

**Rancho Seco**  
**Final Status Survey Summary Report**  
**April 1, 2008**  
**Diesel Tank Storage Pad**  
**Survey Unit F8320001**

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## FINAL STATUS SURVEY SUMMARY REPORT

### **Survey Unit:**

F8320001, Diesel Tank Storage Pad

### **Survey Unit Description:**

Operating History: This land area contained the diesel tank which was used to fuel the diesel generators on site.

### **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 141 m<sup>2</sup> were scanned for approximately 9% coverage. Soil samples were collected at 14 randomly determined locations 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**

<b>Survey Design Parameter</b>	<b>Value</b>	<b>Comment</b>
<b>Survey Area:</b>	F832	Diesel Tank Storage Pad
<b>Survey Unit:</b>	0001	Open Land Area
<b>Class:</b>	3	LTP Table 5-4
<b>SU Area (m<sup>2</sup>):</b>	1560	
<b>Evaluator:</b>	Erin L. Brown	
<b>DCGL Cs137 surrogate (pCi/g):</b>	51.2	
<b>Area Factor:</b>	N/A	Class 3
<b>Design DCGL<sub>mc</sub> (pCi/g):</b>	N/A	Class 3
<b>LBGR (pCi/g):</b>	25.6	Adjusted
<b>Design Sigma (pCi/g):</b>	0.01	DTBD-06-001, Table 5-4D
<b>Type I Error:</b>	0.05	
<b>Type II Error:</b>	0.05	
<b>Nuclide:</b>	Cs137	
<b>Sample Area (m<sup>2</sup>):</b>	N/A	Class 3
<b>Total Area Scanned (m<sup>2</sup>):</b>	141	
<b>Scan Coverage (%):</b>	9%	Class 3
<b>Z<sub>1-α</sub> :</b>	1.645	
<b>Z<sub>1-β</sub> :</b>	1.645	
<b>Sign P:</b>	0.99865	
<b>Calculated Relative Shift:</b>	2560	
<b>Relative Shift Used:</b>	3	Uses 3.0 if Rel Shift >3
<b>N-Value:</b>	11	
<b>Design N-Value + 20%:</b>	14	NUREG-1575 Table 5-5
<b>Grid Spacing L:</b>	N/A	Class 3

### Survey Results:

A total of 14 direct measurements were made in F8320001. 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
<b>Mean:</b>		5.05E-02	
<b>Median:</b>		4.91E-02	
<b>Standard Deviation:</b>		6.17E-03	
<b>Range:</b>	4.34E-02 to 6.26E-02		
F8320001S0001SS	4.84E-02	< 4.84E-02	
F8320001S0002SS	4.97E-02	< 4.97E-02	
F8320001S0003SS	4.70E-02	< 4.70E-02	
F8320001S0004SS	4.34E-02	< 4.34E-02	
F8320001S0005SS	5.48E-02	< 5.48E-02	
F8320001S0006SS	4.37E-02	< 4.37E-02	
F8320001S0007SS	4.45E-02	< 4.45E-02	
F8320001S0008SS	5.91E-02	< 5.91E-02	
F8320001S0009SS	4.99E-02	< 4.99E-02	
F8320001S0010SS	5.36E-02	< 5.36E-02	
F8320001S0011SS	5.77E-02	< 5.77E-02	
F8320001S0012SS	4.47E-02	< 4.47E-02	
F8320001S0013SS	4.72E-02	< 4.72E-02	
F8320001S0014SS	6.26E-02	< 6.26E-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 less than the design standard deviation so no additional samples were required.

**Table 3. Data Assessment Results**

<b>Survey Results Parameter</b>	<b>Value</b>	<b>Comment</b>
<b>Actual Direct Measurements (N):</b>	14	
<b>Median (pCi/g):</b>	4.91E-02	
<b>Mean (pCi/g):</b>	5.05E-02	
<b>Standard Deviation (pCi/g):</b>	6.17E-03	
<b>Maximum (pCi/g):</b>	6.26E-02	
<b>Sign Test Final N Value:</b>	14	
<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	Class 3
<b>Standard Deviation &lt;= Sigma:</b>	Yes	
<b>Pass the Sign Test?</b>	Yes	
<b>Reject the Null Hypothesis?</b>	Yes	
<b>The survey unit passes all conditions?</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 (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 land 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. 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 F8320001 meets the release criteria of 10CFR20.1402.

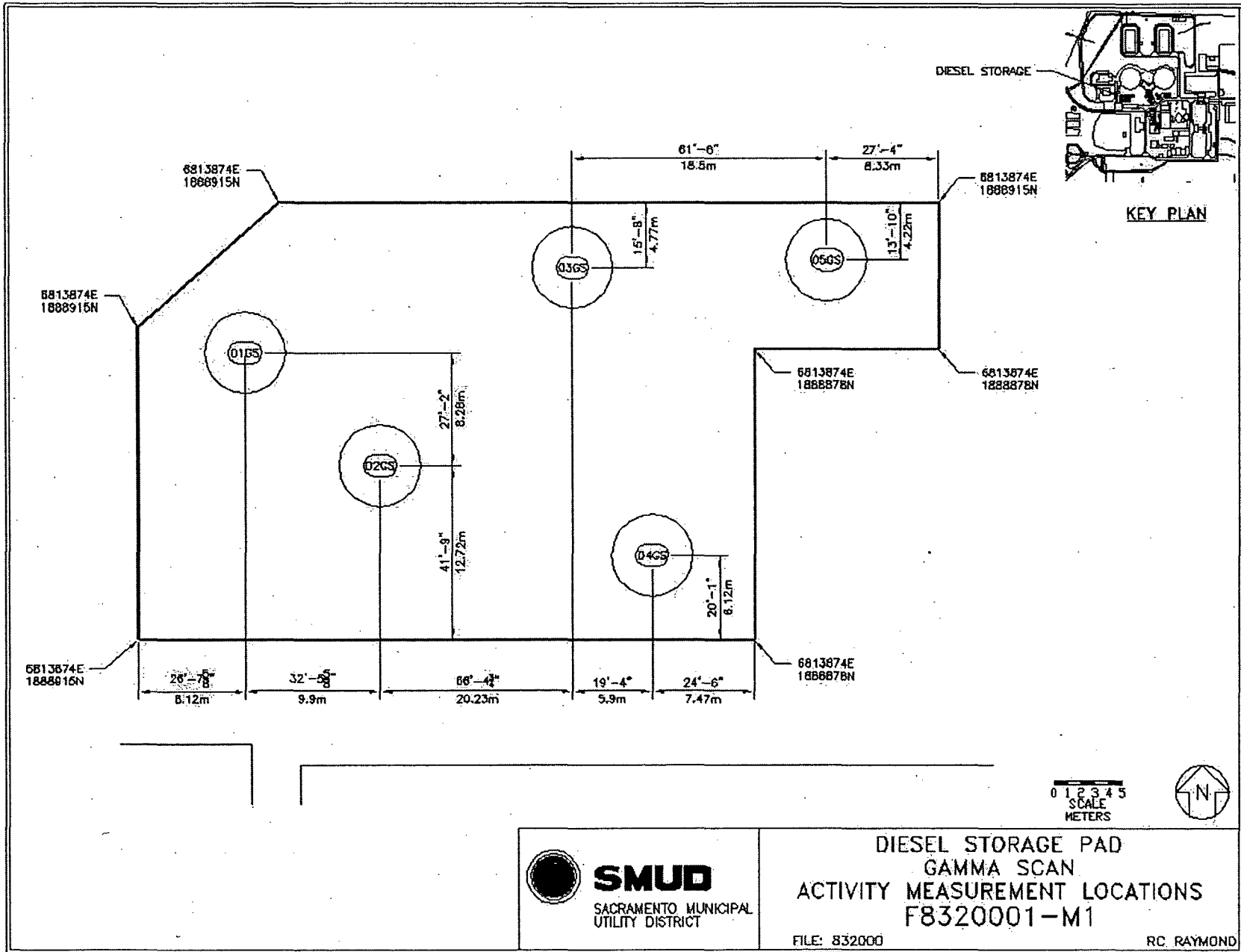
**Attachment 1**

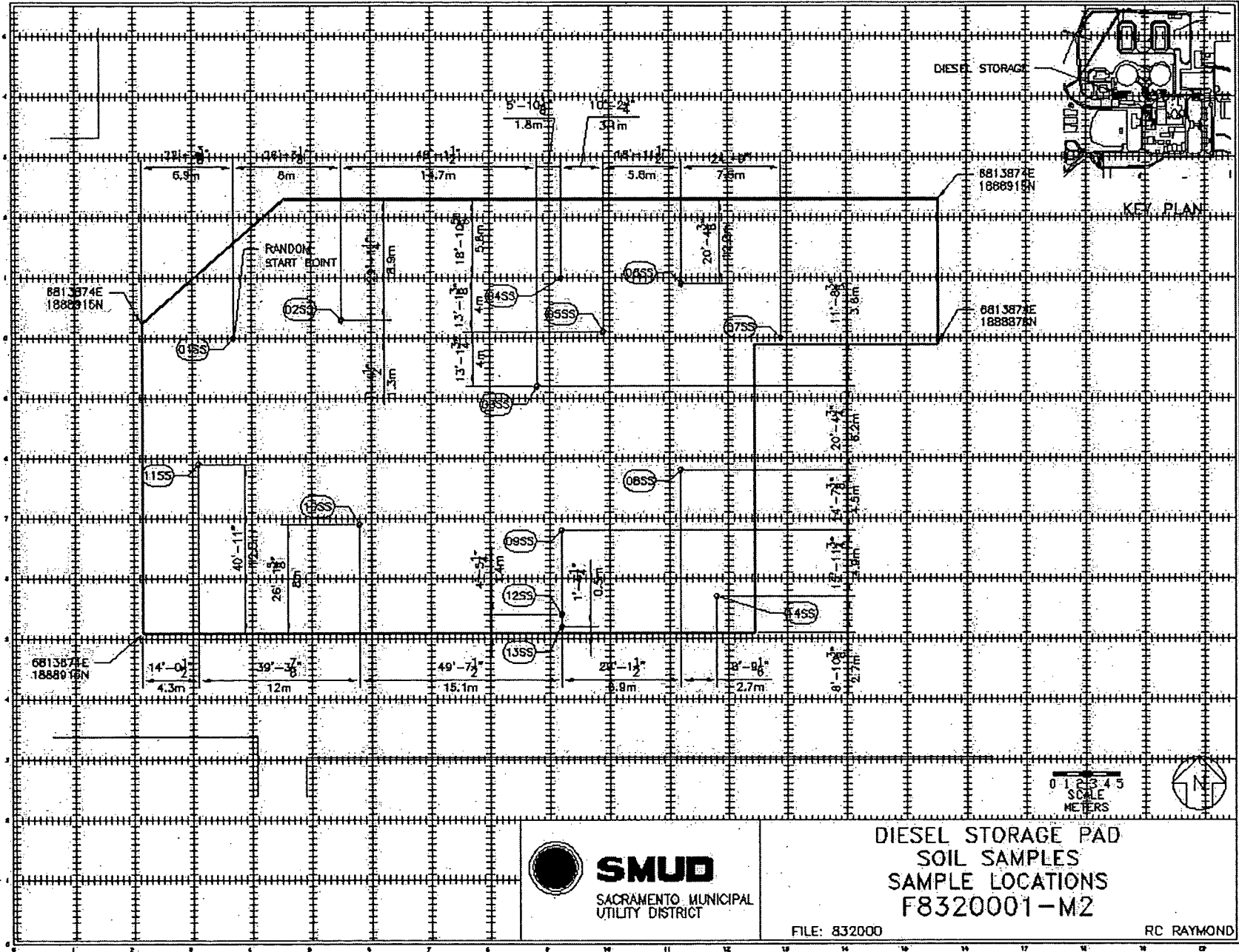
**Maps**

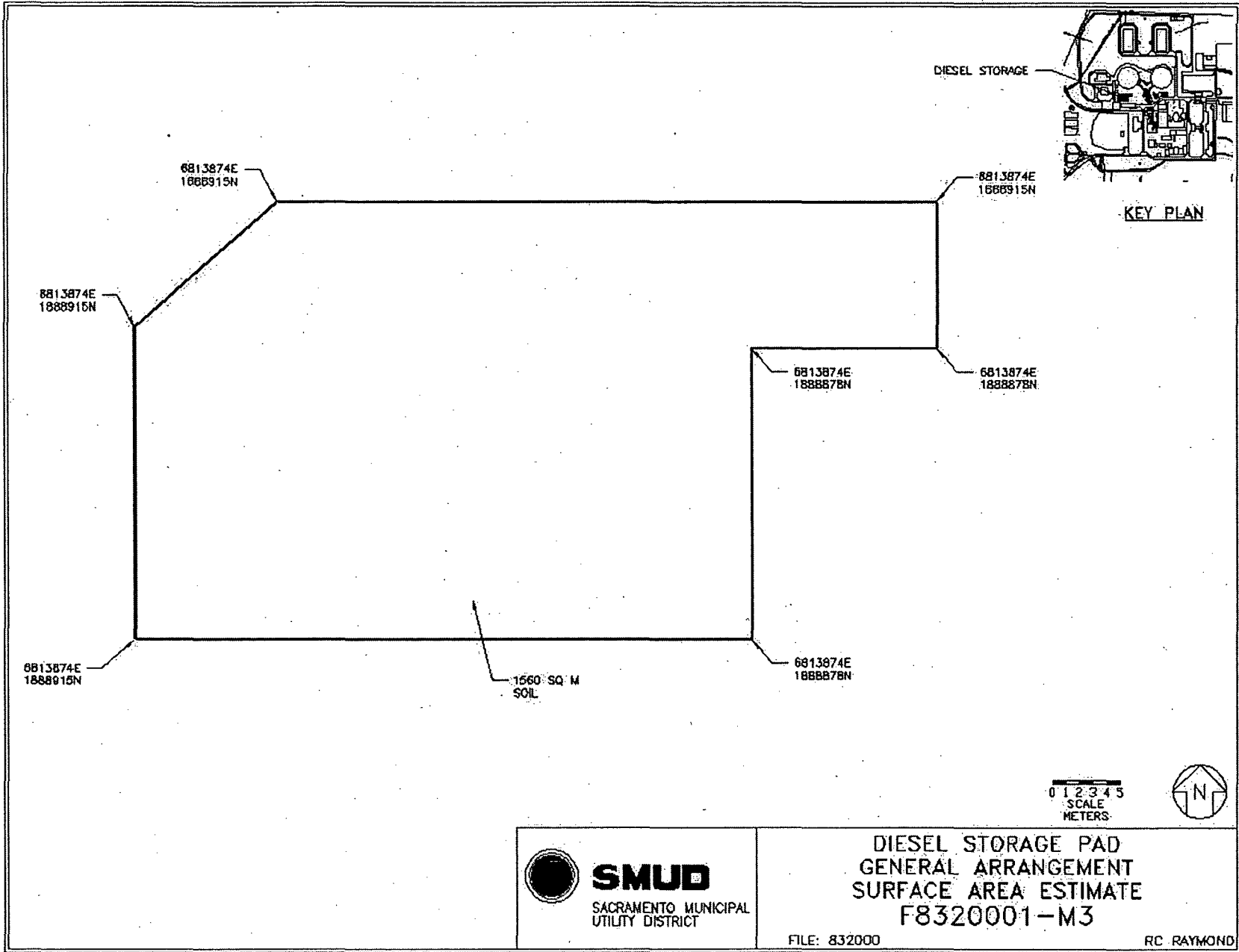
**April 1, 2008**

**Survey Unit F8320001**









 **SMUD**  
SACRAMENTO MUNICIPAL  
UTILITY DISTRICT

DIESEL STORAGE PAD  
GENERAL ARRANGEMENT  
SURFACE AREA ESTIMATE  
F8320001-M3

FILE: 832000

RC RAYMOND

**Attachment 2**

**Instrumentation**

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

<b>Instrument</b>	<b>Detector Model No.</b>	<b>Detector Serial No.</b>	<b>MDC</b>
HPGe	N/A	05069128	Soil – 6.27E-08 pCi/g Cs-137
ISOCS	N/A	2983947	Soil – 2.72E-01 pCi/g Cs-137 Soil – 2.83E-01 pCi/g Co-60

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

<b>Instrument</b>	<b>Parameter</b>	<b>Value</b>
ISOCS	Investigation Criteria - Scan	Soil – 20 pCi/g Cs-137
All	DCGL <sub>w</sub>	51.2 Cs-137 12.6 Co-60
All	DCGL <sub>EMC</sub>	N/A

**Attachment 3**  
**Investigation**  
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**(none required)**

**Attachment 4**

**Data Assessment**

**April 1, 2008**

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