
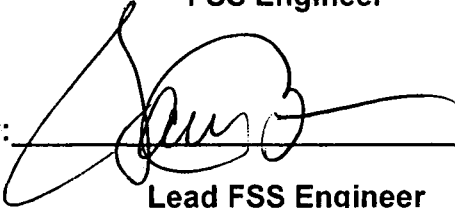


Rancho Seco
Final Status Survey Summary Report
January 30, 2017
IOSB Outside Area Class 1
Survey Unit F8300141

Prepared By:  Date: 1.30.17

FSS Engineer

Reviewed By:  Date: 1-30-17

Lead FSS Engineer

Approved By:  Date: 2/23/17

Manager, Rancho Seco Assets

FINAL STATUS SURVEY F8300141

Survey Unit:

F8300141, Interim Onsite Storage Building (IOSB) Outside Area Class 1

Survey Unit Description:

Operating History: Designed primarily to store packaged radioactive waste containers safely, protected from the elements, and maintain radiological dose as low as reasonably achievable (ALARA), the IOSB possibly stored media of many types, including filters, resins, contaminated chemicals, DAW, activated reactor components, contaminated plant components and other contaminated items. The outside asphalt area at times held waste ready to ship in storage containers and a respiratory cleaning facility.

Site Characterization: Based upon the scanning results of the outside asphalt area an elevated area was identified on the asphalt next to the IOSB. Certain spots in the area exceeded the $DCGL_w$ but not the $DCGL_{EMC}$. The area required remediation. The Outside area was divided into a small Class 1 Survey Unit, buffered by a Class 2 Survey Unit which will be addressed in separate reports. The remainder of the outside area was designated as a Class 3 Survey Unit and is the subject of a separate report.

Survey Unit Design Information:

In accordance with MARSSIM Section 4.6, special considerations may be necessary for survey units with structure surface areas less than 10 m^2 or land areas less than 100 m^2 . In this case, the number of data points obtained from the statistical tests is unnecessarily large and not appropriate for smaller survey unit areas. The data generated from these smaller survey units should be obtained based on judgment, rather than on systematic or random design, and compared individually to the DCGLs. This survey unit meets this criterion as the size is less than one square meter (0.37 m^2).

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**. Static measurement locations were based upon professional judgment in accordance with MARSSIM guidance and approximately 100% of the area scanned. The instrumentation used for the survey along with the MDC values are listed in **Table 2-1 Attachment 2**.

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Table 1, Survey Unit Design Parameters

Evaluation Input Values		Comments
Survey Package:	F830	Outside Asphalt Class 1
Survey Unit:	014	
Class	1	
SU Area (m ²)	0.37	0.37 m ²
Evaluator:	JR	
DCGL _w :	43,000	Gross Activity DCGL
Area Factor	22.1	DTBD-05-003
Design DCGL _{emc} (dpm/100cm ²):	950,300	
DCGL _{emc} :	950,300	
LBGR:	21,500	Default = 50% DCGL
Sigma:	513	Generic Sigma
Type I error:	0.05	
Type II error:	0.05	
Predominant Nuclide	Cs-137	
Sample Area (m ²)	N/A	
Total Instrument Efficiency:	0.130	
Total Area Scanned (m ²):	0.37	
Scan Coverage (%)	100%	Class 1
Material Type:	N/A	Choosing 'N/A' sets material background to "0"
Calculated Values		Comments
Z _{1-α} :	1.645	
Z _{1-β} :	1.645	
Sign p:	0.99865	
Calculated Relative Shift:	41.9	
Relative Shift Used:	3.0	Uses 3.0 if Relative Shift >3
N-Value:	5	Values selected based upon Judgement
N-Value+20%:	N/A	

Survey Results:

A total of 5 direct measurements were made in F8300141. The results of the static measurements are shown in **Table 2**. All of the static measurements were less than the DCGL. None of the scan measurements indicated areas of elevated activity.

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Table 2, Static Measurement Results

Number	Sample #	Beta (cpm)	Beta (dpm)
1	F8300141A00001	370	2,803
2	F8300141A00002	353	2,674
3	F8300141A00003	313	2,371
4	F8300141A00004	347	2,629
5	F8300141A00005	350	2,652

Table 3 contains the statistical summary of the static measurement data for the Outside Area Class 1.

Table 3, Beta Summary Statistics

<i>Beta Static Outside Asphalt Class 1</i>	
Mean	2,626
Median	2,652
Standard Deviation	158
Minimum	2,371
Maximum	2,803
Count	5

Survey Unit Data Assessment:

The survey design was based upon professional judgement and resulted in 5 static measurements. Following the guidance in MARSSIM Section 4.6, these values are compared directly to the DCGL_w.

The comparison and the results are presented in Table 4. The sample mean and median values were less than the DCGL.

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Table 4, Data Assessment Results

Static Data Values		Comments
Number of Samples:	5	
Median:	2,652	
Mean:	2,626	
Static Data Standard Deviation:	158	
Maximum:	2,803	
Criteria Satisfaction		Comments
Sufficient samples collected:	Pass	
Maximum value <DCGL _w :	Pass	
Median value <DCGL _w :	Pass	
Mean value <DCGL _w :	Pass	
Maximum value <DCGL _{enc} :	N/A	
Sign test results:	N/A	
Final Status		Comments
The survey unit passes all conditions:	Pass	

Survey Unit Investigations and Results:

No investigations were required for either direct or scan measurements collected for the FSS 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 1 survey and the sample results are consistent with that classification. No individual measurement exceeded the DCGL. No potential areas of elevated activity were detected.

Conclusion:

The FSS of this survey unit was properly designed as a Class 1 survey based on the results of the investigation survey. The required number of direct measurements was made and the scan coverage met the requirement of Table 5-6 of the LTP. All of the static measurements were less than the DCGL. No investigations were required.

The static 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.

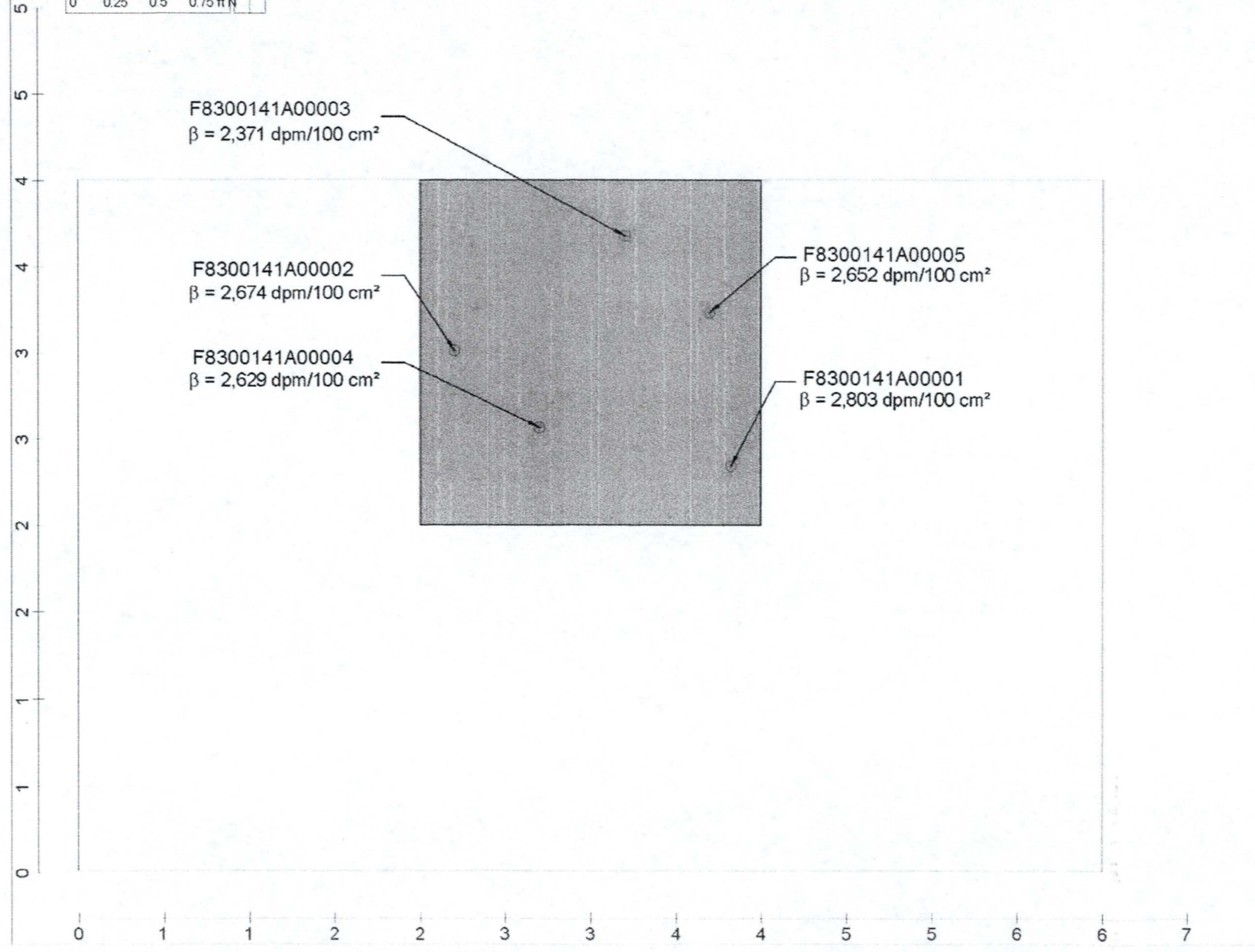
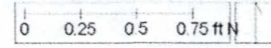
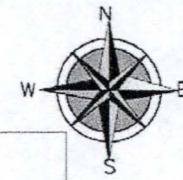
It is concluded that survey unit F8300141 meets the release criteria of 10CFR20.1402.

Attachment 1

Maps

January 30, 2017

Survey Unit F8300141



Outside Area Class 1	
Contract No.: 458891426	SMUD
Location: Rancho Seco	Approved by:
Task: Final Status Survey	
Drawing No.: NA	
Description: Outside Area Class 1	
Drawn By: J. Gonzales	
QC'd: J. Reese	Approval date:
Date: 8/26/2017	
Rev No.: 1	

Attachment 2

Instrumentation

January 30, 2017

Survey Unit F83000141

Table 2-1. Survey Unit Instrumentation

Measurement Type	Instrument Type	Minimum Detectable Activity^a	Detector Efficiencies	Calibration Due Date^b
Beta Static Measurement	Ludlum Model 2350-1 Ludlum Model 44-116 B Detector	Beta – 515 dpm/100 cm ²	13.2%	<u>317897/331972</u> 2/10/17

^a Minimum detectable activities for the count rate instrumentation were calculated in accordance with NUREG-1507, "Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions" (U.S. NRC, 1997).

^b Detectors are required to be calibrated once every 12 months. Calibration due date indicates the date by which the detector must be calibrated again.

cm² = square centimeters

cpm = counts per minute

dpm = disintegrations per minute

Attachment 3
Investigation
January 30, 2017
Survey Unit F8300141
(none)

Attachment 4

Data Assessment

January 25, 2017

Survey Unit F8300141

