

Rancho Seco


Final Status Survey Summary Report

February 10, 2009

Folsom Intake, Helo Pad, South Scrap Yard Combined Survey

Survey Unit F8000011

Revision 1

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Dismantlement Superintendent, Radiological

FINAL STATUS SURVEY SUMMARY REPORT

Survey Unit:

F8000011, Folsom Intake, Helo Pad, South Scrap Yard Combined Survey

Survey Unit Description:

Operating History: The E-W corridor in the Industrial Area was located to the north of the rail spur between the cooling towers and the power block. Included in this survey unit were all the concrete and asphalt roads, the concrete berm beside the road, the raised area next to the cooling tower pipe cradle structure, and the asphalt/concrete pads remaining from the demolition of the Contractor Fab Shop (identified as 853000 in the HAS and is summarized below). Operating records and the HSA document several nearby leaks or spills with the potential for a release of radioactivity associated with this survey area. The HSA documented the storage of radioactive material within the area that may have had the potential to contaminate the area.

Site Characterization: The pavement was surveyed. Measurements taken on the asphalt and concrete surfaces showed a mean level of 3,664 dpm/100 cm² and a maximum of 7,175 dpm/100 cm². Based on the classification procedure (DSIP-0020) and low levels of Cs-137 reported, the area was determined to be a Class 2 land area.

HSA Events: LER-7505, 8304, 8335.

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 1131 m² were scanned for approximately 7% coverage. Soil samples were collected at each direct measurement location and analyzed by HPGe detector. 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:	F800	Folsom Intake, Helo Pad, South Scrap Yard Combined Survey
Survey Unit:	0011	Open Land Area
Class:	3	LTP Table 5-4
SU Area (m²):	17284	
Evaluator:	Gary Frank	
DCGL Cs137 surrogate (pCi/g):	52.6	
Area Factor:	N/A	Class 3
Design DCGL_{mc} (pCi/g):	N/A	Class 3
LBGR (pCi/g):	26.3	Default = 50% DCGL
Design Sigma (pCi/g):	0.1	DTBD-06-001, Table 5-4B
Type I Error:	0.05	
Type II Error:	0.05	
Nuclide:	Cs137	
Sample Area (m²):	N/A	Class 3
Total Area Scanned (m²):	1131	
Scan Coverage (%):	6.5%	Class 3
Z_{1-α} :	1.645	
Z_{1-β} :	1.645	
Sign P:	0.99865	
Calculated Relative Shift:	263	
Relative Shift Used:	3	Uses 3.0 if Rel Shift >3
N-Value:	11	
Design N-Value + 20%:	14	NUREG-1575 Table 5-5
Grid Spacing L:	N/A	Class 3

Survey Results:

A total of 14 direct measurements were made in F8000011. The results including mean, median, standard deviation and range are shown in Table 2. All of the direct measurements were less than the DCGL. None of the scan measurements indicated areas of elevated activity. Soil samples were counted to the MDC shown in Table 2-1 of Attachment 2.

Table 2. Direct Measurement Results
(all activity values in pCi/g)

Measurement ID	Cs137 MDA	Cs137 Activity	Uncertainty
Mean:		4.97E-01	
Median:		7.96E-01	
Standard Deviation:		3.94E-01	
Range:	4.56E-02 to 8.74E-01		
F8000011A0001GD	8.16E-01	< 8.16E-01	
F8000011A0002GD	8.01E-01	< 8.01E-01	
F8000011A0003GD	8.20E-01	< 8.20E-01	
F8000011A0004GD	7.91E-01	< 7.91E-01	
F8000011A0005GD	8.20E-01	< 8.20E-01	
F8000011A0006GD	8.70E-01	< 8.70E-01	
F8000011A0007GD	8.03E-01	< 8.03E-01	
F8000011A0008GD	8.74E-01	< 8.74E-01	
F8000011S0001SS	5.16E-02	< 5.16E-02	
F8000011S0002SS	4.56E-02	< 4.56E-02	
F8000011S0003SS	6.88E-02	< 6.88E-02	
F8000011S0004SS	5.79E-02	< 5.79E-02	
F8000011S0005SS	7.40E-02	< 7.40E-02	
F8000011S0006SS	5.81E-02	< 5.81E-02	

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 3. The sample mean and median values were less than the DCGL. The sample standard deviation was greater than the design standard deviation but both values of sigma resulted in a relative shift greater than three (3), no additional samples were required.

Table 3. Data Assessment Results

Survey Results Parameter	Value	Comment
Actual Direct Measurements (N):	14	
Median (pCi/g):	7.96E-01	
Mean (pCi/g):	4.97E-01	
Standard Deviation (pCi/g):	3.94E-01	
Maximum (pCi/g):	8.74E-01	
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_{emc}:	N/A	Class 3
Standard Deviation <= Sigma:	Investigate	Results <0.5 DCGL
Pass the Sign Test?	Yes	
Reject the Null Hypothesis?	Yes	
The survey unit passes all conditions?	Investigate	Survey unit passes

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 land survey and the sample results are consistent with that classification. The variability of the survey results was greater 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. All of the direct measurements were less than 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.

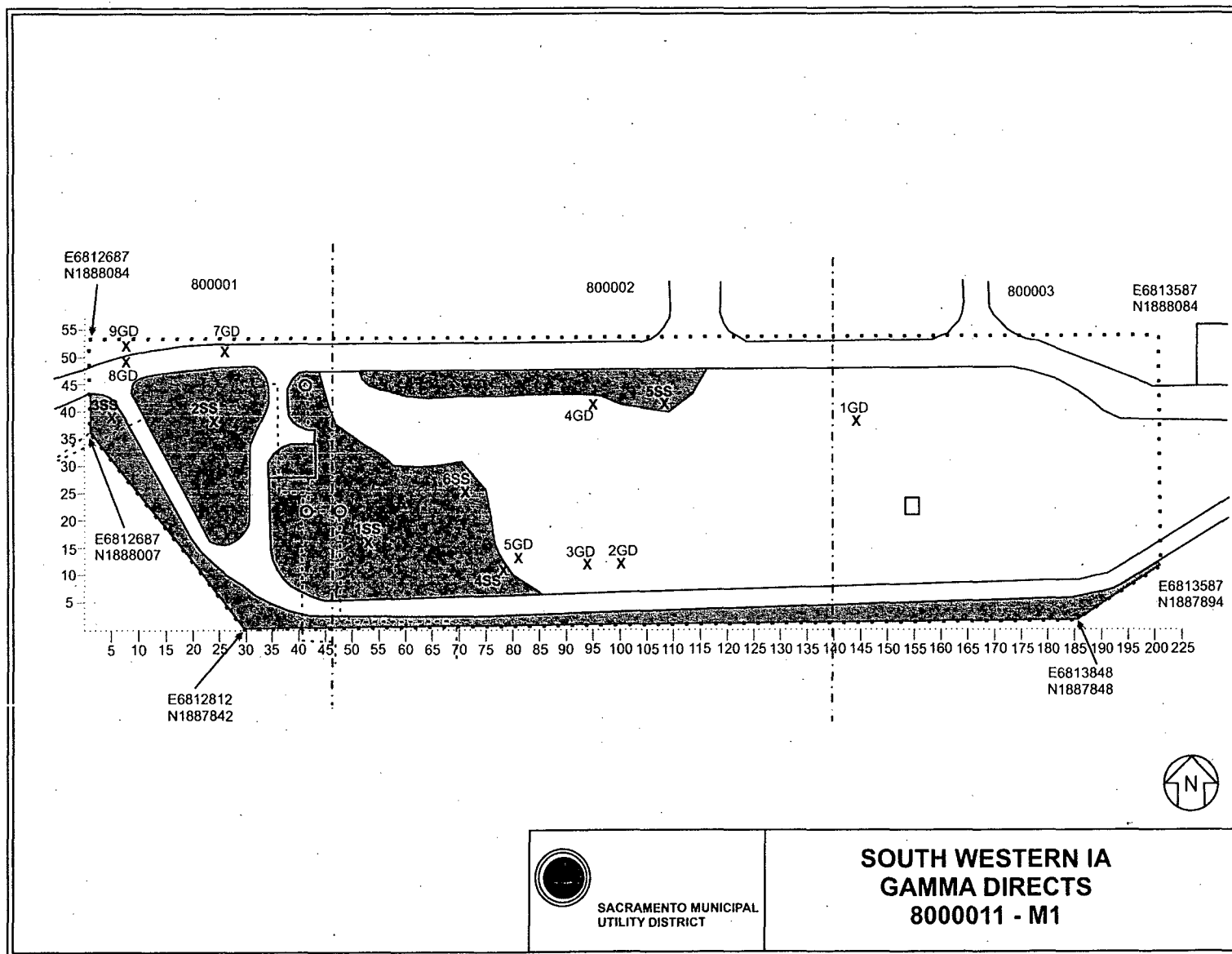
It is concluded that survey unit F8000011 meets the release criteria of 10CFR20.1402.

Attachment 1

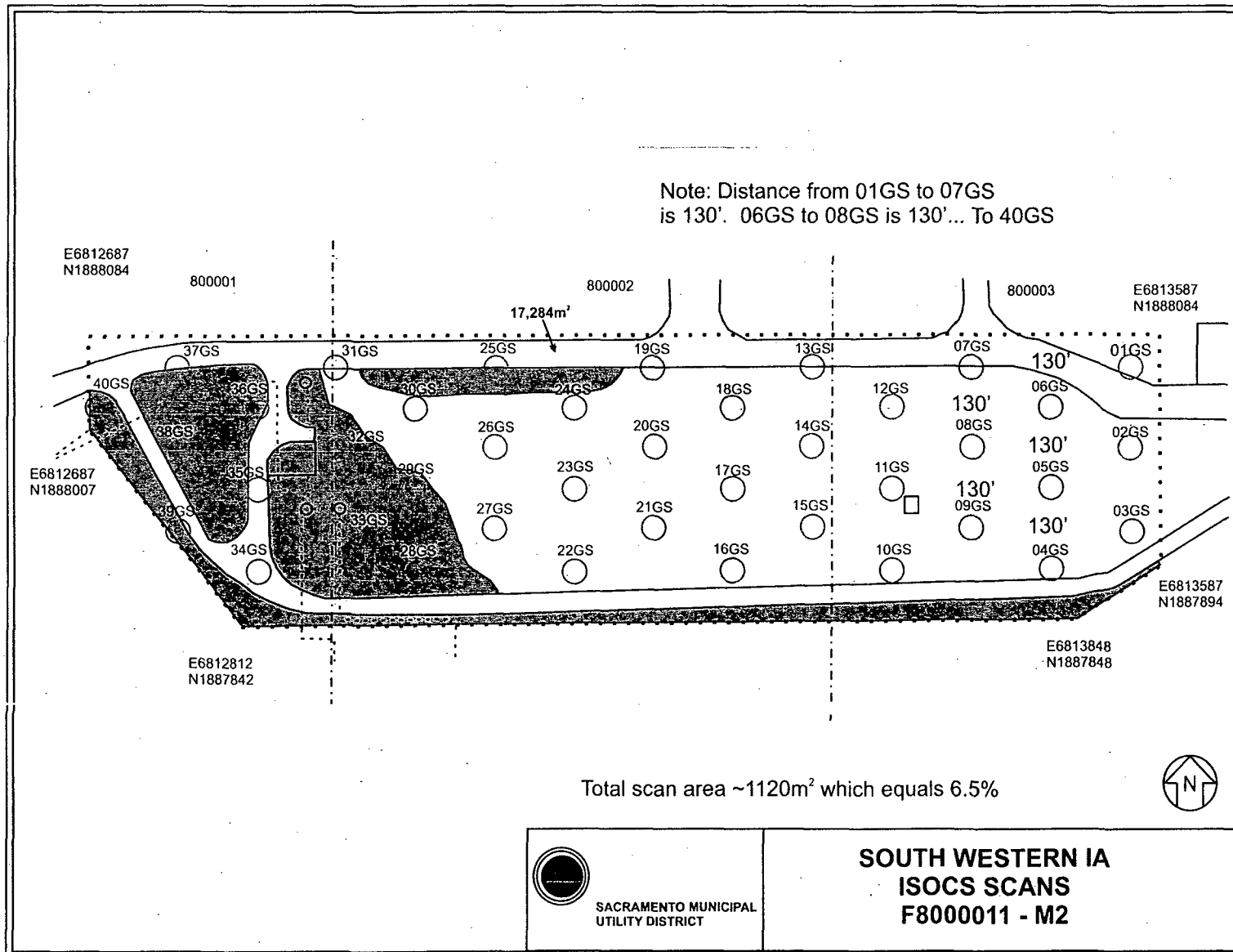
Maps

May 13, 2008

Survey Unit F8000011



Note: Distance from 01GS to 07GS
is 130'. 06GS to 08GS is 130'... To 40GS



Attachment 2

Instrumentation

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Survey Unit F8000011

Table 2-1. Survey Unit Instrumentation

Instrument	Detector Model No.	Detector Serial No.	MDC
HPGe	N/A	05069128	Soil – 0.0456 pCi/g Cs-137
Inspector	N/A	08051294	Asphalt – 0.791 pCi/g Cs-137
ISOCS	N/A	2983947	Soil – 0.15 pCi/g Cs-137 Soil – 0.136 pCi/g Co-60 Asphalt – 0.248 pCi/g Cs-137

Table 2-2. Investigation Criteria and DCGL

Instrument	Parameter	Value
ISOCS	Investigation Criteria - Scan	Soil – 26.3 pCi/g Cs-137 Soil – 6.3 pCi/g Co-60 Asphalt – 26.3 pCi/g Cs-137
All	DCGL _w	52.6 Cs-137 12.6 Co-60

Attachment 3
Investigation
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(none required)

Attachment 4

Data Assessment

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