Survey Unit Release Record				
Design #	EP-FH-102	**Revision #**	Original	**Page 1 of 3**
Survey Unit #(s)	FH-102			
Description	1) Embedded Pipe (EP) Survey Unit FH-102 meets the definition of embedded pipe for Plum Brook Reactor Facility (PBRF). 2) EP FH-102 is a Class 1, Group 3.1 survey unit as per the PBRF Final Status Survey Plan (FSSP) and Technical Basis Document (TBD)-06-004. 3) Surveys in EP FH-102 were performed using a scintillation detector optimized to measure gamma energies representative of Cs-137. Sample #EP 3-6 from Survey Request (SR)-13 was referenced for this decision. 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. 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.			

Approval Signatures		**Date:**
FSS/Characterization Engineer	Ocl Rumbaugh	8-26-07
Technical Reviewer (FSS/Characterization Engineer)	D Wood	10-23-07
FSS/Characterization Manager	R. Case	10/30/07

Form
CS-09/1
Rev 0

1.0 History/Description

1.1 The subject pipe system is the 4" drain line system for the Fan House (FH). The FH floor drain system consists of two major branches that both tie into the header and sump that services the Hot Pipe Tunnel (HPT). The system was accessed at four different locations on the -12 ft elevation of the Fan House. The purpose of the system was to convey water from the floor drain openings on the -12 ft elevation of the FH to a sump located on the -12' elevation of the HPT.

1.2 EP FH-102 consists of approximately 113 feet of drain system piping.

2.0 Survey Design Information

2.1 EP FH-102 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 113 survey measurements.

2.3 Surface area for the 4" ID piping is 973 cm^2 for each foot of piping, corresponding to a total 4" ID piping surface area of 109,935 cm^2 (11.0 m^2) for the entire length of (113') 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 FH-102 passes FSS.

5.4 Background was not subtracted from the survey measurements and the Elevated Measurement Comparison (EMC) was not employed for this survey unit.

5.5 Statistical Summary Table

Statistical Parameter	4" Pipe
Total Number of Survey Measurements	113
Number of Measurements >MDC	107
Number of Measurements Above 50% of DCGL	0
Number of Measurements Above DCGL	0
Mean	0.0219
Median	0.0147
Standard Deviation	0.0272
Maximum	0.1842
Minimum	0.0028

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 EP FH-102 to be less than 1 mrem/yr. The dose contribution is estimated to be 0.022 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 FH-102 & Spreadsheet

SECTION 7
ATTACHMENT 1
5 PAGE(S)

BSI EP/BP SURVEY REPORT

Pipe ID	**EP FH-102**	**Survey Location**	Fan House
Survey Date	02-Nov-06	**2350-1 #**	203438
Survey Time	08:13	**Detector-Sled #**	44-159 238369 / 101
Pipe Size	4"	**Detector Efficiency**	0.00019
DCGL (dpm/100cm2)	3.79E+06	Pipe Area Incorporated by Detector Efficiency (in cm2)	973
Pipe Area Incorporated by Survey Data (m^2)	11.0	**Field BKG** (cpm)	5.1
Routine Survey	X	**Field MDCR** (cpm)	10.8
QA Survey		**Nominal MDC** (dpm/100cm2)	9,453

Survey Measurement Results	
Total Number of Survey Measurements	113
Number of Measurements >MDC	107
Number of Measurements Above 50% DCGL	0
Number of Measurements Above DCGL	0
Mean	0.0219
Median	0.0147
Standard Deviation	0.0272
Maximum	0.1842
Minimum	0.0028

Survey Technician(s)	STOCK

Survey Unit Classification	1
TBD 06-004 Piping Group	3.1
SR-13 Radionuclide Distribution Sample	EP 3-6
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	Del Rudall 8-26-07

EP FH-102
4" Pipe
TBD 06-004 Group 3.1

Measurement #	gcpm	ncpm	Cs-137 activity (total dpm)	Cs-137 activity (dpm/100cm2)	Co-60 activity (dpm/100cm2)	Eu-152 activity (dpm/100cm2)	Eu-154 activity (dpm/100cm2)	Nb-94 activity (dpm/100cm2)	Ag-108m activity (dpm/100cm2)	Unity
1	18	18	94,737	9,738	1,067	-	68	-	-	0.007
2	19	19	100,000	10,279	1,126	-	72	-	-	0.008
3	18	18	94,737	9,738	1,067	-	68	-	-	0.007
4	7	7	36,842	3,787	415	-	27	-	-	0.003
5	17	17	89,474	9,197	1,008	-	65	-	-	0.007
6	17	17	89,474	9,197	1,008	-	65	-	-	0.007
7	20	20	105,263	10,820	1,185	-	76	-	-	0.008
8	19	19	100,000	10,279	1,126	-	72	-	-	0.008
9	29	29	152,632	15,689	1,719	-	110	-	-	0.011
10	22	22	115,789	11,902	1,304	-	84	-	-	0.009
11	17	17	89,474	9,197	1,008	-	65	-	-	0.007
12	34	34	178,947	18,394	2,015	-	129	-	-	0.013
13	23	23	121,053	12,443	1,363	-	87	-	-	0.009
14	31	31	163,158	16,771	1,837	-	118	-	-	0.012
15	27	27	142,105	14,607	1,600	-	103	-	-	0.011
16	30	30	157,895	16,230	1,778	-	114	-	-	0.012
17	54	54	284,211	29,213	3,200	-	205	-	-	0.021
18	33	33	173,684	17,853	1,956	-	125	-	-	0.013
19	25	25	131,579	13,525	1,482	-	95	-	-	0.010
20	18	18	94,737	9,738	1,067	-	68	-	-	0.007
21	17	17	89,474	9,197	1,008	-	65	-	-	0.007
22	28	28	147,368	15,148	1,659	-	106	-	-	0.011
23	24	24	126,316	12,984	1,422	-	91	-	-	0.010
24	27	27	142,105	14,607	1,600	-	103	-	-	0.011
25	18	18	94,737	9,738	1,067	-	68	-	-	0.007
26	23	23	121,053	12,443	1,363	-	87	-	-	0.009
27	27	27	142,105	14,607	1,600	-	103	-	-	0.011
28	18	18	94,737	9,738	1,067	-	68	-	-	0.007
29	23	23	121,053	12,443	1,363	-	87	-	-	0.009
30	19	19	100,000	10,279	1,126	-	72	-	-	0.008
31	22	22	115,789	11,902	1,304	-	84	-	-	0.009
32	54	54	284,211	29,213	3,200	-	205	-	-	0.021

EP FH-102
4" Pipe
TBD 06-004 Group 3.1

Measurement #	gcpm	ncpm	Cs-137 activity (total dpm)	Cs-137 activity (dpm/100cm2)	Co-60 activity (dpm/100cm2)	Eu-152 activity (dpm/100cm2)	Eu-154 activity (dpm/100cm2)	Nb-94 activity (dpm/100cm2)	Ag-108m activity (dpm/100cm2)	Unity
33	21	21	110,526	11,361	1,245	-	80	-	-	0.008
34	25	25	131,579	13,525	1,482	-	95	-	-	0.010
35	31	31	163,158	16,771	1,837	-	118	-	-	0.012
36	36	36	189,474	19,476	2,134	-	137	-	-	0.014
37	29	29	152,632	15,689	1,719	-	110	-	-	0.011
38	36	36	189,474	19,476	2,134	-	137	-	-	0.014
39	32	32	168,421	17,312	1,897	-	122	-	-	0.013
40	31	31	163,158	16,771	1,837	-	118	-	-	0.012
41	20	20	105,263	10,820	1,185	-	76	-	-	0.008
42	22	22	115,789	11,902	1,304	-	84	-	-	0.009
43	16	16	84,211	8,656	948	-	61	-	-	0.006
44	28	28	147,368	15,148	1,659	-	106	-	-	0.011
45	29	29	152,632	15,689	1,719	-	110	-	-	0.011
46	453	453	2,384,211	245,068	26,847	-	1,720	-	-	0.179
47	222	222	1,168,421	120,099	13,157	-	843	-	-	0.088
48	92	92	484,211	49,771	5,452	-	349	-	-	0.036
49	121	121	636,842	65,460	7,171	-	459	-	-	0.048
50	116	116	610,526	62,755	6,875	-	440	-	-	0.046
51	44	44	231,579	23,803	2,608	-	167	-	-	0.017
52	49	49	257,895	26,508	2,904	-	186	-	-	0.019
53	36	36	189,474	19,476	2,134	-	137	-	-	0.014
54	37	37	194,737	20,017	2,193	-	141	-	-	0.015
55	44	44	231,579	23,803	2,608	-	167	-	-	0.017
56	55	55	289,474	29,754	3,260	-	209	-	-	0.022
57	32	32	168,421	17,312	1,897	-	122	-	-	0.013
58	41	41	215,789	22,181	2,430	-	156	-	-	0.016
59	45	45	236,842	24,344	2,667	-	171	-	-	0.018
60	46	46	242,105	24,885	2,726	-	175	-	-	0.018
61	44	44	231,579	23,803	2,608	-	167	-	-	0.017
62	31	31	163,158	16,771	1,837	-	118	-	-	0.012
63	27	27	142,105	14,607	1,600	-	103	-	-	0.011

EP FH-102
4" Pipe
TBD 06-004 Group 3.1

Measurement #	gcpm	ncpm	Cs-137 activity (total dpm)	Cs-137 activity (dpm/100cm2)	Co-60 activity (dpm/100cm2)	Eu-152 activity (dpm/100cm2)	Eu-154 activity (dpm/100cm2)	Nb-94 activity (dpm/100cm2)	Ag-108m activity (dpm/100cm2)	Unity
64	24	24	126,316	12,984	1,422	-	91	-	-	0.010
65	37	37	194,737	20,017	2,193	-	141	-	-	0.015
66	38	38	200,000	20,558	2,252	-	144	-	-	0.015
67	28	28	147,368	15,148	1,659	-	106	-	-	0.011
68	27	27	142,105	14,607	1,600	-	103	-	-	0.011
69	33	33	173,684	17,853	1,956	-	125	-	-	0.013
70	34	34	178,947	18,394	2,015	-	129	-	-	0.013
71	41	41	215,789	22,181	2,430	-	156	-	-	0.016
72	42	42	221,053	22,722	2,489	-	159	-	-	0.017
73	37	37	194,737	20,017	2,193	-	141	-	-	0.015
74	33	33	173,684	17,853	1,956	-	125	-	-	0.013
75	44	44	231,579	23,803	2,608	-	167	-	-	0.017
76	46	46	242,105	24,885	2,726	-	175	-	-	0.018
77	320	320	1,684,211	173,116	18,965	-	1,215	-	-	0.127
78	100	100	526,316	54,099	5,927	-	380	-	-	0.040
79	67	67	352,632	36,246	3,971	-	254	-	-	0.027
80	465	465	2,447,368	251,560	27,559	-	1,766	-	-	0.184
81	58	58	305,263	31,377	3,437	-	220	-	-	0.023
82	29	29	152,632	15,689	1,719	-	110	-	-	0.011
83	41	41	215,789	22,181	2,430	-	156	-	-	0.016
84	36	36	189,474	19,476	2,134	-	137	-	-	0.014
85	39	39	205,263	21,099	2,311	-	148	-	-	0.015
86	46	46	242,105	24,885	2,726	-	175	-	-	0.018
87	59	59	310,526	31,918	3,497	-	224	-	-	0.023
88	51	51	268,421	27,590	3,023	-	194	-	-	0.020
89	52	52	273,684	28,131	3,082	-	197	-	-	0.021
90	44	44	231,579	23,803	2,608	-	167	-	-	0.017
91	63	63	331,579	34,082	3,734	-	239	-	-	0.025
92	76	76	400,000	41,115	4,504	-	289	-	-	0.030
93	47	47	247,368	25,426	2,785	-	178	-	-	0.019
94	39	39	205,263	21,099	2,311	-	148	-	-	0.015

EP FH-102
4" Pipe
TBD 06-004 Group 3.1

Measurement #	gcpm	ncpm	Cs-137 activity (total dpm)	Cs-137 activity (dpm/100cm2)	Co-60 activity (dpm/100cm2)	Eu-152 activity (dpm/100cm2)	Eu-154 activity (dpm/100cm2)	Nb-94 activity (dpm/100cm2)	Ag-108m activity (dpm/100cm2)	Unity
95	54	54	284,211	29,213	3,200	-	205	-	-	0.021
96	45	45	236,842	24,344	2,667	-	171	-	-	0.018
97	79	79	415,789	42,738	4,682	-	300	-	-	0.031
98	73	73	384,211	39,492	4,326	-	277	-	-	0.029
99	62	62	326,316	33,541	3,674	-	235	-	-	0.025
100	207	207	1,089,474	111,985	12,268	-	786	-	-	0.082
101	72	72	378,947	38,951	4,267	-	273	-	-	0.029
102	96	96	505,263	51,935	5,690	-	365	-	-	0.038
103	50	50	263,158	27,049	2,963	-	190	-	-	0.020
104	80	80	421,053	43,279	4,741	-	304	-	-	0.032
105	46	46	242,105	24,885	2,726	-	175	-	-	0.018
106	56	56	294,737	30,295	3,319	-	213	-	-	0.022
107	42	42	221,053	22,722	2,489	-	159	-	-	0.017
108	60	60	315,789	32,459	3,556	-	228	-	-	0.024
109	85	85	447,368	45,984	5,038	-	323	-	-	0.034
110	107	107	563,158	57,886	6,341	-	406	-	-	0.042
111	115	115	605,263	62,214	6,816	-	437	-	-	0.046
112	90	90	473,684	48,689	5,334	-	342	-	-	0.036
113	55	55	289,474	29,754	3,260	-	209	-	-	0.022
									MEAN	0.022
									MEDIAN	0.015
									STD DEV	0.027
									MAX	0.184
									MIN	0.003

SECTION 7
ATTACHMENT 2
__8__ PAGE(S)

Pipe Interior Radiological Survey Form

Date: 11/02/06 Time: 0813

Pipe ID#: FH-102 Pipe Diameter: 4" Access Point Area: FH-1

Building: FAN HOUSE Elevation: -12' System: FLR. DRN.

Type of Survey Investigation _____ Characterization _____ Final Survey X Other ✓

Gross _____ Co60 _____ Cs ✓

Detector ID# / Sled ID# 44-159 #238369 / 101

Detector Cal Date: 9/5/06 Detector Cal Due Date: 9/5/07

Instrument: 2350-1 Instrument ID #: 203488

Instrument Cal Date: 7/5/06 Instrument Cal Due Date: 7/5/07

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

Background Value 5.1 cpm

$MDCR_{static}$ 10.8 cpm

Efficiency Factor for Pipe Diameter 0.00019 (from detector efficiency determination)

MDC_{static} 9453 dpm/ 100 cm^2

Is the MDC_{static} acceptable? (Yes) No (if no, adjust sample count time and recalculate $MDCR_{static}$)

Comments: POST HYDRO RESURVEY PARTIAL
POSITION # 1 IS THE DROP.
EP3-6

Technician Signature _____

Pipe Interior Radiological Survey

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm²
1	1	1	18	18	n/a	n/a
2	2		19	19		
3	3		18	18		
4	4		7	7		
5	5		17	17		
6	6		17	17		
7	7		20	20		
8	8		19	19		
9	9		29	29		
10	10		22	22		

Pipe Interior Radiological Survey Form (Continuation Form)

Date: 11/02/06
Pipe ID#: FH-102 Pipe Diameter: 4" Access Point Area: FH-1
Building: FAN HOUSE Elevation: -12' System: FLR DRNS

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm^2
11	11	1	17	17	n/a	n/a
12	12		34	34		
13	13		23	23		
14	14		31	31		
15	15		27	27		
16	16		30	30		
17	17		54	54		
18	18		33	33		
19	19		25	25		
20	20		18	18		
21	21		17	17		
22	22		28	28		
23	23		24	24		
24	24		27	27		
25	25		18	18		
26	26		23	23		
27	27		27	27		
28	28		18	18		
29	29		23	23		
30	30		19	19		
31	31		22	22		
32	32		54	54		
33	33		21	21		
~~34~~	34		25	25		
35	35		31	31		
36	36		36	36		
37	37		29	29		
38	38		36	36		
39	39		32	32		
40	40		31	31		
41	41		20	20		
			N			
			A			

Package Page 2 of 2

Pipe Interior Radiological Survey Form

Date: 11/02/06 Time: 1054

Pipe ID#: FH-102 Pipe Diameter: 4" Access Point Area: FH-2

Building: FAN HOUSE Elevation: -12' System: PLR DRN

Type of Survey Investigation ____ Characterization ____ Final Survey X Other ✓

Gross ____ Co60 ____ Cs ✓

Detector ID# / Sled ID# 44-159 238369 / 101

Detector Cal Date: 9/5/06 Detector Cal Due Date: 9/5/07

Instrument: 2350-1 Instrument ID #: 203488

Instrument Cal Date: 7/5/06 Instrument Cal Due Date: 7/5/07

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

Background Value 5.1 cpm

$MDCR_{static}$ 10.8 cpm

Efficiency Factor for Pipe Diameter 0.00019 (from detector efficiency determination)

MDC_{static} 9453 dpm/ 100 cm^2

Is the MDC_{static} acceptable? (Yes) No (if no, adjust sample count time and recalculate $MDCR_{static}$)

Comments: POST HYDRO RESURVEY EP3-6 PARTIAL

POSITION # 4 IS THE DROP

Technician Signature

Pipe Interior Radiological Survey

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm²
1	1	1	22	22	n/a	n/a
2	2	~~1~~	16	16	↓	↓
3	3	1	28	28		
4	1	1	29	29		
5						
6						
7			N			
8						
9			A			
10						

Pipe Interior Radiological Survey Form

Date: 11/02/06 Time: 1104

Pipe ID#: FH-102 Pipe Diameter: 4" Access Point Area: FH-3

Building: FAN HOUSE Elevation: -12' System: PLR DRN

Type of Survey Investigation ____ Characterization ____ Final Survey X Other ____

Gross ____ Co60 ____ Cs ✓

Detector ID# / Sled ID# 44-159 #238369 / 101

Detector Cal Date: 9/5/06 Detector Cal Due Date: 9/5/07

Instrument: 2350-1 Instrument ID #: 203488

Instrument Cal Date: 7/5/06 Instrument Cal Due Date: 7/5/07

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

Background Value 5.1 cpm

$MDCR_{static}$ 10.8 cpm

Efficiency Factor for Pipe Diameter 0.00019 (from detector efficiency determination)

MDC_{static} 9453 dpm/ 100 cm^2

Is the MDC_{static} acceptable? (Yes) No (if no, adjust sample count time and recalculate $MDCR_{static}$)

Comments: POST HYDRO RESURVEY EP3-6 PARTIAL
POSITION # 32 IS THE DROP.

Technician Signature [signature]

Pipe Interior Radiological Survey

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm²
1	1	1	453	453	n/a	n/a
2	2	↓	222	222	↓	↓
3	3		92	92		
4	4		121	121		
5	5		116	116		
6	6		44	44		
7	7		49	49		
8	8		36	36		
9	9		37	37		
10	10		44	44		

Pipe Interior Radiological Survey Form (Continuation Form)

Date: 11/02/06
Pipe ID#: FH-102 Pipe Diameter: 4" Access Point Area: FH-3
Building: FAN HOUSE Elevation: -12' System: FLR DRN.

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm^2
11	11	1	55	55	n/a	n/a
12	12		32	32		
13	13		41	41		
14	14		45	45		
15	15		46	46		
16	16		44	44		
17	17		31	31		
18	18		27	27		
19	19		24	24		
20	20		37	37		
21	21		38	38		
22	22		28	28		
23	23		27	27		
24	24		33	33		
25	25		34	34		
26	26		41	41		
27	27		42	42		
28	28		37	37		
29	29		33	33		
30	30		44	44		
31	31	1	46	46		
32	1	1	320	320		
			N			
			A			

Package Page 2 of 2

Pipe Interior Radiological Survey Form

Date: 11/02/06 Time: 1345

Pipe ID#: FH-102 Pipe Diameter: 4" Access Point Area: FH-4

Building: FAN House Elevation: -12' System: FLR DRN

Type of Survey Investigation _____ Characterization _____ Final Survey X Other ✓

Gross _____ Co60 _____ Cs ✓

Detector ID# / Sled ID# 44159 238369 / 101

Detector Cal Date: 9/5/06 Detector Cal Due Date: 9/5/07

Instrument: 2350-1 Instrument ID #: 203488

Instrument Cal Date: 7/5/06 Instrument Cal Due Date: 7/5/07

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

Background Value 5.1 cpm

$MDCR_{static}$ 10.8 cpm

Efficiency Factor for Pipe Diameter 0.00019 (from detector efficiency determination)

MDC_{static} 9453 dpm/ 100 cm^2

Is the MDC_{static} acceptable? (Yes) No (if no, adjust sample count time and recalculate $MDCR_{static}$)

Comments: POST HYDRO RESURVEY EP3-6 ~~PARTIAL~~ COMPLETE
Position #36 is the DROP

Technician Signature _____

Pipe Interior Radiological Survey

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm²
1	1	1	100	100	n/a	n/a
2	2	↓	67	67	↓	↓
3	3		465	465		
4	4		58	58		
5	5		29	29		
6	6		41	41		
7	7		36	36		
8	8		39	39		
9	9		46	46		
10	10	↓	59	59	↓	↓

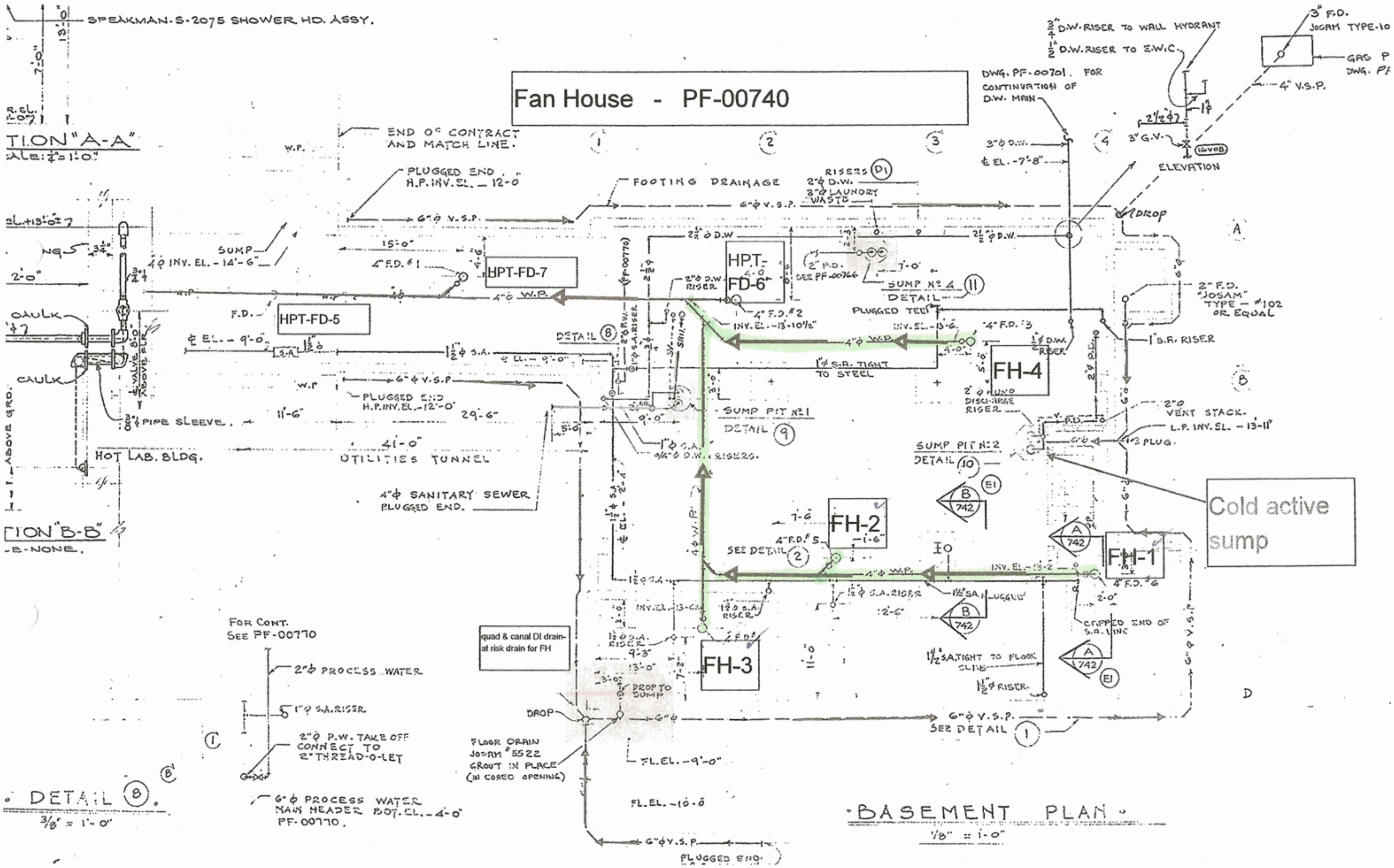
Pipe Interior Radiological Survey Form (Continuation Form)

Date: 11/02/06
Pipe ID#: FH-102 Pipe Diameter: 4" Access Point Area: FH-4
Building: FAN HOUSE Elevation: -12' System: FLR DRAIN

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm^2
11	11	1	51	51	n/a	n/a
12	12		52	52		
13	13		44	44		
14	14		63	63		
15	15		76	76		
16	16		47	47		
17	17		39	39		
18	18		54	54		
19	19		45	45		
20	20		79	79		
21	21		73	73		
22	22		62	62		
23	23		207	207		
24	24		72	72		
25	25		96	96		
26	26		50	50		
27	27		80	80		
28	28		46	46		
29	29		56	56		
30	30		42	42		
31	31		60	60		
32	32		85	85		
33	33		107	107		
34	34		115	115		
35	35		90	90		
36	36		55	55		
			N			
			A			

Package Page 2 of 2

FH-102


Fan House - PF-00740
SPEAKMAN-S-2075 SHOWER HD. ASSY.
END OF CONTRACT AND MATCH LINE.
PLUGGED END H.P. INV. EL. - 12-0
FOOTING DRAINAGE
RISERS (P1)
6"φ V.S.P.
DWG. PF-00701. FOR CONTINUATION OF D.W. MAIN
3/4" D.W. RISER TO WALL HYDRANT
1/2" D.W. RISER TO E.W.C.
3" F.D. JOSAM TYPE-10
4" V.S.P.
3" G.V.
ELEVATION
DROP
HPT-FD-7
HPT-FD-6
HPT-FD-5
4" F.D. #1
SUMP 4φ INV. EL. - 14'-6"
SUMP No 4 DETAIL (11)
PLUGGED TEE
2" F.D. "JOSAM" TYPE - #102 OR EQUAL
1" S.A. RISER
FH-4
FH-2
FH-1
FH-3
DETAIL (8)
1 1/2" S.A. TIGHT TO STEEL
PLUGGED END H.P. INV. EL. - 12'-0"
SUMP PIT No 1 DETAIL (9)
SUMP PIT No 2 DETAIL (10)
2"φ VENT STACK. L.P. INV. EL. - 13'-11"
41'-0"
UTILITIES TUNNEL
HOT LAB. BLDG.
4"φ SANITARY SEWER PLUGGED END.
Cold active sump
SEE DETAIL (2)
quad & canal DI drain- at risk drain for FH
FOR CONT. SEE PF-00770
2"φ PROCESS WATER
1"φ S.A. RISER
2"φ P.W. TAKE OFF CONNECT TO 2" THREAD-O-LET
6"φ PROCESS WATER MAIN HEADER BOT. EL. - 4'-0" PF-00770.
DROP TO SUMP
FLOOR DRAIN JOSAM #5522 GROUT IN PLACE (IN CORED OPENING)
FL. EL. - 9'-0"
FL. EL. - 10'-0
6"φ V.S.P. SEE DETAIL (1)
1 1/2" S.A. TIGHT TO FLOOR SLAB
1 1/2" φ RISER
CRIPPED END OF S.A. LINE
6"φ V.S.P. PLUGGED END
DETAIL (8)
3/8" = 1'-0"
BASEMENT PLAN
1/8" = 1'-0"
SECTION "A-A"
SECTION "B-B"

SECTION 7
ATTACHMENT 3
___/___ PAGE(S)

DQA Check Sheet				
Design #	EP FH-102	Revision #	Original	
Survey Unit #	EP FH-102			

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 $DCGL_W$ for Class 1 and 2 survey units, or below 0.5 $DCGL_W$ for Class 3 survey units?			X
3. Is the instrumentation MDC for embedded/buried piping static measurements below the $DCGL_W$?	X		
4. Was the instrumentation MDC for structure scan measurements, soil scan measurements, and embedded/buried piping scan measurements below the $DCGL_W$, 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% $DCGL_W$?			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 $DCGL_W$ (Class 1 & 2), or 0.5 $DCGL_W$ (Class 3)?	X		
2. Is the mean of the sample data < $DCGL_W$?	X		
3. If elevated areas have been identified by scans and/or sampling, is the average activity in each elevated area < $DCGL_{EMC}$ (Class 1), < $DCGL_W$ (Class 2), or <0.5 $DCGL_W$ (Class 3)?			X
4. Is the result of the Elevated Measurements Test < 1.0?			X
5. Is the result of the statistical test ($S+$ for Sign Test or W_r for WRS Test) $\geq$ the critical value?			X

Comments:

FSS/Characterization Engineer (print/sign)	Dale Randall / Dale Randall	Date	8-26-07
FSS/ Characterization Manager (print/sign)	R. Case	Date	10/30/07

Form CS-09/2 Rev 0

SECTION 7
ATTACHMENT 4
1 DISC