
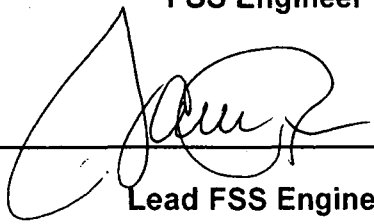


Rancho Seco  
Final Status Survey Summary Report  
January 25, 2017  
IOSB Embedded Pipe  
Survey Unit F8300123

Prepared By:  Date: 1.31.17

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Reviewed By:  Date: 2.1.17

Lead FSS Engineer

Approved By:  Date: 2/24/17

Manager, Rancho Seco Assets

## FINAL STATUS SURVEY F8300123

### Survey Unit:

F8300123, Interim Onsite Storage Building (IOSB) Embedded Piping

### Survey Unit Description:

**Operating History:** The drain and piping system in the IOSB collected liquids from the building either via trench drains (storage cells, DAW Bay, and Truck Bay), or via floor drains. Areas of elevated residual radioactivity were identified in close proximity to the trench drains or floor drains indicating the potential for a spill of radioactive liquid to have traversed down the embedded piping to the sump.

**Site Characterization:** Static measurements were collected every six inches of pipe run in all sections of the embedded piping. Measurements indicated residual radioactivity in the embedded piping of the hot cell drain. The highest measurement obtained in the embedded piping was collected in the hot cell drain line at 26,766 dpm. This value exceeds the level for grouting of piping listed in the RSLTP. Based upon this level, the drain line from the hot cell was classified as a Class 1 survey unit to allow it to be handled separately from the remaining embedded piping. The purpose of designating this section of pipe as a Class 1 was because of the residual activity and the need to perform remediation. A Class 2 buffer survey area was not designated because the density of survey points for embedded piping is independent of classification and is dictated by the RSLTP. Based on the levels of gross activity reported, the remaining embedded piping was determined to be a Class 3 area as an indication that residual radioactivity was not detected during scoping surveys.

### Survey Unit Design Information:

Static measurement locations were collected every six inches of accessible piping as specified in the License Termination Plan. Scanning of the length of piping was not conducted due to the number of static measurements collected. Piping was surveyed in defined segments as shown in **Table 1**.

A total of 504 static measurements were collected in a total of 255 linear feet of embedded piping. This corresponds to a measurement collected on average every 6.07 inches of piping and is consistent with the guidance from the RSLTP for embedded piping. Data collected was compared directly to the DCGL for embedded piping of 100,000 dpm. The instrumentation used for the survey along with the MDC values are listed in **Table 2-1 Attachment 2**.

**FINAL STATUS SURVEY F8300123**

**Survey Results:**

A total of 504 direct measurements were made in F8300123. The results of the static measurements are summarized in **Table 1**. All of the static measurements were less than the DCGL of 100,000 dpm. None of the measurements indicated areas of elevated activity or required grouting of the piping (>21,000 dpm).

**Table 1, Static Measurement Results**

<b>Section of Embedded Piping</b>	<b>Length of Pipe Run (feet)</b>	<b>Number of Measurements</b>	<b>Range of Measurements (dpm)</b>
DAW Bay to Sump	86	154	4,090 – 7,168
DAW Staging Bay to DAW line	40	87	3,819 – 12,437
Cell C-1 to Sump	6	11	6,195 – 6,915
Truck Bay Trench to Truck Bay Sump	28	61	5,764 – 6,657
Truck Bay Sump to Sump 4 inch	16	34	1,100 – 1,659
Truck Bay Sump to Sump 6 inch	23	47	5,935 – 9,376
Cask Wash Down to Sump	20	40	3,620 – 5,518
Expansion line from Sump	36	70	4,880 – 6,700

**Table 2** contains the statistical summary of the static measurement data for the Embedded Piping.

**Table 2, Gamma Summary Statistics**

<i>Embedded Piping</i>	
Mean	5,038
Median	5,097
Standard Deviation	1,355
Minimum	1,100
Maximum	12,437
Count	504

## FINAL STATUS SURVEY F8300123

### **Survey Unit Data Assessment:**

The survey design required a static measurement every six inches of accessible piping. Based upon the estimated length of piping and the number of measurements collected, the FSS resulted in a measurement roughly every 6.07 inches. All measurements were less than the DCGL.

### **Survey Unit Investigations and Results:**

No investigations were required for the direct 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 designated as a Class 3 survey area and surveyed in accordance with the RSLTP for embedded pipe. Measurements were collected every 6.07 inches on average per the RSLTP. However this did not affect the survey effectiveness as 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 the results of the scoping survey. The required number of direct measurements made 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.

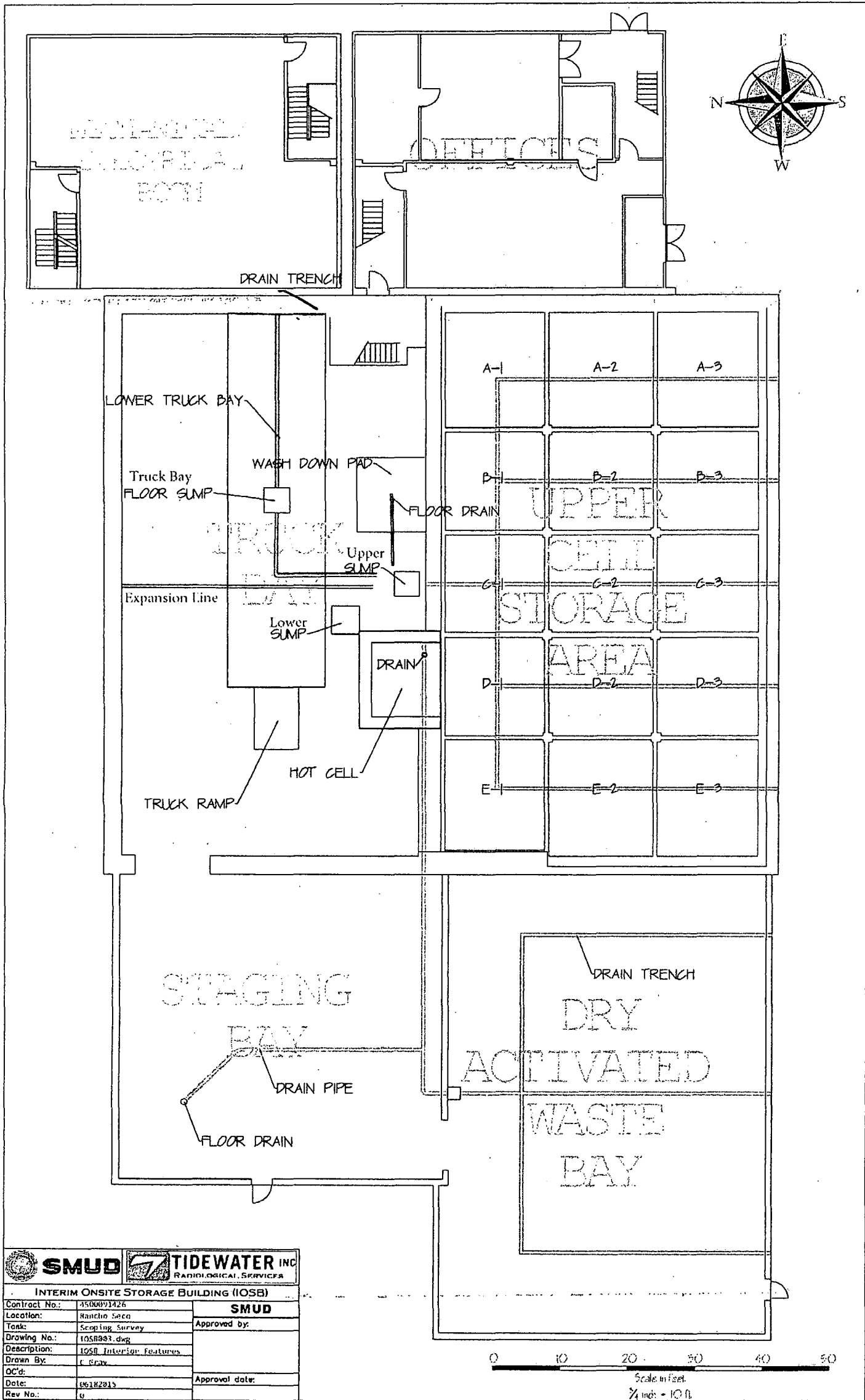
It is concluded that survey unit F8300123 meets the release criteria of 10CFR20.1402.

**Attachment 1**

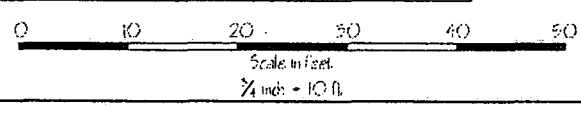
**Maps**

**February 9, 2017**

**Survey Unit F8300123**



<b>INTERIM ONSITE STORAGE BUILDING (IOSB)</b>	
Contract No.:	4500091426
Location:	Rancho Seco
Task:	Scoping Survey
Drawing No.:	1058981.dwg
Description:	IOSB Interior Features
Drawn By:	C. Gray
OC'd:	
Date:	06182015
Rev No.:	0
<b>SMUD</b>	
Approved by: _____ Approval date: _____	



**Attachment 2**

**Instrumentation**

**January 25, 2017**

**Survey Unit F8300123**

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

Measurement Type	Instrument Type	Minimum Detectable Activity <sup>a</sup>	Detector Efficiencies	Calibration Due Date <sup>b</sup>
Gamma Static Measurement 4 inch pipe	Ludlum Model 2350-1 Ludlum Model 44-157 Detector	398 dpm/100 cm <sup>2</sup>	0.791%	203481/201151 4/15/17
Gamma Static Measurement 6 inch pipe	Ludlum Model 2350-1 Ludlum Model 44-159 Detector	247 dpm/100 cm <sup>2</sup>	0.511%	203482/010057 6/30/17

<sup>a</sup> 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).

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

cm<sup>2</sup> = square centimeters

cpm = counts per minute

dpm = disintegrations per minute







**Attachment 3**

**Investigation**

**January 25, 2017**

**Survey Unit F8300123**

**(none required)**

**Attachment 4**

**Data Assessment**

**January 25, 2017**

**Survey Unit F8300123**

