From: Zoon, Robert (NIH/OD/ORS) [E] [zoonr@ors.od.nih.gov]
Sent: Monday, November 17, 2008 8:32 AM
To: Penny Lanzisera
Subject: Survey Plan for Flow Building
Attachments: Danac 4 Sampling Plan Final.pdf
Signed By: zoonr@ors.od.nih.gov

19-00296-10
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142887

Penny,

Clym will do a MARSSIM FSS on Flow. Attached is the plan.

Bob

E-mail Properties

Mail Envelope Properties (ADC8AFB00CB69B4DBDE5DC3CE71350F708AD7849)

Subject: Survey Plan for Flow Building
Sent Date: 11/17/2008 8:32:06 AM
Received Date: 11/17/2008 8:32:06 AM
From: Zoon, Robert (NIH/OD/ORS) [E]

Created By: zoonr@ors.od.nih.gov

Recipients:
Penny.Lanzisera@nrc.gov (Penny Lanzisera)
Tracking Status: None

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MESSAGE	263500	11/17/2008
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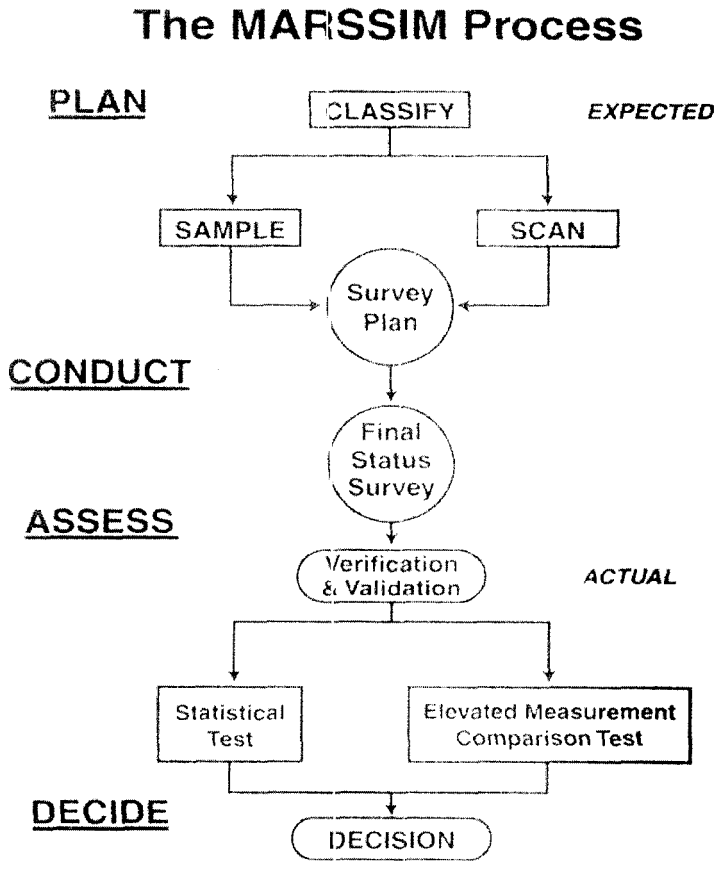
1.0 INTRODUCTION

The National Institutes of Health (NIH) is vacating the facility located at 12501 Washington Avenue, Rockville, MD (known as the Flow Building or Danac 4. NIH is implementing the Multi-Agency Radiation Site Survey Investigation Manual (MARSSIM) as the guidance document for decommissioning the building for release from radiological controls. The MARSSIM framework is used to determine if the mean of collected survey data meets Derived Concentration Guideline Levels (DCGLs) and therefore is focused on the Final Status Survey (FSS). The guidance provided in the MARSSIM on the historical site assessment, the scoping surveys, the characterization surveys, and the remedial action support surveys is intended to address the need for appropriate data in designing the Final Status Survey.

A sampling and survey plan is intended to define the scope of facility surveys that will further qualify individual areas for final status. The general MARSSIM process is shown in Figure 1.0. Surveys in this process are focused on surface contaminants and are comprised of two data collection mechanisms: scanning (e.g. direct measurement) and samples (e.g. wipes or *in situ* measurements). Scoping surveys and Characterization surveys are used to support area classifications, to document areas of contamination and to qualify the radionuclides present at the site.

Scoping surveys typically consist of limited surface activity measurements and sample collection. The intent of scoping surveys is to better define areas within a facility that are potentially contaminated, and therefore to support an initial classification of each area where contamination has not been previously defined. The results of these surveys aid in determining the area Characterization surveys that follow. Characterization surveys, on the other hand, consist of thorough surface scans and systematic sampling of all potentially contaminated areas. So if the historical assessment or scoping survey defines areas as contaminated or potentially contaminated, the Characterization survey would serve to qualify and quantify those contaminants. Based on the history of radioactive material use at Danac 4 and the survey data that is available, scoping and characterization surveys can be performed concurrently. This design will allow for the efficient collection of data and maximize outsourced labor.

Figure 1.0 MARSSIM Process Overview



MARSSIM is intended to support the cleanup regulations that apply to the release of sites or real property. MARSSIM does not address volumetric (mass) contamination. This type of contamination is associated with porous materials into which contaminants may have absorbed or penetrated over time. Examples of such material at Danac 4 include ceiling tiles, benchtops (soapstone), flooring tiles and unsealed concrete or grout. MARSSIM also allows for "judgmental" measurements such as those intended to locate contamination in pipes, drains, ducts, fixtures and inaccessible areas, but does not provide much guidance on the design of surveys for these measurements.

The MARSSIM framework does allow for survey data collected in a previous phase to carry forward to future phases. In short, this means that thoughtful scoping or characterization survey designs may be fashioned to meet the requirements of Final Status, thereby reducing the overall level of surveying in areas of lesser concern and increasing project efficiency.

2.0 INITIAL AREA CLASSIFICATIONS

Based on the findings of the Historical Site Assessment (HSA), NIH has initially classified all areas within Danac 4 for survey. These classifications are subject to revision pending the findings of subsequent surveys. The initial classifications are as follows:

Non-Impacted: These areas are not believed to have a reasonable opportunity for contamination due to their function, location or recent remedial efforts and survey data. No scoping or characterization surveys are required in these areas. These areas include the Parking Lots, Sidewalks and Grounds, and Rooftop.

Impacted: All interior areas of the building are believed to have a reasonable opportunity for some level of contamination based on their function, use history, or location.

An overview of the MARSSIM radiation survey and site investigation process in terms of area classification is included as Figure 2.0. This flow chart details the decision logic employed in moving through a series of pre-release surveys to final status. Immediately following the historical assessment and initial area classifications, scoping and characterization surveys are employed.

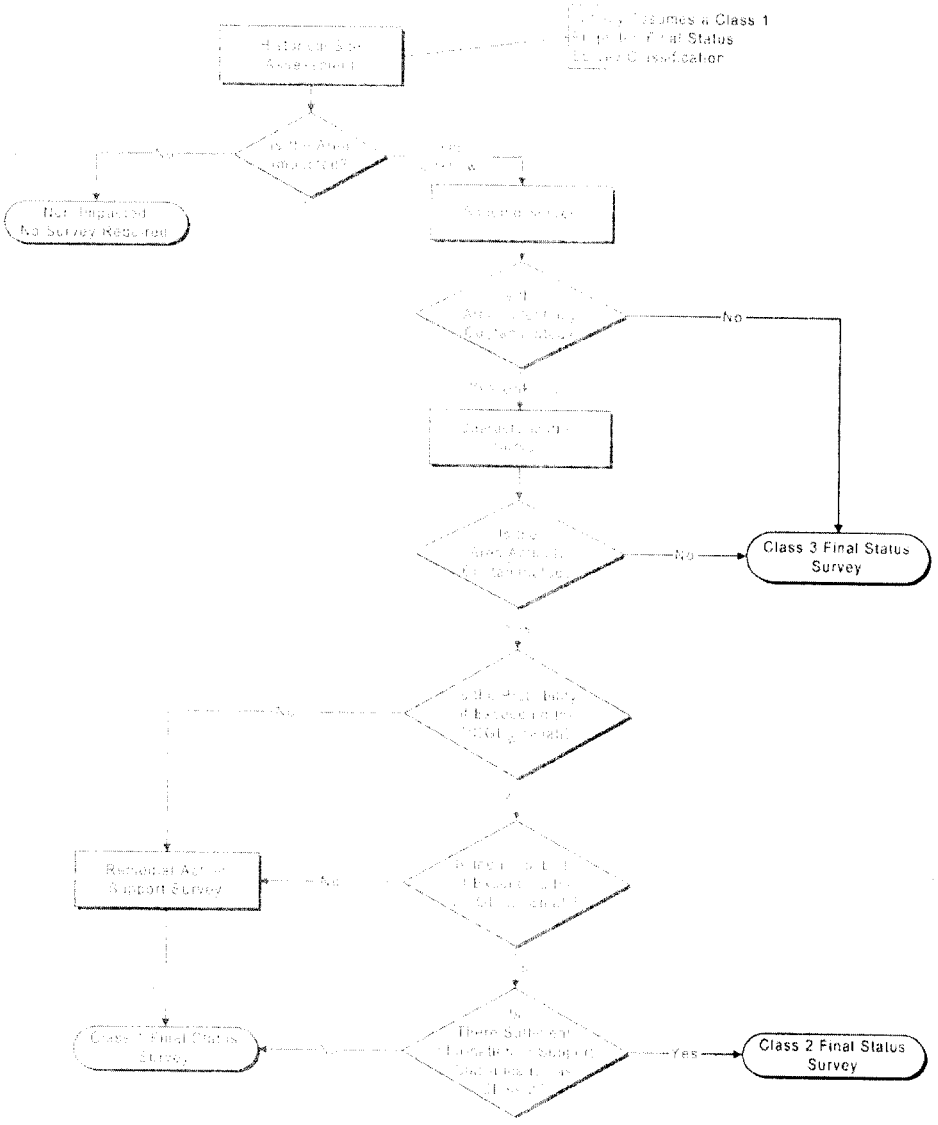


Figure 2.0 **The Radiation Survey and Site Investigation Process in Terms of Area Classification**

3.0 SURVEY APPROACH

Inputs into the Final Status Survey design are from two sources: pre-release surveys and dose modeling. The pre-release surveys, including the historical site assessment, scoping survey, the characterization survey and the remedial action support survey, provide information into planning the FSS. The dose modeling provides DCGLs for both the statistical test used in qualifying the uniformly distributed residual radioactivity and for the elevated measurement comparison of localized residual radioactivity.

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

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

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

3.1 SCOPING AND CHARACTERIZATION SURVEYS

A scoping survey is performed to substantiate and better define potential radioactive contaminants including the general extent of any residual activity. These surveys usually consist of surface scans and direct radiation level measurements at representative points. Samples of residues from surfaces, cracks, pipes, ducts and other areas of potential contamination should be analyzed to determine radionuclide specific activity. Should residual activity be detected, Clym proposed to proceed directly with characterization surveys as to expedite the transition to final status. With this approach, the end of this phase of operations will result in the designation of areas requiring remedial efforts.

Within any survey design, the unit to be surveyed must be defined by type and risk level. Clym has identified two subgroups of these units: building structures and building systems. Building structures consist of ceilings, upper walls, shelves, lower walls, casework and sinks, and floors. Building systems consist of

sink traps and drain lines, and chemical fume hoods, ducting and exhaust blower motors, filters and fans. All building systems and shelves, lower walls, casework and sinks and floors are considered "high risk" units.

The percentage of any unit to be surveyed is based on the potential or known levels of residual contamination. The amount of coverage designated for each area classification has been provided in Table 1.0.

Table 1.0 Percentage of Surface Area Surveyed by Unit

Area Classification	*Building Structures*					*Building Systems*	
	Ceiling	Upper Walls	Lower Walls & Shelves*	Casework & Sinks*	Floors	Traps & Drain Lines*	Hoods & Ducts*
Impacted, Scoping	10%	10%	50%	50%	50%	100% traps 25% lines	100% hoods 25% ducts

*** The parking area and land area to the property line, to include the planted areas and sidewalks, have been classified as non-impacted and are considered released. These areas will not be surveyed.**

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

3.2 INSTRUMENTATION

Radiation detection instrumentation has been selected based on the radionuclides identified in the HSA and to afford the most efficient and thorough data collection by the survey team. Portable instruments will include portable scaler/rate meters equipped with large area gas proportional detectors. Liquid scintillation and gamma counters will be used to analyze all samples in accordance with Clym's radioactive materials license (MD-21-035-01, expiring 11/30/2012).

4.0 REFERENCES

(1) "MARSSIM FRAMEWORK", KEN DUVALL, US DOE/OEPA LETTER OF UNDERSTANDING, (JULY 1999).

(2) MULTI-AGENCY RADIATION SURVEY AND SITE INVESTIGATION MANUAL (MARSSIM), NUREG-1575/EPA 402-4-97-016, (AUGUST 2000).

(3) "DRAFT HISTORICAL SITE ASSESSMENT REPORT", CLYM ENVIRONMENTAL SERVICES, LLC FOR THE NIH, (OCTOBER 2008).

(4) ENVIRONMENTAL PROTECTION AGENCY REPORT: GUIDANCE FOR THE DATA QUALITY OBJECTIVES PROCESS. EPA/600/R-96/055, EPAQA/G-4 (SEPTEMBER 1994).

(5) NMSS DECOMMISSIONING PROGRAM: STANDARD REVIEW PLAN 14.0 FACILITY RADIATION SURVEYS, US NUCLEAR REGULATORY COMMISSION, (SEPTEMBER 2000).

(6) MULTI-AGENCY RADIATION LABORATORY PROTOCOLS (MARLAP) MANUAL (FINAL).

5.0 ABBREVIATIONS

DCGL	Derived Concentration Guideline Level
FSS	Final Status Survey
HSA	Historical Site Assessment
MARSSIM	Multi-Agency Radiation Site Survey Investigation Manual
NIH	National Institutes of Health