

Rancho Seco  
Final Status Survey Summary Report  
May 9, 2008  
Lawn Maintenance Building  
Survey Unit F8540002

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## FINAL STATUS SURVEY SUMMARY REPORT

### Survey Unit:

F8540002, Lawn Maintenance Building

### Survey Unit Description:

Survey Area: South East Industrial Area

Operating History: The area was located on the south east side of the Industrial Area exclusive of the Administrative Building. Operating records and the HSA document no potential for a release of radioactivity associated with this survey area. The HSA documented no storage of radioactive material within the area that may have had the potential to contaminate the area.

Site Characterization: The paved portion was surveyed and found to have a mean value of 2,424 dpm/100 cm<sup>2</sup> and a maximum of 3,425 dpm/100 cm<sup>2</sup>. Based on the classification procedure (DSIP-0020) the area was determined to be a Class 3 area.

HSA Events: None

### Survey Unit Design Information:

The Survey Unit Design Parameters are presented in Table 1 below. The survey unit and measurement locations are depicted on the maps in Attachment 1. Direct measurement locations were randomly determined and 14 m<sup>2</sup> were scanned for approximately 11% coverage. Samples of removable contamination were collected at each direct measurement location. The instrumentation used for the survey along with the MDC values are listed in Tables 2-1 and 2-2 in Attachment 2.

Table 1. Survey Unit Design Parameters

Survey Design Parameter	Value	Comment
Survey Area:	F854	Lawn Maintenance Building
Survey Unit:	0002	Structure Surface
Class:	3	LTP Table 5-4
SU Area (m <sup>2</sup> ):	129.7	
Evaluator:	Gary Frank	
DCGL (dpm/100 cm <sup>2</sup> ):	43000	Gross Activity DCGL
Area Factor:	N/A	Class 3
Design DCGL <sub>emc</sub> (dpm/100 cm <sup>2</sup> ):	N/A	Class 3
LBGR (dpm/100 cm <sup>2</sup> ):	21500	Default = 50% DCGL
Design Sigma (dpm/100 cm <sup>2</sup> ):	495	
Type I Error:	0.05	
Type II Error:	0.05	
Predominant Nuclide:	Cs-137	
Sample Area (m <sup>2</sup> ):	N/A	Class 3
Scan Area (m <sup>2</sup> ):	14	
Scan Coverage (%):	11%	Class 3
Z <sub>1-α</sub> :	1.645	
Z <sub>1-β</sub> :	1.645	
Sign P:	0.99865	
Calculated Relative Shift:	43.4	
Relative Shift Used:	3	Uses 3.0 if Relative Shift is >3
N-Value:	11	
Design N-Value + 20%:	14	NUREG-1575 Table 5-5
Design Min Samples N:	14	Class 3
Grid Spacing L:	N/A	Class 3

### Survey Results:

A total of 14 direct measurements were made in F8540002. The results including mean, median, standard deviation and range are shown in Table 2. All direct measurements were less than the DCGL. None of the scan measurements indicated areas of elevated activity. Scan activity ranged from 3448 to 5949 dpm/100 cm<sup>2</sup>, based on a surveyor efficiency of 0.5 and no background subtracted. Samples for removable surface activity were all less than 10% of the DCGL as shown in Table 3. Removable surface activity samples were counted for alpha activity and none was detected at the MDC shown in Table 2-1 of Attachment 2.

**Table 2. Direct Measurement Results**

Measurement ID	Gross Activity (dpm/100 cm <sup>2</sup> )
F8540002-C0001BD	1686
F8540002-C0002BD	1769
F8540002-C0003BD	1660
F8540002-C0004BD	1805
F8540002-C0005BD	1561
F8540002-C0006BD	1769
F8540002-C0007BD	1779
F8540002-C0008BD	1634
F8540002-C0009BD	1691
F8540002-C0010BD	1152
F8540002-C0011BD	2132
F8540002-C0012BD	1873
F8540002-C0013BD	1691
F8540002-C0014BD	1665
Mean:	1705
Median:	1691
Standard Deviation:	209
Range:	1152 - 2132

**Table 3. Removable Surface Activity Results**

Measurement ID	Surface Beta Activity (dpm/100 cm <sup>2</sup> )
F8540002C0001SM	-2.24
F8540002C0002SM	-4.82
F8540002C0003SM	-2.24
F8540002C0004SM	1.64
F8540002C0005SM	-3.53
F8540002C0006SM	-3.53
F8540002C0007SM	-2.24
F8540002C0008SM	-3.53
F8540002C0009SM	-3.53
F8540002C0010SM	-3.53
F8540002C0011SM	1.64
F8540002C0012SM	-4.82
F8540002C0013SM	-6.11
F8540002C0014SM	-0.95
Mean:	-2.7
Median:	-3.53
Standard Deviation:	2.24
Range:	-6.11 to 1.64

**Survey Unit Data Assessment:**

The survey design required 14 direct measurements for the Sign Test. The critical value and the results of the Sign Test are presented in Table 4. The sample mean and median values were less than the DCGL. The sample standard deviation was less than the design standard deviation so no additional samples were required.

**Table 4. Data Assessment Results**

<b>Survey Results Parameter</b>	<b>Value</b>	<b>Comment</b>	
<b>Material Background Used</b> (dpm/100 cm <sup>2</sup> ):	N/A	Average Ambient BKG = 0	
<b>Ambient Background Used</b> (dpm/100 cm <sup>2</sup> ):	N/A		
<b>Actual Direct Measurements (N):</b>	14		
<b>Median</b> (dpm/100 cm <sup>2</sup> ):	1691		
<b>Mean</b> (dpm/100 cm <sup>2</sup> ):	1705		
<b>Direct Measurement Standard Deviation</b> (dpm/100 cm <sup>2</sup> ):	209		
<b>Total Standard Deviation</b> (dpm/100 cm <sup>2</sup> ):	209		Based on samples and backgrounds.
<b>Maximum</b> (dpm/100 cm <sup>2</sup> ):	2132		Background Subtract Not Applied
<b>Material Type:</b>	N/A		
<b>Sign Test Final N Value:</b>	14		Class 3
<b>S+ Value:</b>	14		
<b>Critical Value:</b>	10		
<b>Sufficient Samples Collected:</b>	Yes		
<b>Maximum Value &lt; DCGL:</b>	Yes		
<b>Median Value &lt; DCGL:</b>	Yes		
<b>Mean Value &lt; DCGL:</b>	Yes		
<b>Maximum Value &lt; DCGL<sub>emc</sub>:</b>	N/A		
<b>Total Standard Deviation &lt;= Sigma:</b>	Yes		
<b>Pass the Sign Test?</b>	Yes		
<b>Reject the Null Hypothesis?</b>	Yes		
<b>Does the Survey Unit Pass All Criteria?</b>	Yes		

**Survey Unit Investigations and Results:**

No investigations were required for either direct or scan measurements and no investigation results are reported.

**ALARA Statement:**

As stated in Chapter 4 of the LTP, as long as the residual activity within the survey unit is less than the DCGL, the ALARA criterion has been met.

**Changes in Initial Survey Unit Assumptions:**

The survey unit was designed as a Class 3 structure survey and the sample results are consistent with that classification. The variability of the survey results was less than the characterization data used for survey design.

**Conclusion:**

The FSS of this survey unit was properly designed as a Class 3 survey based on Table 5-4 of the LTP. The required number of direct measurements was made and the scan coverage met the requirement of Table 5-6 of the LTP. No direct measurements exceeded the DCGL of 43000 dpm/100 cm<sup>2</sup> and none of the removable surface activity measurements exceeded 10% of the DCGL. No investigations were required.

The direct measurement data support rejection of the null hypothesis, providing high confidence that the survey unit satisfied the release criteria and that the data quality objectives were met.

It is concluded that survey unit F8540002 meets the release criteria of 10CFR20.1402.



**Attachment 1**

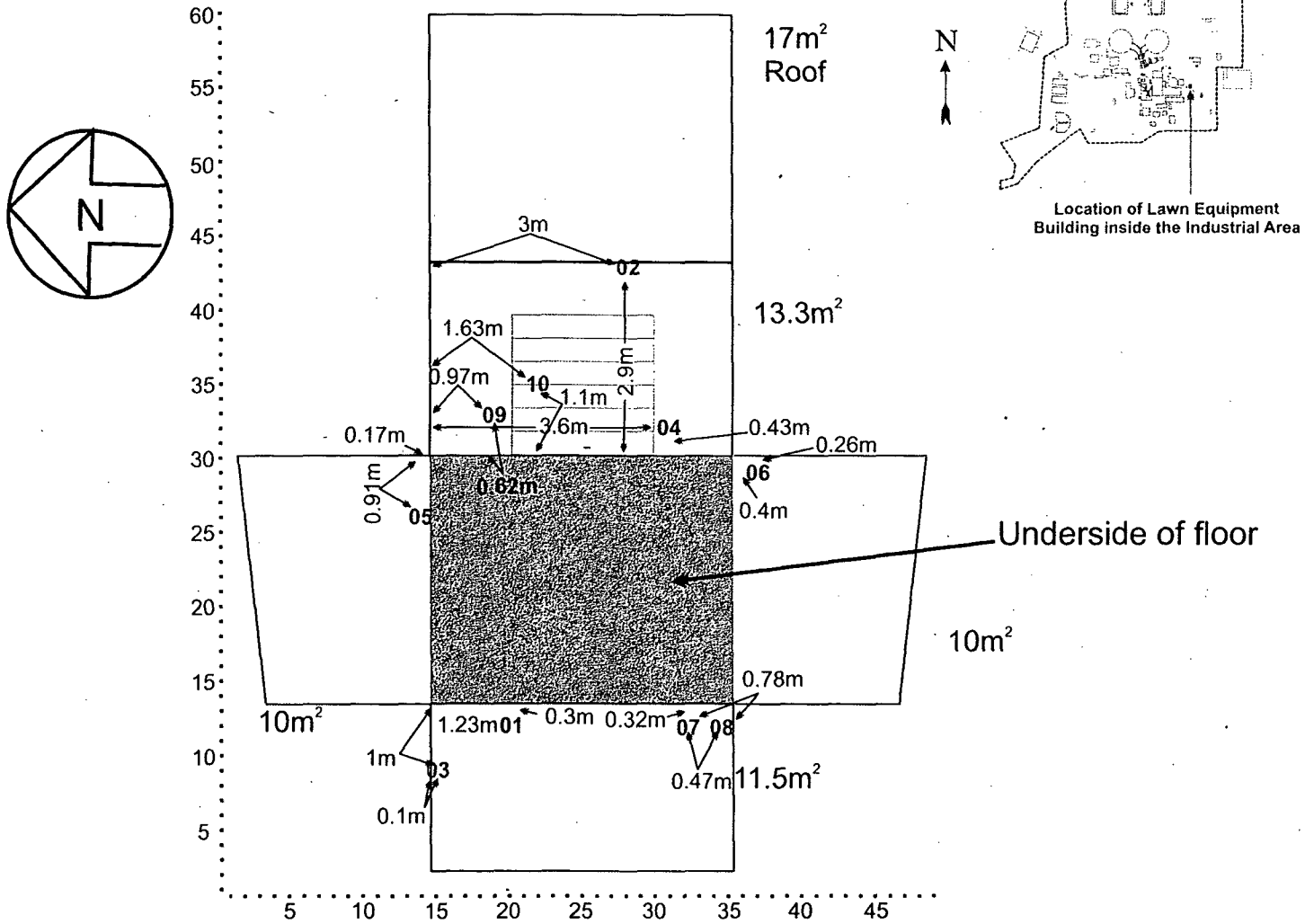
**Maps**

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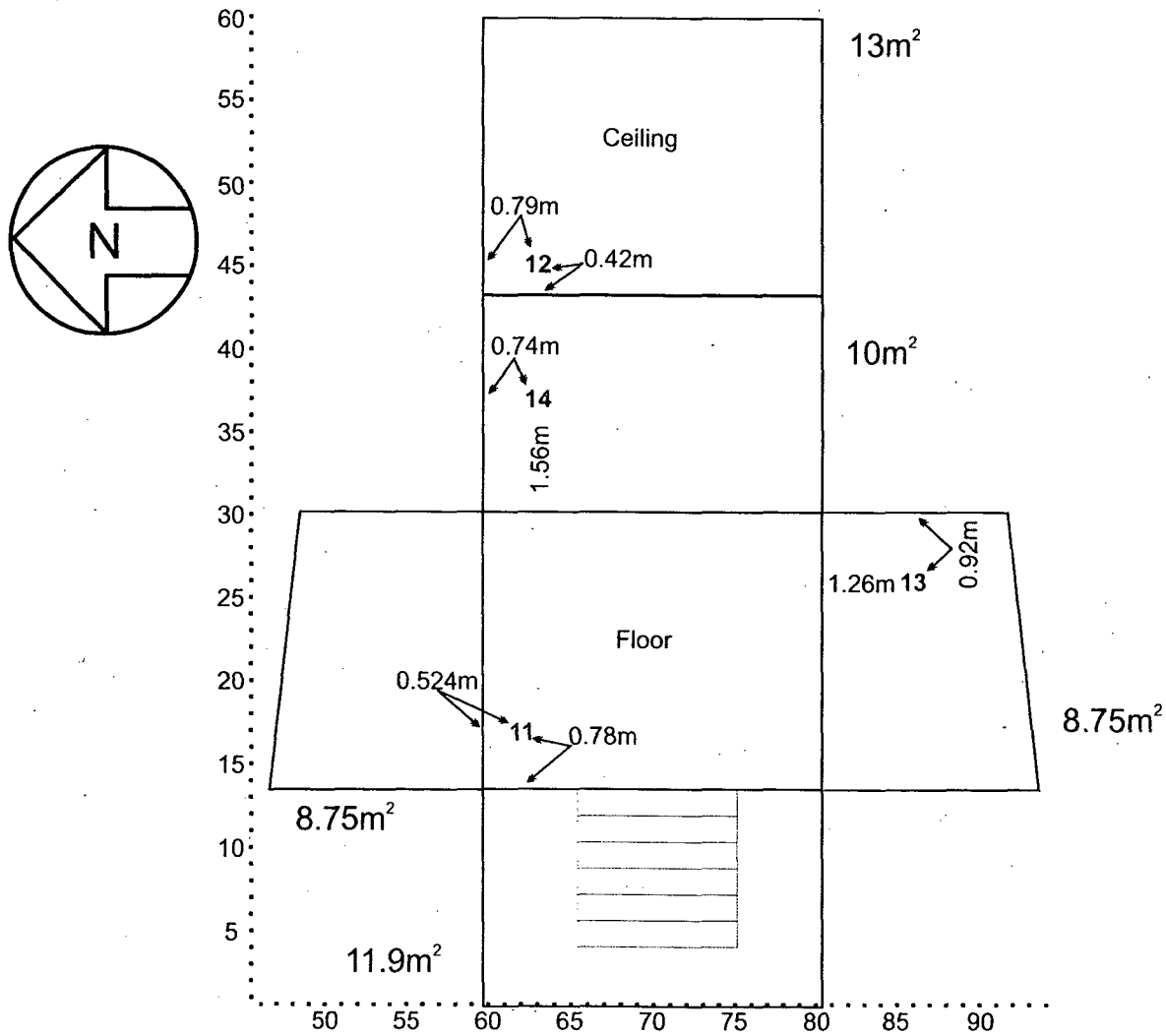
# Lawn Equipment Building Exterior

Beta Directs



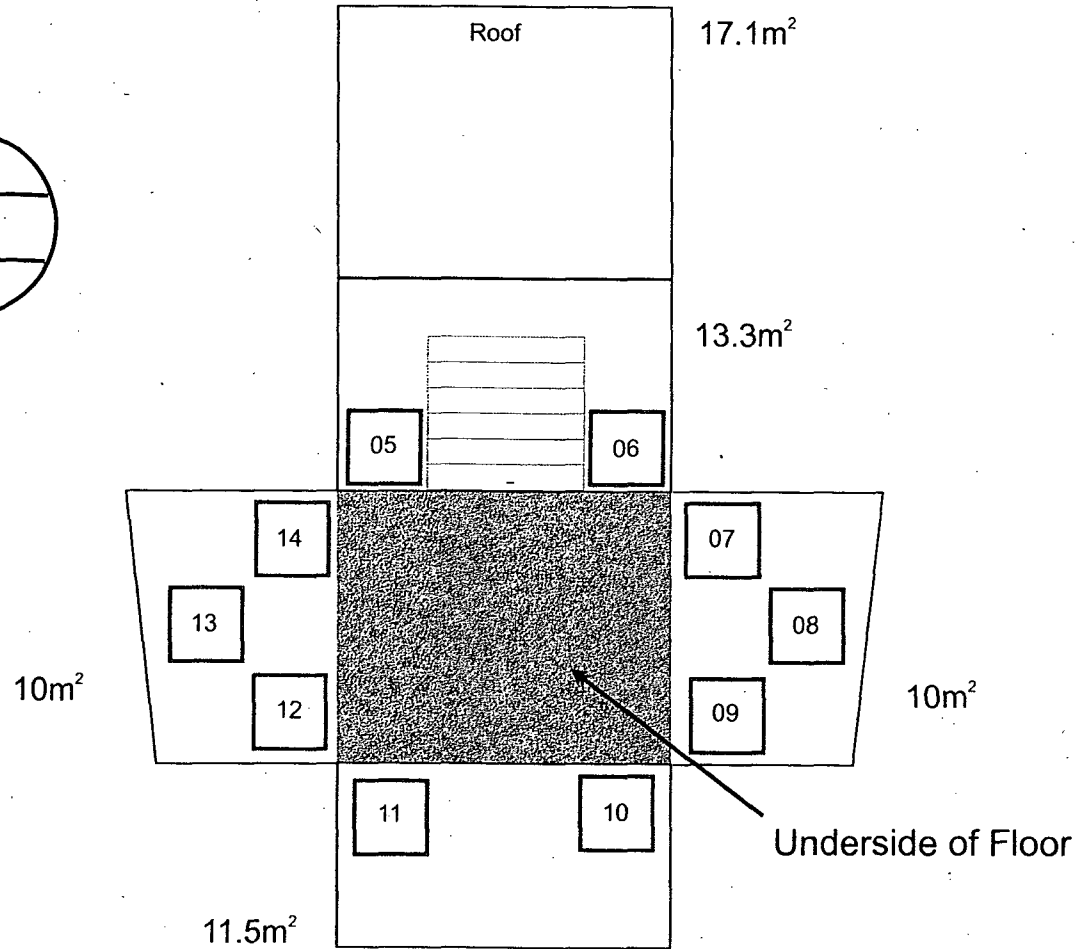
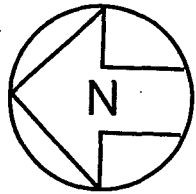
F8540002-M1

# Lawn Equipment Building Interior



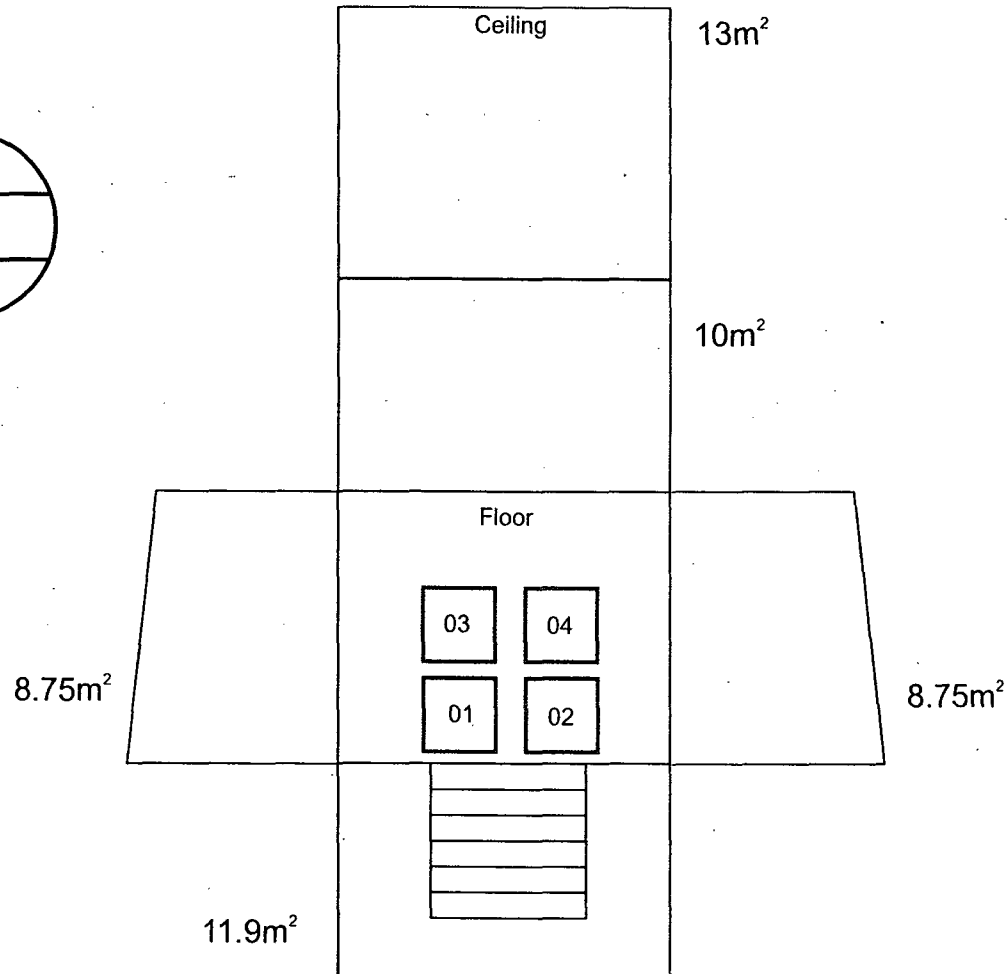
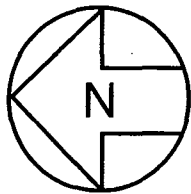
F8540002-M2

# Lawn Equipment Building Exterior Beta Scans



F8540002-M3

# Lawn Equipment Building Interior Beta Scans



F8540002-M4

**Attachment 2**

**Instrumentation**

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**Table 2-1. Survey Unit Instrumentation**

<b>Instrument Model; Serial No.</b>	<b>Detector Model; Serial No.</b>	<b>MDC Static (dpm/100 cm<sup>2</sup>)</b>	<b>MDC Scan (dpm/100 cm<sup>2</sup>)</b>
M2350; 193700	43-68B; 190294	433	1033
Tennelec; 0401171	N/A	5.9 dpm $\alpha$ , 11.7 dpm $\beta$	N/A

**Table 2-2. Investigation Criteria and DCGL**

<b>Parameter</b>	<b>Value (dpm/100 cm<sup>2</sup>)</b>
Investigation Criteria - Direct	21500
Investigation Criteria - Scan	43000
DCGL <sub>w</sub>	43000
DCGL <sub>EMC</sub>	N/A

**Attachment 3**

**Investigation**

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**(none required)**



**Attachment 4**

**Data Assessment**

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