

## Survey Unit Release Record

<b>Design #</b>	EP-SAN 13	<b>Revision #</b>	Original	<b>Page 1 of 3</b>
<b>Survey Unit #(s)</b>	SAN 13			
Description	<p>1) Embedded Pipe (EP) Survey Unit SAN 13 meets the definition of embedded pipe for Plum Brook Reactor Facility (PBRF).</p> <p>2) EP SAN 13 is a Class 1, Group 3.2 survey unit as per the PBRF Final Status Survey Plan (FSSP) and Technical Basis Document (TBD)-06-004.</p> <p>3) Surveys in EP SAN 13 were performed using a scintillation detector optimized to measure gamma energies representative of Cs-137. Sample #EP 3-8 from Survey Request (SR)-13 was referenced for this decision.</p> <p>4) Survey Instructions for this survey unit are incorporated into and performed in accordance with (IAW) the Babcock Services Incorporated (BSI)/LVS-002, Work Execution Package (WEP) 05-006. Survey instructions described in this document constitute "Special Methods" and the survey design used in the acquisition of survey measurements.</p> <p>5) Instrument efficiency determinations are developed in accordance with the BSI/LVS-002, WEP 05-006, these determinations are appropriate for the types of radiation involved and the media being surveyed.</p>			
<b>Approval Signatures</b>			<b>Date:</b>	
FSS/Characterization Engineer			3/5/08	
FSS/Characterization Manager			3/5/08	

## Survey Unit: SAN 13

**1.0 History/Description**

- 1.1 The subject pipe system is a 4" drain line which received influents from the decontamination room and contaminated showers during plant operations. The influents were transferred through the SAN 13 piping to the -15' RB hot sump.
- 1.2 EP SAN 13 is approximately 13 feet in length.

**2.0 Survey Design Information**

- 2.1 EP SAN 13 was surveyed IAW Procedure #BSI/LVS-002.
- 2.2 100% of the 4" ID pipe was accessible for survey. The accessible 4" ID pipe was surveyed by static measurement at one foot increments, for a total of 13 survey measurements.
- 2.3 Surface area for the 4" ID piping is 973 cm<sup>2</sup> for each foot of piping, corresponding to a total 4" ID piping surface area of 12649 cm<sup>2</sup> (1.3 m<sup>2</sup>) for the entire accessible length of (13') of 4" piping.

**3.0 Survey Unit Measurement Locations/Data**

- 3.1 Pipe interior radiological survey forms are provided in Attachment 2 of this release record.

**4.0 Survey Unit Investigations/Results**

- 4.1 None

**5.0 Data Assessment Results**

- 5.1 Data assessment results are provided in the EP/Buried Pipe (BP) Survey Report provided in Attachment 1.
- 5.2 All measurement results are less than the Derived Concentration Guideline Level (DCGL) for radionuclide specific EP that corresponds to the 1 mrem/yr dose goal established in Table 3-3 of the FSSP.
- 5.3 When implementing the Unity Rule, provided in Section 3.6.3 of the FSSP, and applying the Nuclide Fraction (NF), provided in TBD-06-004, the survey unit that is constituted by EP SAN 13 passes FSS.
- 5.4 Background was not subtracted from the survey measurements and the Elevated Measurement Comparison (EMC) was not employed for the accessible portion of this survey unit.
- 5.5 The instrument/detector used for this survey was >12 months and <15 months from it's calibration date. Procedure #BSI/LVS-002, Step 4.3.2 allows use of instrument/detectors within this periodicity. The detector was maintained in service for this survey due to a limited window of schedule opportunity to accomplish the survey of SAN 13, and limited availability of 1" X 1" scintillation detectors with which to accomplish the survey.

Survey Unit: SAN 13

## 5.6 Statistical Summary Table

Statistical Parameter	4" Pipe
Total Number of Survey Measurements	13
Number of Measurements >MDC	13
Number of Measurements Above 50% of DCGL	0
Number of Measurements Above DCGL	0
Mean	0.003
Median	0.003
Standard Deviation	0.001
Maximum	0.004
Minimum	0.002

**6.0** Documentation of evaluations pertaining to compliance with the unrestricted use limit of 25 mrem/yr and dose contributions from Embedded Pipe and radionuclides contributing 10% in aggregate of the total dose for both structural scenarios and soils.

6.1 A review of the survey results has shown that the dose contribution for the accessible portion of EP SAN 13 to be less than 1 mrem/yr. The dose contribution is estimated to be 0.003 mrem/yr based on the average of the actual gross counts.

## 7.0 Attachments

Attachment 1 – BSI EP/BP Survey Report

Attachment 2 -Pipe Interior Radiological Survey Form

Attachment 3 – DQA Worksheet

Attachment 4 –Disc containing RR for EP SAN 13 & Spreadsheet

**SECTION 7  
ATTACHMENT 1  
2 PAGES**



### BSI EP/BP SURVEY REPORT

Pipe ID	SAN 13	Survey Location	-15 RB
Survey Date	17-Jan-08	2350-1 #	189094
Survey Time	1047	Detector-Sled #	LVS1 - 101
Pipe Size	4"	Detector Efficiency	0.00053
DCGL (dpm/100cm2)	3.79E+06	Pipe Area Incorporated by Detector Efficiency (in cm2)	973
Pipe Area Incorporated by Survey Data (m <sup>2</sup> )	1.26	Field BKG (cpm)	8.1
Routine Survey	X	Field MDCR (counts)	19
QA Survey		Nominal MDC (dpm/100cm2)	2,698

#### Survey Measurement Results

Total Number of Survey Measurements	13
Number of Measurements >MDC	13
Number of Measurements Above 50% DCGL	0
Number of Measurements Above DCGL	0
Mean	0.003
Median	0.003
Standard Deviation	0.001
Maximum	0.004
Minimum	0.002

Survey Technician(s) WOOD

Survey Unit Classification	1
TBD 06-004 Piping Group	3.2
SR-13 Radionuclide Distribution Sample	EP 3-8
Measured Nuclide	Cs-137
Area Factor/EMC Used	No
Pass/Fail FSS	Pass
MREM/YR Contribution	<1

COMMENTS:  
ACTIVITY VALUES NOT BACKGROUND CORRECTED

RP Engineer | Date

*Wood* / 3-5-08



**SECTION 7  
ATTACHMENT 2  
2 PAGES**

**SECTION 7  
ATTACHMENT 3  
1 PAGE**

**Pipe Interior Radiological Survey Form**

Date: 1-17-08 Time: 1047  
 Pipe ID#: JAN13 Pipe Diameter: 4" Access Point Area: RB75/  
 Building: RB Elevation: 75' System: JAN  
 Type of Survey Investigation  Characterization  Final Survey  Other   
 Gross  Co60  Cs   
 Detector ID# / Sled ID# LK51 / 101  
 Detector Cal Date: 1-11-07 Detector Cal Due Date: 1-11-08  
 Instrument: 2350-1 Instrument ID #: 189094  
 Instrument Cal Date: 1-11-07 Instrument Cal Due Date: 1-11-08

From the Daily Pipe Survey Detector Control Form for the Selected Detector

Background Value 8.1 cpm  
 MDCR<sub>static</sub> 19 cpm  
 Efficiency Factor for Pipe Diameter 0.00053 (from detector efficiency determination)  
 MDC<sub>static</sub> 2698 dpm/ 100 cm<sup>2</sup>  
 Is the MDC<sub>static</sub> acceptable?  Yes  No (if no, adjust sample count time and recalculate MDC<sub>static</sub>)

Comments:

Instrument w/ 15 months of cal date  
No map available, line located in RB-15 south, east of svmp at floor/wall joint

Technician Signature [Signature]

**Pipe Interior Radiological Survey**

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm <sup>2</sup>
1	1	1.0	16	16	N/A	N/A
2	2	↓	26	26	↓	↓
3	3		20	20		
4	4		18	18		
5	5		19	19		
6	6		22	22		
7	7		28	28		
8	8		18	18		
9	9		19	19		
10	10		19	19		



Pipe Interior Radiological Survey Form (Continuation Form)

Date: 1-17-08  
 Pipe ID#: SAN 13 Pipe Diameter: 4" Access Point Area: RB-15'  
 Building: RB Elevation: -15' System: HOT DRAIN

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm <sup>2</sup>
11	11	1.0	22	22	n/a	n/a
12	12	↓	22	22	↓	↓
13	13	↓	27	27	↓	↓
n/a						



### DQA Check Sheet

Design #	EP SAN 13	Revision #	Original	
Survey Unit #	EP SAN 13			

#### Preliminary Data Review

Answers to the following questions should be fully documented in the Survey Unit Release Record	Yes	No	N/A
1. Have surveys been performed in accordance with survey instructions in the Survey Design?	X		
2. Is the instrumentation MDC for structure static measurements below the DCGL <sub>w</sub> for Class 1 and 2 survey units, or below 0.5 DCGL <sub>w</sub> for Class 3 survey units?			X
3. Is the instrumentation MDC for embedded/buried piping static measurements below the DCGL <sub>w</sub> ?	X		
4. Was the instrumentation MDC for structure scan measurements, soil scan measurements, and embedded/buried piping scan measurements below the DCGL <sub>w</sub> , or, if not, was the need for additional static measurements or soil samples addressed in the survey design?			X
5. Was the instrumentation MDC for volumetric measurements and smear analysis < 10% DCGL <sub>w</sub> ?			X
6. Were the MDCs and assumptions used to develop them appropriate for the instruments and techniques used to perform the survey?	X		
7. Were the survey methods used to collect data proper for the types of radiation involved and for the media being surveyed?	X		
8. Were "Special Methods" for data collection properly applied for the survey unit under review?	X		
9. Is the data set comprised of qualified measurement results collected in accordance with the survey design, which accurately reflects the radiological status of the facility?	x		

#### Graphical Data Review

1. Has a posting plot been created?			X
2. Has a histogram (or other frequency plot) been created?			X
3. Have other graphical data tools been created to assist in analyzing the data?			X

#### Data Analysis

1. Are all sample measurements below the DCGL <sub>w</sub> (Class 1 & 2), or 0.5 DCGL <sub>w</sub> (Class 3)?	X		
2. Is the mean of the sample data < DCGL <sub>w</sub> ?	X		
3. If elevated areas have been identified by scans and/or sampling, is the average activity in each elevated area < DCGL <sub>EMC</sub> (Class 1), < DCGL <sub>w</sub> (Class 2), or <0.5 DCGL <sub>w</sub> (Class 3)?			X
4. Is the result of the Elevated Measurements Test < 1.0?			X
5. Is the result of the statistical test ( <b>S+</b> for Sign Test or <b>W<sub>r</sub></b> for WRS Test) ≥ the critical value?			X

Comments:

FSS/Characterization Engineer (print/sign)	<i>ELWOOD / J Wood</i>	Date	3/5/08
FSS/ Characterization Manager (print/sign)	<i>R. Case</i>	Date	7/5/08

Form  
CS-09/2  
Rev 0

**SECTION 7  
ATTACHMENT 4  
1 DISC**