

Rancho Seco
Final Status Survey Summary Report
October 22, 2007
Administration Building - Interior
Survey Unit F8050011

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Approved By: [Signature] Date: 11-6-07

Dismantlement Superintendent, Radiological

FINAL STATUS SURVEY SUMMARY REPORT

Survey Unit:

F8050011, Administration Building - Interior

Survey Unit Description:

Operating History: The multi-story structure provided office space for the site personnel. There were no reports of this area having been used for the storage of radioactive material. Operating records and the HSA document no events with the potential for a release of radioactivity associated with this survey area.

Site Characterization: Direct measurements were made of the interior and exterior surfaces of the structure confirming the absence of plant-derived radionuclides. Direct measurements showed a mean gross activity level of 2,017 dpm/100 cm² and a maximum value of 4,387 dpm/100 cm². Based on the classification procedure (DSIP-0020) and levels of gross activity reported, the area was determined to be a Class 3 area.

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 56 m² were scanned for approximately 6% 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:	F805	Administration Building - Interior
Survey Unit:	0011	Structure Surface
Class:	3	LTP Table 5-4
SU Area (m ²):	909.9	
Evaluator:	D. Anderson	
DCGL (dpm/100 cm ²):	43,000	Gross Activity DCGL
Area Factor:	N/A	Class 3
Design DCGL _{emc} (dpm/100 cm ²):	N/A	Class 3
LBGR (dpm/100 cm ²):	41,647	Adjusted
Design Sigma (dpm/100 cm ²):	451	
Type I Error:	0.05	
Type II Error:	0.05	
Predominant Nuclide:	Cs-137	
Sample Area (m ²):	N/A	Class 3
Scan Area (m ²):	56	
Scan Coverage (%):	6%	Class 3
Z _{1-α} :	1.645	
Z _{1-β} :	1.645	
Sign P:	0.99865	
Calculated Relative Shift:	3	
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 F8050011. 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 2,771 dpm/100 cm² to 4,316 dpm/100 cm² for interior surfaces, based on a surveyor efficiency of 0.5 with 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 ²)
F8050011-C0001BD	2,251
F8050011-C0002BD	2,205
F8050011-C0003BD	2,256
F8050011-C0004BD	2,231
F8050011-C0005BD	2,148
F8050011-C0006BD	1,924
F8050011-E0007BD	1,707
F8050011-F0008BD	1,743
F8050011-C0009BD	1,971
F8050011-F0010BD	1,644
F8050011-E0011BD	1,748
F8050011-E0012BD	1,810
F8050011-E0013BD	1,696
F8050011-E0014BD	1,629
Mean:	1,926
Median:	1,867
Standard Deviation:	246
Range:	1,629 – 2,256

Table 3. Removable Surface Activity Results

Measurement ID	Surface Beta Activity (dpm/100 cm ²)
F8050011C0001SM	6.14
F8050011C0002SM	8.7
F8050011C0003SM	2.29
F8050011C0004SM	1.01
F8050011C0005SM	1.01
F8050011C0006SM	3.58
F8050011E0007SM	1.01
F8050011F0008SM	3.58
F8050011C0009SM	2.29
F8050011F0010SM	1.01
F8050011E0011SM	3.58
F8050011E0012SM	1.01
F8050011E0013SM	-1.55
F8050011E0014SM	3.58
Mean:	2.66
Median:	2.29
Standard Deviation:	2.54
Range:	-1.55 to 8.7

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

Survey Results Parameter	Value	Comment	
Material Background Used (dpm/100 cm ²):	N/A	Average Ambient BKG = 0	
Ambient Background Used (dpm/100 cm ²):	N/A		
Actual Direct Measurements (N):	14		
Median (dpm/100 cm ²):	1,867		
Mean (dpm/100 cm ²):	1,926		
Direct Measurement Standard Deviation (dpm/100 cm ²):	246		
Total Standard Deviation (dpm/100 cm ²):	246		Based on samples and backgrounds.
Maximum (dpm/100 cm ²):	2,256		
Material Type:	N/A		Background Subtract Not Applied
Sign Test Final N Value:	14		
S+ Value:	14		
Critical Value:	10		
Sufficient Samples Collected:	Yes		
Maximum Value < DCGL:	Yes		
Median Value < DCGL:	Yes		
Mean Value < DCGL:	Yes		
Maximum Value < DCGL_{mc}:	N/A	Class 3	
Total Standard Deviation <= Sigma:	Yes		
Pass the Sign Test?	Yes		
Reject the Null Hypothesis?	Yes		
Does the Survey Unit Pass All Criteria?	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 (i.e. the survey unit average activity is less than the DCGL and the EMC criterion has been met), 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. No potential areas of elevated activity were detected.

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 43,000 dpm/100 cm² 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.

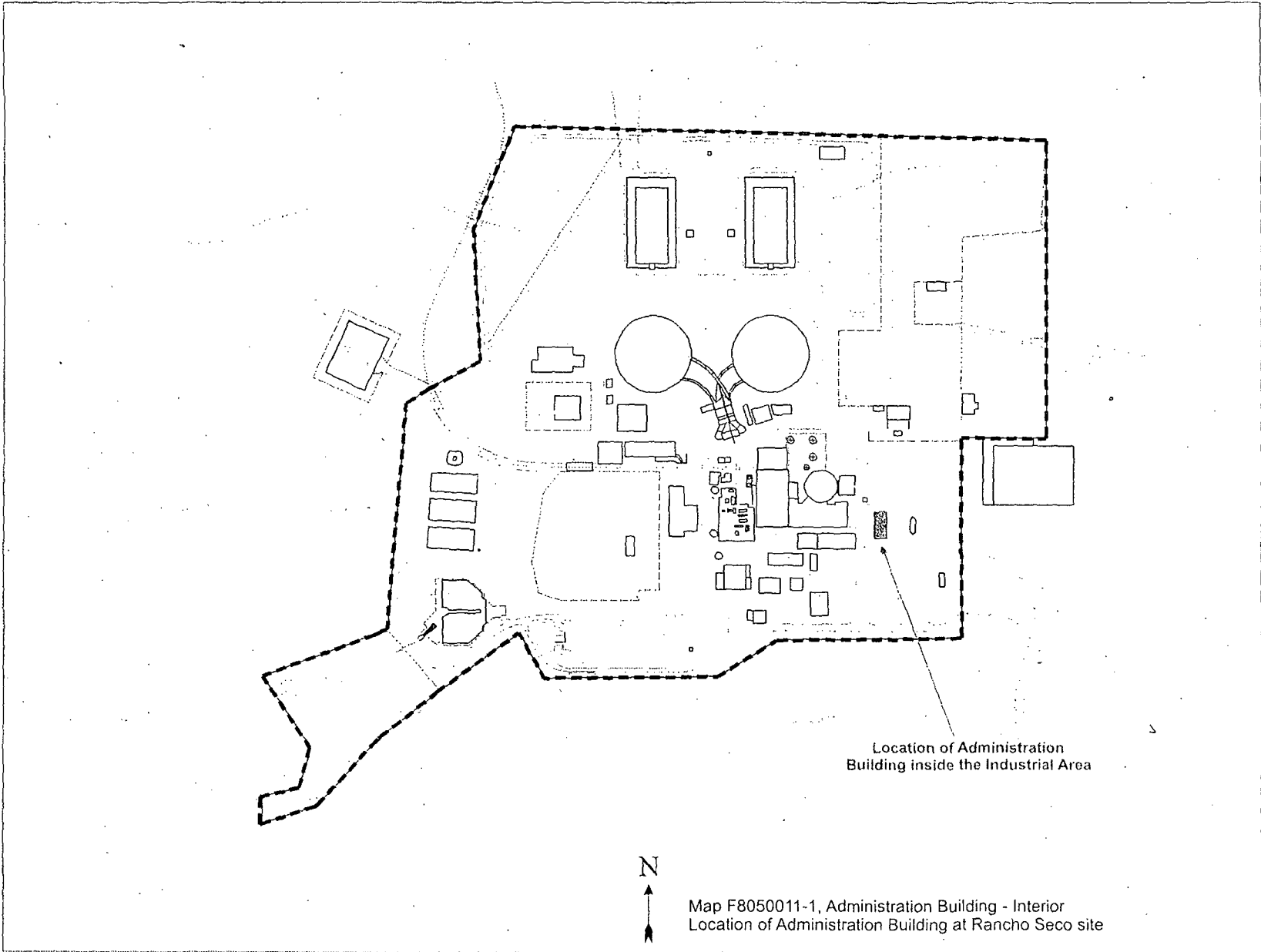
It is concluded that survey unit F8050011 meets the release criteria of 10CFR20.1402.

Attachment 1

Maps

October 22, 2007

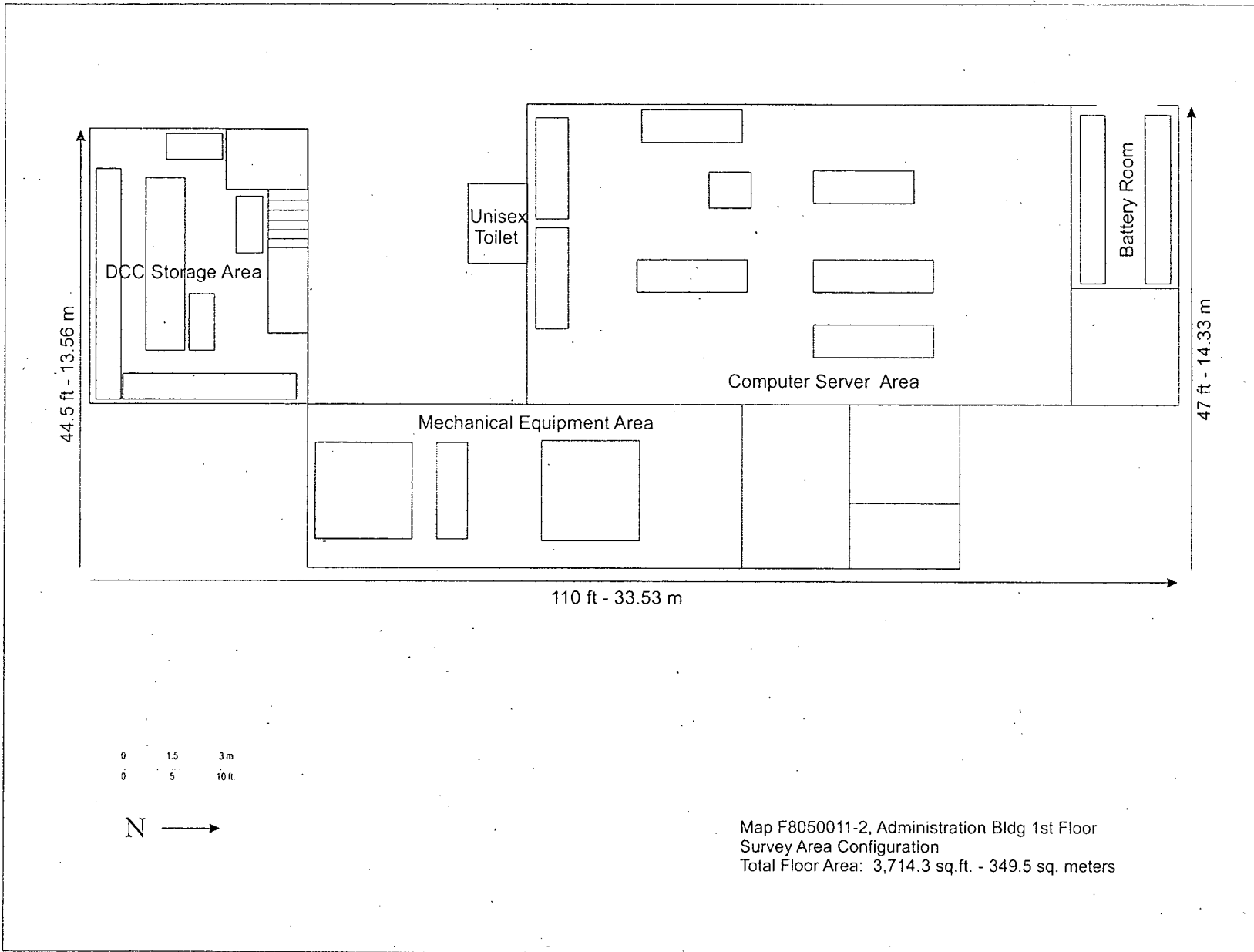
Survey Unit F8050011

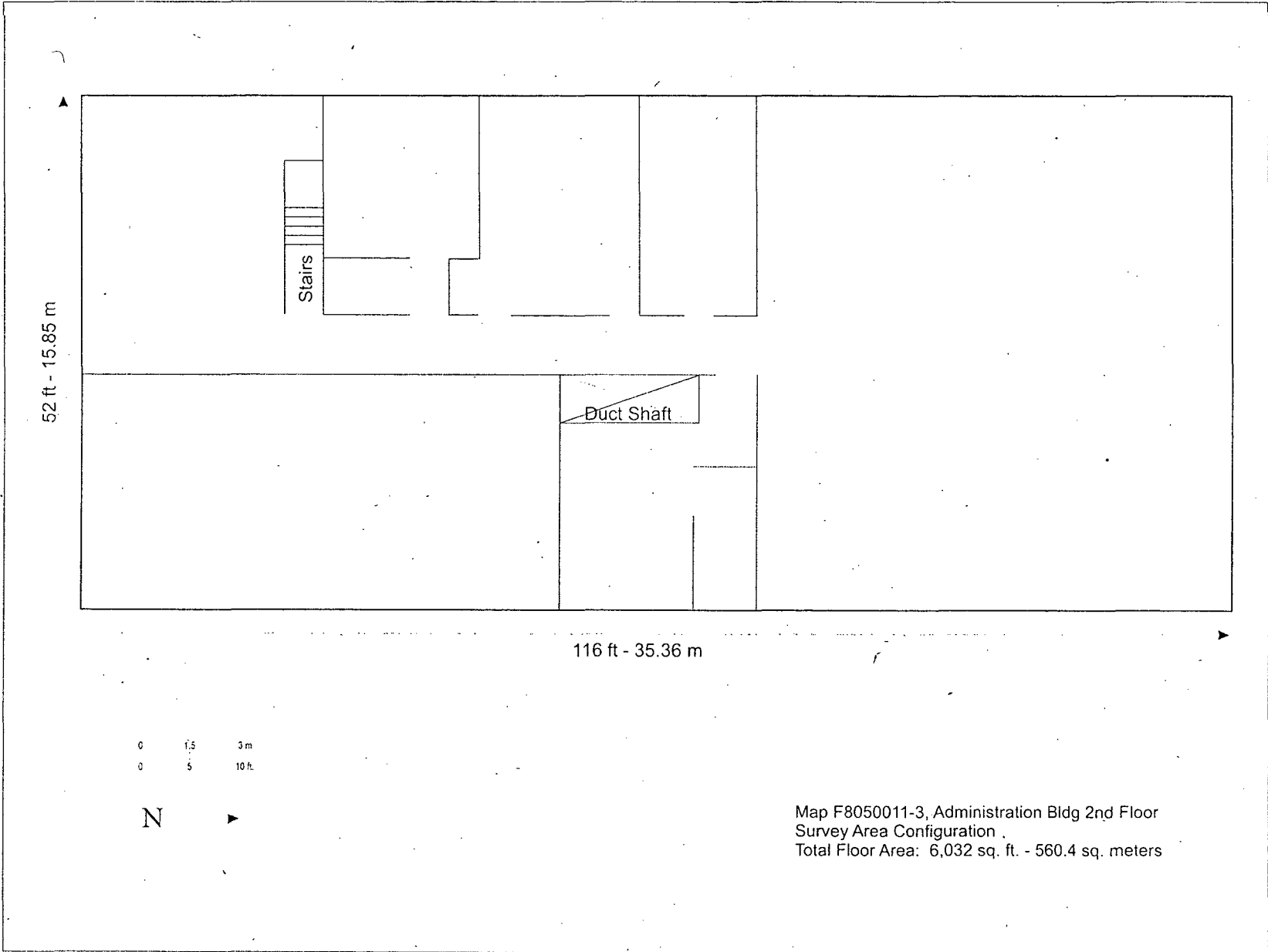


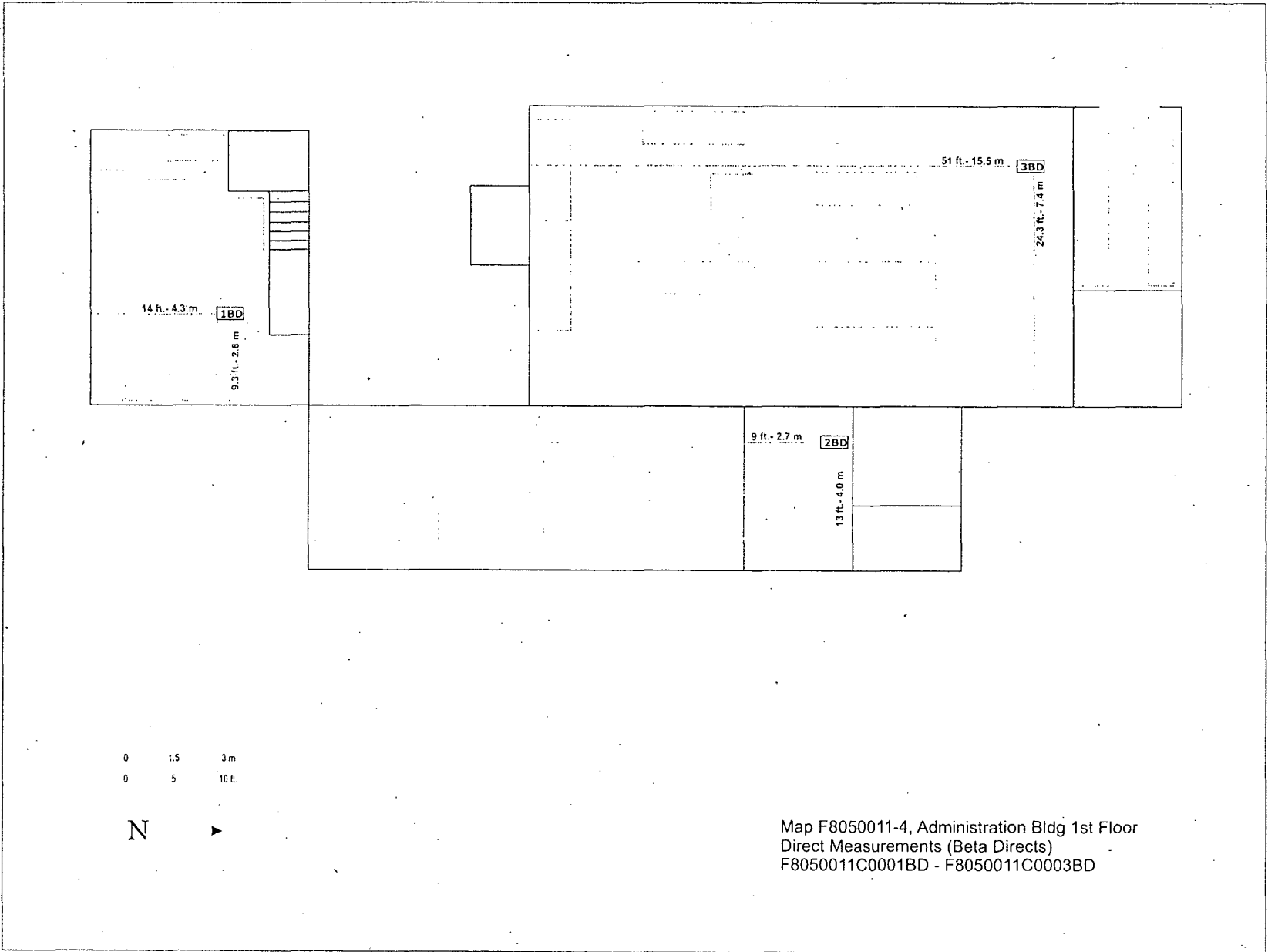
Location of Administration Building inside the Industrial Area

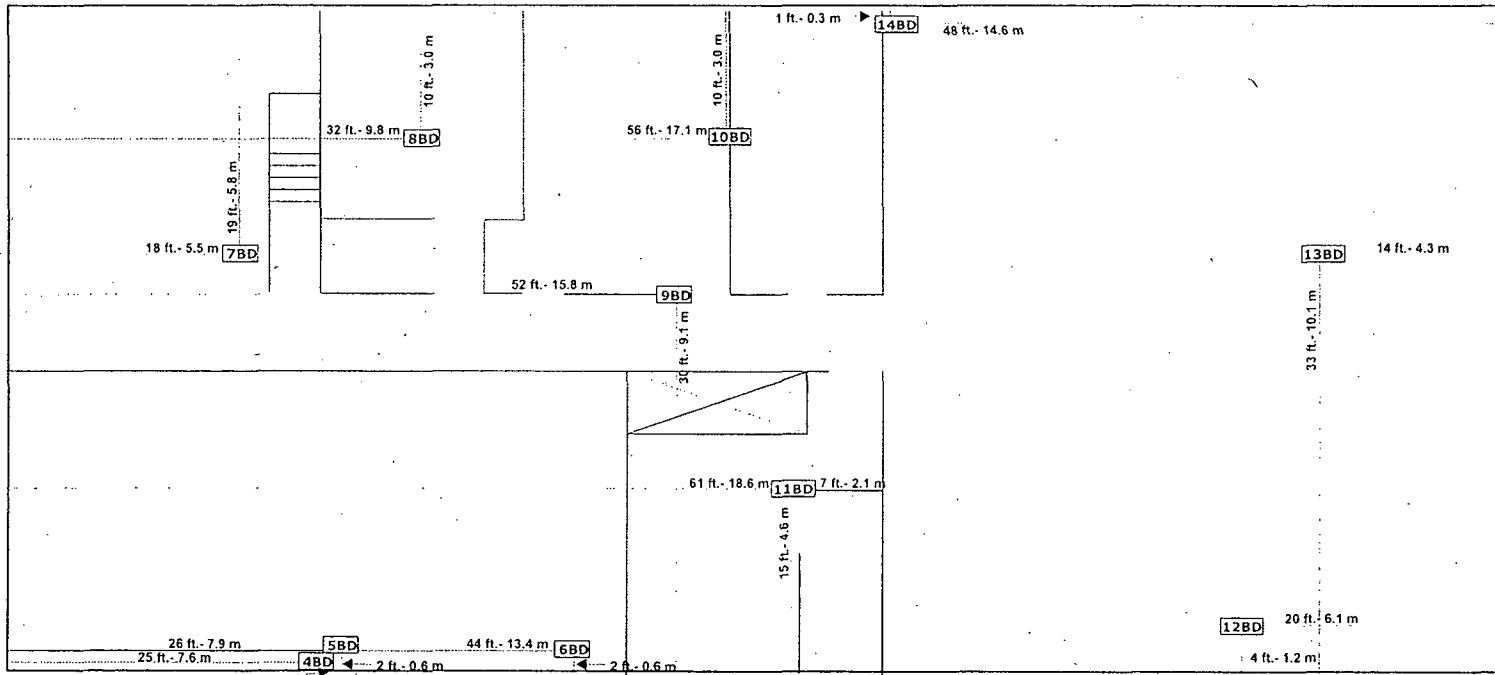


Map F8050011-1, Administration Building - Interior Location of Administration Building at Rancho Seco site





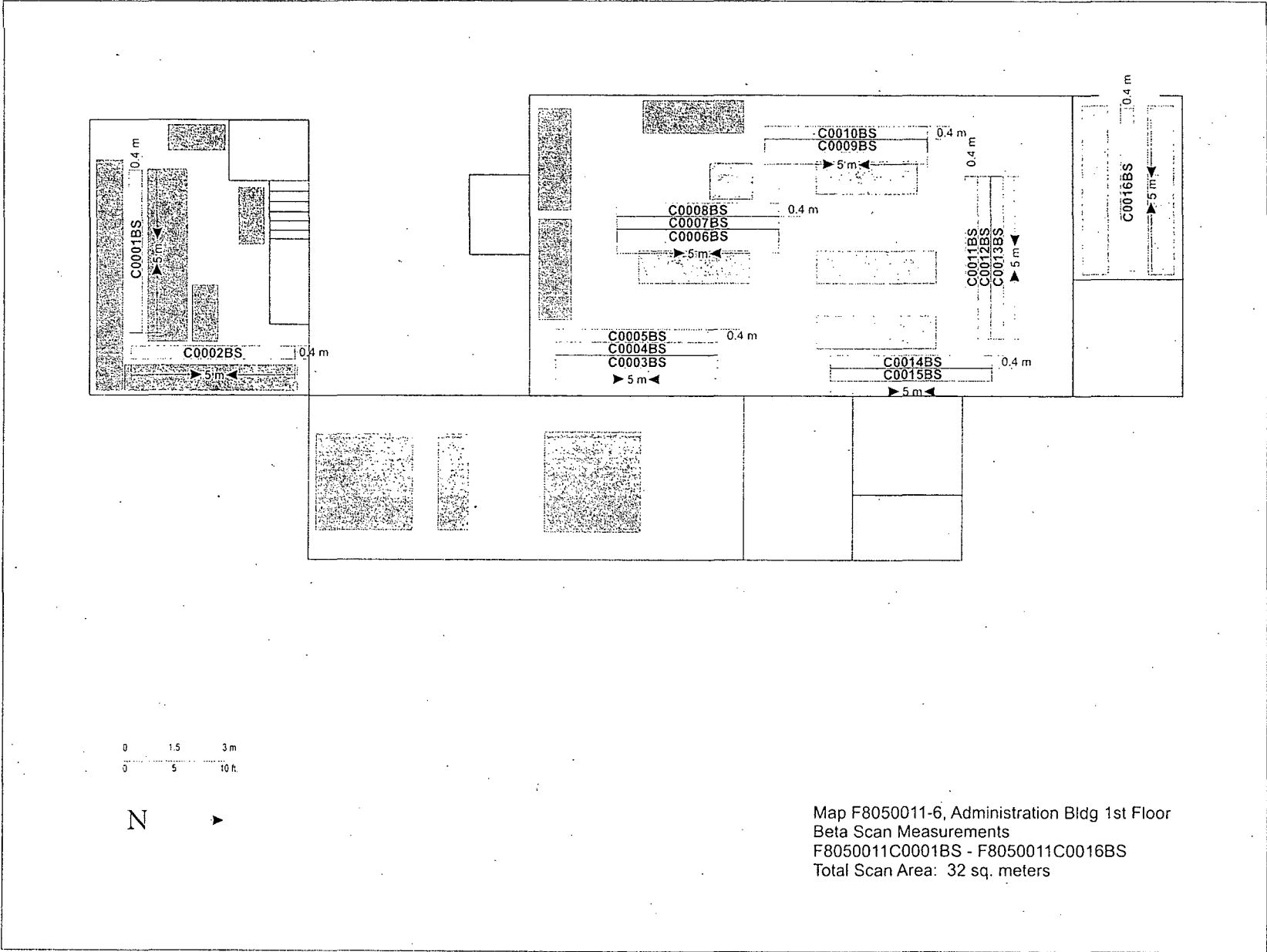


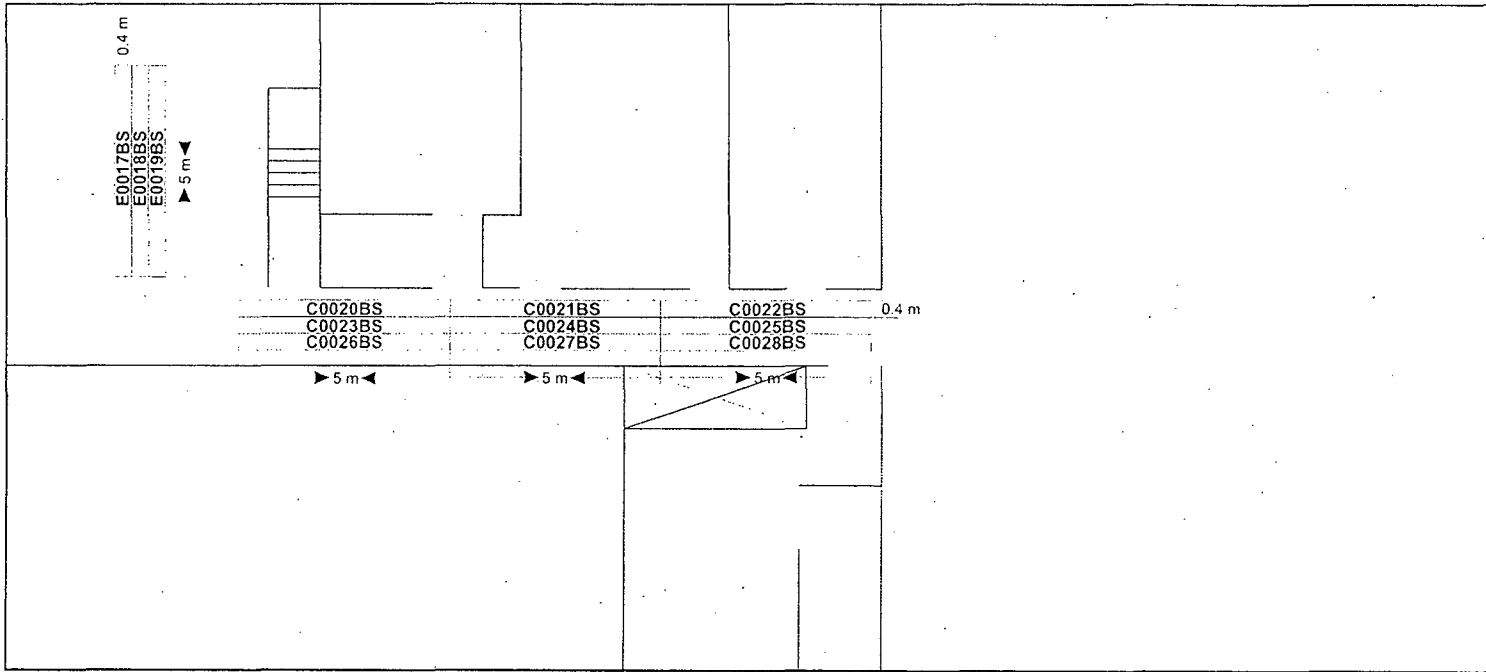


0 15 30
0 5 10 ft.



Map F8050011-5, Administration Bldg 2nd Floor
Direct Measurements (Beta Directs)
F8050011C0004BD - F8050011C00014BD





0 1.5 3m
0 5 10 ft.



Map F8050011-7, Administration Bldg 2nd Floor
Beta Scan Measurements
F8050011E0017BS - F8050011E0019BS
F8050011C0020BS - F8050011C0028BS
Total Scan Area: 24 sq. meters

Attachment 2

Instrumentation

October 22, 2007

Survey Unit F8050011

Table 2-1. Survey Unit Instrumentation

Instrument Model; Serial No.	Detector Model; Serial No.	MDC Static (dpm/100 cm²)	MDC Scan (dpm/100 cm²)
M2350; 193700	43-68B; 190294	433	1,033
M2350; 142499	43-37; 148502	198	616
Tennelec; 0401171	N/A	5 dpm α , 11 dpm β	N/A

Table 2-2. Investigation Criteria and DCGL

Parameter	Value (dpm/100 cm²)
Investigation Criteria - Direct	21,500
Investigation Criteria – Scan	21,500
DCGL _w	43,000
DCGL _{EMC}	N/A

Attachment 3
Investigation
October 22, 2007
Survey Unit F8050011

(none required)

Attachment 4

Data Assessment

October 22, 2007

Survey Unit F8050011

