutes						

NRL Chesapeake Building 218 Room 103A

Room 103A Ceiling Static Points and Scan Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- - - Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids
- Denotes Locations of Scanned Areas, 25%
- ▨ Denotes Light Fixtures

Comments:

- Ⓝ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Adolfo Matus					LOCATION: Room 103A Ceiling/Overhead Biased Readings			
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1				15.3	2185.5	5.0	23.8	See Map For Location
2				31.4	2740.1	5.0	35.1	See Map For Location
3				15.3	3718.7	11.1	8.7	See Map For Location
Maximum:				31.4	3718.7	11.1	35.1	
Average:				20.7	2881.4	7.0	22.5	
Reviewer Daniel Spicuzza			Date: 4/12/2018					
			Time: 14:33					

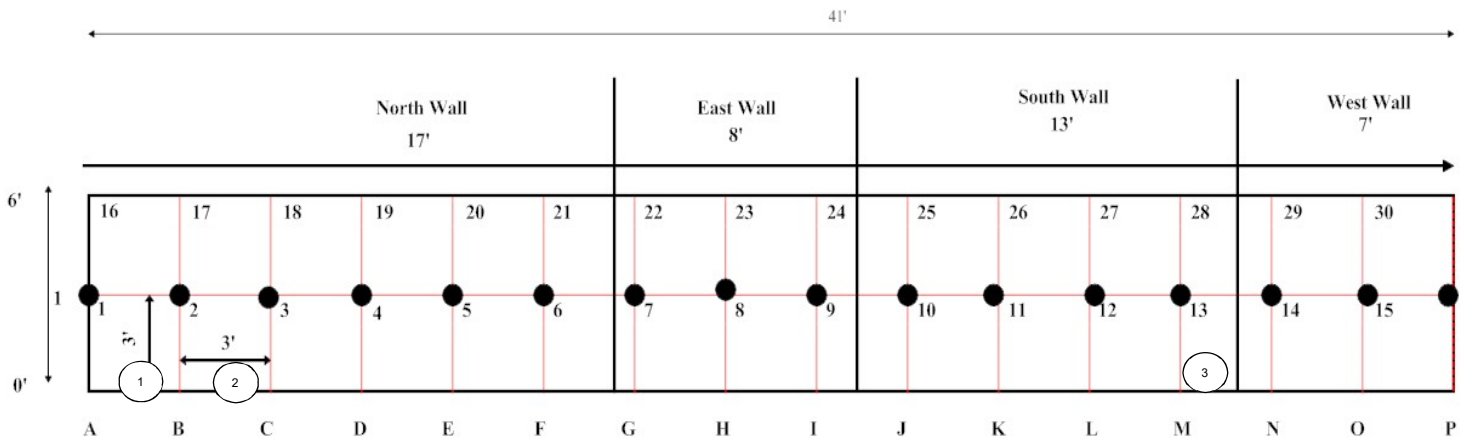
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Tunnel Lower/Upper Walls

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/5/2018	TIME: 10:15	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	297766	12/20/2018	α	40.4%	α 10.1%	α 69.6	α 9.9
LOCATION: Tunnel Lower Wall Biased Readings		43-93	323074		βγ	25.4%	βγ 9.5%	βγ 619.2	βγ 2026.2
SURVEYOR: Richard Thatcher		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 27.8	α 1.2
DATE: 4/5/2018					βγ	53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
TIME: 10:31		Reviewed by: Daniel Spicuzza		Static Count Time: 1 Minutes					
Isotopes of Concern: DU		NRL Chesapeake Building 218 Tunnel							

Tunnel Wall Static Point and Scan Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids

Comments:

- Ⓝ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Richard Thatcher					LOCATION: Tunnel Lower Walls Biased Readings			
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1				23.3	2421.7	5.0	31.3	See Map For Location
2				31.4	2494.2	11.1	27.5	See Map For Location
3				15.3	2365.4	11.1	-2.6	See Map For Location
Maximum:				31.4	2494.2	11.1	31.3	
Average:				23.3	2427.1	9.1	18.7	
Reviewer Daniel Spicuzza			Date: 4/5/2018					
			Time: 10:31					

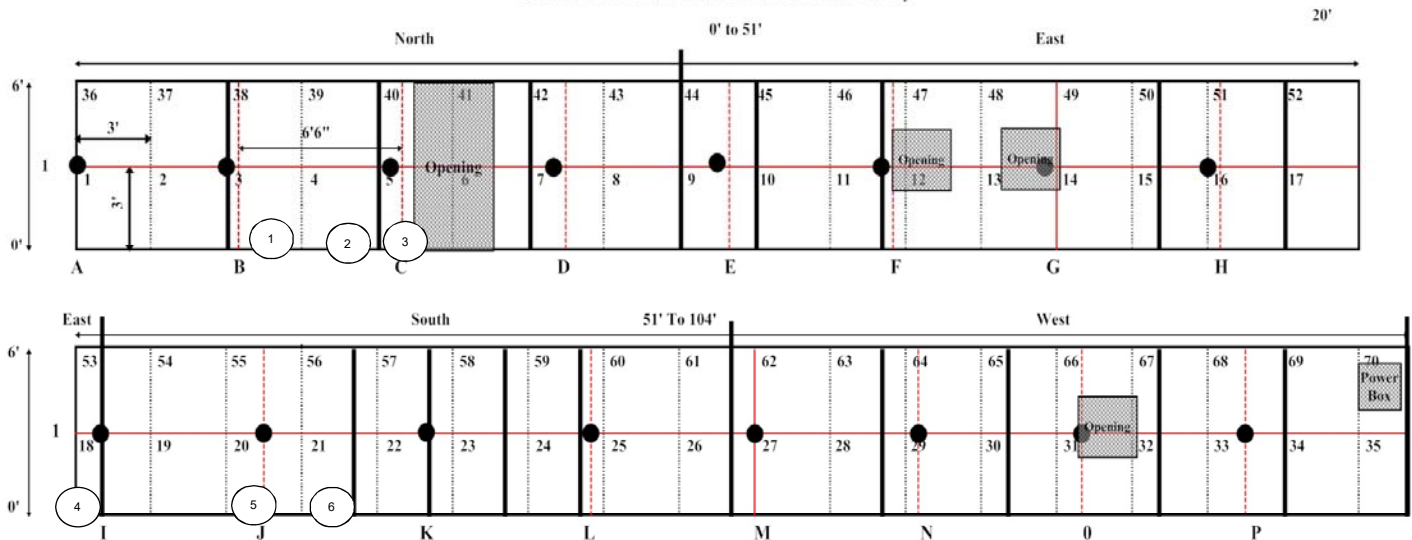
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Room 105A Lower\Upper Walls

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/20/2018	TIME: 10:40	INSTRUMENTATION USED						
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	% Total % Efficiency	MDC/MDA * (dpm/100cm ²)	Background * (dpm/100cm ²)
		2360	193668	8/15/2018	α 49.7%	α 12.4%	α 56.6	α 8.0
SURVEY NUMBER: N/A		43-93	326725		βγ 32.7%	βγ 12.3%	βγ 413.3	βγ 1141.7
LOCATION: Room 105A Biased Readings		2929	146780	6/17/2018	α 64.6%	α 16.2%	α 27.8	α 1.2
					βγ 53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
SURVEYOR: Thomas Hogan								
DATE: 4/20/2018	TIME: 10:53	Reviewed by: Daniel Spicuzza						
Isotopes of Concern: DU		Static Count Time: 1 Minutes						
NRL Chesapeake Building 218 Room 105A								

R-105A Lower Wall Static Points and Scan Survey



- Denotes Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids is Coincident with Direct Measurement/Swipe Sample Location
- Denotes Distance Between Direct Measurement/Swipe Sample Location Point
- Denotes Scan Grids
- Denotes Obstructions

Comments:

- Ⓢ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

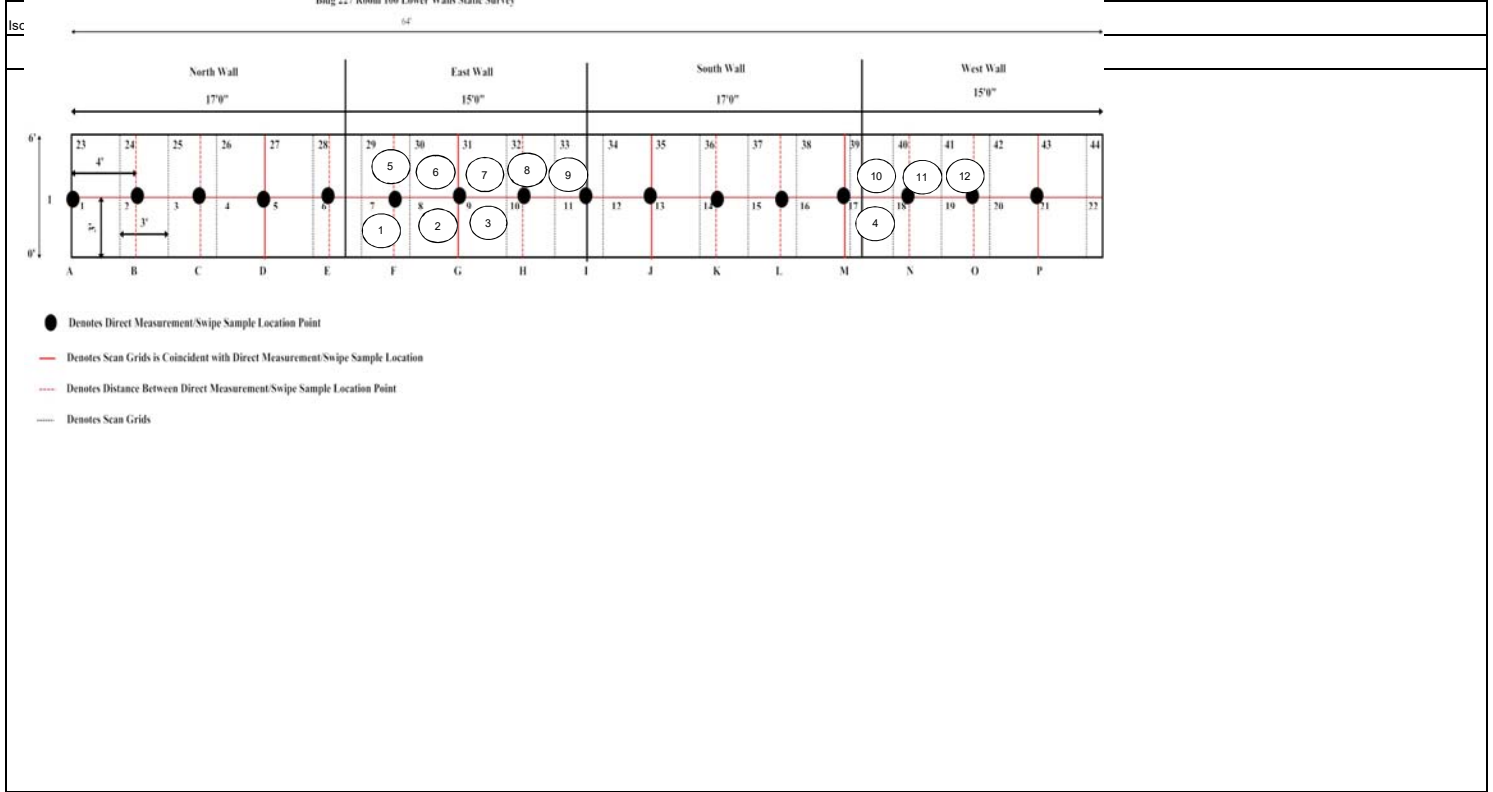
SURVEY NUMBER: N/A								
SURVEYOR: Thomas Hogan			LOCATION: Room 105A Lower Walls Biased Readings					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1				8.0	1321.1	17.3	1.1	See Map For Location
2			16.1	1476.0	11.1	8.7	See Map For Location	
3			24.1	1321.1	5.0	8.7	See Map For Location	
4			8.0	1198.8	11.1	-6.4	See Map For Location	
5			0.0	1296.6	17.3	-2.6	See Map For Location	
6			8.0	1582.1	5.0	31.3	See Map For Location	
Maximum:			24.1	1582.1	17.3	31.3		
Average:	10.7	1366.0	11.1	6.8				
Reviewer Daniel Spicuzza		Date: 4/20/2018						
		Time: 10:53						

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Building 227
Room 100 Lower Walls

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/13/2018	TIME: 09:32	INSTRUMENTATION USED						
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency %	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
		2360	297766	12/20/2018	α 40.4%	α 10.1%	α 84.7	α 18.8
SURVEY NUMBER: N/A		43-93	323074		$\beta\gamma$ 25.4%	$\beta\gamma$ 9.5%	$\beta\gamma$ 640.1	$\beta\gamma$ 2173.2
LOCATION: Bldg. 227 Room 100 Lower Walls Biased Readings		2929	146780	6/17/2018	α 64.6%	α 16.2%	α 27.8	α 1.2
					$\beta\gamma$ 53.0%	$\beta\gamma$ 19.9%	$\beta\gamma$ 121.1	$\beta\gamma$ 199.7
SURVEYOR: Thomas Hogan								
DATE: 4/13/2018	TIME: 09:44	Reviewed by: [Redacted]						
Bldg 227 Room 100 Lower Walls Static Survey								



<p>Comments:</p> <p style="text-align: center;">Routine (Daily / Weekly / Monthly) <input type="checkbox"/> Non-routine <input checked="" type="checkbox"/></p>	<p>Ⓝ denotes swipe location and fixed α/β readings</p> <p># denotes G/A radiation readings</p> <p>#/# denotes contact / 1 meter radiation readings.</p> <p>* denotes highest radiation reading on contact</p> <p>LAW denotes large area massinn wipe</p> <p>Δ denotes static location.</p> <p>+ Unless Otherwise Noted</p> <p>All readings in mr/hr unless otherwise noted</p> <p>K = 1000</p>
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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Thomas Hogan			LOCATION: Bldg. 227 Room 100 Lower Walls Biased Readings					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1				10.9	1658.8	5.0	1.1	See Map For Location
2				1.0	1448.8	5.0	8.7	See Map For Location
3				10.9	1910.8	11.1	-2.6	See Map For Location
4				10.9	2824.1	-1.2	-14.0	See Map For Location
5				1.0	1931.8	-1.2	-10.2	See Map For Location
6				10.9	2362.2	5.0	-6.4	See Map For Location
7				-8.9	3202.1	11.1	8.7	See Map For Location
8				1.0	1438.3	5.0	-10.2	See Map For Location
9				10.9	1616.8	11.1	4.9	See Map For Location
10				1.0	1889.8	-1.2	1.1	See Map For Location
11				10.9	1018.4	-1.2	-6.4	See Map For Location
12				1.0	1144.4	5.0	-10.2	See Map For Location
Maximum:				10.9	3202.1	11.1	8.7	
Average:				5.1	1870.5	4.4	-3.0	
Reviewer Daniel Spicuzza			Date:	4/13/2018				
			Time:	9:41				

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Appendix K

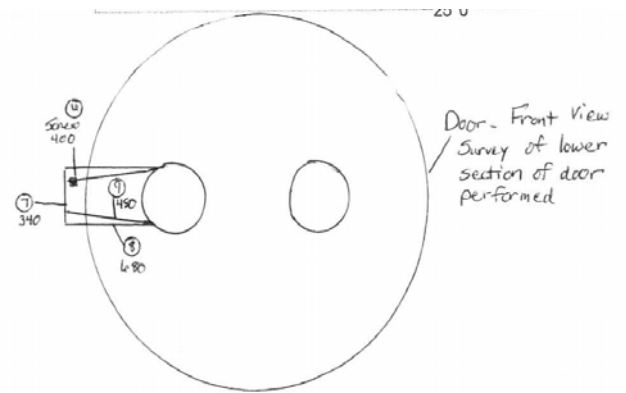
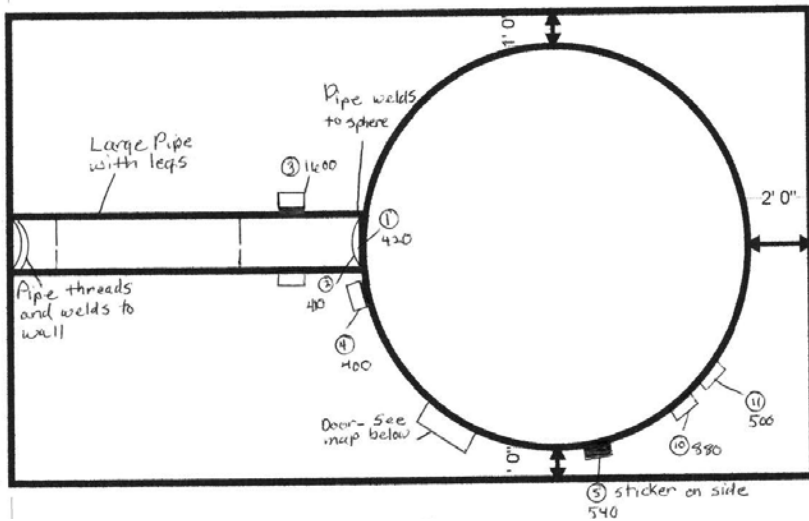
Building 218 Target Sphere/Orthogonal
Optics/Blast Chambers/Flight Tube Survey Data

Target Sphere

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/17/2018	TIME: 09:02	INSTRUMENTATION USED							
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
		2360	193668	8/15/2018	α	49.7%	α 12.4%	α 56.6	α 8.0
SURVEY NUMBER: N/A		43-93	326725		βγ	32.7%	βγ 12.3%	βγ 413.3	βγ 1141.7
LOCATION: Target Sphere Lower Exterior		2929	146700	6/17/2018	α	64.6%	α 16.2%	α 27.8	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
SURVEYOR: Joan Cosgrove									
DATE: 4/17/2018	TIME: 10:13	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 1 Minutes							

NRL Chesapeake Building 218 Target Sphere



Comments:

The sphere was 100% gross alpha-beta/gamma scan surveyed.
All areas not marked on map were at background levels.

denotes swipe location and fixed α/β readings

denotes G/A radiation readings

#/# denotes contact / 1 meter radiation readings.

* denotes highest radiation reading on contact

LAW denotes large area masslinn wipe

Δ denotes static location.

+ Unless Otherwise Noted

All readings in mri/hr unless otherwise noted

K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A										
SURVEYOR: Joan Cosgrove						LOCATION: Target Sphere Lower Exterior				
Location	Exposure Rate (µR/hr)		Scan Range (NET)				Removable (NET)		Comments	
	Contact	1 Meter	Gamma (cpm)	Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²		Beta/Gamma dpm/100cm ²
1				-8.0	32.2	2283.4	2283.4			See Map For Location
2				-8.0	24.1	2120.3	2120.3			See Map For Location
3				-8.0	32.2	11906.2	11906.2			See Map For Location
4				-8.0	24.1	2120.3	2120.3			See Map For Location
5				-8.0	24.1	3262.0	3262.0			See Map For Location
6				-8.0	24.1	3751.3	3751.3			See Map For Location
7				-8.0	40.2	1631.0	1631.0			See Map For Location
8				-8.0	16.1	4403.7	4403.7			See Map For Location
9				-8.0	8.0	2772.7	2772.7			See Map For Location
10				-8.0	24.1	6034.7	6034.7			See Map For Location
11				-8.0	24.1	2935.8	2935.8			See Map For Location
Reviewer Daniel Spicuzza			Date:		4/17/2018					
			Time:		10:13					

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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

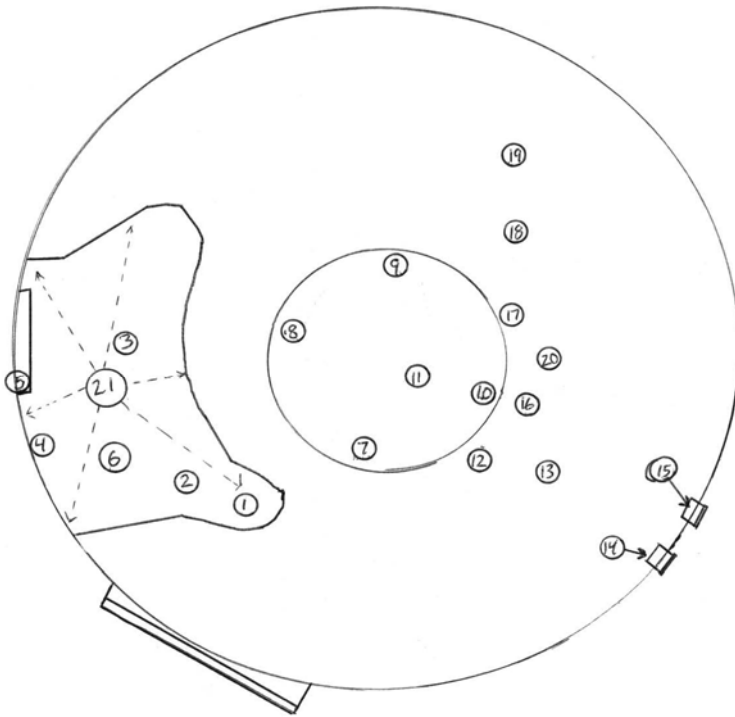
SURVEY NUMBER: N/A								
SURVEYOR: Joan Cosgrove			LOCATION: Target Sphere Lower Exterior					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
3				0.0	11889.9	5.0	-21.5	See Map For Location
5			8.0	3196.7	-1.2	4.9	See Map For Location	
6			0.0	3661.6	11.1	16.2	See Map For Location	
8			8.0	4493.4	5.0	-2.6	See Map For Location	
10			16.1	6124.4	17.3	-10.2	See Map For Location	
11			0.0	3033.6	11.1	-6.4	See Map For Location	
Maximum:			16.1	11889.9	17.3	16.2		
Average:	5.4	5399.9	8.0	-3.3				
Reviewer Daniel Spicuzza			Date: 4/17/2018					
			Time: 10:13					

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RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/17/2018	TIME: 09:35	INSTRUMENTATION USED							
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
		2360	297758	2/14/2019	α	44.4%	α 11.1%	α 65.1	α 9.9
SURVEY NUMBER: N/A		43-93	299597		βγ	31.3%	βγ 11.7%	βγ 448.8	βγ 1295.0
LOCATION: Target Sphere Lower Interior		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 27.8	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
SURVEYOR: Adolfo Matus									
DATE: 4/17/2018	TIME: 09:42	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 1 Minutes							

NRL Chesapeake Building 218 Target Sphere



Comments:

The sphere was 100% gross alpha-beta/gamma scan surveyed.
All areas not marked on map were at background levels.

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A										
SURVEYOR: Adolfo Matus						LOCATION: Target Sphere Lower Interior				
Location	Exposure Rate (µR/hr)		Scan Range (NET)				Removable (NET)		Comments	
	Contact	1 Meter	Gamma (cpm)	Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²		Beta/Gamma dpm/100cm ²
1				-9.9	35.1	2112.9	2112.9			See Map For Location
2				-0.9	26.1	4242.8	4242.8			See Map For Location
3				-0.9	35.1	15744.4	15744.4			See Map For Location
4				-0.9	26.1	7224.7	7224.7			See Map For Location
5				-0.9	17.1	14040.5	14040.5			See Map For Location
6				-0.9	26.1	8928.6	8928.6			See Map For Location
7				-9.9	44.1	4668.8	4668.8			See Map For Location
8				-0.9	17.1	10632.6	10632.6			See Map For Location
9				-0.9	8.1	14040.5	14040.5			See Map For Location
10				-0.9	26.1	12336.5	12336.5			See Map For Location
11				-9.9	26.1	1686.9	1686.9			See Map For Location
12				-0.9	35.1	2964.9	2964.9			See Map For Location
13				-0.9	8.1	7224.7	7224.7			See Map For Location
14				-9.9	26.1	11484.6	11484.6			See Map For Location
15				-0.9	26.1	4668.8	4668.8			See Map For Location
16				-0.9	17.1	2964.9	2964.9			See Map For Location
17				-0.9	17.1	2964.9	2964.9			See Map For Location
18				-0.9	8.1	1686.9	1686.9			See Map For Location
19				-0.9	17.1	2538.9	2538.9			See Map For Location
20				-0.9	17.1	2538.9	2538.9			See Map For Location
21				-0.9	17.1	1260.9	10632.6			See Map For Location
Reviewer Daniel Spicuzza			Date: 4/17/2018							
			Time: 9:42							

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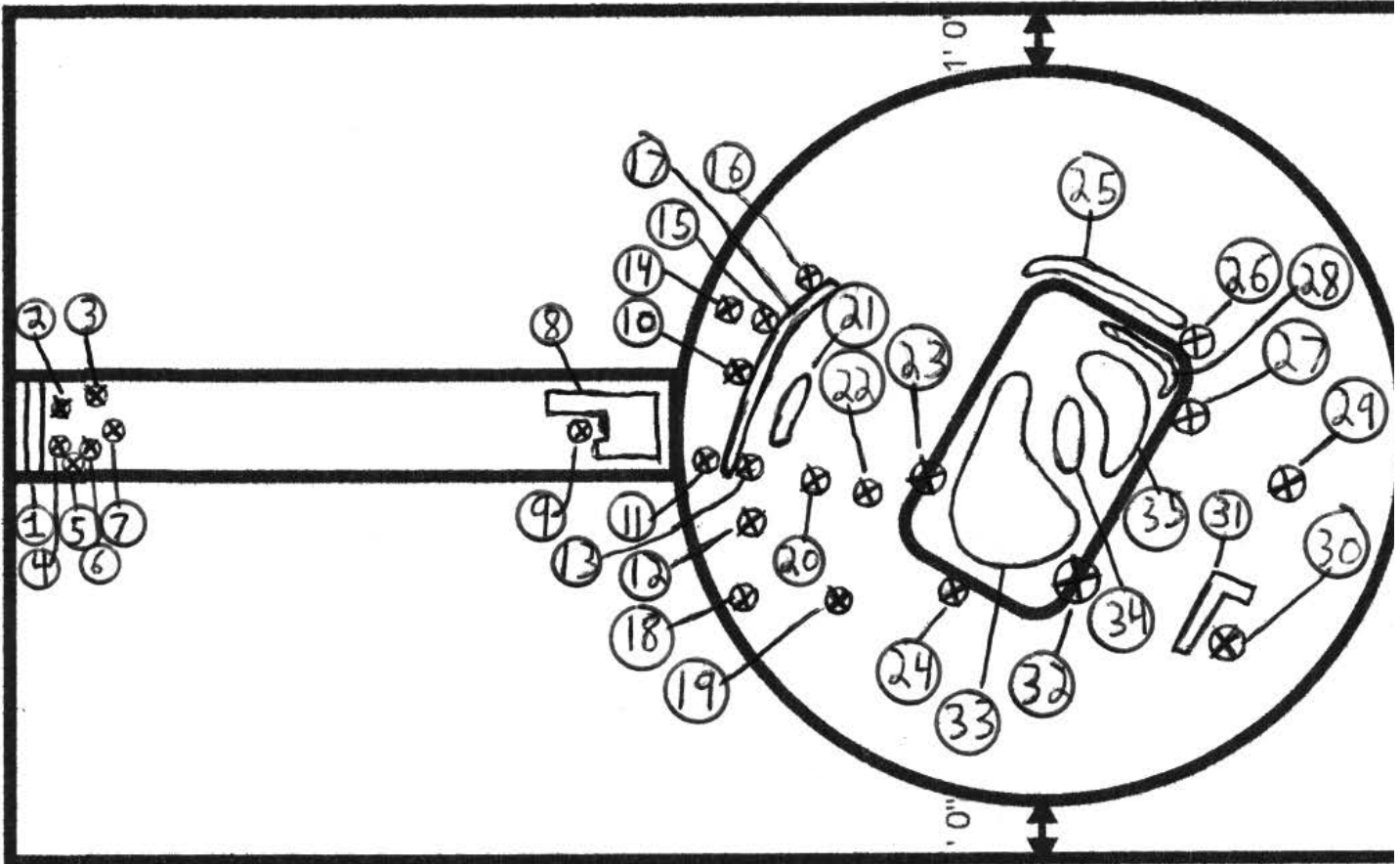
RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Adolfo Matus			LOCATION: Target Sphere Lower Interior					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
3				8.1	15642.2	5.0	4.9	See Map For Location
8			17.1	10445.2	11.1	-6.4	See Map For Location	
10			26.1	14066.0	17.3	8.7	See Map For Location	
13			8.1	7037.3	5.0	1.1	See Map For Location	
14			-0.9	11126.7	-1.2	-2.6	See Map For Location	
21			8.1	10896.7	5.0	-10.2	See Map For Location	
Maximum:			26.1	15642.2	17.3	8.7		
Average:	11.1	11535.7	7.0	-0.8				
Reviewer Daniel Spicuzza		Date: 4/17/2018						
		Time: 9:42						

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RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/17/2018		TIME: 11:12		INSTRUMENTATION USED					
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	297766	12/20/2018	α	40.4%	α 10.1%	α 69.6	α 9.9
		43-93	323074		βγ	25.4%	βγ 9.5%	βγ 574.9	βγ 1732.3
LOCATION: Target Sphere Upper Exterior		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 27.8	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
SURVEYOR: Thomas Hogan									
DATE: 4/17/2018	TIME: 11:19	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 1 Minutes							
NRL Chesapeake Building 218 Target Sphere									



RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A											
SURVEYOR: Thomas Hogan						LOCATION: Target Sphere Upper Exterior					
Location	Exposure Rate (µR/hr)		Scan Range (NET)				Removable (NET)		Comments		
	Contact	1 Meter	Gamma (cpm)	Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²		Beta/Gamma dpm/100cm ²	
1				-9.9	39.6	367.5	12965.9			See Map For Location	
2				0.0	29.7	12965.9	12965.9			See Map For Location	
3				0.0	39.6	3517.1	3517.1			See Map For Location	
4				-9.9	29.7	4566.9	4566.9			See Map For Location	
5				0.0	29.7	4566.9	4566.9			See Map For Location	
6				-9.9	29.7	4566.9	4566.9			See Map For Location	
7				0.0	-9.9	2467.2	2467.2			See Map For Location	
8				0.0	49.5	1417.3	10866.1			See Map For Location	
9				-9.9	9.9	8766.4	8766.4			See Map For Location	
10				-9.9	29.7	1417.3	17165.4			See Map For Location	
11				0.0	-9.9	367.5	10866.1			See Map For Location	
12				-9.9	49.5	1417.3	12965.9			See Map For Location	
13				0.0	29.7	17165.4	19265.1			See Map For Location	
14				0.0	9.9	1417.3	3517.1			See Map For Location	
15				-9.9	19.8	1417.3	6666.7			See Map For Location	
16				-9.9	9.9	1417.3	2467.2			See Map For Location	
17				0.0	29.7	1417.3	17165.4			See Map For Location	
18				0.0	39.6	1417.3	3517.1			See Map For Location	
19				0.0	29.7	1417.3	4566.9			See Map For Location	
20				0.0	39.6	1417.3	2467.2			See Map For Location	
21				0.0	49.5	1417.3	5616.8			See Map For Location	
22				0.0	29.7	1417.3	2467.2			See Map For Location	
23				-9.9	39.6	1942.3	1942.3			See Map For Location	
24				0.0	29.7	1417.3	2467.2			See Map For Location	
25				-9.9	49.5	1417.3	2467.2			See Map For Location	
26				0.0	39.6	1417.3	2992.1			See Map For Location	
27				0.0	29.7	1417.3	3517.1			See Map For Location	
28				0.0	19.8	1417.3	1417.3			See Map For Location	
29				-9.9	29.7	1417.3	3517.1			See Map For Location	
30				0.0	49.5	1417.3	4566.9			See Map For Location	
31				0.0	39.6	1417.3	4566.9			See Map For Location	
32				0.0	19.8	1417.3	1417.3			See Map For Location	
33				-9.9	39.6	1417.3	10866.1			See Map For Location	
34				0.0	29.7	1417.3	8766.4			See Map For Location	
35				-9.9	19.8	1417.3	3517.1			See Map For Location	
Reviewer Daniel Spicuzza			Date:	4/17/2018							
			Time:	11:19							

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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

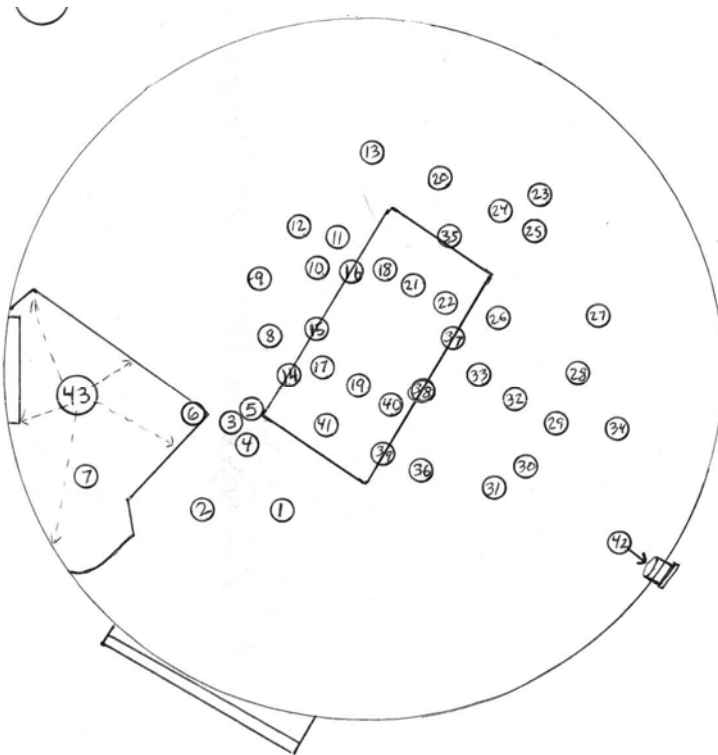
SURVEY NUMBER: N/A								
SURVEYOR: Thomas Hogan					LOCATION: Target Sphere Upper Exterior			
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
2				0.0	12850.4	5.0	-2.6	See Map For Location
5				9.9	4692.9	5.0	4.9	See Map For Location
8				9.9	11013.1	11.1	1.1	See Map For Location
10				19.8	17490.8	5.0	-6.4	See Map For Location
12				0.0	12713.9	5.0	-2.6	See Map For Location
13				9.9	19716.5	11.1	4.9	See Map For Location
17				0.0	17228.3	5.0	1.1	See Map For Location
21				29.7	5637.8	5.0	-10.2	See Map For Location
27				19.8	3706.0	-1.2	-6.4	See Map For Location
33				9.9	11002.6	11.1	1.1	See Map For Location
35				0.0	3370.1	5.0	-10.2	See Map For Location
Maximum:				19.8	19716.5	11.1	4.9	
Average:				8.3	13079.6	7.0	-0.1	
Reviewer Daniel Spicuzza			Date: 4/17/2018					
			Time: 11:19					

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RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/16/2018	TIME: 09:00	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
		2360	297758	2/14/2019	α	44.4%	α 11.1%	α 44.6	α 9.9
SURVEY NUMBER: N/A		43-93	299597		βγ	31.3%	βγ 11.7%	βγ 358.4	βγ 1295.0
LOCATION: Target Sphere Upper Interior		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
SURVEYOR: Adolfo Matus									
DATE: 4/16/2018	TIME: 09:21	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Building 218 Target Sphere



Comments:

The sphere was 100% gross alpha-beta/gamma scan surveyed.
All areas not marked on map were at background levels.

- denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A										
SURVEYOR: Adolfo Matus				LOCATION: Target Sphere Upper Interior						
Location	Exposure Rate (µR/hr)		Scan Range (NET)				Removable (NET)		Comments	
	Contact	1 Meter	Gamma (cpm)	Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²		Beta/Gamma dpm/100cm ²
1				-9.9	35.1	3816.8	3816.8			See Map For Location
2				-0.9	26.1	1686.9	1686.9			See Map For Location
3				-0.9	35.1	1260.9	1260.9			See Map For Location
4				-0.9	26.1	2964.9	2964.9			See Map For Location
5				-0.9	17.1	2538.9	2538.9			See Map For Location
6				-0.9	26.1	2112.9	2112.9			See Map For Location
7				-9.9	44.1	5520.8	5520.8			See Map For Location
8				-0.9	17.1	1686.9	1686.9			See Map For Location
9				-0.9	8.1	4668.8	4668.8			See Map For Location
10				-0.9	26.1	2964.9	2964.9			See Map For Location
11				-9.9	26.1	2964.9	2964.9			See Map For Location
12				-0.9	35.1	1431.3	1431.3			See Map For Location
13				-0.9	8.1	2112.9	2112.9			See Map For Location
14				-9.9	26.1	1686.9	1686.9			See Map For Location
15				-0.9	26.1	1686.9	1686.9			See Map For Location
16				-0.9	17.1	3816.8	3816.8			See Map For Location
17				-0.9	17.1	5520.8	5520.8			See Map For Location
18				-0.9	8.1	3816.8	3816.8			See Map For Location
19				-0.9	17.1	2538.9	2538.9			See Map For Location
20				-0.9	17.1	1601.7	1601.7			See Map For Location
21				-0.9	17.1	1431.3	1431.3			See Map For Location
22				-0.9	26.1	2964.9	2964.9			See Map For Location
23				-0.9	35.1	2964.9	2964.9			See Map For Location
24				-9.9	44.1	1772.1	1772.1			See Map For Location
25				-9.9	26.1	5520.8	5520.8			See Map For Location
26				-0.9	35.1	2964.9	2964.9			See Map For Location
27				-0.9	26.1	4668.8	4668.8			See Map For Location
28				-0.9	35.1	8928.6	8928.6			See Map For Location
29				-0.9	35.1	8928.6	8928.6			See Map For Location
30				-0.9	26.1	83902.0	83902.0			See Map For Location
31				-0.9	17.1	3816.8	3816.8			See Map For Location
32				-0.9	35.1	1431.3	1431.3			See Map For Location
33				-0.9	26.1	17448.3	17448.3			See Map For Location
34				-0.9	35.1	3816.8	3816.8			See Map For Location
35				-0.9	26.1	2964.9	2964.9			See Map For Location
36				-0.9	35.1	7224.7	7224.7			See Map For Location
37				-0.9	44.1	12336.5	12336.5			See Map For Location
38				-0.9	17.1	15744.4	15744.4			See Map For Location
39				-0.9	26.1	2112.9	2112.9			See Map For Location
40				-0.9	35.1	2538.9	2538.9			See Map For Location
41				-0.9	8.1	3816.8	3816.8			See Map For Location
42				-0.9	26.1	7224.7	7224.7			See Map For Location
43				-0.9	35.1	1260.9	5520.8			See Map For Location
Reviewer Daniel Spicuzza			Date:	4/16/2018						
			Time:	9:21						

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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Adolfo Matus			LOCATION: Target Sphere Upper Interior					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
7				8.1	5512.2	17.3	20.0	See Map For Location
9				17.1	4685.8	11.1	-2.6	See Map For Location
17				26.1	5537.8	5.0	16.2	See Map For Location
22				8.1	2939.3	5.0	8.7	See Map For Location
25				-0.9	5699.7	11.1	-2.6	See Map For Location
28				8.1	8911.6	5.0	12.5	See Map For Location
30				8.1	82658.1	-1.2	23.8	See Map For Location
33				-0.9	17320.6	-1.2	4.9	See Map For Location
38				17.1	15599.6	5.0	1.1	See Map For Location
42				-0.9	7114.0	5.0	-2.6	See Map For Location
Maximum:				26.1	82658.1	17.3	23.8	
Average:				9.0	15597.9	6.2	7.9	
Reviewer Daniel Spicuzza			Date: 4/16/2018					
			Time: 9:21					

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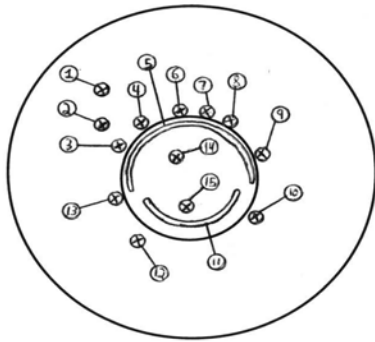
Blast Tank

RADIATION/CONTAMINATION SURVEY FORM

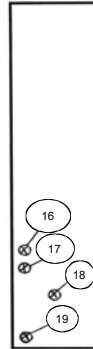
DATE:	TIME:	INSTRUMENTATION USED						
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency %	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
4/24/2018	14:24	2360	297758	2/14/2019	α 44.4%	α 11.1%	α 44.6	α 9.9
SURVEY NUMBER:	N/A	43-93	299597		βγ 31.3%	βγ 11.738%	βγ 358.4	βγ 1295.0
LOCATION: Baffle #1		2929	146780	6/17/2018	α 64.6%	α 16.2%	α 15.9	α 1.2
					βγ 53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
SURVEYOR: Thomas Hogan								
DATE:	TIME:	Reviewed by:						
4/24/2018	14:35	Daniel Spicuzza						
Isotopes of Concern: DU		Static Count Time: 2 Minutes						

NRL Chesapeake Building 218 Blast Tank

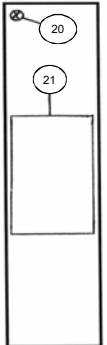
Baffle #: 1
East/West



Baffle Area: _____
Bottom/Top



Baffle Area: _____
Bottom/Top



Comments:

The chamber was 100% gross alpha-beta/gamma scan surveyed.
All areas not marked on map were at background levels.

- # denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area massinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A										
SURVEYOR: Thomas Hogan						LOCATION: Baffle #1				
Location	Exposure Rate (µR/hr)		Scan Range (NET)				Removable (NET)		Comments	
	Contact	1 Meter	Gamma (cpm)	Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²		Beta/Gamma dpm/100cm ²
1				-9.9	26.1	2112.9	2112.9			See Map For Location
2				-0.9	26.1	2964.9	2964.9			See Map For Location
3				-0.9	35.1	3816.8	3816.8			See Map For Location
4				-0.9	26.1	7224.7	7224.7			See Map For Location
5				-0.9	17.1	2112.9	3816.8			See Map For Location
6				-0.9	26.1	5520.8	5520.8			See Map For Location
7				-9.9	17.1	5520.8	5520.8			See Map For Location
8				-0.9	35.1	5520.8	5520.8			See Map For Location
9				-0.9	8.1	4668.8	4668.8			See Map For Location
10				-0.9	26.1	2112.9	2112.9			See Map For Location
11				-9.9	35.1	5520.8	41303.5			See Map For Location
12				-0.9	26.1	2112.9	2112.9			See Map For Location
13				-0.9	8.1	2112.9	2112.9			See Map For Location
14				-9.9	26.1	3816.8	3816.8			See Map For Location
15				-0.9	26.1	5520.8	5520.8			See Map For Location
16				-0.9	17.1	3816.8	3816.8			See Map For Location
17				-0.9	17.1	2964.9	2964.9			See Map For Location
18				-0.9	8.1	2112.9	2112.9			See Map For Location
19				-0.9	17.1	2964.9	2964.9			See Map For Location
20				-0.9	35.1	2964.9	2964.9			See Map For Location
21				-0.9	17.1	2964.9	3816.8			See Map For Location
Reviewer Daniel Spicuzza			Date:		4/24/2018					
			Time:		14:35					

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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

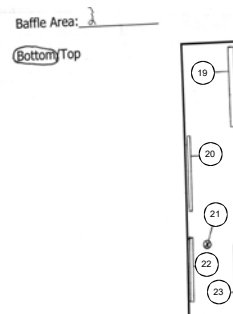
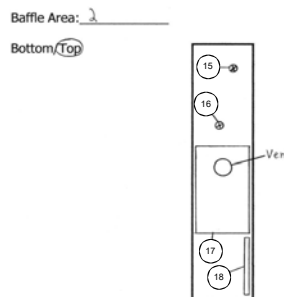
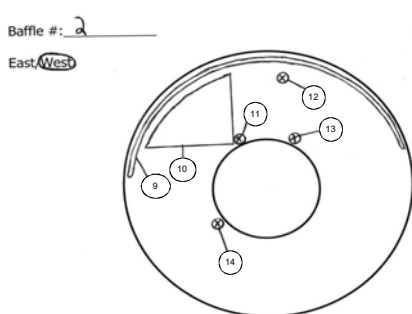
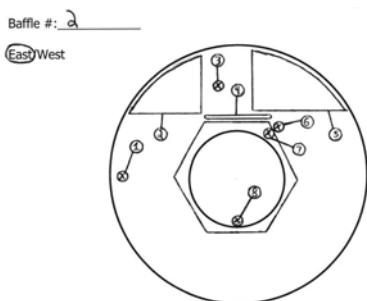
SURVEY NUMBER: N/A								
SURVEYOR: Thomas Hogan				LOCATION: Baffle #1				
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm²	Beta/Gamma dpm/100cm²	Alpha dpm/100cm²	Beta/Gamma dpm/100cm²	
1				8.9	2173.2	-1.2	1.1	See Map For Location
2				18.8	2493.4	-1.2	-27.2	See Map For Location
3				8.9	3580.1	5.0	-6.4	See Map For Location
4				-1.0	7475.1	-1.2	-15.8	See Map For Location
5				8.9	3868.8	-1.2	-19.6	See Map For Location
6				18.8	5490.8	8.0	-15.8	See Map For Location
7				8.9	5123.4	-1.2	3.0	See Map For Location
8				13.9	5322.8	5.0	-19.6	See Map For Location
9				8.9	4792.7	-1.2	-0.8	See Map For Location
10				28.7	2141.7	1.9	-25.3	See Map For Location
11				33.7	42530.2	-1.2	10.6	See Map For Location
12				8.9	2052.5	-1.2	16.2	See Map For Location
Maximum:				33.7	42530.2	8.0	16.2	
Average:				13.9	7253.7	0.8	-8.3	
N/A								
N/A								
N/A								
N/A								
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N/A								
Reviewer			Date:	4/24/2018				
Daniel Spicuzza			Time:	14:35				

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RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/26/2018	TIME: 12:40	INSTRUMENTATION USED							
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA * (dpm/100cm²)	Background * (dpm/100cm²)
SURVEY NUMBER: N/A		2360	297758	2/14/2019	α 44.4%	α 11.1%	α 44.6	α 9.9	
		43-93	299597		βγ 31.3%	βγ 11.738%	βγ 358.4	βγ 1295.0	
LOCATION: Baffle #2		2929	146780	6/17/2018	α 71.0%	α 17.8%	α 14.5	α 1.1	
					βγ 53.0%	βγ 19.9%	βγ 83.7	βγ 199.7	
SURVEYOR: Thomas Hogan									
DATE: 4/26/2018	TIME: 12:54	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Building 218 Blast Tank



Comments:

The chamber was 100% gross alpha-beta/gamma scan surveyed.
All areas not marked on map were at background levels.

- ⊙ denotes swipe location and fixed α/β readings
 - # denotes G/A radiation readings
 - #/# denotes contact / 1 meter radiation readings.
 - * denotes highest radiation reading on contact
 - LAW denotes large area mass/m wipe
 - Δ denotes static location.
 - Unless Otherwise Noted
- All readings in m/hr unless otherwise noted
K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A											
SURVEYOR: Thomas Hogan						LOCATION: Baffle #2					
Location	Exposure Rate (µR/hr)		Scan Range (NET)				Removable (NET)		Comments		
	Contact	1 Meter	Gamma (cpm)	Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²		Beta/Gamma dpm/100cm ²	
1				-0.9	17.1	2112.9	2112.9			See Map For Location	
2				-0.9	26.1	1260.9	2112.9			See Map For Location	
3				-0.9	17.1	3816.8	3816.8			See Map For Location	
4				-0.9	26.1	2112.9	3816.8			See Map For Location	
5				-0.9	17.1	1260.9	2964.9			See Map For Location	
6				-0.9	26.1	2964.9	2964.9			See Map For Location	
7				-9.9	17.1	2964.9	2964.9			See Map For Location	
8				-0.9	35.1	2964.9	2964.9			See Map For Location	
9				-0.9	8.1	1260.9	2964.9			See Map For Location	
10				-0.9	26.1	1260.9	2112.9			See Map For Location	
11				-9.9	35.1	4668.8	4668.8			See Map For Location	
12				-0.9	26.1	2112.9	2112.9			See Map For Location	
13				-0.9	8.1	3816.8	3816.8			See Map For Location	
14				-9.9	26.1	3816.8	3816.8			See Map For Location	
15				-0.9	26.1	1260.9	1260.9			See Map For Location	
16				-0.9	17.1	2964.9	2964.9			See Map For Location	
17				-0.9	17.1	1260.9	3816.8			See Map For Location	
18				-0.9	8.1	1260.9	2112.9			See Map For Location	
19				-0.9	17.1	1260.9	2964.9			See Map For Location	
20				-0.9	35.1	1260.9	2964.9			See Map For Location	
21				-0.9	17.1	2112.9	2112.9			See Map For Location	
22				-0.9	62.2	1260.9	2964.9			See Map For Location	
23				-0.9	17.1	2112.9	2112.9			See Map For Location	
Reviewer Daniel Spicuzza			Date:	4/26/2018							
			Time:	12:54							

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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Thomas Hogan				LOCATION: Baffle #2				
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
15				-0.9	1243.9	-1.2	1.1	See Map For Location
17				17.1	2304.6	-1.2	-27.2	See Map For Location
18				-0.9	2078.8	-1.2	-6.4	See Map For Location
19				-0.9	2862.6	-1.2	-15.8	See Map For Location
20				8.1	2828.5	-1.2	-19.6	See Map For Location
23				-0.9	2129.9	14.2	-4.5	See Map For Location
Maximum:				17.1	2862.6	14.2	1.1	
Average:				3.6	2241.4	1.3	-12.1	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
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N/A								
Reviewer			Date:	4/26/2018				
Daniel Spicuzza			Time:	12:54				

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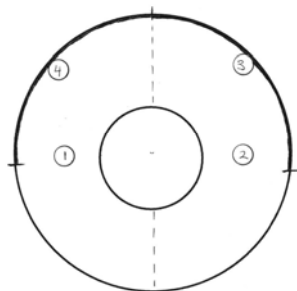
RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/25/2018	TIME: 12:23	INSTRUMENTATION USED							
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA * (dpm/100cm ²)	Background * (dpm/100cm ²)
SURVEY NUMBER: N/A		2360	184949	3/6/2019	α	42.3%	α 10.6%	α 42.0	α 7.6
		43-93	268605		βγ	26.8%	βγ 10.050%	βγ 398.1	βγ 1363.2
LOCATION: Baffle #3		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
SURVEYOR: Adolfo Matus									
DATE: 4/25/2018	TIME: 12:54	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Building 218 Blast Tank

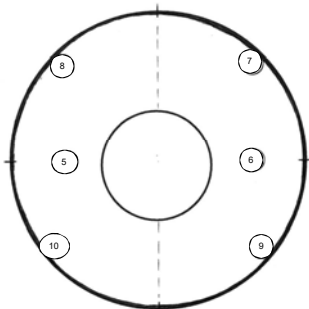
Baffle #: 3

East/West



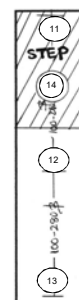
Baffle #: 3

East/West



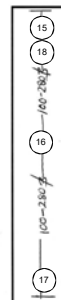
Baffle Area: 3

Bottom/Top



Baffle Area: 3

Bottom/Top



Comments:

The chamber was 100% gross alpha-beta/gamma scan surveyed.
All areas not marked on map were at background levels.

- ⊙ denotes swipe location and fixed α/β readings
 - # denotes G/A radiation readings
 - #/# denotes contact / 1 meter radiation readings.
 - * denotes highest radiation reading on contact
 - LAW denotes large area mass/m wipe
 - ▲ denotes static location.
 - Unless Otherwise Noted
- All readings in m/hr unless otherwise noted
K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A										
SURVEYOR: Adolfo Matus						LOCATION: Baffle #3				
Location	Exposure Rate (µR/hr)		Scan Range (NET)				Removable (NET)		Comments	
	Contact	1 Meter	Gamma (cpm)	Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²		Beta/Gamma dpm/100cm ²
1				-7.6	11.3	-69.7	1422.9			See Map For Location
2				1.9	11.3	-169.2	1422.9			See Map For Location
3				11.3	30.3	1621.9	2616.9			See Map For Location
4				11.3	30.3	1621.9	2616.9			See Map For Location
5				1.9	20.8	-169.2	1024.9			See Map For Location
6				1.9	30.3	-169.2	1024.9			See Map For Location
7				-7.6	20.8	1621.9	2616.9			See Map For Location
8				1.9	39.7	1621.9	3611.9			See Map For Location
9				1.9	11.3	1621.9	3611.9			See Map For Location
10				11.3	30.3	1621.9	2616.9			See Map For Location
11				1.9	30.3	-169.2	1422.9			See Map For Location
12				1.9	30.3	-169.2	1422.9			See Map For Location
13				1.9	11.3	-169.2	1422.9			See Map For Location
14				-7.6	30.3	1621.9	4607.0			See Map For Location
15				1.9	30.3	-169.2	1422.9			See Map For Location
16				1.9	39.7	-169.2	1422.9			See Map For Location
17				11.3	20.8	-169.2	1422.9			See Map For Location
18				1.9	11.3	1621.9	2616.9			See Map For Location
N/A										See Map For Location
N/A										See Map For Location
N/A										See Map For Location
Reviewer Daniel Spicuzza			Date: 4/25/2018							
			Time: 12:54							

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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A										
SURVEYOR: Thomas Hogan/Josefina Matus				LOCATION: Baffle #3						
Location	Exposure Rate ($\mu\text{R/hr}$)		Fixed + Removable (NET)			Removable (NET)		Comments		
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²			
11				-7.6	1447.8	1.9	3.0	See Map For Location		
12				-7.6	1472.6	-1.2	-10.2	See Map For Location		
13				-7.6	1338.3	1.9	1.1	See Map For Location		
15				-7.6	1497.5	8.0	-10.2	See Map For Location		
16				1.9	1522.4	5.0	18.1	See Map For Location		
17				-7.6	1437.8	1.9	-2.6	See Map For Location		
Maximum:						1.9	1522.4	8.0	18.1	
Average:						-6.0	1452.7	2.9	-0.1	
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
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Reviewer Daniel Spicuzza			Date:	4/25/2018						
			Time:	12:54						

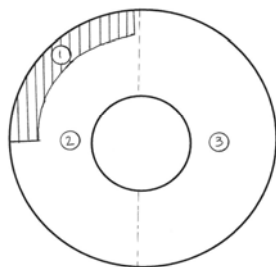
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RADIATION/CONTAMINATION SURVEY FORM

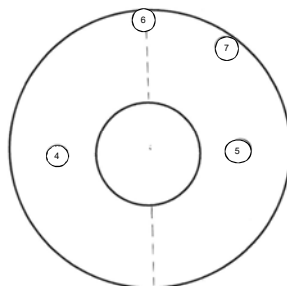
DATE:	TIME:	INSTRUMENTATION USED						
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA * (dpm/100cm ²)
4/25/2018	09:33	2360	184949	3/6/2019	α 42.3%	α 10.6%	α 42.0	α 7.6
SURVEY NUMBER:	N/A	43-93	268605		βγ 26.8%	βγ 10.05%	βγ 398.1	βγ 1363.2
LOCATION:	Baffle #4	2929	146780	6/17/2018	α 64.6%	α 16.2%	α 15.9	α 1.2
					βγ 53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
SURVEYOR: Adolfo Matus								
DATE:	TIME:	Reviewed by:						
4/25/2018	09:49	Daniel Spicuzza						
Isotopes of Concern: DU		Static Count Time: 2 Minutes						

NRL Chesapeake Building 218 Blast Tank

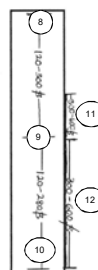
Baffle #: 4
East/West



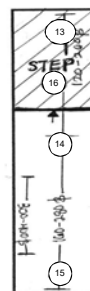
Baffle #: 4
East/West



Baffle Area: 4
Bottom/Top



Baffle Area: 4
Bottom/Top



Comments:

The chamber was 100% gross alpha-beta/gamma scan surveyed.
All areas not marked on map were at background levels.

- ⊙ denotes swipe location and fixed α/β readings
 - # denotes G/A radiation readings
 - #/# denotes contact / 1 meter radiation readings.
 - * denotes highest radiation reading on contact
 - LAW denotes large area mass/m wipe
 - ▲ denotes static location.
 - Unless Otherwise Noted
- All readings in m/hr unless otherwise noted
K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A										
SURVEYOR: Adolfo Matus						LOCATION: Baffle #4				
Location	Exposure Rate (µR/hr)		Scan Range (NET)				Removable (NET)		Comments	
	Contact	1 Meter	Gamma (cpm)	Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²		Beta/Gamma dpm/100cm ²
1				-7.6	11.3	1621.9	3611.9			See Map For Location
2				1.9	11.3	29.9	1422.9			See Map For Location
3				11.3	30.3	-69.7	1422.9			See Map For Location
4				-7.6	39.7	-169.2	1223.9			See Map For Location
5				-7.6	39.7	-169.2	1422.9			See Map For Location
6				1.9	30.3	1621.9	2616.9			See Map For Location
7				1.9	20.8	2616.9	2616.9			See Map For Location
8				1.9	39.7	-169.2	1621.9			See Map For Location
9				1.9	11.3	-169.2	1621.9			See Map For Location
10				11.3	30.3	-169.2	1422.9			See Map For Location
11				1.9	30.3	1621.9	4607.0			See Map For Location
12				1.9	30.3	1621.9	4607.0			See Map For Location
13				1.9	11.3	-169.2	1422.9			See Map For Location
14				-7.6	30.3	1621.9	4607.0			See Map For Location
15				1.9	30.3	-169.2	1422.9			See Map For Location
16				1.9	39.7	-169.2	1422.9			See Map For Location
17				11.3	20.8	-169.2	1422.9			See Map For Location
18				1.9	11.3	1621.9	2616.9			See Map For Location
N/A										
N/A										
N/A										
Reviewer Daniel Spicuzza			Date: 4/25/2018							
			Time: 9:49							

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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Thomas Hogan/Josefina Matus				LOCATION: Baffle #4				
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
8				-7.6	1611.9	1.9	3.0	See Map For Location
9				49.2	1741.3	-1.2	-10.2	See Map For Location
10				58.6	1482.6	1.9	1.1	See Map For Location
13				-7.6	1373.1	1.9	-8.3	See Map For Location
14				-7.6	4587.1	5.0	16.2	See Map For Location
15				11.3	1611.9	1.9	-2.6	See Map For Location
Maximum:				58.6	4587.1	5.0	16.2	
Average:				16.1	2068.0	1.9	-0.1	
N/A								
N/A								
N/A								
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N/A								
Reviewer Daniel Spicuzza			Date:	4/25/2018				
			Time:	9:49				

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RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/25/2018	TIME: 09:23	INSTRUMENTATION USED							
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA * (dpm/100cm ²)	Background * (dpm/100cm ²)
SURVEY NUMBER: N/A		2360	297766	12/20/2018	α	40.4%	α 10.1%	α 49.0	α 10.9
		43-93	323074		βγ	25.4%	βγ 9.53%	βγ 459.4	βγ 1732.3
LOCATION: Baffle #5		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
SURVEYOR: Richard Thatcher									
DATE: 4/25/2018	TIME: 09:47	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Building 218 Blast Tank

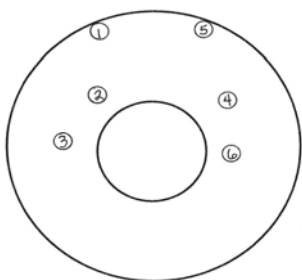
Baffle #: 5

Baffle #: 5

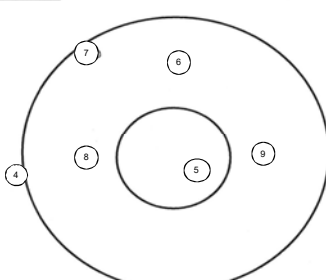
Baffle Area: 5

Baffle Area: 5

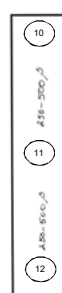
East/West



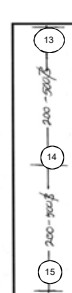
East/West



Bottom/Top



Bottom/Top



Comments:

The chamber was 100% gross alpha-beta/gamma scan surveyed.
All areas not marked on map were at background levels.

- ⊙ denotes swipe location and fixed α/β readings
 - # denotes G/A radiation readings
 - #/# denotes contact / 1 meter radiation readings.
 - * denotes highest radiation reading on contact
 - LAW denotes large area mass/m wipe
 - ▲ denotes static location.
 - Unless Otherwise Noted
- All readings in mR/hr unless otherwise noted
K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A										
SURVEYOR: Richard Thatcher							LOCATION: Baffle #5			
Location	Exposure Rate (µR/hr)		Scan Range (NET)				Removable (NET)		Comments	
	Contact	1 Meter	Gamma (cpm)	Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²		Beta/Gamma dpm/100cm ²
1				-10.9	8.9	1417.3	8766.4			See Map For Location
2				-1.0	48.5	2467.2	3517.1			See Map For Location
3				8.9	28.7	-157.5	1207.3			See Map For Location
4				-1.0	18.8	2467.2	3517.1			See Map For Location
5				-1.0	38.6	1417.3	8766.4			See Map For Location
6				-1.0	48.5	-52.5	1102.4			See Map For Location
7				-1.0	28.7	892.4	2992.1			See Map For Location
8				-1.0	38.6	-157.5	1207.3			See Map For Location
9				-1.0	8.9	-157.5	1312.3			See Map For Location
10				-10.9	28.7	892.4	3517.1			See Map For Location
11				-1.0	38.6	892.4	3517.1			See Map For Location
12				8.9	38.6	892.4	3517.1			See Map For Location
13				-1.0	8.9	367.5	3517.1			See Map For Location
14				-10.9	28.7	367.5	3517.1			See Map For Location
15				-1.0	28.7	367.5	3517.1			See Map For Location
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
Reviewer Daniel Spicuzza			Date: 4/25/2018							
			Time: 9:47							

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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

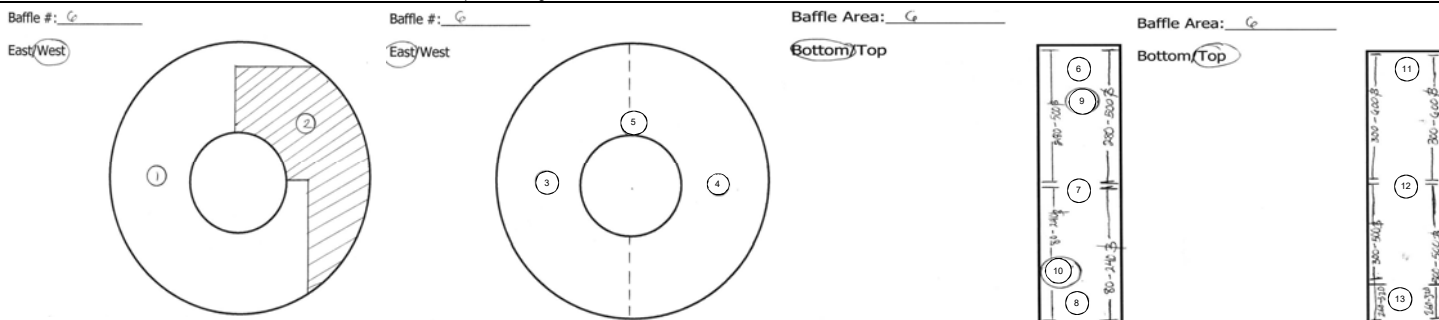
SURVEY NUMBER: N/A									
SURVEYOR: Thomas Hogan/Josefina Matus				LOCATION: Baffle #5					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments	
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²		
10				8.9	3989.5	5.0	-4.5	See Map For Location	
11				28.7	4325.5	-1.2	-8.3	See Map For Location	
12				28.7	3758.5	1.9	-2.6	See Map For Location	
13				28.7	3979.0	1.9	14.3	See Map For Location	
14				8.9	3853.0	1.9	12.5	See Map For Location	
15				48.5	4220.5	1.9	3.0	See Map For Location	
Maximum:				48.5	4325.5	5.0	14.3		
Average:				25.4	4021.0	1.9	2.4		
N/A									
N/A									
N/A									
N/A									
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Reviewer Daniel Spicuzza			Date: 4/25/2018						
			Time: 9:47						

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RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/24/2018	TIME: 09:35	INSTRUMENTATION USED							
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA * (dpm/100cm ²)	Background * (dpm/100cm ²)
SURVEY NUMBER: N/A		2360	193668	8/15/2018	α	49.7%	α 12.4%	α 38.6	α 8.0
		43-93	326725		βγ	32.7%	βγ 12.26%	βγ 329.7	βγ 1141.7
LOCATION: Baffle #6		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
SURVEYOR: Adolfo Matus Jr.									
DATE: 4/24/2018	TIME: 10:17	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Building 218 Blast Tank



Comments:

The chamber was 100% gross alpha-beta/gamma scan surveyed.
All areas not marked on map were at background levels.

- ⊙ denotes swipe location and fixed α/β readings
 - # denotes G/A radiation readings
 - #/# denotes contact / 1 meter radiation readings.
 - * denotes highest radiation reading on contact
 - LAW denotes large area masslim wipe
 - ▲ denotes static location.
 - Unless Otherwise Noted
- All readings in m/hr unless otherwise noted
K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A										
SURVEYOR: Adolfo Matus Jr.						LOCATION: Baffle #6				
Location	Exposure Rate (µR/hr)		Scan Range (NET)				Removable (NET)		Comments	
	Contact	1 Meter	Gamma (cpm)	Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²		Beta/Gamma dpm/100cm ²
1										See Map For Location/Steel Removed
2				-8.0	8.0	-81.5	1141.7			See Map For Location
3				-8.0	8.0	-81.5	978.6			See Map For Location
4				-8.0	8.0	-81.5	978.6			See Map For Location
5				0.0	16.1	326.2	1631.0			See Map For Location
6				-8.0	16.1	1141.7	3343.5			See Map For Location
7				0.0	24.1	-81.5	815.5			See Map For Location
8				0.0	24.1	-81.5	815.5			See Map For Location
9				0.0	8.0	1141.7	3751.3			See Map For Location
10				-8.0	24.1	326.2	1467.9			See Map For Location
11				0.0	32.2	1304.8	3751.3			See Map For Location
12				8.0	32.2	1304.8	2935.8			See Map For Location
13				0.0	24.1	978.6	1467.9			See Map For Location
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
Reviewer Daniel Spicuzza			Date: 4/24/2018							
			Time: 10:17							

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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

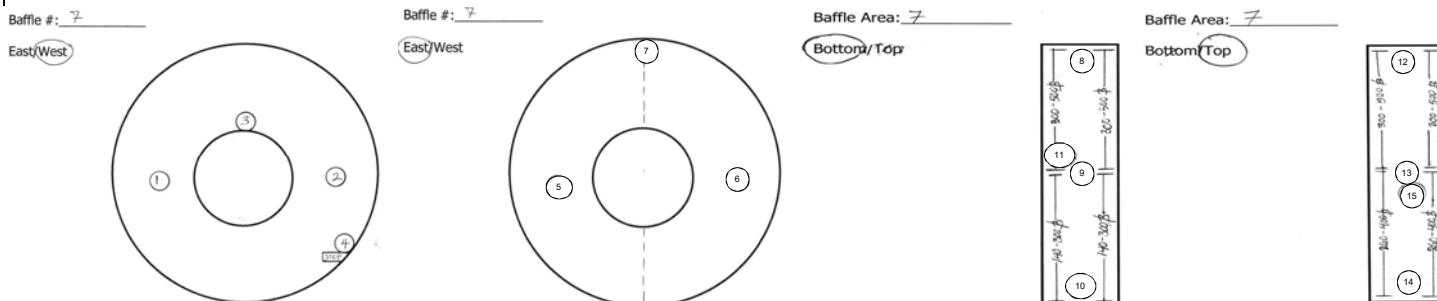
SURVEY NUMBER: N/A								
SURVEYOR: Thomas Hogan/Josefina Matus	LOCATION: Baffle #6							
Location	Exposure Rate (μR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
6				8.0	3156.0	1.9	8.7	See Map For Location
7				8.0	583.1	1.9	-2.6	See Map For Location
8				-8.0	521.9	1.9	16.2	See Map For Location
11				24.1	3437.3	5.0	-0.8	See Map For Location
12				16.1	2882.8	1.9	-6.4	See Map For Location
13				-8.0	1170.2	1.9	1.1	See Map For Location
Maximum:				24.1	3437.3	5.0	16.2	
Average:				6.7	1958.5	2.4	2.7	
N/A								
N/A								
N/A								
N/A								
N/A								
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Reviewer Daniel Spicuzza			Date: 4/24/2018					
			Time: 10:17					

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RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/24/2018	TIME: 10:46	INSTRUMENTATION USED							
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA * (dpm/100cm²)	Background * (dpm/100cm²)
SURVEY NUMBER: N/A		2360	184949	3/6/2019	α 42.3%		α 10.6%	α 42.0	α 7.6
		43-93	268605		βγ 26.8%		βγ 10.05%	βγ 398.1	βγ 1363.2
LOCATION: Baffle #7		2929	146780	6/17/2018	α 64.6%		α 16.2%	α 27.8	α 1.2
					βγ 53.0%		βγ 19.9%	βγ 121.1	βγ 199.7
SURVEYOR: Adolfo Matus									
DATE: 4/25/2018	TIME: 09:22	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Building 218 Blast Tank



Comments:

The chamber was 100% gross alpha-beta/gamma scan surveyed.
All areas not marked on map were at background levels.

- ⊙ denotes swipe location and fixed α/β readings
 - # denotes G/A radiation readings
 - #/# denotes contact / 1 meter radiation readings.
 - * denotes highest radiation reading on contact
 - LAW denotes large area mass/m wipe
 - ▲ denotes static location.
 - Unless Otherwise Noted
- All readings in m/hr unless otherwise noted
K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A										
SURVEYOR: Adolfo Matus						LOCATION: Baffle #7				
Location	Exposure Rate (µR/hr)		Scan Range (NET)				Removable (NET)		Comments	
	Contact	1 Meter	Gamma (cpm)	Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²		Beta/Gamma dpm/100cm ²
1				-7.6	11.3	-69.7	1024.9			See Map For Location
2				1.9	30.3	-69.7	1223.9			See Map For Location
3				11.3	30.3	626.9	2616.9			See Map For Location
4				-7.6	39.7	626.9	2616.9			See Map For Location
5				-7.6	39.7	-69.7	1024.9			See Map For Location
6				1.9	30.3	-69.7	1223.9			See Map For Location
7				1.9	20.8	2119.4	6597.0			See Map For Location
8				1.9	39.7	1621.9	3611.9			See Map For Location
9				1.9	11.3	1621.9	3611.9			See Map For Location
10				11.3	30.3	29.9	1621.9			See Map For Location
11				1.9	39.7	8587.1	8587.1			See Map For Location
12				1.9	20.8	1621.9	3611.9			See Map For Location
13				1.9	11.3	1621.9	3611.9			See Map For Location
14				-7.6	30.3	1223.9	2616.9			See Map For Location
15				1.9	30.3	6597.0	6597.0			See Map For Location
N/A										
N/A										
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N/A										
Reviewer Daniel Spicuzza			Date: 4/25/2018							
			Time: 9:22							

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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

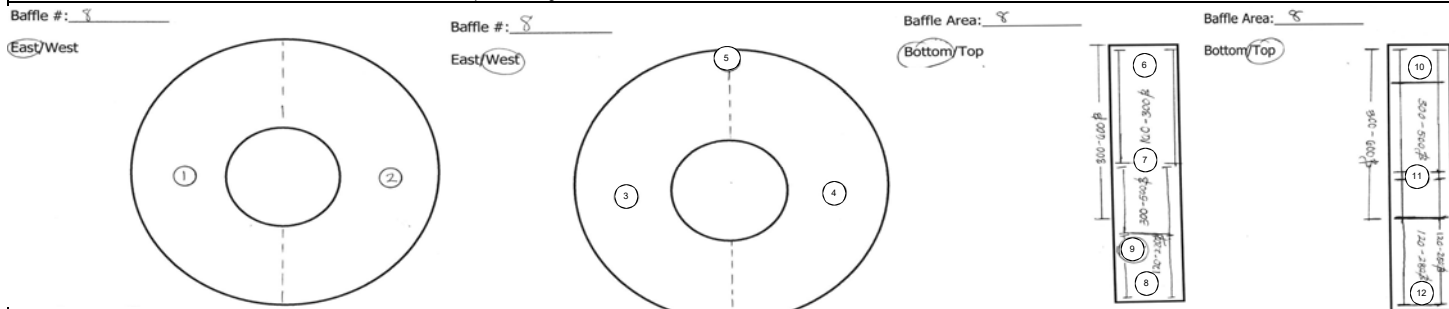
SURVEY NUMBER: N/A									
SURVEYOR: Thomas Hogan/Josefina Matus				LOCATION: Baffle #7					
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments	
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²		
8				11.3	3592.0	5.0	-2.6	See Map For Location	
9				-7.6	3492.5	1.9	4.9	See Map For Location	
10				30.3	1054.7	1.9	8.7	See Map For Location	
12				1.9	3283.6	1.9	-4.5	See Map For Location	
13				1.9	3368.2	5.0	10.6	See Map For Location	
14				11.3	2776.1	1.9	-0.8	See Map For Location	
Maximum:				30.3	3592.0	5.0	10.6		
Average:				8.2	2927.9	2.9	2.7		
N/A									
N/A									
N/A									
N/A									
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Reviewer Daniel Spicuzza			Date:	4/25/2018					
			Time:	9:22					

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RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/24/2018	TIME: 13:55	INSTRUMENTATION USED							
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA * (dpm/100cm ²)	Background * (dpm/100cm ²)
SURVEY NUMBER: N/A		2360	184949	3/6/2019	α	42.3%	α 10.6%	α 42.0	α 7.6
		43-93	268605		βγ	26.8%	βγ 10.05%	βγ 398.1	βγ 1363.2
LOCATION: Baffle #8		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 27.8	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
SURVEYOR: Adolfo Matus									
DATE: 4/26/2018	TIME: 12:21	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Building 218 Blast Tank



Comments:

The chamber was 100% gross alpha-beta/gamma scan surveyed.
All areas not marked on map were at background levels.

- ⊙ denotes swipe location and fixed α/β readings
 - # denotes G/A radiation readings
 - #/# denotes contact / 1 meter radiation readings.
 - * denotes highest radiation reading on contact
 - LAW denotes large area masslim wipe
 - ▲ denotes static location.
 - Unless Otherwise Noted
- All readings in m/hr unless otherwise noted
K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A										
SURVEYOR: Adolfo Matus						LOCATION: Baffle #8				
Location	Exposure Rate (µR/hr)		Scan Range (NET)				Removable (NET)		Comments	
	Contact	1 Meter	Gamma (cpm)	Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²		Beta/Gamma dpm/100cm ²
1				-7.6	11.3	-69.7	1223.9			See Map For Location
2				-7.6	20.8	29.9	1422.9			See Map For Location
3				1.9	30.3	-69.7	1422.9			See Map For Location
4				-7.6	11.3	-69.7	1422.9			See Map For Location
5				30.3	68.1	6597.0	6597.0			See Map For Location
6				1.9	30.3	1621.9	7592.0			See Map For Location
7				1.9	20.8	1621.9	6597.0			See Map For Location
8				1.9	39.7	-169.2	626.9			See Map For Location
9				30.3	39.7	8587.1	8587.1			See Map For Location
10				30.3	30.3	-69.7	1422.9			See Map For Location
11				1.9	39.7	1621.9	4607.0			See Map For Location
12				1.9	20.8	-169.2	1422.9			See Map For Location
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
Reviewer Daniel Spicuzza			Date: 4/26/2018							
			Time: 12:21							

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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Thomas Hogan/Josefina Matus				LOCATION: Baffle #8				
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
6				58.6	10024.9	5.0	-12.1	See Map For Location
7				30.3	7422.9	5.0	16.2	See Map For Location
8				11.3	621.9	1.9	4.9	See Map For Location
10				-7.6	1119.4	1.9	-2.6	See Map For Location
11				-2.8	4562.2	1.9	1.1	See Map For Location
12				11.3	1005.0	1.9	-0.8	See Map For Location
Maximum:				58.6	10024.9	5.0	16.2	
Average:				16.9	4126.0	2.9	1.1	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
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N/A								
Reviewer Daniel Spicuzza			Date:	4/26/2018				
			Time:	12:21				

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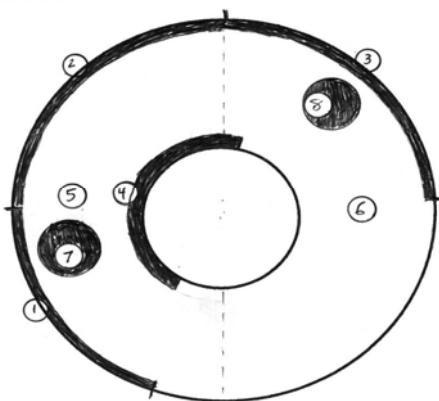
RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/25/2018	TIME: 15:00	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA * (dpm/100cm ²)	Background * (dpm/100cm ²)
SURVEY NUMBER: N/A		2360	184949	3/6/2019	α	42.3%	α 10.6%	α 42.0	α 7.6
		43-93	268605		βγ	26.8%	βγ 10.05%	βγ 398.1	βγ 1363.2
LOCATION: Blast Tank Main Baffles Room 107		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 27.8	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
SURVEYOR: Adolfo Matus									
DATE: 4/25/2018	TIME: 15:14	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							
NRL Chesapeake Building 218 Blast Tank									

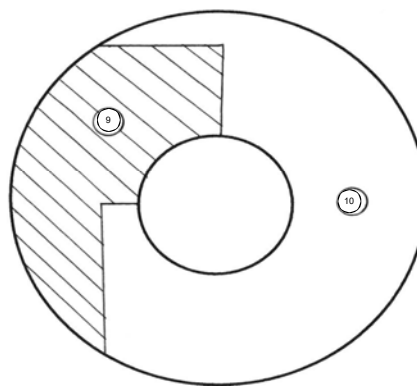
Baffle #: 107

Baffle #: 107

East/West



East/West



Comments:

The chamber was 100% gross alpha-beta/gamma scan surveyed.
All areas not marked on map were at background levels.

- ⊙ denotes swipe location and fixed α/β readings
 - # denotes G/A radiation readings
 - #/# denotes contact / 1 meter radiation readings.
 - * denotes highest radiation reading on contact
 - LAW denotes large area mass/m wipe
 - Δ denotes static location.
 - Unless Otherwise Noted
- All readings in m/hr unless otherwise noted
K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A										
SURVEYOR: Adolfo Matus						LOCATION: Blast Tank Main Baffles Room 107				
Location	Exposure Rate (µR/hr)		Scan Range (NET)				Removable (NET)		Comments	
	Contact	1 Meter	Gamma (cpm)	Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²		Beta/Gamma dpm/100cm ²
1				-7.6	11.3	1621.9	3611.9			See Map For Location
2				1.9	20.8	1621.9	3611.9			See Map For Location
3				1.9	30.3	1621.9	2616.9			See Map For Location
4				-7.6	20.8	1621.9	2616.9			See Map For Location
5				30.3	68.1	-69.7	1422.9			See Map For Location
6				1.9	30.3	-169.2	1422.9			See Map For Location
7				1.9	20.8	2218.9	2218.9			See Map For Location
8				1.9	30.3	2019.9	2019.9			See Map For Location
9				1.9	20.8	-169.2	1223.9			See Map For Location
10				N/A	N/A	N/A	N/A			See Map For Location/Steel Removed
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
Reviewer Daniel Spicuzza			Date: 4/25/2018							
			Time: 15:14							

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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Adolfo Matus				LOCATION: Blast Tank Main Baffles Room 107				
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1				16.1	3771.1	5.0	-19.6	See Map For Location
3				30.3	2607.0	5.0	6.8	See Map For Location
7				11.3	2124.4	1.9	-6.4	See Map For Location
8				-7.6	2044.8	1.9	-4.5	See Map For Location
Maximum:				30.3	3771.1	5.0	6.8	
Average:				12.5	2636.8	3.4	-5.9	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
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N/A								
N/A								
Reviewer Daniel Spicuzza			Date: 4/25/2018					
			Time: 15:14					

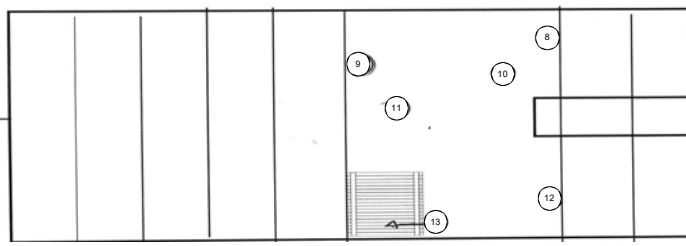
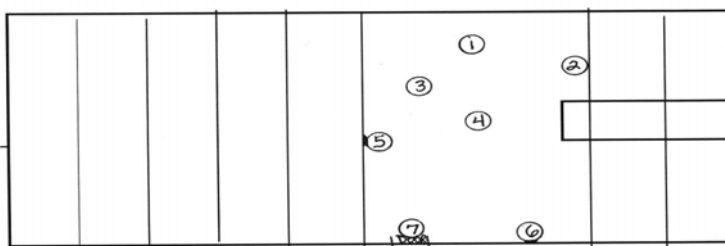
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RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/24/2018	TIME: 12:45	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA * (dpm/100cm ²)	Background * (dpm/100cm ²)
SURVEY NUMBER: N/A		2360	297766	12/20/2018	α	40.4%	α 10.1%	α 49.0	α 10.9
		43-93	323074		βγ	25.4%	βγ 9.53%	βγ 459.4	βγ 1732.3
LOCATION: Room 107		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
SURVEYOR: Richard Thatcher									
DATE: 4/24/2018	TIME: 13:13	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							
NRL Chesapeake Building 218 Blast Tank									

Blast Tank Bottom View Looking Up

Blast Tank Top View Looking Down



<p>Comments:</p> <p>The chamber was 100% gross alpha-beta/gamma scan surveyed. All areas not marked on map were at background levels.</p>	<p>⊙ denotes swipe location and fixed α/β readings</p> <p># denotes G/A radiation readings</p> <p>#/# denotes contact / 1 meter radiation readings.</p> <p>* denotes highest radiation reading on contact</p> <p>LAW denotes large area mass/m wipe</p> <p>Δ denotes static location.</p> <p>* Unless Otherwise Noted</p> <p>All readings in m/hr unless otherwise noted</p> <p>K = 1000</p>
	<p>Routine (Daily / Weekly / Monthly) <input type="checkbox"/></p> <p>Non-routine <input checked="" type="checkbox"/></p>

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A										
SURVEYOR: Richard Thatcher						LOCATION: Room 107				
Location	Exposure Rate (µR/hr)		Scan Range (NET)				Removable (NET)		Comments	
	Contact	1 Meter	Gamma (cpm)	Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²		Beta/Gamma dpm/100cm ²
1				28.7	8.9	-157.5	2467.2			See Map For Location
2				-1.0	18.8	-157.5	2467.2			See Map For Location
3				8.9	28.7	-157.5	2467.2			See Map For Location
4				-1.0	28.7	-157.5	2467.2			See Map For Location
5				-1.0	18.8	-157.5	2467.2			See Map For Location
6				-1.0	38.6	-157.5	2467.2			See Map For Location
7				-1.0	48.5	6666.7	6666.7			See Map For Location
8				-10.9	8.9	-262.5	1417.3			See Map For Location
9				-10.9	18.8	-52.5	1627.3			See Map For Location
10				-1.0	38.6	-262.5	1627.3			See Map For Location
11				-1.0	28.7	-157.5	1417.3			See Map For Location
12				8.9	18.8	157.5	2677.2			See Map For Location
13				-1.0	28.7	52.5	3517.1			See Map For Location
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
Reviewer Daniel Spicuzza			Date: 4/24/2018							
			Time: 13:13							

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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Richard Thatcher				LOCATION: Room 107				
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
2				13.9	2635.2	5.0	1.1	See Map For Location
7				18.8	6671.9	1.9	-2.6	See Map For Location
10				-1.0	1527.6	1.9	-4.5	See Map For Location
13				13.9	3312.3	1.9	-2.6	See Map For Location
Maximum:				18.8	6671.9	5.0	1.1	
Average:				11.4	3536.7	2.6	-2.2	
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
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N/A								
N/A								
Reviewer			Date:	4/24/2018				
Daniel Spicuzza			Time:	13:13				

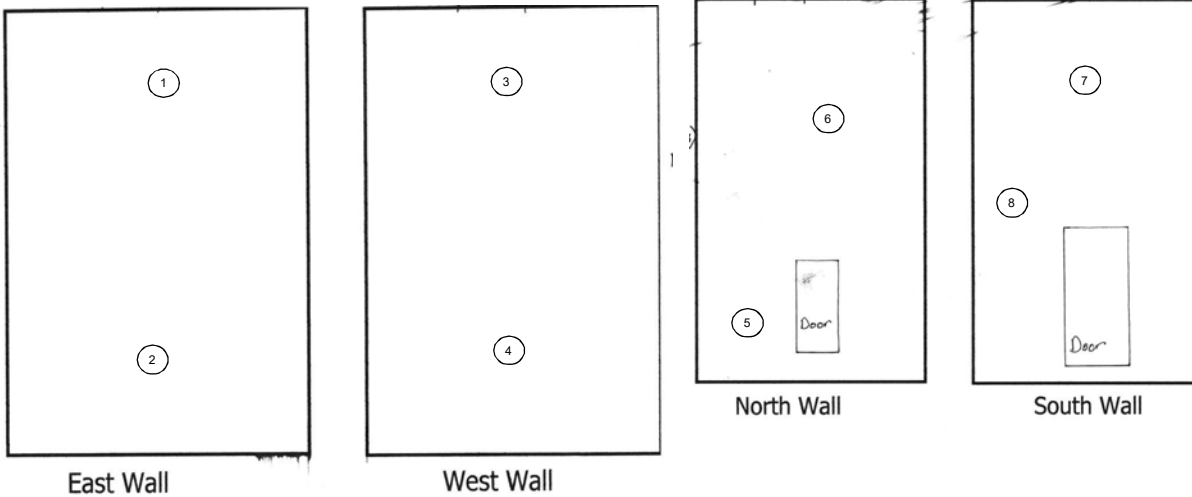
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Optics Chamber

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/25/2018	TIME: 14:30	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
		2360	297766	12/20/2018	α	40.4%	α 10.1%	α 49.0	α 10.9
SURVEY NUMBER: N/A		43-93	323074		βγ	25.4%	βγ 9.525%	βγ 459.4	βγ 1732.3
LOCATION: Optics Chamber Interior					64.6%		16.2%	15.9	1.2
					53.0%		19.9%	83.7	199.7
SURVEYOR: Richard Thatcher									
DATE: 4/25/2018	TIME: 14:41	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU				Static Count Time: 2 Minutes					

NRL Chesapeake Building 218 Optics Chamber



Comments:

The chamber was 100% gross alpha-beta/gamma scan surveyed.
All areas not marked on map were at background levels.

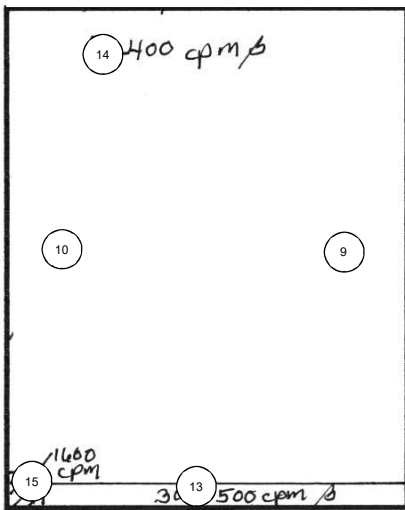
- ⊙ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

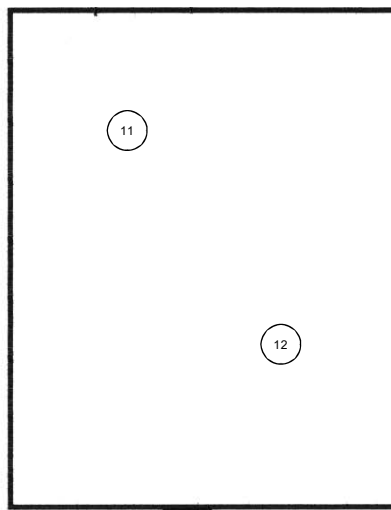
Non-routine

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/25/2018	TIME: 14:30	INSTRUMENTATION USED							
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)
		2360	297766	12/20/2018	α	40.4%	α 10.1%	α 49.0	α 10.9
SURVEY NUMBER: N/A		43-93	323074		βγ	25.4%	βγ 9.5%	βγ 459.4	βγ 1732.3
LOCATION: Optics Chamber Interior					64.6%		16.2%	15.9	1.2
					53.0%		19.9%	83.7	199.7
SURVEYOR: Richard Thatcher									
DATE: 4/25/2018	TIME: 14:41	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: Cs-137		Static Count Time: 2 Minutes							
NRL Chesapeake Building 218 Optics Chamber									



Bottom



Top

Comments:

- ⊙ # denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in m/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A										
SURVEYOR: Richard Thatcher					LOCATION: Optics Chamber Interior					
Location	Exposure Rate (µR/hr)		Scan Range (NET)				Removable (NET)		Comments	
	Contact	1 Meter	Gamma (cpm)	Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²		Beta/Gamma dpm/100cm ²
1				-1.0	38.6	-577.4	892.4			See Map For Location
2				-1.0	28.7	-472.4	787.4			See Map For Location
3				-1.0	38.6	-472.4	892.4			See Map For Location
4				-1.0	28.7	-472.4	892.4			See Map For Location
5				-1.0	18.8	-472.4	787.4			See Map For Location
6				-1.0	28.7	-472.4	787.4			See Map For Location
7				-10.9	18.8	-262.5	892.4			See Map For Location
8				-1.0	18.8	-262.5	892.4			See Map For Location
9				-1.0	8.9	-472.4	997.4			See Map For Location
10				-1.0	28.7	-472.4	997.4			See Map For Location
11				18.8	38.6	-157.5	997.4			See Map For Location
12				-1.0	28.7	-157.5	997.4			See Map For Location
13				-1.0	38.6	1417.3	3517.1			See Map For Location
14				-10.9	28.7	1417.3	2467.2			See Map For Location
15				-1.0	28.7	10866.1	15065.6			See Map For Location
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
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N/A										
Reviewer Daniel Spicuzza	Date:	4/25/2018								
	Time:	14:41								

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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Thomas Hogan/Josefina Matus				LOCATION: Northern Section East Lower Wall				
Location	Exposure Rate (μ R/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1				8.9	-94.5	-1.2	1.1	See Map For Location
2				18.8	10.5	-1.2	-25.3	See Map For Location
3				28.7	-52.5	-1.2	-6.4	See Map For Location
4				-1.0	440.9	-1.2	-15.8	See Map For Location
5				8.9	965.9	-1.2	-19.6	See Map For Location
6				8.9	776.9	-1.2	-15.8	See Map For Location
7				8.9	913.4	-1.2	3.0	See Map For Location
8				8.9	1123.4	-1.2	-19.6	See Map For Location
9				8.9	944.9	-1.2	-0.8	See Map For Location
10				28.7	1018.4	-1.2	-25.3	See Map For Location
11				-10.9	477.7	-1.2	10.6	See Map For Location
12				8.9	451.4	-1.2	16.2	See Map For Location
13				23.8	3695.5	1.9	4.9	See Map For Location
14				13.9	2808.4	5.0	-4.5	See Map For Location
15				18.8	15422.6	8.0	-2.6	See Map For Location
Maximum:				28.7	15422.6	8.0	16.2	
Average:				10.6	2419.9	0.3	-5.8	
N/A								
N/A								
N/A								
N/A								
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N/A								
N/A								
Reviewer Daniel Spicuzza			Date: 4/25/2018		Time: 14:41			

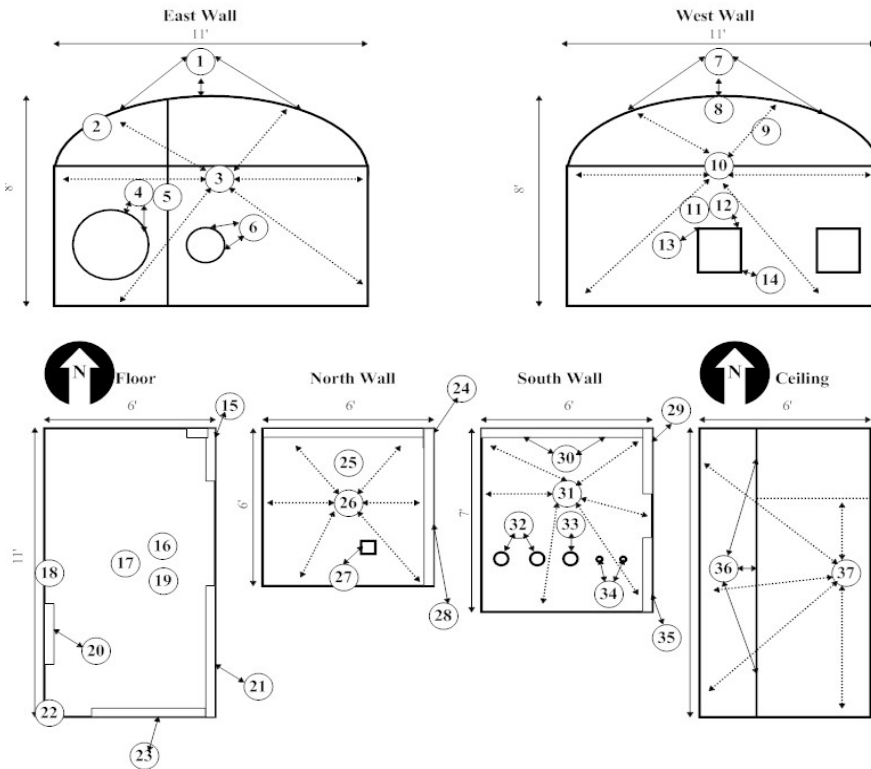
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Orthogonal Chamber

RADIATION/CONTAMINATION SURVEY FORM

DATE:	TIME:	INSTRUMENTATION USED							
4/20/2018	09:00	Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	193668	8/15/2018	α	49.7%	α 12.4%	α 38.6	α 8.0
LOCATION: Orthogonal Chamber Interior		43-93	326725		βγ	32.7%	βγ 12.3%	βγ 329.7	βγ 1141.7
SURVEYOR: Adolfo Matus		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 15.9	α 1.2
DATE: 4/20/2018					βγ	53.0%	βγ 19.9%	βγ 83.7	βγ 199.7
TIME: 09:10		Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

NRL Chesapeake Building 218 Orthogonal Chamber



Comments:

The chamber was 100% gross alpha-beta/gamma scan surveyed.
All areas not marked on map were at background levels.

- ⊙ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A											
SURVEYOR: Adolfo Matus						LOCATION: Orthogonal Chamber Interior					
Location	Exposure Rate (µR/hr)		Scan Range (NET)				Removable (NET)		Comments		
	Contact	1 Meter	Gamma (cpm)	Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²		Beta/Gamma dpm/100cm ²	
1				-8.0	32.2	1304.8	2935.8			See Map For Location	
2				0.0	24.1	5382.3	5382.3			See Map For Location	
3				0.0	32.2	81.5	652.4			See Map For Location	
4				0.0	24.1	1304.8	5382.3			See Map For Location	
5				0.0	16.1	2120.3	2120.3			See Map For Location	
6				0.0	24.1	1304.8	2935.8			See Map For Location	
7				-8.0	16.1	2120.3	3751.3			See Map For Location	
8				0.0	16.1	7013.3	7013.3			See Map For Location	
9				0.0	8.0	2120.3	2120.3			See Map For Location	
10				0.0	24.1	81.5	652.4			See Map For Location	
11				-8.0	24.1	8644.2	8644.2			See Map For Location	
12				0.0	24.1	2120.3	2120.3			See Map For Location	
13				0.0	8.0	2935.8	2935.8			See Map For Location	
14				-8.0	24.1	2120.3	2120.3			See Map For Location	
15				0.0	24.1	1304.8	2935.8			See Map For Location	
16				0.0	16.1	8644.2	8644.2			See Map For Location	
17				0.0	16.1	10275.2	10275.2			See Map For Location	
18				0.0	8.0	2935.8	2935.8			See Map For Location	
19				0.0	16.1	3751.3	3751.3			See Map For Location	
20				0.0	16.1	1304.8	2935.8			See Map For Location	
21				0.0	16.1	2120.3	2935.8			See Map For Location	
22				0.0	8.0	11906.2	11906.2			See Map For Location	
23				0.0	16.1	1304.8	2935.8			See Map For Location	
24				-8.0	8.0	3751.3	3751.3			See Map For Location	
25				-8.0	24.1	2120.3	5382.3			See Map For Location	
26				0.0	16.1	81.5	163.1			See Map For Location	
27				0.0	8.0	2120.3	2120.3			See Map For Location	
28				-8.0	24.1	2935.8	2935.8			See Map For Location	
29				-8.0	8.0	2935.8	5382.3			See Map For Location	
30				0.0	24.1	1304.8	3751.3			See Map For Location	
31				0.0	16.1	81.5	652.4			See Map For Location	
32				-8.0	24.1	3751.3	3751.3			See Map For Location	
33				-8.0	8.0	5382.3	5382.3			See Map For Location	
34				0.0	24.1	2120.3	2120.3			See Map For Location	
35				0.0	16.1	1304.8	2935.8			See Map For Location	
36				-8.0	8.0	2120.3	3751.3			See Map For Location	
37				-8.0	8.0	1304.8	5382.3			See Map For Location	
Reviewer Daniel Spicuzza			Date:	4/20/2018							
			Time:	9:10							

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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

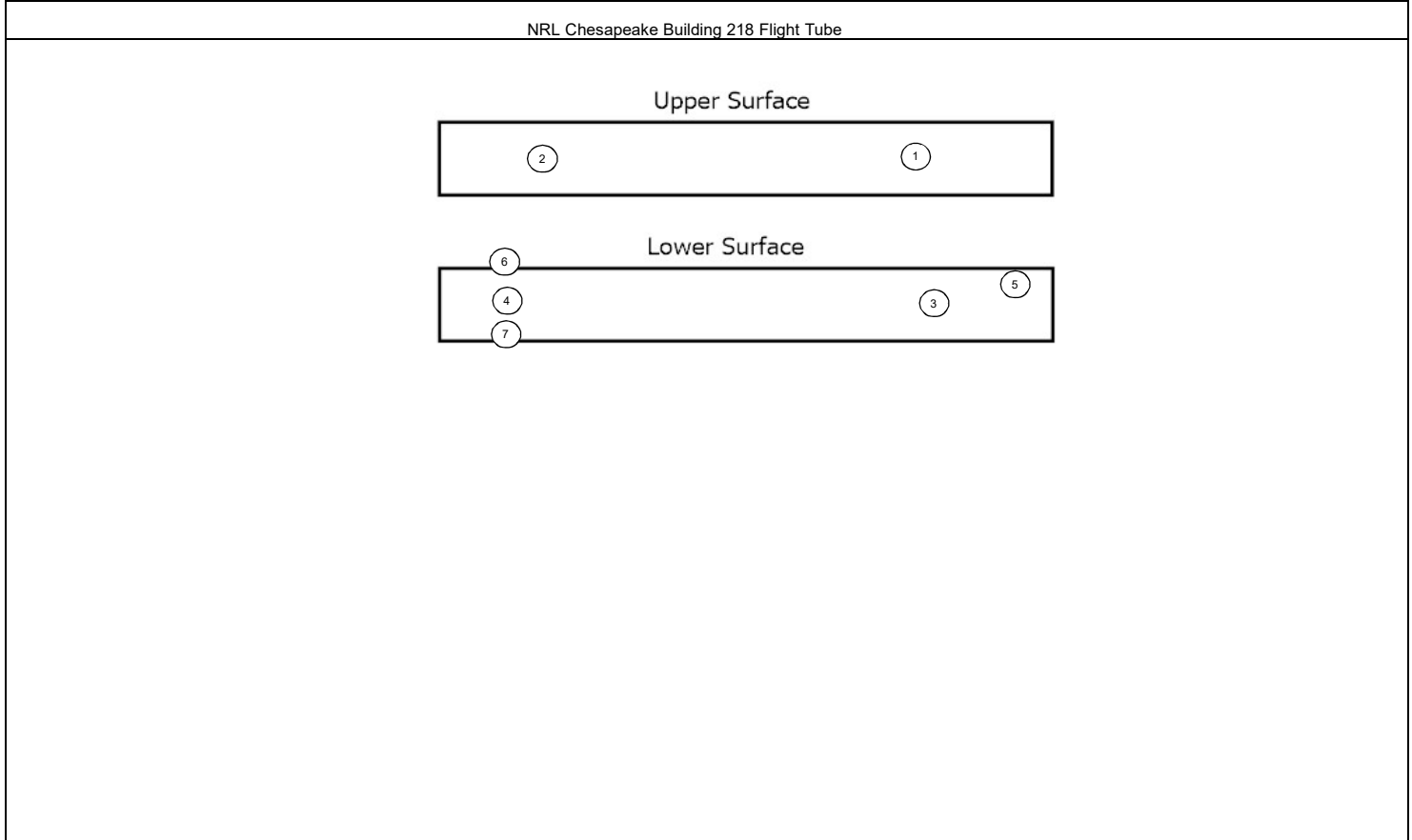
SURVEY NUMBER:		N/A									
SURVEYOR:				Adolfo Matus				LOCATION: Orthogonal Chamber			
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments			
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²				
2				12.1	4652.4	5.0	-10.2	See Map For Location			
8				24.1	5843.0	5.0	6.8	See Map For Location			
11				8.0	7649.3	1.9	-6.4	See Map For Location			
17				12.1	9325.2	1.9	-4.5	See Map For Location			
22				12.1	10095.8	8.0	-0.8				
33				16.1	4774.7	5.0	-6.4				
Maximum:				24.1	10095.8	8.0	6.8				
Average:				14.1	7056.7	4.4	-3.6				
N/A											
N/A											
N/A											
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N/A											
Reviewer Daniel Spicuzza			Date:	4/20/2018							
			Time:	9:10							

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Flight Tube

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/26/2018		TIME: 14:20		INSTRUMENTATION USED					
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	297766	12/20/2018	α	40.4%	α 10.1%	α 71.5	α 10.9
LOCATION: Flight Tube Interior		43-93	323074		βγ	25.4%	βγ 9.525%	βγ 574.9	βγ 1732.3
SURVEYOR: Adolfo Matus		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 27.8	α 1.2
DATE: 4/26/2018		TIME: 14:28			βγ	53.0%	βγ 19.9%	βγ 121.1	βγ 199.7
Reviewed by: Daniel Spicuzza		Static Count Time: 1 Minutes							
Isotopes of Concern: DU		NRL Chesapeake Building 218 Flight Tube							



Comments:
 The chamber was 100% gross alpha-beta/gamma scan surveyed.
 All areas not marked on map were at background levels.

Routine (Daily / Weekly / Monthly)
 Non-routine

- ⊙ denotes swipe location and fixed α/β readings
 - # denotes G/A radiation readings
 - #/# denotes contact / 1 meter radiation readings.
 - * denotes highest radiation reading on contact
 - LAW denotes large area masslinn wipe
 - Δ denotes static location.
 - + Unless Otherwise Noted
- All readings in mR/hr unless otherwise noted
 K = 1000

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A											
SURVEYOR: Adolfo Matus					LOCATION: Flight Tube Interior						
Location	Exposure Rate (µR/hr)		Gamma (cpm)	Scan Range (NET)				Removable (NET)		Comments	
	Contact	1 Meter		Lowest Observed Alpha dpm/100cm ²	Highest Observed Alpha dpm/100cm ²	Lowest Observed Beta/Gamma dpm/100cm ²	Highest Observed Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²		
1				-10.9	28.7	1417.3	8766.4			See Map For Location	
2				-1.0	28.7	1417.3	50761.2			See Map For Location	
3				-1.0	38.6	1417.3	6666.7			See Map For Location	
4				-1.0	68.3	1417.3	24514.4			See Map For Location	
N/A											
N/A											
N/A											
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Reviewer			Date:	4/26/2018							
Daniel Spicuzza			Time:	14:28							

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RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Adolfo Matus					LOCATION: Flight Tube Interior			
Location	Exposure Rate (μR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1				8.9	9049.9	1.9	-68.7	See Map For Location
2				-1.0	51212.6	5.0	-74.3	See Map For Location
3				18.8	6866.1	1.9	-72.5	See Map For Location
4				-1.0	8829.4	8.0	-76.2	See Map For Location
5				8.9	11233.6	1.9	-78.1	See Map For Location
6				28.7	7023.6	-1.2	-63.0	See Map For Location
7				28.7	28168.0	-1.2	-68.7	See Map For Location
Maximum:				28.7	51212.6	8.0	-63.0	
Average:				13.2	17483.3	2.3	-71.6	
N/A								
N/A								
N/A								
N/A								
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Reviewer Daniel Spicuzza			Date:	4/26/2018				
		Time:	14:28					

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Appendix L
Sample Laboratory Reports

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

TestAmerica Job ID: 160-28002-1

Client Project/Site: Naval Research Lab, Chesapeake Bay, MD

For:

Aleut World Solutions
615 E. 82nd Ave.
Suite 200
Anchorage, Alaska 99518

Attn: Sarah Skrobialowski



Authorized for release by:
5/16/2018 10:52:43 AM

Ivan Vania, Project Manager II
(314)298-8566
ivan.vania@testamericainc.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Aleut World Solutions
Project/Site: Naval Research Lab, Chesapeake Bay, MD

TestAmerica Job ID: 160-28002-1

Job ID: 160-28002-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Aleut World Solutions

Project: Naval Research Lab, Chesapeake Bay, MD

Report Number: 160-28002-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica St. Louis attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Manual Integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure. Detailed information can be found in the raw data section of the level IV report.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 4/25/2018 9:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.9° C.

TCLP METALS (ICP)

Sample NRLCBD-2 (160-28002-2) was analyzed for TCLP metals (ICP) in accordance with EPA SW-846 Method 1311/6010C. The samples were leached on 04/29/2018, prepared on 05/01/2018 and analyzed on 05/02/2018.

Case Narrative

Client: Aleut World Solutions
Project/Site: Naval Research Lab, Chesapeake Bay, MD

TestAmerica Job ID: 160-28002-1

Job ID: 160-28002-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

The serial dilution performed for the following samples associated with batch preparation batch 160-363142 and 160-363477 and analytical batch 160-363737 was outside control limits for Lead indicating a potential matrix interference: (160-28002-A-2-D SD ^).

Due to the high concentration of Lead, the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 160-363142 and 160-363477 and analytical batch 160-363737 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria: NRLCBD-2 (160-28002-2[MS]) and NRLCBD-2 (160-28002-2[MSD]).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TCLP MERCURY

Sample NRLCBD-2 (160-28002-2) was analyzed for TCLP mercury in accordance with EPA SW-846 Methods 1311/7470A. The samples were leached on 04/29/2018, and prepared and analyzed on 05/04/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ISOTOPIC URANIUM (ALPHA SPECTROMETRY)

Sample NRLCBD-1 (160-28002-1) was analyzed for Isotopic Uranium (Alpha Spectrometry) in accordance with DOE. The samples were leached on 04/26/2018, prepared on 05/02/2018 and analyzed on 05/05/2018.

Prep Batch 160-363695:

The pulser associated with the method blank (AV91) is displaying a "FAIL" in the final report. The result for Pulser Center (217.0) is within the range of 207.0-217.0. The LIM system is identifying it as "FAIL"; however, the lab considers the value to be within limits: (MB 160-363695/1-A).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TestAmerica St. Louis
13715 Ridler Trail North

Earth City, MO 63045
phone 314.298.8566 fax 314.298.8757

Chain of Custody Record



TestAmerica Laboratories, Inc.
COC No. NRLCDBD-1
Sampler: Cosgrove/Spicuzza
Lab Sampling:
Job / SDG No.: USN 2017-012

Regulatory Program: RCRA DW NPDES Other: RCRA
Site Contact: Daniel Spicuzza
Lab Contact: Ivan Vania

Project Manager: Daniel Spicuzza
Tel/Fax: 412.848.7022/888.705.7408
Analysis Turnaround Time: WORKING DAYS
CALENDAR DAYS: TAT if different from Below: 21

2 weeks
1 week
2 days
1 day

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Isotopic Uranium (Alpha Spec)	TCLP RCRA Metals 60100	TCLP Metals, 7470A Hg	Other:
NRLCDBD-1	4/24/2018	0955	C	Solid	1	N	N	X			
NRLCDBD-2	4/24/2018	1000	C	Solid	1	N	N	X	X		

Sample Specific Notes:
QC Level III
QC Level III

160-28002 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other: 1
Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
 Non-Hazard Flammable Skin Irritant Poison B Unknown

Special Instructions/QC Requirements & Comments: See sample specific notes for QC Levels.

Custody Seals Intact: Yes No
Relinquished by: [Signature]
Relinquished by: [Signature]
Relinquished by: [Signature]

Received by: [Signature] Date/Time: 4/25/18 0920
Received by: [Signature] Date/Time: [Signature]
Received in Laboratory by: [Signature] Date/Time: [Signature]

Return to Client Disposal by Lab Archive for: _____ Months

Therm ID No.: _____
Cooler Temp. (°C): _____
Company: TA St Louis



Login Sample Receipt Checklist

Client: Aleut World Solutions

Job Number: 160-28002-1

Login Number: 28002

List Source: TestAmerica St. Louis

List Number: 1

Creator: Taylor, Kristene N

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Definitions/Glossary

Client: Aleut World Solutions
Project/Site: Naval Research Lab, Chesapeake Bay, MD

TestAmerica Job ID: 160-28002-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Method Summary

Client: Aleut World Solutions
Project/Site: Naval Research Lab, Chesapeake Bay, MD

TestAmerica Job ID: 160-28002-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL SL
7470A	Mercury (CVAA)	SW846	TAL SL
A-01-R	Isotopic Uranium (Alpha Spectrometry)	DOE	TAL SL
1311	TCLP Extraction	SW846	TAL SL
3010A	Preparation, Total Metals	SW846	TAL SL
7470A	Preparation, Mercury	SW846	TAL SL
Dry and Grind	Preparation, Dry and Grind	None	TAL SL
ExtChrom	Preparation, Extraction Chromatography Resin Actinide Separation	None	TAL SL

Protocol References:

DOE = U.S. Department of Energy

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: Aleut World Solutions
Project/Site: Naval Research Lab, Chesapeake Bay, MD

TestAmerica Job ID: 160-28002-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-28002-1	NRLCBD-1	Solid	04/24/18 09:55	04/25/18 09:20
160-28002-2	NRLCBD-2	Solid	04/24/18 10:00	04/25/18 09:20

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Client Sample Results

Client: Aleut World Solutions
 Project/Site: Naval Research Lab, Chesapeake Bay, MD

TestAmerica Job ID: 160-28002-1

Client Sample ID: NRLCBD-1

Lab Sample ID: 160-28002-1

Date Collected: 04/24/18 09:55

Matrix: Solid

Date Received: 04/25/18 09:20

Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Uranium-233/234	3.38		0.442	0.525	1.00	0.0697	pCi/g	05/02/18 16:38	05/05/18 17:22	1
Uranium-235/236	0.305		0.148	0.150	1.00	0.0538	pCi/g	05/02/18 16:38	05/05/18 17:22	1
Uranium-238	19.4		1.06	1.94	1.00	0.0431	pCi/g	05/02/18 16:38	05/05/18 17:22	1
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Uranium-232	56.6		30 - 110					05/02/18 16:38	05/05/18 17:22	1

Client Sample ID: NRLCBD-2

Lab Sample ID: 160-28002-2

Date Collected: 04/24/18 10:00

Matrix: Solid

Date Received: 04/25/18 09:20

Method: 6010C - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.025	0.010	mg/L		05/01/18 14:58	05/02/18 17:46	1
Barium	0.70	J	1.0	0.038	mg/L		05/01/18 14:58	05/02/18 17:46	1
Cadmium	0.50		0.013	0.0038	mg/L		05/01/18 14:58	05/02/18 17:46	1
Chromium	0.044		0.025	0.0075	mg/L		05/01/18 14:58	05/02/18 17:46	1
Lead	11		0.025	0.0075	mg/L		05/01/18 14:58	05/02/18 17:46	1
Selenium	ND		0.038	0.020	mg/L		05/01/18 14:58	05/02/18 17:46	1
Silver	ND		0.025	0.0075	mg/L		05/01/18 14:58	05/02/18 17:46	1

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0039		0.0010	0.00030	mg/L		05/04/18 08:49	05/04/18 15:16	1

QC Sample Results

Client: Aleut World Solutions
 Project/Site: Naval Research Lab, Chesapeake Bay, MD

TestAmerica Job ID: 160-28002-1

Method: 6010C - Metals (ICP)

Lab Sample ID: LCS 160-363477/2-A
Matrix: Solid
Analysis Batch: 363737

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 363477

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	2.50	2.70		mg/L		108	80 - 120
Barium	2.50	2.41		mg/L		97	80 - 120
Cadmium	2.50	2.61		mg/L		104	80 - 120
Chromium	2.50	2.58		mg/L		103	80 - 120
Lead	2.50	2.54		mg/L		101	80 - 120
Selenium	1.25	1.39		mg/L		111	80 - 120
Silver	0.500	0.505		mg/L		101	80 - 120

Lab Sample ID: LB 160-363142/1-B
Matrix: Solid
Analysis Batch: 363737

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 363477

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.025	0.010	mg/L		05/01/18 14:58	05/02/18 17:22	1
Barium	ND		1.0	0.038	mg/L		05/01/18 14:58	05/02/18 17:22	1
Cadmium	ND		0.013	0.0038	mg/L		05/01/18 14:58	05/02/18 17:22	1
Chromium	ND		0.025	0.0075	mg/L		05/01/18 14:58	05/02/18 17:22	1
Lead	ND		0.025	0.0075	mg/L		05/01/18 14:58	05/02/18 17:22	1
Selenium	ND		0.038	0.020	mg/L		05/01/18 14:58	05/02/18 17:22	1
Silver	ND		0.025	0.0075	mg/L		05/01/18 14:58	05/02/18 17:22	1

Lab Sample ID: 160-28002-2 MS
Matrix: Solid
Analysis Batch: 363737

Client Sample ID: NRLCBD-2
Prep Type: TCLP
Prep Batch: 363477

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Arsenic	ND		2.50	2.72		mg/L		109	75 - 125
Barium	0.70	J	2.50	3.18		mg/L		99	75 - 125
Cadmium	0.50		2.50	3.13		mg/L		105	75 - 125
Chromium	0.044		2.50	2.61		mg/L		103	75 - 125
Lead	11		2.50	14.4	4	mg/L		127	75 - 125
Selenium	ND		1.25	1.38		mg/L		111	75 - 125
Silver	ND		0.500	0.510		mg/L		102	75 - 125

Lab Sample ID: 160-28002-2 MSD
Matrix: Solid
Analysis Batch: 363737

Client Sample ID: NRLCBD-2
Prep Type: TCLP
Prep Batch: 363477

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Arsenic	ND		2.50	2.72		mg/L		109	75 - 125	0	20
Barium	0.70	J	2.50	3.25		mg/L		102	75 - 125	2	20
Cadmium	0.50		2.50	3.13		mg/L		105	75 - 125	0	20
Chromium	0.044		2.50	2.63		mg/L		103	75 - 125	1	20
Lead	11		2.50	14.2	4	mg/L		116	75 - 125	2	20
Selenium	ND		1.25	1.38		mg/L		111	75 - 125	0	20
Silver	ND		0.500	0.516		mg/L		103	75 - 125	1	20

TestAmerica St. Louis

QC Sample Results

Client: Aleut World Solutions
 Project/Site: Naval Research Lab, Chesapeake Bay, MD

TestAmerica Job ID: 160-28002-1

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LCS 160-364019/2-A
Matrix: Solid
Analysis Batch: 364172

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 364019

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	0.0250	0.0264		mg/L		106	80 - 120

Lab Sample ID: LB 160-363142/1-D
Matrix: Solid
Analysis Batch: 364172

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 364019

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.0010	0.00030	mg/L		05/04/18 08:49	05/04/18 15:12	1

Lab Sample ID: 160-28002-2 MS
Matrix: Solid
Analysis Batch: 364172

Client Sample ID: NRLCBD-2
Prep Type: TCLP
Prep Batch: 364019

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Mercury	0.0039		0.0250	0.0311		mg/L		109	70 - 130

Lab Sample ID: 160-28002-2 MSD
Matrix: Solid
Analysis Batch: 364172

Client Sample ID: NRLCBD-2
Prep Type: TCLP
Prep Batch: 364019

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	0.0039		0.0250	0.0307		mg/L		107	70 - 130	1	20

Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Lab Sample ID: MB 160-363695/1-A
Matrix: Solid
Analysis Batch: 364252

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 363695

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Uranium-233/234	0.01964	U	0.0329	0.0329	1.00	0.0590	pCi/g	05/02/18 16:38	05/05/18 17:22	1
Uranium-235/236	0.007333	U	0.0202	0.0202	1.00	0.0473	pCi/g	05/02/18 16:38	05/05/18 17:22	1
Uranium-238	0.005881	U	0.0296	0.0296	1.00	0.0668	pCi/g	05/02/18 16:38	05/05/18 17:22	1
Tracer	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Uranium-232	99.1		30 - 110					05/02/18 16:38	05/05/18 17:22	1

Lab Sample ID: LCS 160-363695/2-A
Matrix: Solid
Analysis Batch: 364253

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 363695

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	Limits
Uranium-233/234	6.37	6.739		0.764	1.00	0.0694	pCi/g	106	84 - 120
Uranium-238	6.51	6.967		0.784	1.00	0.0545	pCi/g	107	82 - 122

TestAmerica St. Louis

QC Sample Results

Client: Aleut World Solutions
 Project/Site: Naval Research Lab, Chesapeake Bay, MD

TestAmerica Job ID: 160-28002-1

Method: A-01-R - Isotopic Uranium (Alpha Spectrometry) (Continued)

Lab Sample ID: LCS 160-363695/2-A
Matrix: Solid
Analysis Batch: 364253

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 363695

<i>Tracer</i>	<i>LCS %Yield</i>	<i>LCS Qualifier</i>	<i>Limits</i>
Uranium-232	85.9		30 - 110

Lab Sample ID: 160-28002-1 DU
Matrix: Solid
Analysis Batch: 364255

Client Sample ID: NRLCBD-1
Prep Type: Total/NA
Prep Batch: 363695

<i>Analyte</i>	<i>Sample Result</i>	<i>Sample Qual</i>	<i>DU Result</i>	<i>DU Qual</i>	<i>Total Uncert. (2σ+/-)</i>	<i>RL</i>	<i>MDC</i>	<i>Unit</i>	<i>RER</i>	<i>RER Limit</i>
Uranium-233/234	3.38		2.565		0.435	1.00	0.149	pCi/g	0.85	1
Uranium-235/236	0.305		0.2935		0.154	1.00	0.148	pCi/g	0.04	1
Uranium-238	19.4		17.07		1.73	1.00	0.130	pCi/g	0.63	1

<i>Tracer</i>	<i>DU %Yield</i>	<i>DU Qualifier</i>	<i>Limits</i>
Uranium-232	63.1		30 - 110

QC Association Summary

Client: Aleut World Solutions
 Project/Site: Naval Research Lab, Chesapeake Bay, MD

TestAmerica Job ID: 160-28002-1

Metals

Leach Batch: 363142

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-28002-2	NRLCBD-2	TCLP	Solid	1311	
LB 160-363142/1-B	Method Blank	TCLP	Solid	1311	
LB 160-363142/1-D	Method Blank	TCLP	Solid	1311	
160-28002-2 MS	NRLCBD-2	TCLP	Solid	1311	
160-28002-2 MSD	NRLCBD-2	TCLP	Solid	1311	

Prep Batch: 363477

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-28002-2	NRLCBD-2	TCLP	Solid	3010A	363142
LB 160-363142/1-B	Method Blank	TCLP	Solid	3010A	363142
LCS 160-363477/2-A	Lab Control Sample	Total/NA	Solid	3010A	
160-28002-2 MS	NRLCBD-2	TCLP	Solid	3010A	363142
160-28002-2 MSD	NRLCBD-2	TCLP	Solid	3010A	363142

Analysis Batch: 363737

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-28002-2	NRLCBD-2	TCLP	Solid	6010C	363477
LB 160-363142/1-B	Method Blank	TCLP	Solid	6010C	363477
LCS 160-363477/2-A	Lab Control Sample	Total/NA	Solid	6010C	363477
160-28002-2 MS	NRLCBD-2	TCLP	Solid	6010C	363477
160-28002-2 MSD	NRLCBD-2	TCLP	Solid	6010C	363477

Prep Batch: 364019

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-28002-2	NRLCBD-2	TCLP	Solid	7470A	363142
LB 160-363142/1-D	Method Blank	TCLP	Solid	7470A	363142
LCS 160-364019/2-A	Lab Control Sample	Total/NA	Solid	7470A	
160-28002-2 MS	NRLCBD-2	TCLP	Solid	7470A	363142
160-28002-2 MSD	NRLCBD-2	TCLP	Solid	7470A	363142

Analysis Batch: 364172

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-28002-2	NRLCBD-2	TCLP	Solid	7470A	364019
LB 160-363142/1-D	Method Blank	TCLP	Solid	7470A	364019
LCS 160-364019/2-A	Lab Control Sample	Total/NA	Solid	7470A	364019
160-28002-2 MS	NRLCBD-2	TCLP	Solid	7470A	364019
160-28002-2 MSD	NRLCBD-2	TCLP	Solid	7470A	364019

Rad

Leach Batch: 362818

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-28002-1	NRLCBD-1	Total/NA	Solid	Dry and Grind	
160-28002-1 DU	NRLCBD-1	Total/NA	Solid	Dry and Grind	

Prep Batch: 363695

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-28002-1	NRLCBD-1	Total/NA	Solid	ExtChrom	362818
MB 160-363695/1-A	Method Blank	Total/NA	Solid	ExtChrom	
LCS 160-363695/2-A	Lab Control Sample	Total/NA	Solid	ExtChrom	

TestAmerica St. Louis

QC Association Summary

Client: Aleut World Solutions
Project/Site: Naval Research Lab, Chesapeake Bay, MD

TestAmerica Job ID: 160-28002-1

Rad (Continued)

Prep Batch: 363695 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-28002-1 DU	NRLCBD-1	Total/NA	Solid	ExtChrom	362818

1

2

3

4

5

6

7

8

9

10

11

12

Tracer/Carrier Summary

Client: Aleut World Solutions
Project/Site: Naval Research Lab, Chesapeake Bay, MD

TestAmerica Job ID: 160-28002-1

Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Matrix: Solid

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Uranium-232 (30-110)
160-28002-1	NRLCBD-1	56.6
160-28002-1 DU	NRLCBD-1	63.1
LCS 160-363695/2-A	Lab Control Sample	85.9
MB 160-363695/1-A	Method Blank	99.1

Tracer/Carrier Legend

Uranium-232 = Uranium-232

1

2

3

4

5

6

7

8

9

10

11

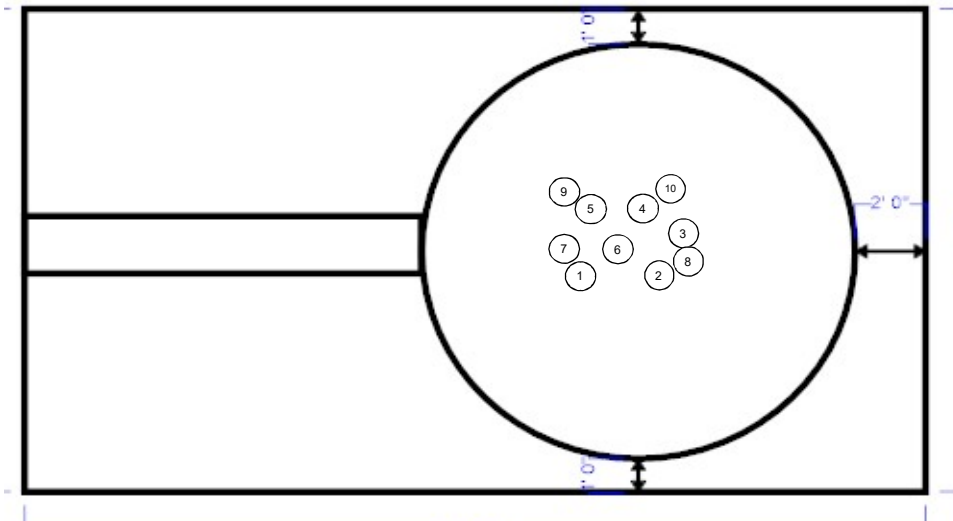
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Appendix M
Miscellaneous Survey Reports

RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/17/2018	TIME: 12:45	INSTRUMENTATION USED										
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)			
SURVEY NUMBER: N/A												
LOCATION: NRL Chesapeake Bldg. 218		2929	146780	6/17/2018	α	71.0%	α	17.8%	α	25.3	α	1.1
					βγ	53.0%	βγ	26.5%	βγ	89.5	βγ	144.9
SURVEYOR: Adolfo Matus Jr.												
DATE: 4/17/2018	TIME: 13:25	Reviewed by: Daniel Spicuzza										
Isotopes of Concern: DU		Static Count Time: N/A Minutes										

Swipe Survey of Sphere Interior



Comments:

Swipe Survey Of Target Sphere Interior

- ⊙ denotes swipe location and fixed α/β readings
 - # denotes G/A radiation readings
 - #/# denotes contact / 1 meter radiation readings.
 - * denotes highest radiation reading on contact
 - LAW denotes large area masslinn wipe
 - Δ denotes static location.
 - + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

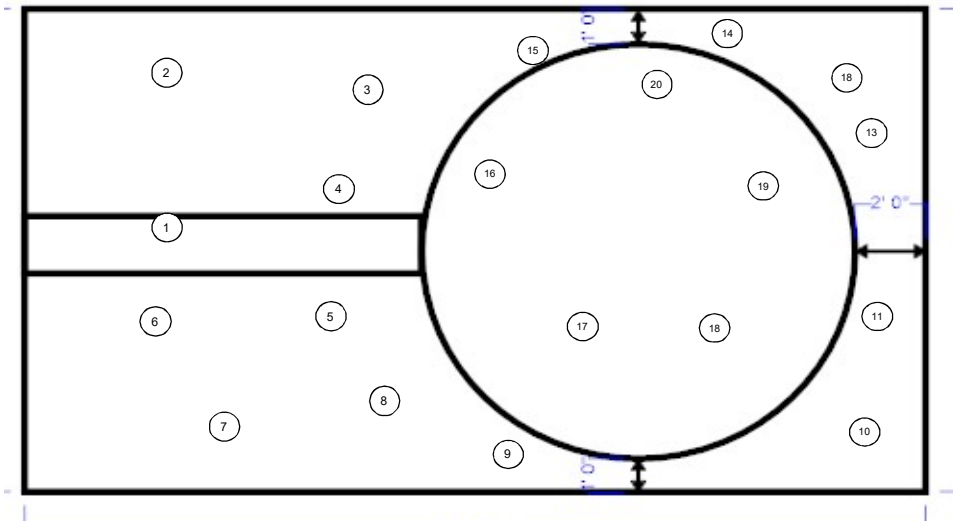
SURVEY NUMBER: N/A								
SURVEYOR: Adolfo Matus Jr.				LOCATION: NRL Chesapeake Bldg. 218				
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1						-1.1	43.8	See Map For Smear Location
2						-1.1	28.7	See Map For Smear Location
3						-1.1	62.6	See Map For Smear Location
4						-1.1	32.5	See Map For Smear Location
5						-1.1	24.9	See Map For Smear Location
6						-1.1	13.6	See Map For Smear Location
7						-1.1	6.0	See Map For Smear Location
8						10.1	13.6	See Map For Smear Location
9						-1.1	2.3	See Map For Smear Location
10						4.5	36.2	See Map For Smear Location
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
Reviewer Daniel Spicuzza		Date: 4/17/2018						
		Time: 13:25						

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RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/18/2018	TIME: 12:10	INSTRUMENTATION USED							
SURVEY NUMBER: N/A		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
LOCATION: NRL Chesapeake Bldg. 218		2929	146780	6/17/2018	α	71.0%	α 17.8%	α 25.3	α 1.1
SURVEYOR: Adolfo Matus Jr.									
DATE: 4/18/2018	TIME: 12:45	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: N/A Minutes							

Swipe Survey of Beam Areas



Comments:

Weekly Routine Survey

- ⊙ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

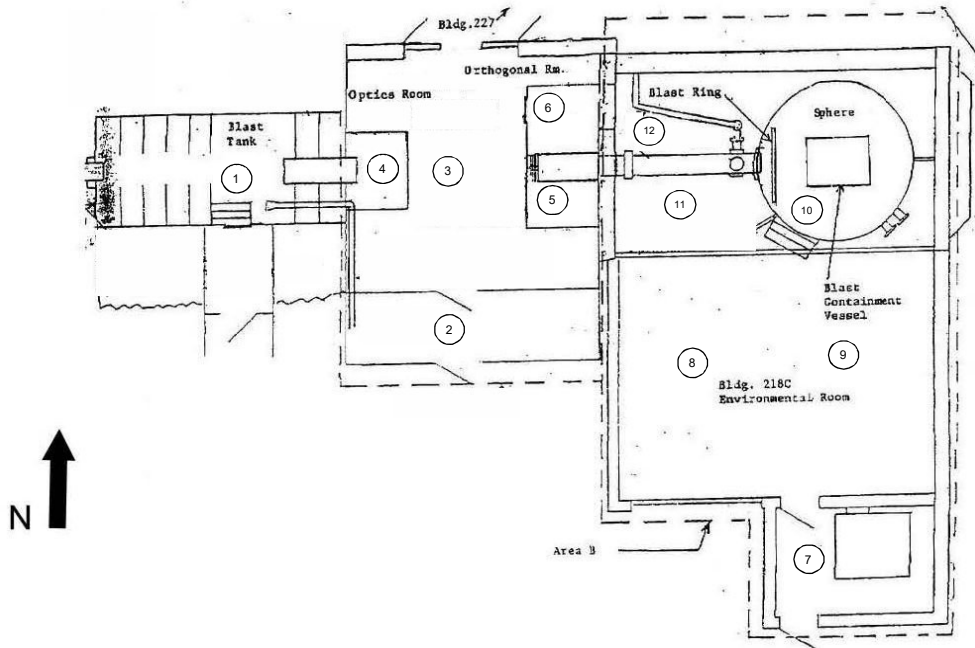
SURVEY NUMBER: N/A								
SURVEYOR: Adolfo Matus Jr.				LOCATION: NRL Chesapeake Bldg. 218				
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1						4.5	27.7	See Map For Smear Location
2						-1.1	17.6	See Map For Smear Location
3						-1.1	52.8	See Map For Smear Location
4						4.5	32.7	See Map For Smear Location
5						4.5	-2.5	See Map For Smear Location
6						4.5	-17.6	See Map For Smear Location
7						10.1	12.6	See Map For Smear Location
8						4.5	7.5	See Map For Smear Location
9						-1.1	2.5	See Map For Smear Location
10						4.5	-7.5	See Map For Smear Location
11						-1.1	7.5	See Map For Smear Location
12						4.5	12.6	See Map For Smear Location
13						-1.1	17.6	See Map For Smear Location
14						-1.1	7.5	See Map For Smear Location
15						4.5	2.5	See Map For Smear Location
16						4.5	12.6	See Map For Smear Location
17						-1.1	42.8	See Map For Smear Location
18						-1.1	32.7	See Map For Smear Location
19						-1.1	27.7	See Map For Smear Location
20						4.5	12.6	See Map For Smear Location
3D						-1.1	47.8	Duplicate Swipe
12D						4.5	7.5	Duplicate Swipe
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
Reviewer Daniel Spicuzza		Date: 4/18/2018						
		Time: 12:45						

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RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/6/2018	TIME: 11:45	INSTRUMENTATION USED										
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)			
SURVEY NUMBER: N/A												
LOCATION: NRL Chesapeake Bldg. 218		2929	146780	6/17/2018	α	71.0%	α	17.8%	α	22.9	α	0.6
					βγ	53.0%	βγ	26.5%	βγ	89.0	βγ	143.0
SURVEYOR: Thomas Hogan/Richard Thatcher												
DATE: 4/6/2018	TIME: 12:20	Reviewed by: Daniel Spicuzza										
Isotopes of Concern: DU				Static Count Time: N/A Minutes								

Swipe Survey of Floors



Comments:

Swipe Survey of Floors

- ⊙ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

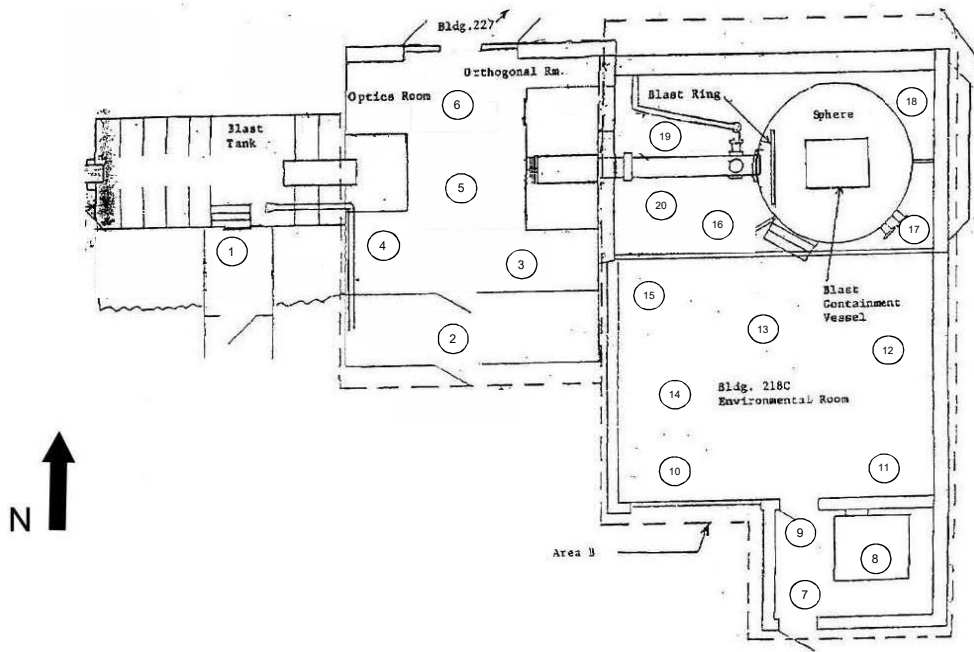
SURVEY NUMBER: N/A								
SURVEYOR: Thomas Hogan/Richard Thatcher				LOCATION: NRL Chesapeake Bldg. 218				
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1						-0.6	4.2	See Map For Smear Location
2						-0.6	11.7	See Map For Smear Location
3						-0.6	-3.4	See Map For Smear Location
4						5.1	-10.9	See Map For Smear Location
5						-0.6	23.0	See Map For Smear Location
6						-0.6	4.2	See Map For Smear Location
7						5.1	7.9	See Map For Smear Location
8						-0.6	11.7	See Map For Smear Location
9						5.1	-10.9	See Map For Smear Location
10						10.7	0.4	See Map For Smear Location
11						-0.6	19.2	See Map For Smear Location
12						-0.6	4.2	See Map For Smear Location
3D						-0.6	-10.9	Duplicate Swipe
8D						-0.6	7.9	Duplicate Swipe
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
N/A								
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N/A								
N/A								
N/A								
N/A								
Reviewer Daniel Spicuzza	Date: 4/6/2018							
	Time: 12:20							

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RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/13/2018	TIME: 13:45	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2929	146780	6/17/2018	α	71.0%	α 17.8%	α 25.3	α 1.1
LOCATION: NRL Chesapeake Bldg. 218					$\beta\gamma$	53.0%	$\beta\gamma$ 19.9%	$\beta\gamma$ 119.5	$\beta\gamma$ 193.7
SURVEYOR: Adolfo Matus Jr.									
DATE: 4/13/2018	TIME: 14:00	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: N/A Minutes							

Swipe Survey of Floor Areas



Comments:

Weekly Routine Survey

- ⊙ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly) Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

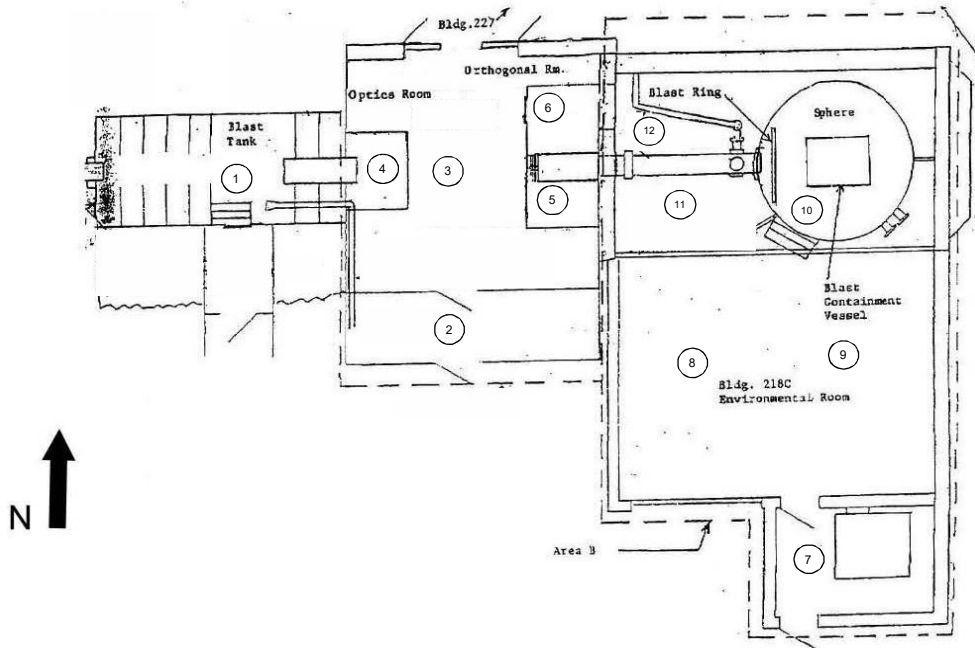
SURVEY NUMBER: N/A								
SURVEYOR: Adolfo Matus Jr.				LOCATION: NRL Chesapeake Bldg. 218				
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1						4.5	32.7	See Map For Smear Location
2						-1.1	52.8	See Map For Smear Location
3						4.5	-2.5	See Map For Smear Location
4						4.5	32.7	See Map For Smear Location
5						10.1	7.5	See Map For Smear Location
6						4.5	27.7	See Map For Smear Location
7						10.1	2.5	See Map For Smear Location
8						-1.1	32.7	See Map For Smear Location
9						-1.1	57.9	See Map For Smear Location
10						4.5	67.9	See Map For Smear Location
11						10.1	42.8	See Map For Smear Location
12						4.5	-17.6	See Map For Smear Location
13						-1.1	2.5	See Map For Smear Location
14						-1.1	22.6	See Map For Smear Location
15						4.5	12.6	See Map For Smear Location
16						10.1	7.5	See Map For Smear Location
17						-1.1	-7.5	See Map For Smear Location
18						-1.1	-17.6	See Map For Smear Location
19						4.5	32.7	See Map For Smear Location
20						4.5	62.9	See Map For Smear Location
4D						4.5	27.7	Duplicate Swipe
15D						4.5	7.5	Duplicate Swipe
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Reviewer Daniel Spicuzza		Date: 4/13/2018						
		Time: 14:00						

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RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/20/2018	TIME: 08:40	INSTRUMENTATION USED										
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA ⁺ (dpm/100cm ²)	Background ⁺ (dpm/100cm ²)			
SURVEY NUMBER: N/A												
LOCATION: NRL Chesapeake Bldg. 218		2929	146780	6/17/2018	α	71.0%	α	17.8%	α	25.3	α	1.1
					βγ	53.0%	βγ	19.9%	βγ	119.5	βγ	193.7
SURVEYOR: Adolfo Matus Jr.												
DATE: 4/20/2018	TIME: 09:02	Reviewed by: Daniel Spicuzza										
Isotopes of Concern: DU		Static Count Time: N/A Minutes										

Swipe Survey of Floor Areas



Comments:

Weekly Routine Survey

- ⊙ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

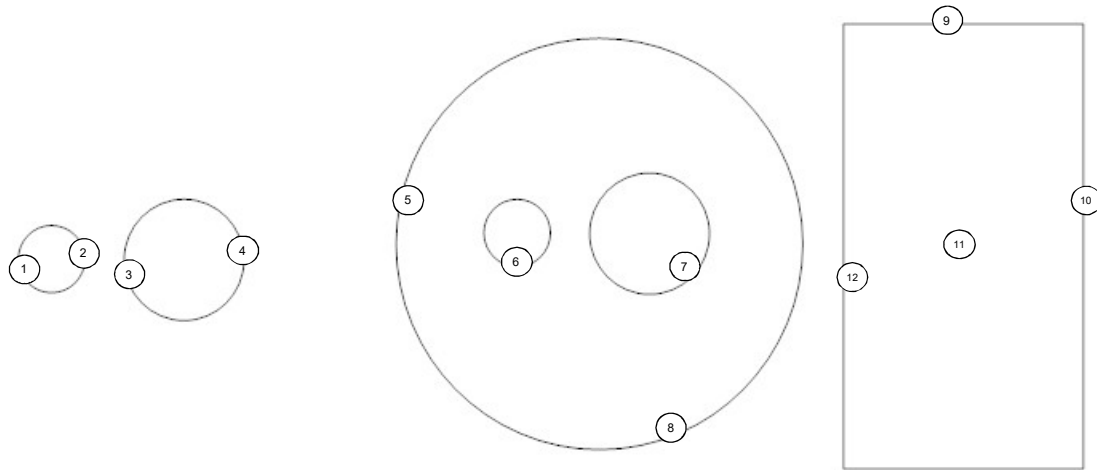
SURVEY NUMBER: N/A								
SURVEYOR: Adolfo Matus Jr.				LOCATION: NRL Chesapeake Bldg. 218				
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1						4.5	22.6	See Map For Smear Location
2						-1.1	27.7	See Map For Smear Location
3						4.5	2.5	See Map For Smear Location
4						-1.1	32.7	See Map For Smear Location
5						-1.1	62.9	See Map For Smear Location
6						4.5	47.8	See Map For Smear Location
7						4.5	22.6	See Map For Smear Location
8						-1.1	27.7	See Map For Smear Location
9						-1.1	17.6	See Map For Smear Location
10						4.5	2.5	See Map For Smear Location
11						4.5	-42.8	See Map For Smear Location
12						4.5	-2.5	See Map For Smear Location
N/A								
N/A								
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Reviewer: Daniel Spicuzza		Date: 4/20/2018						
		Time: 9:02						

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RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/26/2018	TIME: 10:43	INSTRUMENTATION USED							
		Model Inst./Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
		2360	184949	3/6/2019	α	42.3%	α 10.6%	α 62.4	α 7.6
SURVEY NUMBER: N/A		43-93	268605		βγ	26.8%	βγ 10.1%	βγ 497.4	βγ 1353.2
LOCATION: NRL Chesapeake Bldg. 218		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 27.8	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 119.5	βγ 193.7
SURVEYOR: Richard Thatcher									
DATE: 4/26/2018	TIME: 11:13	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 1 Minutes							

Survey of Roof Vents



Comments:

Survey Of Roof Vents

- Ⓝ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

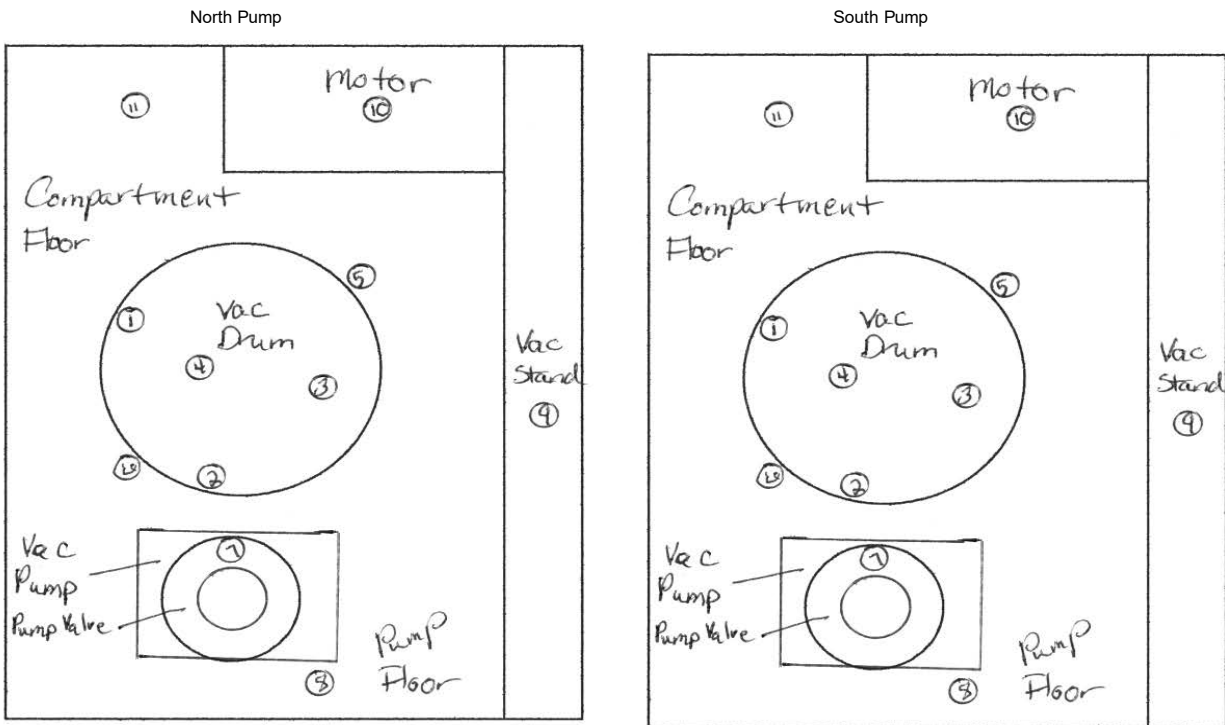
SURVEY NUMBER: N/A								
SURVEYOR: Richard Thatcher				LOCATION: NRL Chesapeake Bldg. 218				
Location	Exposure Rate ($\mu\text{R/hr}$)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1				1.9	69.7	5.0	-12.6	See Map for Smear Location
2				11.3	10.0	5.0	2.5	See Map for Smear Location
3				1.9	-19.9	5.0	12.6	See Map for Smear Location
4				11.3	69.7	-1.2	27.7	See Map for Smear Location
5				20.8	29.9	-1.2	17.6	See Map for Smear Location
6				1.9	19.9	5.0	7.5	See Map for Smear Location
7				11.3	129.4	5.0	-12.6	See Map for Smear Location
8				20.8	149.3	-1.2	-22.6	See Map for Smear Location
9				607.1	2298.5	11.1	-2.5	See Map for Smear Location
10				1.9	99.5	-1.2	-12.6	See Map for Smear Location
11				11.3	29.9	-1.2	2.5	See Map for Smear Location
12				-7.6	129.4	5.0	12.6	See Map for Smear Location
N/A								
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Reviewer Daniel Spicuzza	Date: 4/26/2018							
	Time: 11:13							

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RADIATION/CONTAMINATION SURVEY FORM

DATE: 4/23/2018	TIME: 12:05	INSTRUMENTATION USED							
		Model Inst/Det.	Serial Number	Calibration Due Date	Instrument Efficiency	%	Total % Efficiency	MDC/MDA⁺ (dpm/100cm²)	Background⁺ (dpm/100cm²)
SURVEY NUMBER: N/A		2360	184949	3/6/2019	α	42.3%	α 10.6%	α 42.0	α 7.6
LOCATION: NRL Chesapeake Bldg. 218		43-93	268605		βγ	26.8%	βγ 10.1%	βγ 396.7	βγ 1353.2
		2929	146780	6/17/2018	α	64.6%	α 16.2%	α 27.8	α 1.2
					βγ	53.0%	βγ 19.9%	βγ 119.5	βγ 193.7
SURVEYOR: Joan Cosgrove									
DATE: 4/23/2018	TIME: 12:42	Reviewed by: Daniel Spicuzza							
Isotopes of Concern: DU		Static Count Time: 2 Minutes							

Survey of Vacuum Pumps in Room 105



Comments:

Survey of Vacuum Pumps

- Ⓝ denotes swipe location and fixed α/β readings
- # denotes G/A radiation readings
- #/# denotes contact / 1 meter radiation readings.
- * denotes highest radiation reading on contact
- LAW denotes large area masslinn wipe
- Δ denotes static location.
- + Unless Otherwise Noted
- All readings in mri/hr unless otherwise noted
- K = 1000

Routine (Daily / Weekly / Monthly)

Non-routine

RADIATION/CONTAMINATION SURVEY SUPPLEMENT

SURVEY NUMBER: N/A								
SURVEYOR: Joan Cosgrove				LOCATION: NRL Chesapeake Bldg. 218				
Location	Exposure Rate (µR/hr)		Fixed + Removable (NET)			Removable (NET)		Comments
	Contact	1 Meter	Gamma (cpm)	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	Alpha dpm/100cm ²	Beta/Gamma dpm/100cm ²	
1				1.9	-54.7	5.0	7.5	North Pump See Map for Smear Location
2				1.9	-59.7	-1.2	2.5	North Pump See Map for Smear Location
3				1.9	14.9	5.0	12.6	North Pump See Map for Smear Location
4				-7.6	34.8	5.0	7.5	North Pump See Map for Smear Location
5				-2.8	-139.3	11.1	2.5	North Pump See Map for Smear Location
6				6.6	-69.7	-1.2	-2.5	North Pump See Map for Smear Location
7				6.6	-44.8	5.0	-7.5	North Pump See Map for Smear Location
8				1.9	-89.6	5.0	7.5	North Pump See Map for Smear Location
9				-7.6	-44.8	11.1	2.5	North Pump See Map for Smear Location
10				-2.8	24.9	5.0	-2.5	North Pump See Map for Smear Location
11				1.9	-79.6	5.0	-7.5	North Pump See Map for Smear Location
12				-7.6	-104.5	5.0	-12.6	North Pump See Map for Smear Location
1				-7.6	-79.6	5.0	22.6	South Pump See Map for Smear Location
2				6.6	79.6	5.0	2.5	South Pump See Map for Smear Location
3				6.6	124.4	-1.2	-7.5	South Pump See Map for Smear Location
4				1.9	49.8	-1.2	-2.5	South Pump See Map for Smear Location
5				16.1	-19.9	5.0	17.6	South Pump See Map for Smear Location
6				1.9	44.8	-1.2	12.6	South Pump See Map for Smear Location
7				11.3	149.3	-1.2	-7.5	South Pump See Map for Smear Location
8				-2.8	94.5	-1.2	7.5	South Pump See Map for Smear Location
9				-7.6	-54.7	-1.2	2.5	South Pump See Map for Smear Location
10				20.8	29.9	5.0	-7.5	South Pump See Map for Smear Location
11				11.3	34.8	-1.2	-2.5	South Pump See Map for Smear Location
12				-2.8	-109.5	5.0	7.5	South Pump See Map for Smear Location
N/A								
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Reviewer Daniel Spicuzza	Date: 4/23/2018							
	Time: 12:42							

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