Survey Unit Release Record				
Design #	EP-PPH 109	**Revision #**	Original	**Page 1 of 4**
Survey Unit #(s)	PPH 109			
Description	1) Portions of Embedded Pipe (EP) Survey Unit PPH 109 that remain embedded in the building foundation walls meet the definition of embedded pipe for Plum Brook Reactor Facility (PBRF). The portion of piping which transits in soil under and between the buildings does not meet the criteria for embedded piping. Upon demonstration of compliance with the release criteria (Sect. 5.2) , the complete piping system will be grouted, including the portions embedded in the building structure that will remain embedded for any future reuse and those portions in the ground that can be released for unrestricted use. 2) EP PPH 109 is a Class 1, Group 1 survey unit as per the PBRF Final Status Survey Plan (FSSP) and Technical Basis Document (TBD)-06-004. 3) Multiple core bores were performed to remove sections of this pipe system to facilitate access for remediation and survey. Underlying soils were exposed by this activity. Isotopic analysis of soil samples taken after the completion of these activities indicate residual radioactivity at concentrations well below the release criteria. 4) Surveys in EP PPH 109 were performed using a scintillation detector optimized to measure gamma energies representative of Co^{60}. Sample #EP 3-7 from Survey Request (SR)-13 was referenced for this decision. 5) 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. 6) 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		5/2/08
FSS/Characterization Manager	R. Case	5/6/08

Form
CS-09/1
Rev 0

1.0 History/Description

1.1 The subject pipe is a 4, 6 and 8" drain line from PPH Room 1, PPH Room 2, PPH Room 3, PPH Room 4, and PPH Room 8 to the sump located in PPH Room 8.

1.2 EP PPH 109 consists of 4, 6 and 8" diameter piping that is approximately 209 feet in length.

2.0 Survey Design Information

2.1 EP PPH 109 was surveyed IAW Procedure #BSI/LVS-002.

2.2 100% of the 4" pipe was accessible for survey. The accessible 4" pipe was surveyed by static measurement at one foot increments, for a total of 142 survey measurements.

2.3 Surface area for the 4" piping is 973 cm^2 for each foot of piping, corresponding to a total 4" piping surface area of 138166 cm^2 (13.9 m^2) for the entire length of (approximately 142') of 4" piping.

2.4 100% of the 6" pipe was accessible for survey. The accessible 6" pipe was surveyed by static measurement at one foot increments, for a total of 47 survey measurements.

2.5 Surface area for the 6" piping is 1,459 cm^2 for each foot of piping, corresponding to a total 6" piping surface area of 68573 cm^2 (6.8 m^2) for the entire length of (approximately 47') of 6" piping.

2.6 100% of the 8" pipe was accessible for survey. The accessible 8" pipe was surveyed by static measurement at one foot increments, for a total of 20 survey measurements.

2.7 Surface area for the 8" piping is 1,946 cm^2 for each foot of piping, corresponding to a total 8" piping surface area of 38920 cm^2 (3.9 m^2) for the entire length of (approximately 20') of 8" piping.

2.8 The surface area of PPH 109 is 24.6 m^2.

3.0 Survey Unit Measurement Locations/Data

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

3.2 All floor drains, risers and connecting piping to the main collection headers were removed by core bore during the remediation efforts with the exception of FD 8-1. Graphical presentation of these excavations in included in Attachment 3.

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 Reports provided in Attachment 1.

5.2 This survey unit was assessed as a building re-use scenario with all activity derived dose as a 100% Co^{60} nuclide distribution. This is the most conservative DCGL for the facility (11,000 dpm/100cm^2).

5.3 Four measurements observed in EP PPH 109 exceeded the Unity Rule as provided in Section 3.6.3 of the FSSP. Elevated Measurement Comparisons (EMC) and Elevated Measurement Tests were performed. EMC Unity for this survey unit is 0.130, EMT Unity is 0.550. The survey unit that is constituted by EP PPH 109 passes FSS.

5.4 The elevated measurements discussed in 5.3 above occurred in different rooms of the Primary Pump House. Additionally, PPH Room 4 may constitute more than one survey unit for structural survey unit dispositions. Individual data assessments were performed for each discreet section of piping to assist with future FSS efforts in the PPH. A composite assessment of all the piping bounded by EP PPH 109 was also performed. This composite assessment is reported in Section 5.7, the individual assessments may be reviewed in Attachment 1.

5.5 DCGL's for the building reuse scenario are used to demonstrate compliance with the release criterion for this release record. The DCGL's for embedded pipe are not applied.

5.6 Background was not subtracted from the survey measurements.

5.7 Statistical Summary Table

Statistical Parameter	
Total Number of Survey Measurements	209
Number of Measurements >MDC	207
Number of Measurements Above 50% of DCGL	100
Number of Measurements Above DCGL	4
Mean	0.502
Median	0.479
Standard Deviation	0.209
Maximum	1.437
Minimum	0.144

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 PPH 109 to be less than 25 mrem/yr. The dose contribution is estimated to be 12.6 mrem/yr based on the average of the actual gross counts measured.

7.0 Attachments

Attachment 1 – BSI EP/BP Survey Report
Attachment 2 – Pipe Interior Radiological Survey Form
Attachment 3 – Soil Sample Analysis
Attachment 4 – DQA Worksheet
Attachment 5 – EP PPH 109 Spreadsheet Disc

SECTION 7
ATTACHMENT 1
37 PAGES

BSI EP/BP SURVEY REPORT

Pipe ID	**PPH 109**	**Survey Location**	PRIMARY PUMP HOUSE
Survey Date	See Survey Sheets	**2350-1 #**	189094 / 203438
Survey Time	See Survey Sheets	**Detector-Sled #**	LVS1-101
Pipe Size	4", 6", 8"	**Detector Efficiency**	See Survey Sheets
DCGL (dpm/100cm2)	1.10E+04	Pipe Area Incorporated by Detector Efficiency (in cm2)	See Survey Sheets
Pipe Area Incorporated by Survey Data (m^2)	24.6	**Field BKG** (cpm)	See Survey Sheets
Routine Survey	X	**Field MDCR** (cpm)	See Survey Sheets
QA Survey		**Nominal MDC** (dpm/100cm2)	See Survey Sheets

Survey Measurement Results	
Total Number of Survey Measurements	209
Number of Measurements >MDC	207
Number of Measurements Above 50% DCGL	100
Number of Measurements Above DCGL	4
Mean	0.502
Median	0.479
Standard Deviation	0.209
Maximum	1.437
Minimum	0.144

Survey Technician(s)	PHELPS

Survey Unit Classification	1
TBD 06-004 Piping Group	1
SR-13 Radionuclide Distribution Sample	EP 3-7
Measured Nuclide	Co-60
Area Factor/EMC Used	Yes
Pass/Fail FSS	Pass
MREM/YR Contribution	<25

COMMENTS:

ACTIVITY VALUES NOT BACKGROUND CORRECTED.

RP Engineer | Date	DWood / 5-2-08

PPH 109
4', 6", 8" Pipe
TBD 06-004 Group 1

	Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity	
PPH CO-1 4 INCH	1	23	23	58,974	6,061	0.551		0.551	
	2	20	20	51,282	5,271	0.479		0.479	
	3	18	18	46,154	4,743	0.431		0.431	
	4	15	15	38,462	3,953	0.359		0.359	
	5	30	30	76,923	7,906	0.719		0.719	
	7	18	18	46,154	4,743	0.431		0.431	
	8	30	30	76,923	7,906	0.719		0.719	
	9	25	25	64,103	6,588	0.599		0.599	
	10	12	12	30,769	3,162	0.287		0.287	
	11	17	17	43,590	4,480	0.407		0.407	
	12	12	12	30,769	3,162	0.287		0.287	
	13	13	13	33,333	3,426	0.311		0.311	
	14	10	10	25,641	2,635	0.240		0.240	
	15	28	28	71,795	7,379	0.671		0.671	
	16	23	23	58,974	6,061	0.551		0.551	
	17	22	22	56,410	5,798	0.527		0.527	
	18	15	15	38,462	3,953	0.359		0.359	
	19	25	25	64,103	6,588	0.599		0.599	
	20	34	34	87,179	8,960	0.815		0.815	
	21	58	58	148,718	15,284	1.389	0.035		0.022
PPH CO-2 4 INCH	1	14	14	35,897	3,689	0.335		0.335	
	2	13	13	33,333	3,426	0.311		0.311	
	3	15	15	38,462	3,953	0.359		0.359	
	4	14	14	35,897	3,689	0.335		0.335	
	5	10	10	25,641	2,635	0.240		0.240	
	7	15	15	38,462	3,953	0.359		0.359	
	8	18	18	46,154	4,743	0.431		0.431	
	9	21	21	53,846	5,534	0.503		0.503	
	10	6	6	15,385	1,581	0.144		0.144	
	11	12	12	30,769	3,162	0.287		0.287	
	12	14	14	35,897	3,689	0.335		0.335	
	13	12	12	30,769	3,162	0.287		0.287	
	14	28	28	71,795	7,379	0.671		0.671	
	15	16	16	41,026	4,216	0.383		0.383	
	16	9	9	23,077	2,372	0.216		0.216	
	17	22	22	56,410	5,798	0.527		0.527	
	18	12	12	30,769	3,162	0.287		0.287	
	19	17	17	43,590	4,480	0.407		0.407	
	20	26	26	66,667	6,852	0.623		0.623	
	21	25	25	64,103	6,588	0.599		0.599	
	22	39	39	100,000	10,277	0.934		0.934	
	23	60	60	153,846	15,812	1.437	0.036		0.024

PPH 109
4', 6", 8" Pipe
TBD 06-004 Group 1

	Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity	
PPH CO 3-1 4 IN	1	23	23	58,974	6,061	0.551		0.551	
	2	26	26	66,667	6,852	0.623		0.623	
	3	14	14	35,897	3,689	0.335		0.335	
	4	25	25	64,103	6,588	0.599		0.599	
	5	22	22	56,410	5,798	0.527		0.527	
	7	58	58	148,718	15,284	1.389	0.035		0.018
	8	42	42	107,692	11,068	1.006	0.025		
	9	36	36	92,308	9,487	0.862		0.862	
	10	35	35	89,744	9,223	0.838		0.838	
	11	23	23	58,974	6,061	0.551		0.551	
	12	37	37	94,872	9,750	0.886		0.886	
PPH CO 3-2 4 IN	1	12	12	30,769	3,162	0.287		0.287	
	2	19	19	48,718	5,007	0.455		0.455	
	3	6	6	15,385	1,581	0.144		0.144	
	4	26	26	66,667	6,852	0.623		0.623	
	5	38	38	97,436	10,014	0.910		0.910	
	6	16	16	41,026	4,216	0.383		0.383	
	7	13	13	33,333	3,426	0.311		0.311	
	8	17	17	43,590	4,480	0.407		0.407	
	9	14	14	35,897	3,689	0.335		0.335	
	10	22	22	56,410	5,798	0.527		0.527	
	11	23	23	58,974	6,061	0.551		0.551	
	12	24	24	61,538	6,325	0.575		0.575	
	13	19	19	48,718	5,007	0.455		0.455	

PPH 109
4', 6", 8" Pipe
TBD 06-004 Group 1

	Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity	
PPH CO 3-2 6 IN	14	36	36	116,129	7,959	0.724		0.724	
	15	30	30	96,774	6,633	0.603		0.603	
	16	10	10	32,258	2,211	0.201		0.201	
	17	29	29	93,548	6,412	0.583		0.583	
	18	20	20	64,516	4,422	0.402		0.402	
	19	36	36	116,129	7,959	0.724		0.724	
	20	32	32	103,226	7,075	0.643		0.643	
	21	36	36	116,129	7,959	0.724		0.724	
	22	37	37	119,355	8,181	0.744		0.744	
	23	32	32	103,226	7,075	0.643		0.643	
	24	25	25	80,645	5,527	0.502		0.502	
	25	27	27	87,097	5,970	0.543		0.543	
	26	35	35	112,903	7,738	0.703		0.703	
	27	40	40	129,032	8,844	0.804		0.804	
	28	38	38	122,581	8,402	0.764		0.764	
	29	38	38	122,581	8,402	0.764		0.764	
	30	30	30	96,774	6,633	0.603		0.603	
	31	39	39	125,806	8,623	0.784		0.784	
	32	37	37	119,355	8,181	0.744		0.744	
	33	35	35	112,903	7,738	0.703		0.703	
	34	25	25	80,645	5,527	0.502		0.502	
	35	39	39	125,806	8,623	0.784		0.784	
PPH CO 4-1 4 IN	1	19	19	48,718	5,007	0.455		0.455	
	2	23	23	58,974	6,061	0.551		0.551	
	3	21	21	53,846	5,534	0.503		0.503	
	4	15	15	38,462	3,953	0.359		0.359	
	5	29	29	74,359	7,642	0.695		0.695	
	6	23	23	58,974	6,061	0.551		0.551	
	7	21	21	53,846	5,534	0.503		0.503	
	8	26	26	66,667	6,852	0.623		0.623	
PPH CO 4-1 6 IN	9	27	27	87,097	5,970	0.543		0.543	
	10	22	22	70,968	4,864	0.442		0.442	
	11	24	24	77,419	5,306	0.482		0.482	
	12	21	21	67,742	4,643	0.422		0.422	
	13	18	18	58,065	3,980	0.362		0.362	
	14	17	17	54,839	3,759	0.342		0.342	
	15	21	21	67,742	4,643	0.422		0.422	
	16	27	27	87,097	5,970	0.543		0.543	
	17	32	32	103,226	7,075	0.643		0.643	
	18	25	25	80,645	5,527	0.502		0.502	
	19	11	11	35,484	2,432	0.221		0.221	

PPH 109
4', 6", 8" Pipe
TBD 06-004 Group 1

	Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity	
PPH CO 4-2	1	17	17	43,590	4,480	0.407		0.407	
	2	15	15	38,462	3,953	0.359		0.359	
	3	22	22	56,410	5,798	0.527		0.527	
	4	14	14	35,897	3,689	0.335		0.335	
	5	13	13	33,333	3,426	0.311		0.311	
	6	41	41	105,128	10,805	0.982		0.982	
	8	30	30	76,923	7,906	0.719		0.719	
	9	26	26	66,667	6,852	0.623		0.623	
	10	20	20	51,282	5,271	0.479		0.479	
	11	30	30	76,923	7,906	0.719		0.719	
	12	23	23	58,974	6,061	0.551		0.551	
	13	22	22	56,410	5,798	0.527		0.527	
	14	24	24	61,538	6,325	0.575		0.575	
	15	22	22	56,410	5,798	0.527		0.527	
	16	36	36	92,308	9,487	0.862		0.862	
	17	20	20	51,282	5,271	0.479		0.479	
	18	15	15	38,462	3,953	0.359		0.359	
	19	19	19	48,718	5,007	0.455		0.455	
PPH CO 4-3 4IN	1	20	20	51,282	5,271	0.479		0.479	
	2	14	14	35,897	3,689	0.335		0.335	
	3	12	12	30,769	3,162	0.287		0.287	
	4	24	24	61,538	6,325	0.575		0.575	
	5	16	16	41,026	4,216	0.383		0.383	
	6	28	28	71,795	7,379	0.671		0.671	
	7	19	19	48,718	5,007	0.455		0.455	
	8	23	23	58,974	6,061	0.551		0.551	
PPH CO 4-3 6IN	9	19	19	61,290	4,201	0.382		0.382	
	10	23	23	74,194	5,085	0.462		0.462	
	11	15	15	48,387	3,316	0.301		0.301	
	12	9	9	29,032	1,990	0.181		0.181	
	13	13	13	41,935	2,874	0.261		0.261	
	14	19	19	61,290	4,201	0.382		0.382	
	15	13	13	41,935	2,874	0.261		0.261	
	16	24	24	77,419	5,306	0.482		0.482	
	17	14	14	45,161	3,095	0.281		0.281	
	18	13	13	41,935	2,874	0.261		0.261	
	19	15	15	48,387	3,316	0.301		0.301	
	20	19	19	61,290	4,201	0.382		0.382	
	21	30	30	96,774	6,633	0.603		0.603	
	22	13	13	41,935	2,874	0.261		0.261	

PPH 109
4', 6", 8" Pipe
TBD 06-004 Group 1

	Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity	
PPH CO 4-3 8IN	23	24	24	82,759	4,253	0.387		0.387	
	24	22	22	75,862	3,898	0.354		0.354	
	25	21	21	72,414	3,721	0.338		0.338	
	26	56	56	193,103	9,923	0.902		0.902	
	27	44	44	151,724	7,797	0.709		0.709	
	28	27	27	93,103	4,784	0.435		0.435	
	29	27	27	93,103	4,784	0.435		0.435	
	30	55	55	189,655	9,746	0.886		0.886	
	31	35	35	120,690	6,202	0.564		0.564	
	32	35	35	120,690	6,202	0.564		0.564	
	33	21	21	72,414	3,721	0.338		0.338	
	34	24	24	82,759	4,253	0.387		0.387	
	35	18	18	62,069	3,190	0.290		0.290	
	36	16	16	55,172	2,835	0.258		0.258	
	37	20	20	68,966	3,544	0.322		0.322	
	38	23	23	79,310	4,076	0.371		0.371	
	39	20	20	68,966	3,544	0.322		0.322	
	40	12	12	41,379	2,126	0.193		0.193	
	41	17	17	58,621	3,012	0.274		0.274	
	42	17	17	58,621	3,012	0.274		0.274	
PPH CO8-1	1	22	22	56,410	5,798	0.527		0.527	
	2	23	23	58,974	6,061	0.551		0.551	
	3	27	27	69,231	7,115	0.647		0.647	
	4	20	20	51,282	5,271	0.479		0.479	
	5	11	11	28,205	2,899	0.264		0.264	
	6	15	15	38,462	3,953	0.359		0.359	
PPH CO 8-2	1	16	16	41,026	4,216	0.383		0.383	
	2	13	13	33,333	3,426	0.311		0.311	
	3	16	16	41,026	4,216	0.383		0.383	
	4	14	14	35,897	3,689	0.335		0.335	
	5	18	18	46,154	4,743	0.431		0.431	

PPH 109
4', 6", 8" Pipe
TBD 06-004 Group 1

	Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity	
PPH CO 8-3	1	24	24	61,538	6,325	0.575		0.575	
	2	28	28	71,795	7,379	0.671		0.671	
	3	17	17	43,590	4,480	0.407		0.407	
	4	30	30	76,923	7,906	0.719		0.719	
	5	16	16	41,026	4,216	0.383		0.383	
	6	22	22	56,410	5,798	0.527		0.527	
	7	26	26	66,667	6,852	0.623		0.623	
	8	18	18	46,154	4,743	0.431		0.431	
	9	18	18	46,154	4,743	0.431		0.431	
	10	20	20	51,282	5,271	0.479		0.479	
	11	10	10	25,641	2,635	0.240		0.240	
	12	12	12	30,769	3,162	0.287		0.287	
	13	21	21	53,846	5,534	0.503		0.503	
	14	21	21	53,846	5,534	0.503		0.503	
	15	26	26	66,667	6,852	0.623		0.623	
	16	35	35	89,744	9,223	0.838		0.838	
	17	11	11	28,205	2,899	0.264		0.264	
	18	17	17	43,590	4,480	0.407		0.407	
	19	24	24	61,538	6,325	0.575		0.575	
	20	21	21	53,846	5,534	0.503		0.503	
	21	21	21	53,846	5,534	0.503		0.503	
	22	16	16	41,026	4,216	0.383		0.383	
	23	28	28	71,795	7,379	0.671		0.671	
	24	12	12	30,769	3,162	0.287		0.287	
	25	12	12	30,769	3,162	0.287		0.287	
FD 8-1	1	21	21	53,846	5,534	0.503		0.503	
	2	15	15	38,462	3,953	0.359		0.359	
	3	17	17	43,590	4,480	0.407		0.407	
	4	12	12	30,769	3,162	0.287		0.287	
	5	30	30	76,923	7,906	0.719		0.719	
	6	25	25	64,103	6,588	0.599		0.599	
					5,346		**0.130**	**0.550**	
					MEAN	0.502	**EMC Unity**	**EMT Unity**	
					MEDIAN	0.479			
					STD DEV	0.209			
					MAX	1.437			
					MIN	0.144			

Babcock

BSI EP/BP SURVEY REPORT

Pipe ID	PPH 109	Survey Location	PPH RM 1, CO-1
Survey Date	See Survey Sheets	2350-1 #	203438
Survey Time	See Survey Sheets	Detector-Sled #	LVS1-101
Pipe Size	4"	Detector Efficiency	0.00039
DCGL (dpm/100cm2)	1.10E+04	Pipe Area Incorporated by Detector Efficiency (in cm2)	973
Pipe Area Incorporated by Survey Data (m^2)	1.9	Field BKG (cpm)	See Survey Sheets
Routine Survey	X	Field MDCR (cpm)	See Survey Sheets
QA Survey		Nominal MDC (dpm/100cm2)	2,366

Survey Measurement Results	
Total Number of Survey Measurements	20
Number of Measurements >MDC	20
Number of Measurements Above 50% DCGL	10
Number of Measurements Above DCGL	1
Mean	0.537
Median	0.503
Standard Deviation	0.258
Maximum	1.389
Minimum	0.240

Survey Technician(s)	PHELPS

Survey Unit Classification	1
TBD 06-004 Piping Group	1
SR-13 Radionuclide Distribution Sample	EP 3-7
Measured Nuclide	Co-60
Area Factor/EMC Used	Yes
Pass/Fail FSS	Pass
MREM/YR Contribution	<25

COMMENTS:

ACTIVITY VALUES NOT BACKGROUND CORRECTED.

RP Engineer | Date	[illegible] / 5-2-08

ACTIVITY WORKSHEET CO-1 4 INCH

Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity	
1	23	23	58,974	6,061	0.551		0.551	
2	20	20	51,282	5,271	0.479		0.479	
3	18	18	46,154	4,743	0.431		0.431	
4	15	15	38,462	3,953	0.359		0.359	
5	30	30	76,923	7,906	0.719		0.719	
7	18	18	46,154	4,743	0.431		0.431	
8	30	30	76,923	7,906	0.719		0.719	
9	25	25	64,103	6,588	0.599		0.599	
10	12	12	30,769	3,162	0.287		0.287	
11	17	17	43,590	4,480	0.407		0.407	
12	12	12	30,769	3,162	0.287		0.287	
13	13	13	33,333	3,426	0.311		0.311	
14	10	10	25,641	2,635	0.240		0.240	
15	28	28	71,795	7,379	0.671		0.671	
16	23	23	58,974	6,061	0.551		0.551	
17	22	22	56,410	5,798	0.527		0.527	
18	15	15	38,462	3,953	0.359		0.359	
19	25	25	64,103	6,588	0.599		0.599	
20	34	34	87,179	8,960	0.815		0.815	
21	58	58	148,718	15,284	1.389	0.035		0.026
				3,750		**0.035**	**0.518**	
				MEAN	0.537	EMC Unity	EMT Unity	
				MEDIAN	0.503			
				STD DEV	0.258			
				MAX	1.389			
				MIN	0.240			

Babcock

BSI EP/BP SURVEY REPORT

Pipe ID	PPH 109	Survey Location	PPH RM 2, CO-2
Survey Date	See Survey Sheets	2350-1 #	203438
Survey Time	See Survey Sheets	Detector-Sled #	LVS1-101
Pipe Size	4"	Detector Efficiency	0.00039
DCGL (dpm/100cm2)	1.10E+04	Pipe Area Incorporated by Detector Efficiency (in cm2)	973
Pipe Area Incorporated by Survey Data (m^2)	2.1	Field BKG (cpm)	See Survey Sheets
Routine Survey	X	Field MDCR (cpm)	See Survey Sheets
QA Survey		Nominal MDC (dpm/100cm2)	2,366

Survey Measurement Results	
Total Number of Survey Measurements	22
Number of Measurements >MDC	21
Number of Measurements Above 50% DCGL	7
Number of Measurements Above DCGL	1
Mean	0.455
Median	0.359
Standard Deviation	0.282
Maximum	1.437
Minimum	0.144
Survey Technician(s)	PHELPS

Survey Unit Classification	1
TBD 06-004 Piping Group	1
SR-13 Radionuclide Distribution Sample	EP 3-7
Measured Nuclide	Co-60
Area Factor/EMC Used	Yes
Pass/Fail FSS	Pass
MREM/YR Contribution	<25

COMMENTS:

ACTIVITY VALUES NOT BACKGROUND CORRECTED.

RP Engineer | Date	GWood / 5-2-08

ACTIVITY WORKSHEET CO-2 4 INCH

Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity	
1	14	14	35,897	3,689	0.335		0.335	
2	13	13	33,333	3,426	0.311		0.311	
3	15	15	38,462	3,953	0.359		0.359	
4	14	14	35,897	3,689	0.335		0.335	
5	10	10	25,641	2,635	0.240		0.240	
7	15	15	38,462	3,953	0.359		0.359	
8	18	18	46,154	4,743	0.431		0.431	
9	21	21	53,846	5,534	0.503		0.503	
10	6	6	15,385	1,581	0.144		0.144	
11	12	12	30,769	3,162	0.287		0.287	
12	14	14	35,897	3,689	0.335		0.335	
13	12	12	30,769	3,162	0.287		0.287	
14	28	28	71,795	7,379	0.671		0.671	
15	16	16	41,026	4,216	0.383		0.383	
16	9	9	23,077	2,372	0.216		0.216	
17	22	22	56,410	5,798	0.527		0.527	
18	12	12	30,769	3,162	0.287		0.287	
19	17	17	43,590	4,480	0.407		0.407	
20	26	26	66,667	6,852	0.623		0.623	
21	25	25	64,103	6,588	0.599		0.599	
22	39	39	100,000	10,277	0.934		0.934	
23	60	60	153,846	15,812	1.437	0.036		0.030
				2,676		**0.036**	**0.408**	
				MEAN	0.455	**EMC Unity**	**EMT Unity**	
				MEDIAN	0.359			
				STD DEV	0.282			
				MAX	1.437			
				MIN	0.144			

BSI EP/BP SURVEY REPORT

Pipe ID	**PPH 109**	**Survey Location**	PPH RM 3, CO 3-1
Survey Date	See Survey Sheets	**2350-1 #**	203438
Survey Time	See Survey Sheets	**Detector-Sled #**	LVS1-101
Pipe Size	4"	**Detector Efficiency**	0.00039
DCGL (dpm/100cm2)	1.10E+04	Pipe Area Incorporated by Detector Efficiency (in cm2)	973
Pipe Area Incorporated by Survey Data (m^2)	1.1	**Field BKG** (cpm)	See Survey Sheets
Routine Survey	X	**Field MDCR** (cpm)	See Survey Sheets
QA Survey		**Nominal MDC** (dpm/100cm2)	2,366

Survey Measurement Results	
Total Number of Survey Measurements	11
Number of Measurements >MDC	11
Number of Measurements Above 50% DCGL	10
Number of Measurements Above DCGL	2
Mean	0.743
Median	0.623
Standard Deviation	0.292
Maximum	1.389
Minimum	0.335

Survey Technician(s)	PHELPS

Survey Unit Classification	1
TBD 06-004 Piping Group	1
SR-13 Radionuclide Distribution Sample	EP 3-7
Measured Nuclide	Co-60
Area Factor/EMC Used	Yes
Pass/Fail FSS	Pass
MREM/YR Contribution	<25

COMMENTS:

ACTIVITY VALUES NOT BACKGROUND CORRECTED.

RP Engineer | Date	Wood / 5-2-08

ACTIVITY WORKSHEET CO 3-1 4IN

Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity	
1	23	23	58,974	6,061	0.551		0.551	
2	26	26	66,667	6,852	0.623		0.623	
3	14	14	35,897	3,689	0.335		0.335	
4	25	25	64,103	6,588	0.599		0.599	
5	22	22	56,410	5,798	0.527		0.527	
7	58	58	148,718	15,284	1.389	0.035		0.019
8	42	42	107,692	11,068	1.006	0.025		
9	36	36	92,308	9,487	0.862		0.862	
10	35	35	89,744	9,223	0.838		0.838	
11	23	23	58,974	6,061	0.551		0.551	
12	37	37	94,872	9,750	0.886		0.886	
				4,885		**0.060**	**0.660**	
				MEAN	0.743	**EMC Unity**	**EMT Unity**	
				MEDIAN	0.623			
				STD DEV	0.292			
				MAX	1.389			
				MIN	0.335			

BSI EP/BP SURVEY REPORT

Pipe ID	**PPH 109**	**Survey Location**	**PPH RM 3, CO 3-2 4 INCH**
Survey Date	See Survey Sheets	**2350-1 #**	203438
Survey Time	See Survey Sheets	**Detector-Sled #**	LVS1-101
Pipe Size	4"	**Detector Efficiency**	0.00039
DCGL (dpm/100cm2)	1.10E+04	Pipe Area Incorporated by Detector Efficiency (in cm2)	973
Pipe Area Incorporated by Survey Data (m^2)	1.3	**Field BKG** (cpm)	See Survey Sheets
Routine Survey	X	**Field MDCR** (cpm)	See Survey Sheets
QA Survey		**Nominal MDC** (dpm/100cm2)	2,366

Survey Measurement Results	
Total Number of Survey Measurements	13
Number of Measurements >MDC	12
Number of Measurements Above 50% DCGL	5
Number of Measurements Above DCGL	0
Mean	0.459
Median	0.455
Standard Deviation	0.190
Maximum	0.910
Minimum	0.144

Survey Technician(s)	PHELPS

Survey Unit Classification	1
TBD 06-004 Piping Group	1
SR-13 Radionuclide Distribution Sample	EP 3-7
Measured Nuclide	Co-60
Area Factor/EMC Used	No
Pass/Fail FSS	Pass
MREM/YR Contribution	<25

COMMENTS:

ACTIVITY VALUES NOT BACKGROUND CORRECTED.

RP Engineer | Date	Wood 15-2-08

ACTIVITY WORKSHEET CO 3-2 4IN

Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity
1	12	12	30,769	3,162	0.287		
2	19	19	48,718	5,007	0.455		
3	6	6	15,385	1,581	0.144		
4	26	26	66,667	6,852	0.623		
5	38	38	97,436	10,014	0.910		
6	16	16	41,026	4,216	0.383		
7	13	13	33,333	3,426	0.311		
8	17	17	43,590	4,480	0.407		
9	14	14	35,897	3,689	0.335		
10	22	22	56,410	5,798	0.527		
11	23	23	58,974	6,061	0.551		
12	24	24	61,538	6,325	0.575		
13	19	19	48,718	5,007	0.455		
				MEAN	0.459		
				MEDIAN	0.455		
				STD DEV	0.190		
				MAX	0.910		
				MIN	0.144		

BSI EP/BP SURVEY REPORT

Pipe ID	**PPH 109**	**Survey Location**	**PPH RM 3, CO 3-2 6 INCH**
Survey Date	See Survey Sheets	**2350-1 #**	203438
Survey Time	See Survey Sheets	**Detector-Sled #**	LVS1-101
Pipe Size	6"	**Detector Efficiency**	0.00031
DCGL (dpm/100cm2)	1.10E+04	Pipe Area Incorporated by Detector Efficiency (in cm2)	1459
Pipe Area Incorporated by Survey Data (m^2)	3.2	**Field BKG** (cpm)	See Survey Sheets
Routine Survey	X	**Field MDCR** (cpm)	See Survey Sheets
QA Survey		**Nominal MDC** (dpm/100cm2)	1,985

Survey Measurement Results	
Total Number of Survey Measurements	22
Number of Measurements >MDC	22
Number of Measurements Above 50% DCGL	20
Number of Measurements Above DCGL	0
Mean	0.645
Median	0.703
Standard Deviation	0.147
Maximum	0.804
Minimum	0.201
Survey Technician(s)	PHELPS

Survey Unit Classification	1
TBD 06-004 Piping Group	1
SR-13 Radionuclide Distribution Sample	EP 3-7
Measured Nuclide	Co-60
Area Factor/EMC Used	No
Pass/Fail FSS	Pass
MREM/YR Contribution	<25

COMMENTS:

ACTIVITY VALUES NOT BACKGROUND CORRECTED.

RP Engineer | Date	15-2-08

ACTIVITY WORKSHEET CO 3-2 6IN

Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity
14	36	36	116,129	7,959	0.724		
15	30	30	96,774	6,633	0.603		
16	10	10	32,258	2,211	0.201		
17	29	29	93,548	6,412	0.583		
18	20	20	64,516	4,422	0.402		
19	36	36	116,129	7,959	0.724		
20	32	32	103,226	7,075	0.643		
21	36	36	116,129	7,959	0.724		
22	37	37	119,355	8,181	0.744		
23	32	32	103,226	7,075	0.643		
24	25	25	80,645	5,527	0.502		
25	27	27	87,097	5,970	0.543		
26	35	35	112,903	7,738	0.703		
27	40	40	129,032	8,844	0.804		
28	38	38	122,581	8,402	0.764		
29	38	38	122,581	8,402	0.764		
30	30	30	96,774	6,633	0.603		
31	39	39	125,806	8,623	0.784		
32	37	37	119,355	8,181	0.744		
33	35	35	112,903	7,738	0.703		
34	25	25	80,645	5,527	0.502		
35	39	39	125,806	8,623	0.784		
				MEAN	0.645	**EMC Unity**	**EMT Unity**
				MEDIAN	0.703		
				STD DEV	0.147		
				MAX	0.804		
				MIN	0.201		

BSI EP/BP SURVEY REPORT

Pipe ID	**PPH 109**	**Survey Location**	**PPH RM 4, CO 4-1 4 INCH**
Survey Date	See Survey Sheets	**2350-1 #**	189094
Survey Time	See Survey Sheets	**Detector-Sled #**	LVS1-101
Pipe Size	4"	**Detector Efficiency**	0.00039
DCGL (dpm/100cm2)	1.10E+04	Pipe Area Incorporated by Detector Efficiency (in cm2)	973
Pipe Area Incorporated by Survey Data (m^2)	0.8	**Field BKG** (cpm)	See Survey Sheets
Routine Survey	X	**Field MDCR** (cpm)	See Survey Sheets
QA Survey		**Nominal MDC** (dpm/100cm2)	2,366

Survey Measurement Results	
Total Number of Survey Measurements	8
Number of Measurements >MDC	8
Number of Measurements Above 50% DCGL	6
Number of Measurements Above DCGL	0
Mean	0.530
Median	0.527
Standard Deviation	0.102
Maximum	0.695
Minimum	0.359

Survey Technician(s)	PHELPS

Survey Unit Classification	1
TBD 06-004 Piping Group	1
SR-13 Radionuclide Distribution Sample	EP 3-7
Measured Nuclide	Co-60
Area Factor/EMC Used	No
Pass/Fail FSS	Pass
MREM/YR Contribution	<25

COMMENTS:

ACTIVITY VALUES NOT BACKGROUND CORRECTED.

RP Engineer | Date	[illegible] / 5-2-08

ACTIVITY WORKSHEET CO 4-1 4IN

Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity
1	19	19	48,718	5,007	0.455		
2	23	23	58,974	6,061	0.551		
3	21	21	53,846	5,534	0.503		
4	15	15	38,462	3,953	0.359		
5	29	29	74,359	7,642	0.695		
6	23	23	58,974	6,061	0.551		
7	21	21	53,846	5,534	0.503		
8	26	26	66,667	6,852	0.623		
				MEAN	0.530		
				MEDIAN	0.527		
				STD DEV	0.102		
				MAX	0.695		
				MIN	0.359		

BSI EP/BP SURVEY REPORT

Pipe ID	**PPH 109**	**Survey Location**	**PPH RM 4, CO 4-1 6 INCH**
Survey Date	See Survey Sheets	**2350-1 #**	189094
Survey Time	See Survey Sheets	**Detector-Sled #**	LVS1-101
Pipe Size	6"	**Detector Efficiency**	0.00031
DCGL (dpm/100cm2)	1.10E+04	Pipe Area Incorporated by Detector Efficiency (in cm2)	1459
Pipe Area Incorporated by Survey Data (m^2)	1.6	**Field BKG** (cpm)	See Survey Sheets
Routine Survey	X	**Field MDCR** (cpm)	See Survey Sheets
QA Survey		**Nominal MDC** (dpm/100cm2)	1,985

Survey Measurement Results	
Total Number of Survey Measurements	11
Number of Measurements >MDC	11
Number of Measurements Above 50% DCGL	4
Number of Measurements Above DCGL	0
Mean	0.448
Median	0.442
Standard Deviation	0.115
Maximum	0.643
Minimum	0.221

Survey Technician(s)	PHELPS

Survey Unit Classification	1
TBD 06-004 Piping Group	1
SR-13 Radionuclide Distribution Sample	EP 3-7
Measured Nuclide	Co-60
Area Factor/EMC Used	No
Pass/Fail FSS	Pass
MREM/YR Contribution	<25

COMMENTS:

ACTIVITY VALUES NOT BACKGROUND CORRECTED.

RP Engineer | Date	[illegible] / 5-2-08

ACTIVITY WORKSHEET CO 4-1 6IN

Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity
9	27	27	87,097	5,970	0.543		
10	22	22	70,968	4,864	0.442		
11	24	24	77,419	5,306	0.482		
12	21	21	67,742	4,643	0.422		
13	18	18	58,065	3,980	0.362		
14	17	17	54,839	3,759	0.342		
15	21	21	67,742	4,643	0.422		
16	27	27	87,097	5,970	0.543		
17	32	32	103,226	7,075	0.643		
18	25	25	80,645	5,527	0.502		
19	11	11	35,484	2,432	0.221		
				MEAN	0.448	**EMC Unity**	**EMT Unity**
				MEDIAN	0.442		
				STD DEV	0.115		
				MAX	0.643		
				MIN	0.221		

BSI EP/BP SURVEY REPORT

Pipe ID	**PPH 109**	**Survey Location**	PPH RM 4, CO 4-2
Survey Date	See Survey Sheets	**2350-1 #**	189094
Survey Time	See Survey Sheets	**Detector-Sled #**	LVS1-101
Pipe Size	4"	**Detector Efficiency**	0.00039
DCGL (dpm/100cm2)	1.10E+04	Pipe Area Incorporated by Detector Efficiency (in cm2)	973
Pipe Area Incorporated by Survey Data (m^2)	1.8	**Field BKG** (cpm)	See Survey Sheets
Routine Survey	X	**Field MDCR** (cpm)	See Survey Sheets
QA Survey		**Nominal MDC** (dpm/100cm2)	2,366

Survey Measurement Results	
Total Number of Survey Measurements	18
Number of Measurements >MDC	18
Number of Measurements Above 50% DCGL	10
Number of Measurements Above DCGL	0
Mean	0.544
Median	0.527
Standard Deviation	0.182
Maximum	0.982
Minimum	0.311

Survey Technician(s)	PHELPS

Survey Unit Classification	1
TBD 06-004 Piping Group	1
SR-13 Radionuclide Distribution Sample	EP 3-7
Measured Nuclide	Co-60
Area Factor/EMC Used	No
Pass/Fail FSS	Pass
MREM/YR Contribution	<25

COMMENTS:

ACTIVITY VALUES NOT BACKGROUND CORRECTED.

RP Engineer | Date	[illegible] 15-2-08

ACTIVITY WORKSHEET CO 4-2

Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity
1	17	17	43,590	4,480	0.407		
2	15	15	38,462	3,953	0.359		
3	22	22	56,410	5,798	0.527		
4	14	14	35,897	3,689	0.335		
5	13	13	33,333	3,426	0.311		
6	41	41	105,128	10,805	0.982		
8	30	30	76,923	7,906	0.719		
9	26	26	66,667	6,852	0.623		
10	20	20	51,282	5,271	0.479		
11	30	30	76,923	7,906	0.719		
12	23	23	58,974	6,061	0.551		
13	22	22	56,410	5,798	0.527		
14	24	24	61,538	6,325	0.575		
15	22	22	56,410	5,798	0.527		
16	36	36	92,308	9,487	0.862		
17	20	20	51,282	5,271	0.479		
18	15	15	38,462	3,953	0.359		
19	19	19	48,718	5,007	0.455		
				MEAN	0.544		
				MEDIAN	0.527		
				STD DEV	0.182		
				MAX	0.982		
				MIN	0.311		

BSI EP/BP SURVEY REPORT

Pipe ID	**PPH 109**	**Survey Location**	**PPH RM 4, CO 4-3 4 INCH**
Survey Date	See Survey Sheets	**2350-1 #**	203438
Survey Time	See Survey Sheets	**Detector-Sled #**	LVS1-101
Pipe Size	4"	**Detector Efficiency**	0.00039
DCGL (dpm/100cm2)	1.10E+04	Pipe Area Incorporated by Detector Efficiency (in cm2)	973
Pipe Area Incorporated by Survey Data (m^2)	0.8	**Field BKG** (cpm)	See Survey Sheets
Routine Survey	X	**Field MDCR** (cpm)	See Survey Sheets
QA Survey		**Nominal MDC** (dpm/100cm2)	2,366

Survey Measurement Results	
Total Number of Survey Measurements	8
Number of Measurements >MDC	8
Number of Measurements Above 50% DCGL	3
Number of Measurements Above DCGL	0
Mean	0.467
Median	0.467
Standard Deviation	0.129
Maximum	0.671
Minimum	0.287

Survey Technician(s)	PHELPS

Survey Unit Classification	1
TBD 06-004 Piping Group	1
SR-13 Radionuclide Distribution Sample	EP 3-7
Measured Nuclide	Co-60
Area Factor/EMC Used	No
Pass/Fail FSS	Pass
MREM/YR Contribution	<25

COMMENTS:

ACTIVITY VALUES NOT BACKGROUND CORRECTED.

RP Engineer | Date	[illegible] 15-2-08

ACTIVITY WORKSHEET CO 4-3 4IN

Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity
1	20	20	51,282	5,271	0.479		
2	14	14	35,897	3,689	0.335		
3	12	12	30,769	3,162	0.287		
4	24	24	61,538	6,325	0.575		
5	16	16	41,026	4,216	0.383		
6	28	28	71,795	7,379	0.671		
7	19	19	48,718	5,007	0.455		
8	23	23	58,974	6,061	0.551		
				MEAN	0.467		
				MEDIAN	0.467		
				STD DEV	0.129		
				MAX	0.671		
				MIN	0.287		

BSI EP/BP SURVEY REPORT

Pipe ID	**PPH 109**	**Survey Location**	**PPH RM 4, CO 4-3 6 INCH**
Survey Date	See Survey Sheets	**2350-1 #**	203438
Survey Time	See Survey Sheets	**Detector-Sled #**	LVS1-101
Pipe Size	6"	**Detector Efficiency**	0.00031
DCGL (dpm/100cm2)	1.10E+04	Pipe Area Incorporated by Detector Efficiency (in cm2)	1459
Pipe Area Incorporated by Survey Data (m^2)	2.0	**Field BKG** (cpm)	See Survey Sheets
Routine Survey	X	**Field MDCR** (cpm)	See Survey Sheets
QA Survey		**Nominal MDC** (dpm/100cm2)	1,985

Survey Measurement Results	
Total Number of Survey Measurements	14
Number of Measurements >MDC	14
Number of Measurements Above 50% DCGL	1
Number of Measurements Above DCGL	0
Mean	0.343
Median	0.301
Standard Deviation	0.113
Maximum	0.603
Minimum	0.181

Survey Technician(s)	PHELPS

Survey Unit Classification	1
TBD 06-004 Piping Group	1
SR-13 Radionuclide Distribution Sample	EP 3-7
Measured Nuclide	Co-60
Area Factor/EMC Used	No
Pass/Fail FSS	Pass
MREM/YR Contribution	<25

COMMENTS:

ACTIVITY VALUES NOT BACKGROUND CORRECTED.

RP Engineer | Date	[illegible] 5-2-08

ACTIVITY WORKSHEET CO 4-3 6IN

Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity
9	19	19	61,290	4,201	0.382		
10	23	23	74,194	5,085	0.462		
11	15	15	48,387	3,316	0.301		
12	9	9	29,032	1,990	0.181		
13	13	13	41,935	2,874	0.261		
14	19	19	61,290	4,201	0.382		
15	13	13	41,935	2,874	0.261		
16	24	24	77,419	5,306	0.482		
17	14	14	45,161	3,095	0.281		
18	13	13	41,935	2,874	0.261		
19	15	15	48,387	3,316	0.301		
20	19	19	61,290	4,201	0.382		
21	30	30	96,774	6,633	0.603		
22	13	13	41,935	2,874	0.261		
				MEAN	0.343	**EMC Unity**	**EMT Unity**
				MEDIAN	0.301		
				STD DEV	0.113		
				MAX	0.603		
				MIN	0.181		

BSI EP/BP SURVEY REPORT

Pipe ID	**PPH 109**	**Survey Location**	**PPH RM 4, CO 4-3 8 INCH**
Survey Date	See Survey Sheets	**2350-1 #**	203438
Survey Time	See Survey Sheets	**Detector-Sled #**	LVS1-101
Pipe Size	8"	**Detector Efficiency**	0.00029
DCGL (dpm/100cm2)	1.10E+04	Pipe Area Incorporated by Detector Efficiency (in cm2)	1946
Pipe Area Incorporated by Survey Data (m^2)	3.9	**Field BKG** (cpm)	See Survey Sheets
Routine Survey	X	**Field MDCR** (cpm)	See Survey Sheets
QA Survey		**Nominal MDC** (dpm/100cm2)	1,591

Survey Measurement Results	
Total Number of Survey Measurements	20
Number of Measurements >MDC	20
Number of Measurements Above 50% DCGL	5
Number of Measurements Above DCGL	0
Mean	0.430
Median	0.362
Standard Deviation	0.199
Maximum	0.902
Minimum	0.193

Survey Technician(s)	PHELPS

Survey Unit Classification	1
TBD 06-004 Piping Group	1
SR-13 Radionuclide Distribution Sample	EP 3-7
Measured Nuclide	Co-60
Area Factor/EMC Used	No
Pass/Fail FSS	Pass
MREM/YR Contribution	<25

COMMENTS:

ACTIVITY VALUES NOT BACKGROUND CORRECTED.

RP Engineer | Date	G Wood / 5-2-08

ACTIVITY WORKSHEET CO 4-3 8IN

Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity
23	24	24	82,759	4,253	0.387		
24	22	22	75,862	3,898	0.354		
25	21	21	72,414	3,721	0.338		
26	56	56	193,103	9,923	0.902		
27	44	44	151,724	7,797	0.709		
28	27	27	93,103	4,784	0.435		
29	27	27	93,103	4,784	0.435		
30	55	55	189,655	9,746	0.886		
31	35	35	120,690	6,202	0.564		
32	35	35	120,690	6,202	0.564		
33	21	21	72,414	3,721	0.338		
34	24	24	82,759	4,253	0.387		
35	18	18	62,069	3,190	0.290		
36	16	16	55,172	2,835	0.258		
37	20	20	68,966	3,544	0.322		
38	23	23	79,310	4,076	0.371		
39	20	20	68,966	3,544	0.322		
40	12	12	41,379	2,126	0.193		
41	17	17	58,621	3,012	0.274		
42	17	17	58,621	3,012	0.274		
				MEAN	0.430	**EMC Unity**	**EMT Unity**
				MEDIAN	0.362		
				STD DEV	0.199		
				MAX	0.902		
				MIN	0.193		

BSI EP/BP SURVEY REPORT

Pipe ID	**PPH 109**	**Survey Location**	PPH RM 8, CO 8-1
Survey Date	See Survey Sheets	**2350-1 #**	203438
Survey Time	See Survey Sheets	**Detector-Sled #**	LVS1-101
Pipe Size	4"	**Detector Efficiency**	0.00039
DCGL (dpm/100cm2)	1.10E+04	Pipe Area Incorporated by Detector Efficiency (in cm2)	973
Pipe Area Incorporated by Survey Data (m^2)	0.6	**Field BKG** (cpm)	See Survey Sheets
Routine Survey	X	**Field MDCR** (cpm)	See Survey Sheets
QA Survey		**Nominal MDC** (dpm/100cm2)	2,366

Survey Measurement Results	
Total Number of Survey Measurements	6
Number of Measurements >MDC	6
Number of Measurements Above 50% DCGL	3
Number of Measurements Above DCGL	0
Mean	0.471
Median	0.503
Standard Deviation	0.139
Maximum	0.647
Minimum	0.264

Survey Technician(s)	PHELPS

Survey Unit Classification	1
TBD 06-004 Piping Group	1
SR-13 Radionuclide Distribution Sample	EP 3-7
Measured Nuclide	Co-60
Area Factor/EMC Used	No
Pass/Fail FSS	Pass
MREM/YR Contribution	<25

COMMENTS:

ACTIVITY VALUES NOT BACKGROUND CORRECTED.

RP Engineer | Date	5-2-08

ACTIVITY WORKSHEET CO 8-1

Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity
1	22	22	56,410	5,798	0.527		
2	23	23	58,974	6,061	0.551		
3	27	27	69,231	7,115	0.647		
4	20	20	51,282	5,271	0.479		
5	11	11	28,205	2,899	0.264		
6	15	15	38,462	3,953	0.359		
				MEAN	0.471		
				MEDIAN	0.503		
				STD DEV	0.139		
				MAX	0.647		
				MIN	0.264		

BSI EP/BP SURVEY REPORT

Pipe ID	**PPH 109**	**Survey Location**	PPH RM 8, CO 8-2
Survey Date	See Survey Sheets	**2350-1 #**	203438
Survey Time	See Survey Sheets	**Detector-Sled #**	LVS1-101
Pipe Size	4"	**Detector Efficiency**	0.00039
DCGL (dpm/100cm2)	1.10E+04	Pipe Area Incorporated by Detector Efficiency (in cm2)	973
Pipe Area Incorporated by Survey Data (m^2)	0.5	**Field BKG** (cpm)	See Survey Sheets
Routine Survey	X	**Field MDCR** (cpm)	See Survey Sheets
QA Survey		**Nominal MDC** (dpm/100cm2)	2,366

Survey Measurement Results	
Total Number of Survey Measurements	5
Number of Measurements >MDC	5
Number of Measurements Above 50% DCGL	0
Number of Measurements Above DCGL	0
Mean	0.369
Median	0.383
Standard Deviation	0.047
Maximum	0.431
Minimum	0.311

Survey Technician(s)	PHELPS

Survey Unit Classification	1
TBD 06-004 Piping Group	1
SR-13 Radionuclide Distribution Sample	EP 3-7
Measured Nuclide	Co-60
Area Factor/EMC Used	No
Pass/Fail FSS	Pass
MREM/YR Contribution	<25

COMMENTS:

ACTIVITY VALUES NOT BACKGROUND CORRECTED.

RP Engineer | Date	[illegible] 15-2-08

ACTIVITY WORKSHEET CO 8-2

Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity
1	16	16	41,026	4,216	0.383		
2	13	13	33,333	3,426	0.311		
3	16	16	41,026	4,216	0.383		
4	14	14	35,897	3,689	0.335		
5	18	18	46,154	4,743	0.431		
				MEAN	0.369		
				MEDIAN	0.383		
				STD DEV	0.047		
				MAX	0.431		
				MIN	0.311		

BSI EP/BP SURVEY REPORT

Pipe ID	**PPH 109**	**Survey Location**	PPH RM 8, CO 8-3
Survey Date	See Survey Sheets	**2350-1 #**	203438
Survey Time	See Survey Sheets	**Detector-Sled #**	LVS1-101
Pipe Size	4"	**Detector Efficiency**	0.00039
DCGL (dpm/100cm2)	1.10E+04	Pipe Area Incorporated by Detector Efficiency (in cm2)	973
Pipe Area Incorporated by Survey Data (m^2)	2.4	**Field BKG** (cpm)	See Survey Sheets
Routine Survey	X	**Field MDCR** (cpm)	See Survey Sheets
QA Survey		**Nominal MDC** (dpm/100cm2)	2,366

Survey Measurement Results	
Total Number of Survey Measurements	25
Number of Measurements >MDC	25
Number of Measurements Above 50% DCGL	13
Number of Measurements Above DCGL	0
Mean	0.485
Median	0.503
Standard Deviation	0.154
Maximum	0.838
Minimum	0.240

Survey Technician(s)	PHELPS

Survey Unit Classification	1
TBD 06-004 Piping Group	1
SR-13 Radionuclide Distribution Sample	EP 3-7
Measured Nuclide	Co-60
Area Factor/EMC Used	No
Pass/Fail FSS	Pass
MREM/YR Contribution	<25

COMMENTS:

ACTIVITY VALUES NOT BACKGROUND CORRECTED.

RP Engineer | Date	Wood / 5-2-08

ACTIVITY WORKSHEET CO 8-3

Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity
1	24	24	61,538	6,325	0.575		
2	28	28	71,795	7,379	0.671		
3	17	17	43,590	4,480	0.407		
4	30	30	76,923	7,906	0.719		
5	16	16	41,026	4,216	0.383		
6	22	22	56,410	5,798	0.527		
7	26	26	66,667	6,852	0.623		
8	18	18	46,154	4,743	0.431		
9	18	18	46,154	4,743	0.431		
10	20	20	51,282	5,271	0.479		
11	10	10	25,641	2,635	0.240		
12	12	12	30,769	3,162	0.287		
13	21	21	53,846	5,534	0.503		
14	21	21	53,846	5,534	0.503		
15	26	26	66,667	6,852	0.623		
16	35	35	89,744	9,223	0.838		
17	11	11	28,205	2,899	0.264		
18	17	17	43,590	4,480	0.407		
19	24	24	61,538	6,325	0.575		
20	21	21	53,846	5,534	0.503		
21	21	21	53,846	5,534	0.503		
22	16	16	41,026	4,216	0.383		
23	28	28	71,795	7,379	0.671		
24	12	12	30,769	3,162	0.287		
25	12	12	30,769	3,162	0.287		
				MEAN	0.485		
				MEDIAN	0.503		
				STD DEV	0.154		
				MAX	0.838		
				MIN	0.240		

BSI EP/BP SURVEY REPORT

Pipe ID	**PPH 109**	**Survey Location**	PPH RM 8, FD 8-1
Survey Date	See Survey Sheets	**2350-1 #**	203438
Survey Time	See Survey Sheets	**Detector-Sled #**	LVS1-101
Pipe Size	4"	**Detector Efficiency**	0.00039
DCGL (dpm/100cm2)	1.10E+04	Pipe Area Incorporated by Detector Efficiency (in cm2)	973
Pipe Area Incorporated by Survey Data (m^2)	0.6	**Field BKG** (cpm)	See Survey Sheets
Routine Survey	X	**Field MDCR** (cpm)	See Survey Sheets
QA Survey		**Nominal MDC** (dpm/100cm2)	2,366

Survey Measurement Results	
Total Number of Survey Measurements	6
Number of Measurements >MDC	6
Number of Measurements Above 50% DCGL	3
Number of Measurements Above DCGL	0
Mean	0.479
Median	0.455
Standard Deviation	0.160
Maximum	0.719
Minimum	0.287

Survey Technician(s)	PHELPS

Survey Unit Classification	1
TBD 06-004 Piping Group	1
SR-13 Radionuclide Distribution Sample	EP 3-7
Measured Nuclide	Co-60
Area Factor/EMC Used	No
Pass/Fail FSS	Pass
MREM/YR Contribution	<25

COMMENTS:

ACTIVITY VALUES NOT BACKGROUND CORRECTED.

RP Engineer | Date	GWood / 5-2-08

ACTIVITY WORKSHEET FD 8-1

Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Unity	EMC Unity	EMT Unity
1	21	21	53,846	5,534	0.503		
2	15	15	38,462	3,953	0.359		
3	17	17	43,590	4,480	0.407		
4	12	12	30,769	3,162	0.287		
5	30	30	76,923	7,906	0.719		
6	25	25	64,103	6,588	0.599		
				MEAN	0.479		
				MEDIAN	0.455		
				STD DEV	0.160		
				MAX	0.719		
				MIN	0.287		

SECTION 7
ATTACHMENT 2
30 PAGES

Pipe Interior Radiological Survey Form

Date: 3-13-08 Time: 1340

Pipe ID#: PPH Co-01 Pipe Diameter: 4" Access Point Area: PPH Rm 1

Building: PPH Elevation: 0 System: FD

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

Gross ____ Co60 ✓ Cs ____

Detector ID# / Sled ID# LVS-1 / 101

Detector Cal Date: 1·25·08 Detector Cal Due Date: 1·25·09

Instrument: 2350-1 Instrument ID #: 203438

Instrument Cal Date: 10-16·07 Instrument Cal Due Date: 10-16·08

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

Background Value 3 cpm

$MDCR_{static}$ 9 cpm

Efficiency Factor for Pipe Diameter 0.00039 (from detector efficiency determination)

MDC_{static} 2366 dpm/ 100 cm^2

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

Comments: One foot from Elbow there is a hole in the pipe about 4" By One foot long that they did while core Boring. Took off the last 4 foot of pipe that went into header they core bored it.

Technician Signature Russel A. Phelps

Pipe Interior Radiological Survey

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm²
1	1 Drop	1	23	23		
2	2 Drop		20	20		
3	3 Drop		18	18		
4	4 Elbow		15	15		
5	1		30	30	N/A	
6	2 Hole		N/A			
7	3		18	18		
8	4		30	30		
9	5		25	25		
10	6	1	12	12		

Package Page 1 of 3

REFERENCE COPY

Babcock Services Inc.

Pipe Interior Radiological Survey Form (Continuation Form)

Date: 3·13·08
Pipe ID#: PPH CO-01 Pipe Diameter: 4" Access Point Area: PPH Rm 1
Building: PPH Elevation: 0 System: FD

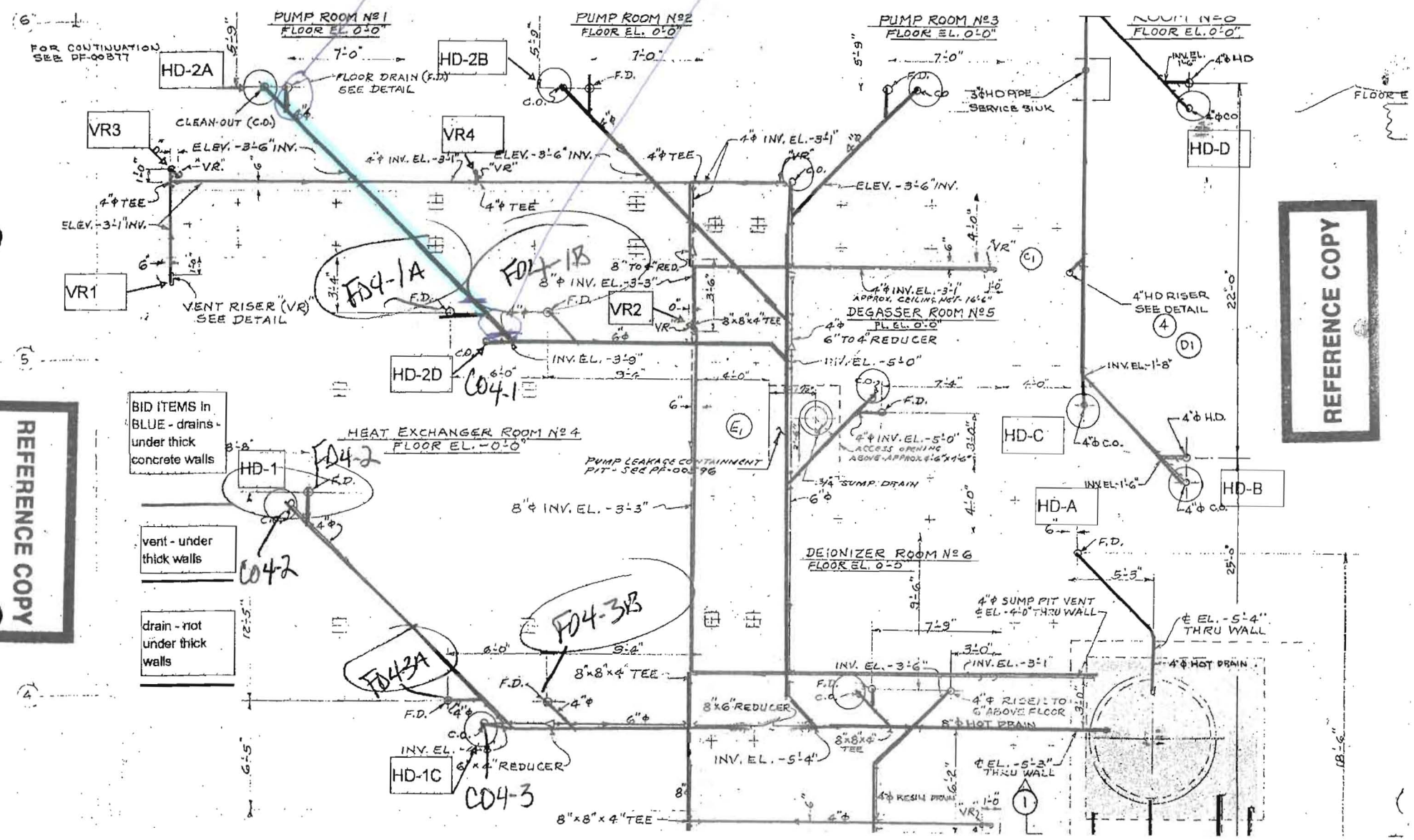
Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm^2
11	7.	1	17	17		
12	8.		12	12		
13	9.		13	13		
14	10		10	10		
15	11		28	28		
16	12		23	23		
17	13		22	22		
18	14		15	15		
19	15		25	25		
20	16	1	34	34		
21	17	1	58	58		

Package Page 2 of 3

REFERENCE COPY

Took out F.D. and put hole in pipe

Took out last 4'



CO-1

3 of 3

Pipe Interior Radiological Survey Form

Date: 3·13·08 Time: 1000

Pipe ID#: PPH CO-2 Pipe Diameter: 4" Access Point Area: PPH Rm 2

Building: PPH Elevation: 0 System: FD

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

Gross _____ Co60 ✓ Cs ✓

Detector ID# / Sled ID# LVS-1 / 101

Detector Cal Date: 1·25·08 Detector Cal Due Date: 1·25·09

Instrument: 2350-1 Instrument ID #: 203438

Instrument Cal Date: 10·16·07 Instrument Cal Due Date: 10·16·08

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

Background Value 6 cpm

$MDCR_{static}$ 9 cpm

Efficiency Factor for Pipe Diameter 0.00039 (from detector efficiency determination)

MDC_{static} 2366 dpm/ 100 cm^2

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

Comments: Pipe cut out 1 Ft From Elbow about 1 Ft Long
Dec #11

Technician Signature Russell A. Phelps

Pipe Interior Radiological Survey

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm²
1	1' Drop	1	14	14		
2	2' Drop		13	13		
3	3' Drop		15	15		
4	4' Elbow		14	14		
5	1'		10	10		N/A
6	2' no pipe cut out		N A			
7	3.		15	15		
8	4		18	18		
9	5		21	21		
10	6	1	6	6		

Package Page 1 of 3

REFERENCE COPY

Babcock SERVICES INC.

Pipe Interior Radiological Survey Form (Continuation Form)

Date: 3-13-08
Pipe ID#: PPH CO-2 Pipe Diameter: 4" Access Point Area: PPH Rm 4
Building: PPH Elevation: 0 System: FD

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm^2
11	7'	1	12	12		
12	8'		14	14		
13	9'		12	12		
14	10'		28	28		
15	11'		16	16		
16	12'		9	9		
17	13'		22	22		
18	14'		12	12		
19	15'		17	17		
20	16'		26	26		
21	17'		25	25		
22	18'		39	39		
23	19'	1	60	60		

N A

Package Page 2 of 3

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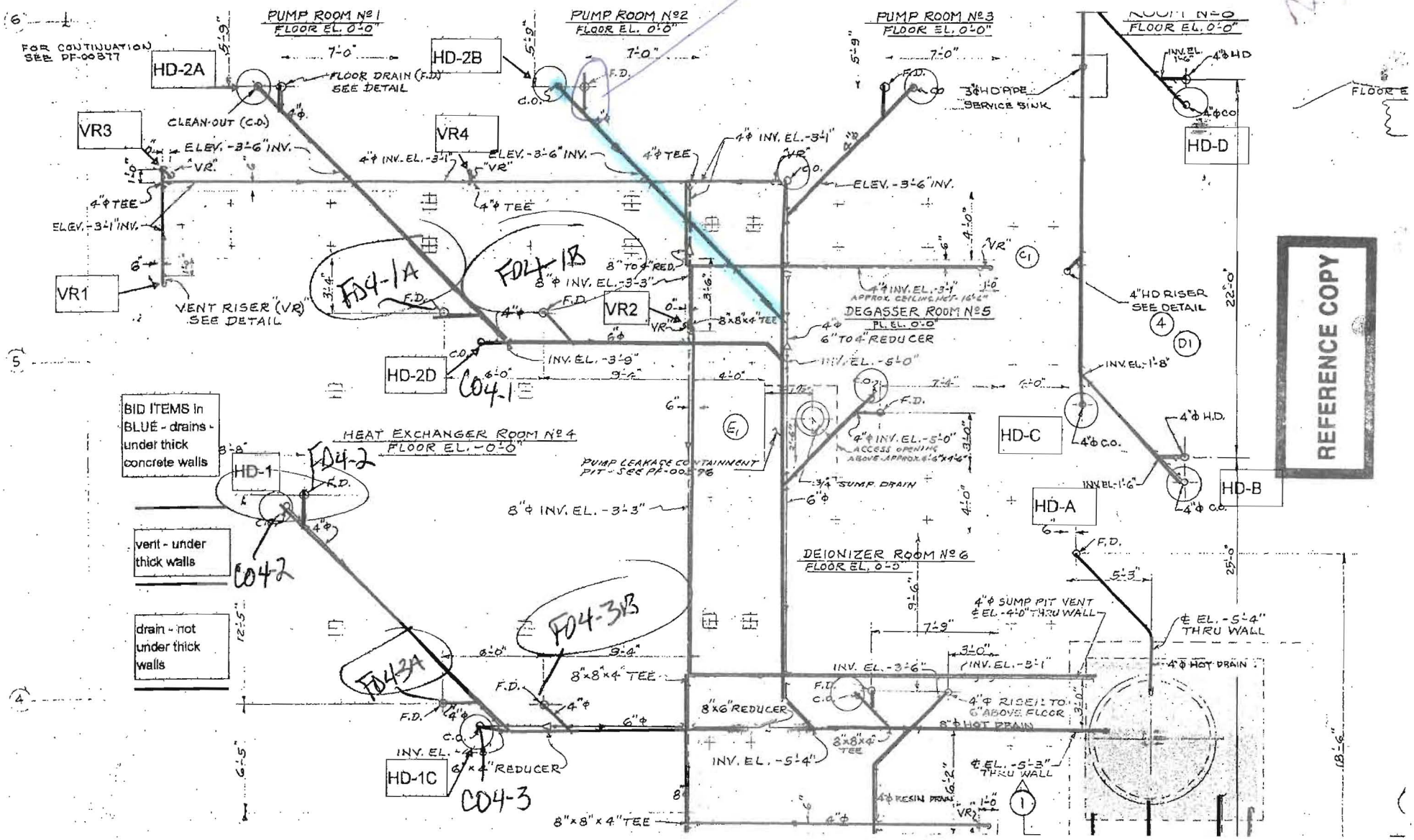
Babcock SERVICES INC.

Pipe cut out



CO-2

Pipe Interior Radiological Survey Form

Date: 3·14·08 Time: RP 4 0945

Pipe ID#: PPH CO-3-1 Pipe Diameter: 4" Access Point Area: PPHRm 3

Building: PPH Elevation: 0 System: FD

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

Gross ____ Co60 ✓ Cs ____

Detector ID# / Sled ID# LVS-1 / 101

Detector Cal Date: 1·25·08 Detector Cal Due Date: 1·25·09

Instrument: 2350-1 Instrument ID #: 203438

Instrument Cal Date: 10·16·~~08~~ RP 07 Instrument Cal Due Date: 10·16·08

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

Background Value 3 cpm

$MDCR_{static}$ 9 cpm

Efficiency Factor for Pipe Diameter 0.00039 (from detector efficiency determination)

MDC_{static} 2366 dpm/ 100 cm^2

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

Comments: Started at top of Drop surveyed Drop, there was part of the pipe missing so I surveyed 1' past Elbow going in where pipe was missing. Then turned around and survey the rest of the pipe.

Technician Signature Russel A. Phelps

Pipe Interior Radiological Survey

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm²
1	1	1	23	23		
2	2		26	26		
3	3		14	14		
4	4		25	25		
5	5		22	22	N	A
6	6 no pipe					
7	7		58	58		
8	8		42	42		
9	9		36	36		
10	10		35	35		

Package Page 1 of 3

REFERENCE COPY

Pipe Interior Radiological Survey Form (Continuation Form)

Date: 3-14-08
Pipe ID#: PPHC03-1 Pipe Diameter: 4" Access Point Area: PPH Rm 3
Building: PPH Elevation: 0 System: FD

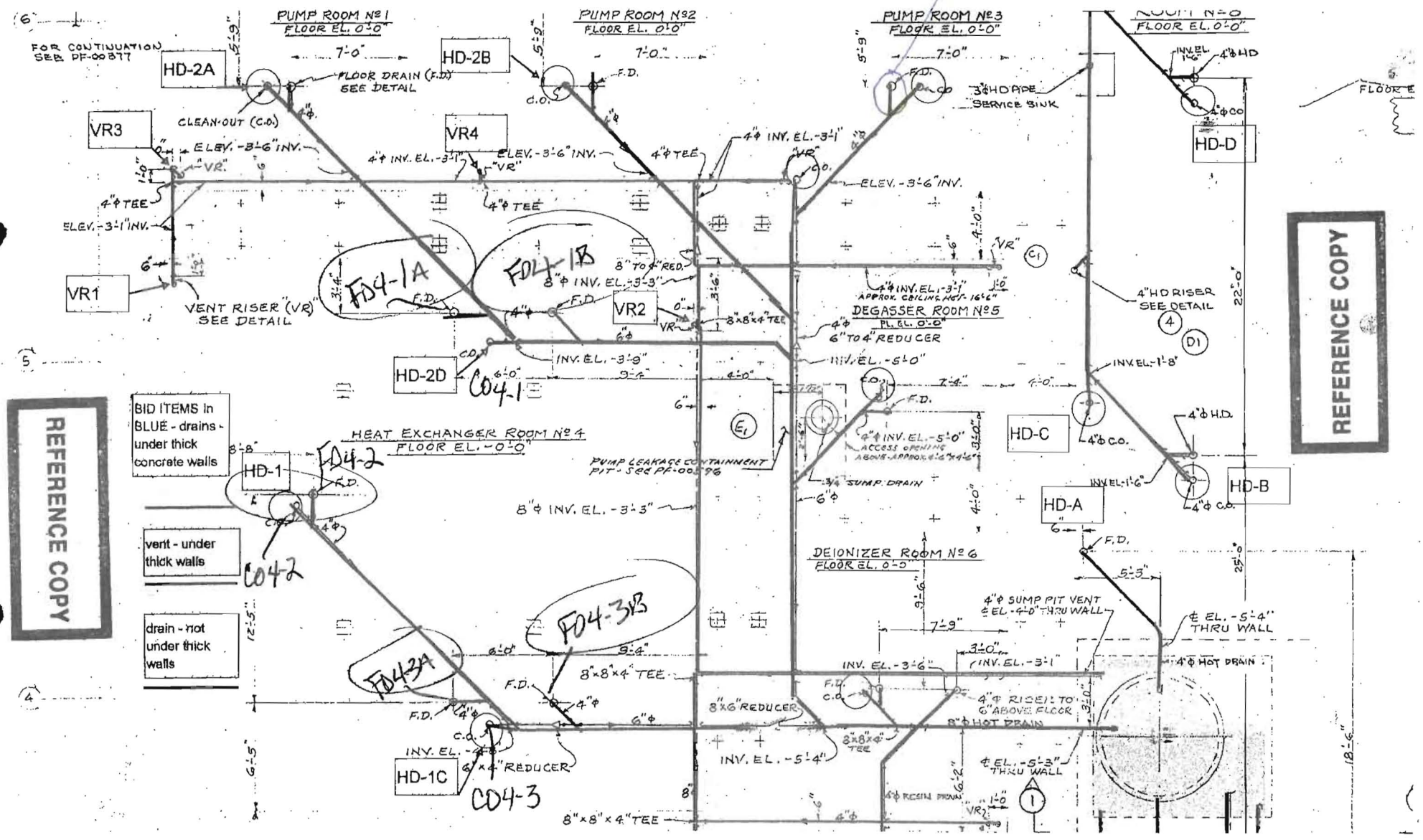
Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm^2
11	11	1	23	23	n/a	
12	12	1	37	37	↓	
~~13~~						
				N/A		

Package Page 2 of 3

REFERENCE COPY

Babcock SERVICES INC

F.D. 3 and part of pipe gone
Due to core boring



3 of 3

Pipe Interior Radiological Survey Form

Date: 4·11·08 Time: 0836

Pipe ID#: PPHC03-2 Pipe Diameter: 4" Access Point Area: PPH Rm 3

Building: PPH Elevation: 0 System: FD

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

Gross _____ Co60 ✓ Cs _____

Detector ID# / Sled ID# LVS-1 / 101

Detector Cal Date: 1·25·08 Detector Cal Due Date: 1·25·09

Instrument: 2350-1 Instrument ID #: 203438

Instrument Cal Date: 10-16-07 Instrument Cal Due Date: 10·16·08

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

Background Value 2.8 cpm

$MDCR_{static}$ 9 cpm

Efficiency Factor for Pipe Diameter 0.00039/0.00031 (from detector efficiency determination)

MDC_{static} 2366/1985 dpm/ 100/100 cm^2

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

Comments: 13' of pipe is 4" the rest is 6"

Technician Signature Russel A. Phelps

Pipe Interior Radiological Survey

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm²
1	1		12	12		
2	2		19	19		
3	3		6	6		
4	4		26	26		
5	5		38	38	N/A	
6	6		16	16		
7	7		13	13		
8	8		17	17		
9	9		14	14		
10	10		22	22		

Package Page 1 of 3

REFERENCE COPY

Babcock SERVICES INC.

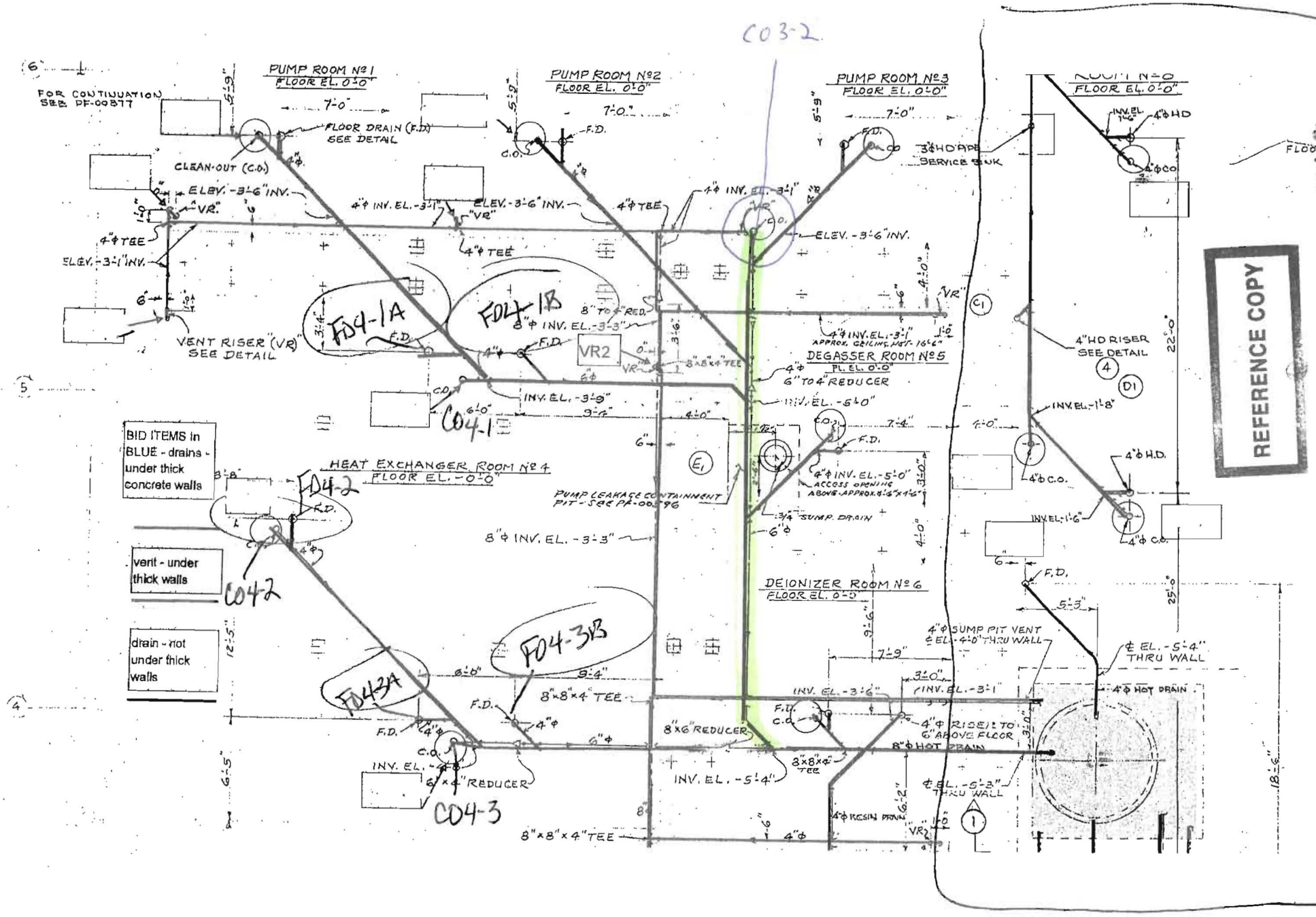
Pipe Interior Radiological Survey Form (Continuation Form)

Date: 4-11-08
Pipe ID#: PPH CO 3-2 Pipe Diameter: 4" to 6" Access Point Area: PPH Rm 3
Building: PPH Elevation: 0 System: FO

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm²
11	11		23	23		
12	12		24	24		
13	13		19	19		
14	14		36	36		
15	15		30	30		
16	16		10	10		
17	17		29	29		
18	18		20	20		
19	19		36	36		
20	20		32	32		
21	21		36	36		
22	22		37	37		
23	23		32	32		
24	24		25	25		
25	25		27	27		
26	26		35	35		
27	27		40	40		
28	28		28	38	N/A	
29	29		38	38		
30	30		30	30		
31	31		39	39		
32	32		37	37		
33	33		35	35		
34	34		25	25		
35	35		39	39		
		N/A				

Package Page 2 of 3

REFERENCE COPY


PUMP ROOM Nº1
FLOOR EL. 0'-0"
PUMP ROOM Nº2
FLOOR EL. 0'-0"
PUMP ROOM Nº3
FLOOR EL. 0'-0"
FOR CONTINUATION SEE PF-00877
FLOOR DRAIN (F.D.) SEE DETAIL
CLEAN-OUT (C.O.)
ELEV. -3'-6" INV.
4"Φ INV. EL. -3'-1"
4"Φ TEE
ELEV. -3'-1" INV.
VENT RISER "(VR)" SEE DETAIL
FD4-1A
FD4-1B
8" TO 4" RED.
8"Φ INV. EL. -3'-3"
VR2
8"x8"x4" TEE
4"Φ INV. EL. -3'-1" APPROX. CEILING HGT. 16'-6"
DEGASSER ROOM Nº5
PL. EL. 0'-0"
4"Φ 6" TO 4" REDUCER
INV. EL. -5'-0"
INV. EL. -3'-9"
C04-1
BID ITEMS in BLUE - drains - under thick concrete walls
HEAT EXCHANGER ROOM Nº4
FLOOR EL. -0'-0"
FD4-2
PUMP LEAKAGE CONTAINMENT PIT - SEE PF-00596
4"Φ INV. EL. -5'-0" ACCESS OPENING ABOVE APPROX. 8'-6"x4'-6"
3/4" SUMP DRAIN
8"Φ INV. EL. -3'-3"
verit - under thick walls
C04-2
DEIONIZER ROOM Nº6
FLOOR EL. 0'-0"
drain - not under thick walls
FD4-3B
FD4-3A
8"x8"x4" TEE
8"x6" REDUCER
INV. EL. -5'-4"
6"x4" REDUCER
C04-3
8"x8"x4" TEE
4"Φ SUMP PIT VENT ℄ EL. -4'-0" THRU WALL
℄ EL. -5'-4" THRU WALL
4"Φ HOT DRAIN
4"Φ RISER TO 6" ABOVE FLOOR
8"Φ HOT DRAIN
℄ EL. -5'-3" THRU WALL
4"Φ RESIN DRAIN
3"Φ HD PIPE SERVICE SINK
4"HD RISER SEE DETAIL
INV. EL. -1'-8"
INV. EL. -1'-6"
4"Φ H.D.
4"Φ C.O.
FLOOR
C03-2
C04-1
C04-2
C04-3
REFERENCE COPY

Pipe Interior Radiological Survey Form

Date: 2·11·08 Time: 0935

Pipe ID#: C04-1 Pipe Diameter: 4" - 6" Access Point Area: C04-1

Building: PPH Elevation: -5 System: ~~PP~~ FO

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

Gross ____ Co60 ✓ Cs ____

Detector ID# / Sled ID# LVS-1 / C01

Detector Cal Date: 1·25·08 Detector Cal Due Date: 1·25·09

Instrument: 2350-1 Instrument ID #: 189094

Instrument Cal Date: 1·25·08 Instrument Cal Due Date: 1·25·09

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

Background Value 2·6 cpm

$MDCR_{static}$ 3·5 cpm

Efficiency Factor for Pipe Diameter 0.00039 / 0.00031 (from detector efficiency determination)

MDC_{static} 23606 / 1985 dpm/ 100 / 100 cm^2

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

Comments: Dec # 3 after 8' pipe changes from 4" to 6"

Technician Signature Russell A. Phelps

Pipe Interior Radiological Survey

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm²
1	1	1	19	19		
2	2		23	23		
3	3		21	21		
4	4		15	15		
5	5		29	29	N/A	
6	6		23	23		
7	7		21	21		
8	8		26	26		
9	9		27	27		
10	10		22	22		

Package Page 1 of 3

REFERENCE COPY

Pipe Interior Radiological Survey Form (Continuation Form)

Date: 2·11·08
Pipe ID#: C04-1 Pipe Diameter: 4"-6" Access Point Area: PPH
Building: PPH Elevation: 5 System: FO

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm^2
11	11		24	24		
12	12		21	21		
13	13		18	18		
14	14		17	17		
15	15		21	21		
16	16		27	27		
17	17		32	32		
18	18		25	25		
19	19		11	11		
			N/A			

Package Page 2 of 3

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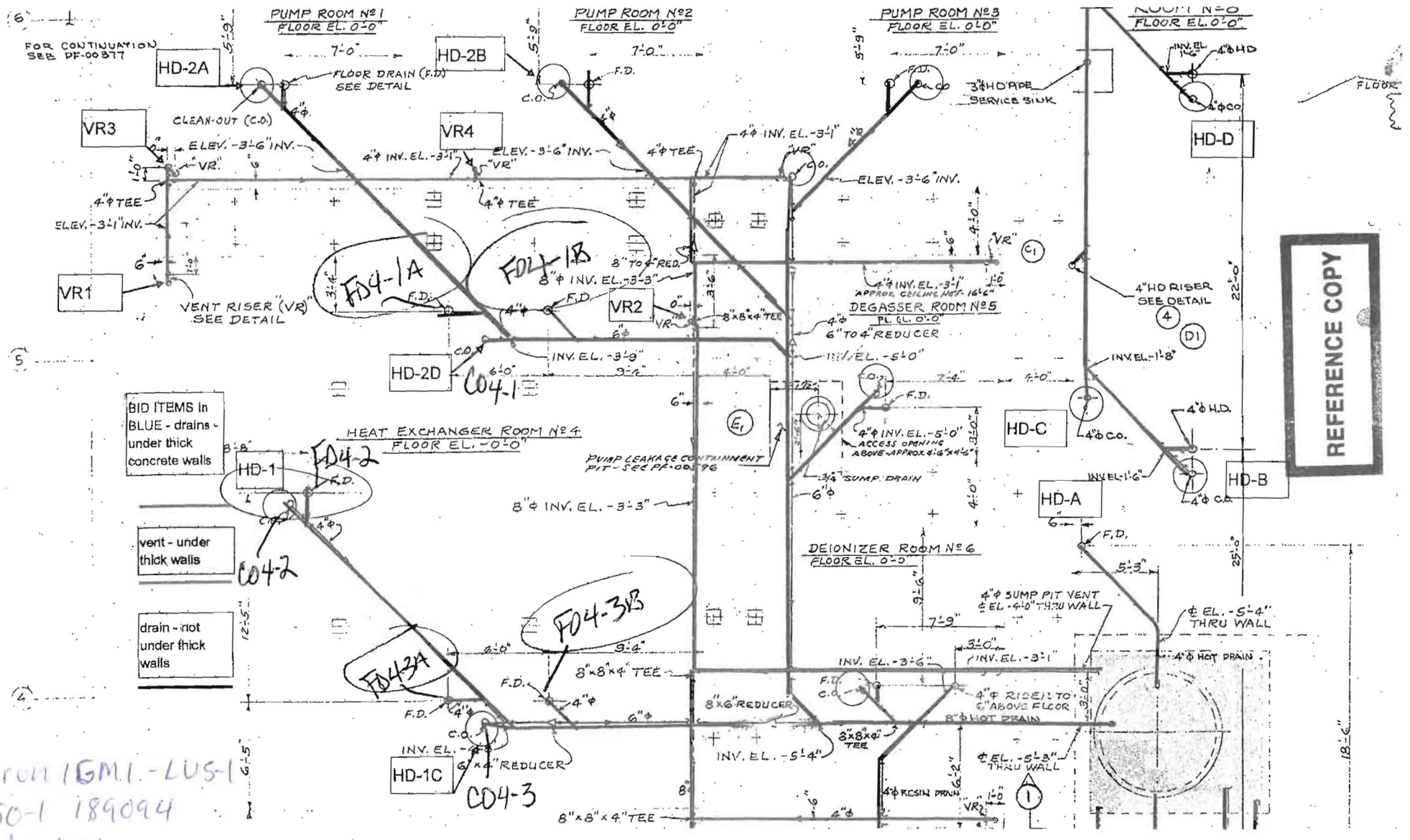

Bicron / GMI - LUS-1
2350-1 189094
Sled - 101
Dec #3 2-11-08
R.F.

3 of 3

Pipe Interior Radiological Survey Form

Date: 2·8·08 Time: 0930

Pipe ID#: C04-2 Pipe Diameter: 4" Access Point Area: C04-2

Building: Primary Pump Rm 4 Elevation: 0' System: Primary Pump

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

Gross _____ Co60 ✓ Cs _____

Detector ID# / Sled ID# Im61/LVS-1 / sled 101

Detector Cal Date: 1·25·08 Detector Cal Due Date: 1-25-09

Instrument: 2350-1 Instrument ID #: 189094

Instrument Cal Date: 1·25·08 Instrument Cal Due Date: 1·25·09

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

Background Value 10.8 cpm

$MDCR_{static}$ 4 cpm

Efficiency Factor for Pipe Diameter 0.00039 (from detector efficiency determination)

MDC_{static} 2366 dpm/ 100 cm^2

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

Comments: on Reading line 7 there was no pipe. They cut that part out while coreboring. ~~at End of Pipe swith Dec-3 for Co60 to Dec 4 for Cs137.~~

Technician Signature Russel A. Phelps

Pipe Interior Radiological Survey

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm²
1 Drop	1 Ft	1	17	17		
2 Drop	2 Ft	1	15	15		
3 Drop	3 Ft	1	22	22		
4 Drop	4 Ft	1	14	14		
5 Elbow	5 Ft	1	13	13	N	A
6	6 Ft	1	41	41		
7	7 Ft					
8	8 Ft	1	30	30		
9	9 Ft	1	26	26		
10	10 Ft	1	20	20		

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Pipe Interior Radiological Survey Form (Continuation Form)

Date: 2·8·08
Pipe ID#: CO 4-2 Pipe Diameter: 4" Access Point Area: CO 4-2
Building: Pump Rm 4 Elevation: 0' System: Primary Pump

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm^2
11	11 Ft	1	30	30		
12	12 Ft	1	23	23		
13	13 Ft	1	22	22		
14	14 Ft	1	24	24		
15	15 Ft	1	22	22		
16	16 Ft	1	36	36		
17	17 Ft	1	20	20		
18	18 Ft	1	15	15		
19.	19 Ft	1	19	19		
			N/A		N/A	

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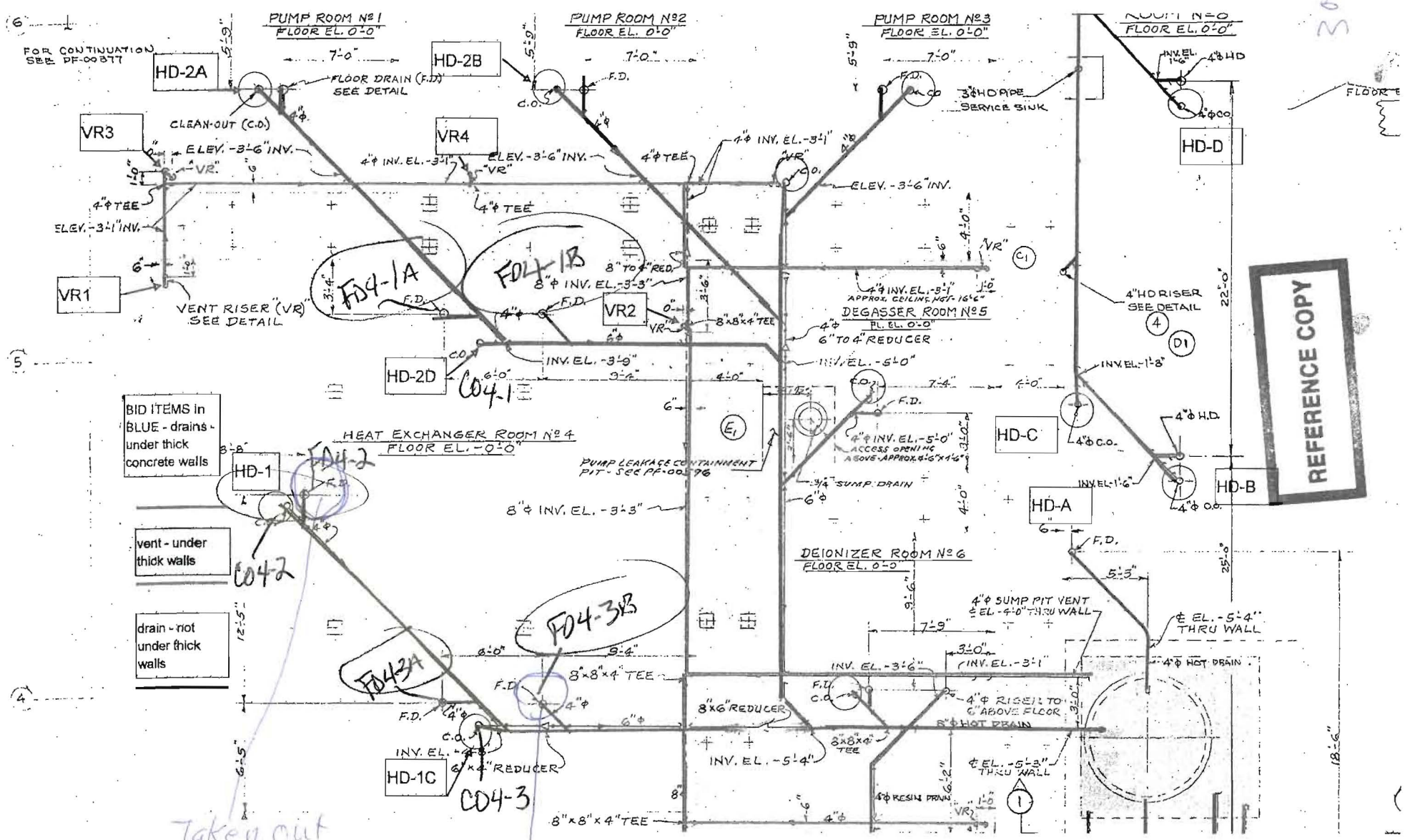
Babcock SERVICES INC.


PUMP ROOM Nº 1
FLOOR EL. 0'-0"
PUMP ROOM Nº 2
FLOOR EL. 0'-0"
PUMP ROOM Nº 3
FLOOR EL. 0'-0"
FOR CONTINUATION SEE PF-00377
HD-2A
HD-2B
HD-2D
HD-1
HD-1C
HD-A
HD-B
HD-C
HD-D
VR1
VR2
VR3
VR4
FLOOR DRAIN (F.D.) SEE DETAIL
CLEAN-OUT (C.O.)
VENT RISER "(VR)" SEE DETAIL
ELEV. -3'-6" INV.
ELEV. -3'-1" INV.
4"ϕ TEE
4"ϕ INV. EL. -3'-1"
8"ϕ INV. EL. -3'-3"
8" TO 4" RED.
8"x8"x4" TEE
6" TO 4" REDUCER
INV. EL. -3'-9"
INV. EL. -5'-0"
DEGASSER ROOM Nº 5
FL. EL. 0'-0"
4"ϕ INV. EL. -3'-1" APPROX. CEILING HGT. 16'-6"
4"ϕ INV. EL. -5'-0" ACCESS OPENING ABOVE APPROX. 4'-6"x1'-6"
3/4" SUMP DRAIN
6"ϕ
HEAT EXCHANGER ROOM Nº 4
FLOOR EL. -0'-0"
PUMP LEAKAGE CONTAINMENT PIT - SEE PF-00296
8"ϕ INV. EL. -3'-3"
DEIONIZER ROOM Nº 6
FLOOR EL. 0'-0"
4"ϕ SUMP PIT VENT ℄ EL. -4'-0" THRU WALL
℄ EL. -5'-4" THRU WALL
4"ϕ HOT DRAIN
INV. EL. -3'-6"
INV. EL. -3'-1"
4"ϕ RISER TO 6" ABOVE FLOOR
8"ϕ HOT DRAIN
8"x6" REDUCER
8"x8"x4" TEE
INV. EL. -5'-4"
℄ EL. -5'-3" THRU WALL
4"ϕ RESIN DRAIN
8"x8"x4" TEE
6"x4" REDUCER
3"ϕ HD PIPE SERVICE SINK
4"ϕ HD
4"ϕ CO
4"ϕ C.O.
4"ϕ H.D.
4"HD RISER SEE DETAIL
INV. EL. -1'-8"
INV. EL. -1'-6"
FD4-1A
FD4-1B
FD4-2
FD4-3A
FD4-3B
C04-1
C04-2
C04-3
BID ITEMS in BLUE - drains - under thick concrete walls
vent - under thick walls
drain - not under thick walls
Taken out During core Boring
Taken out During coreboring
REFERENCE COPY

Pipe Interior Radiological Survey Form

Date: 3·31·08 Time: 0900

Pipe ID#: PPH C04-3 Pipe Diameter: 4" to 6" to 8" Access Point Area: PPH Rm 4

Building: PPH Elevation: 0 System: FD

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

Gross ____ Co60 ✓ Cs ____

Detector ID# / Sled ID# LVS-1 / 101

Detector Cal Date: 1·25·08 Detector Cal Due Date: 1·25·09

Instrument: 2350-1 Instrument ID #: 203438

Instrument Cal Date: 10·16·~~08~~ 07 Instrument Cal Due Date: 10·16·08

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

Background Value 3.2 cpm

$MDCR_{static}$ 9 cpm

Efficiency Factor for Pipe Diameter $3.9E^{-4}/3.1E^{-4}/2.9E^{-4}$ (from detector efficiency determination)

MDC_{static} 2366/1985/1591 dpm/ 100/100/100 cm^2

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

Comments: Pipe has 8' of 4" 14' of 6" and 20' of 8" pipe

Technician Signature Russell A. Phelps

Pipe Interior Radiological Survey

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm²
1	1		20	20		
2	2		14	14		
3	3		12	12		
4	4		24	24		
5	5		16	16	N/A	
6	6		28	28		
7	7		19	19		
8	8		23	23		
9	9		19	19		
10	10		23	23		

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Pipe Interior Radiological Survey Form (Continuation Form)

Date: 3·31·08
Pipe ID#: PPH C04·3 Pipe Diameter: 4"+6"+8" Access Point Area: PPH Rm 4
Building: PPH Elevation: 0 System: FD

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm^2
11	11	1	15	15		
12	12		9	9		
13	13		13	13		
14	14		19	19		
15	15		13	13		
16	16		24	24		
17	17		14	14		
18	18		13	13		
19	19		15	15		
20	20		19	19		
21	21		30	30		
22	22		13	13		
23	23		24	24		
24	24		22	22		
25	25		21	21		
26	26		56	56		N/A
27	27		44	44		
28	28		27	27		
29	29		27	27		
30	30		55	55		
31	31		35	35		
32	32		35	35		
33	33		21	21		
34	34		24	24		
35	35		18	18		
36	36		16	16		
37	37		20	20		
38	38		23	23		
39	39		20	20		
40	40		12	12		
41	41		17	17		
42	42		17	17		

Package Page 2 of 3

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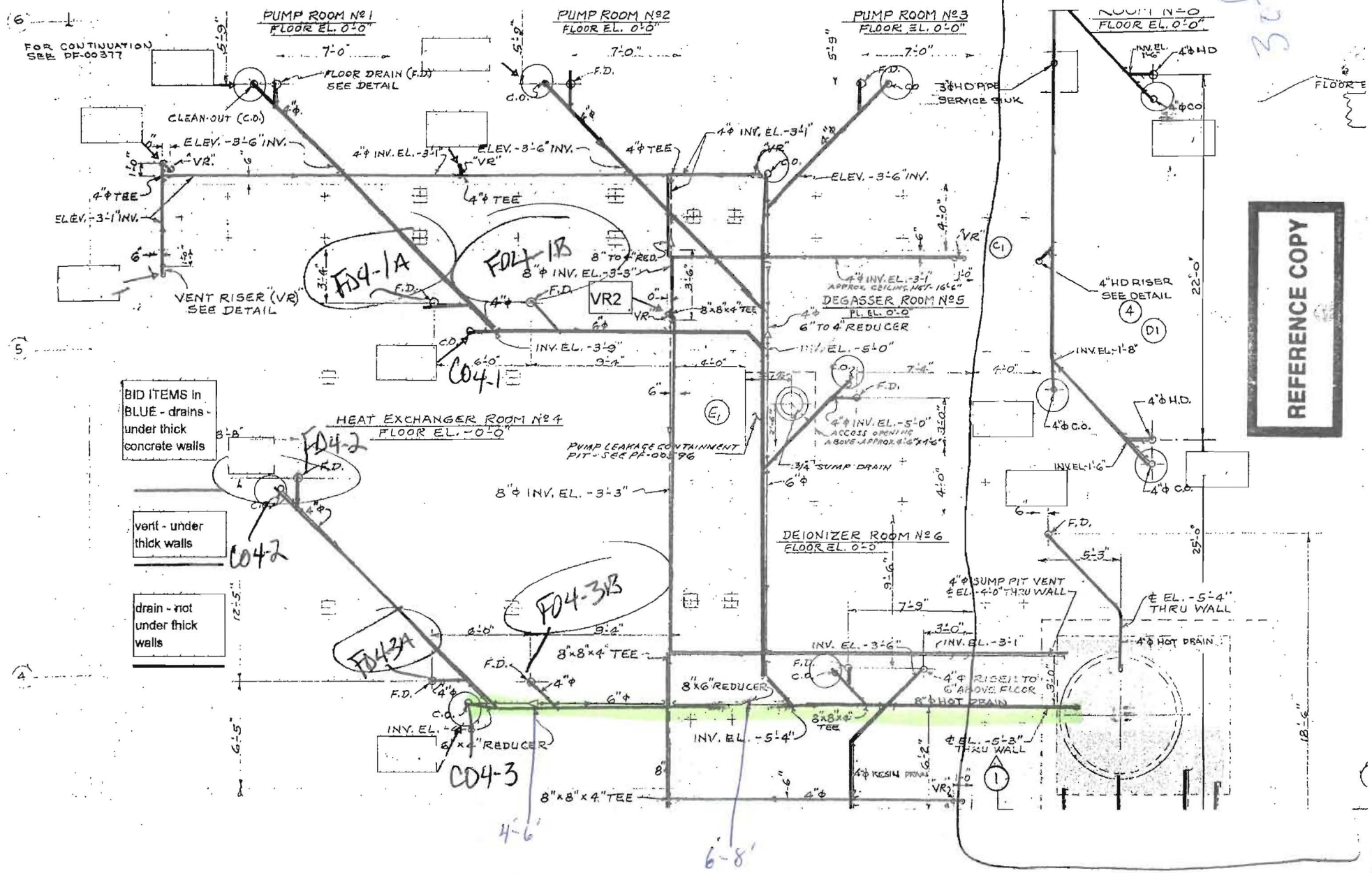
PUMP ROOM Nº 1
FLOOR EL. 0'-0"
PUMP ROOM Nº 2
FLOOR EL. 0'-0"
PUMP ROOM Nº 3
FLOOR EL. 0'-0"
FOR CONTINUATION SEE PF-00377
FLOOR DRAIN (F.D.) SEE DETAIL
CLEAN-OUT (C.O.)
ELEV. -3'-6" INV.
4"φ INV. EL. -3'-1"
4"φ TEE
ELEV. -3'-1" INV.
VENT RISER (VR) SEE DETAIL
FD4-1A
FD4-1B
8" TO 4" RED.
8"φ INV. EL. -3'-3"
VR2
8"x8"x4" TEE
DEGASSER ROOM Nº 5
PL. EL. 0'-0"
6" TO 4" REDUCER
INV. EL. -3'-9"
INV. EL. -5'-0"
C04-1
BID ITEMS in BLUE - drains under thick concrete walls
HEAT EXCHANGER ROOM Nº 4
FLOOR EL. -0'-0"
FD4-2
PUMP LEAKAGE CONTAINMENT PIT - SEE PF-00596
4"φ INV. EL. -5'-0" ACCESS OPENING ABOVE APPROX. 4'-6"x4'-6"
3/4" SUMP DRAIN
vent - under thick walls
C04-2
DEIONIZER ROOM Nº 6
FLOOR EL. 0'-0"
drain - not under thick walls
FD4-3A
FD4-3B
8"x8"x4" TEE
8"x6" REDUCER
INV. EL. -5'-4"
6"x4" REDUCER
C04-3
4"φ SUMP PIT VENT ℄ EL. -4'-0" THRU WALL
℄ EL. -5'-4" THRU WALL
4"φ HOT DRAIN
4"φ RISER TO 6" ABOVE FLOOR
8"φ HOT DRAIN
℄ EL. -5'-3" THRU WALL
4"φ RESIN DRAIN
4"HD RISER SEE DETAIL
4"φ H.D.
4"φ C.O.
REFERENCE COPY

Pipe Interior Radiological Survey Form

Date: 3·27·08 Time: 1046

Pipe ID#: PPHC08-~~3~~ 1 Pipe Diameter: 4" Access Point Area: PPH Rm 8

Building: PPH Elevation: 0 System: FD

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

Gross _____ Co60 ✓ Cs _____

Detector ID# / Sled ID# LVS-1 / 101

Detector Cal Date: 1·25·08 Detector Cal Due Date: 1·25·09

Instrument: 2350-1 Instrument ID #: 203438

Instrument Cal Date: 10-16·07 Instrument Cal Due Date: 10·16·08

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

Background Value 3.7 cpm

$MDCR_{static}$ 10 cpm

Efficiency Factor for Pipe Diameter 0.00039 (from detector efficiency determination)

MDC_{static} 2366 dpm/ 100 cm^2

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

Comments: FD 8-3 is completely gone, Riser For C08-~~3~~ 1 is completly gone

Technician Signature Russell A. Phelps

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		
2	2	1	23	23		
3	3	1	27	27		
4	4	1	20	20		
5	5	1	11	11	N/A	
6	6	1	15	15		
7						
8		N/A				
9						
10						

Package Page 1 of 2

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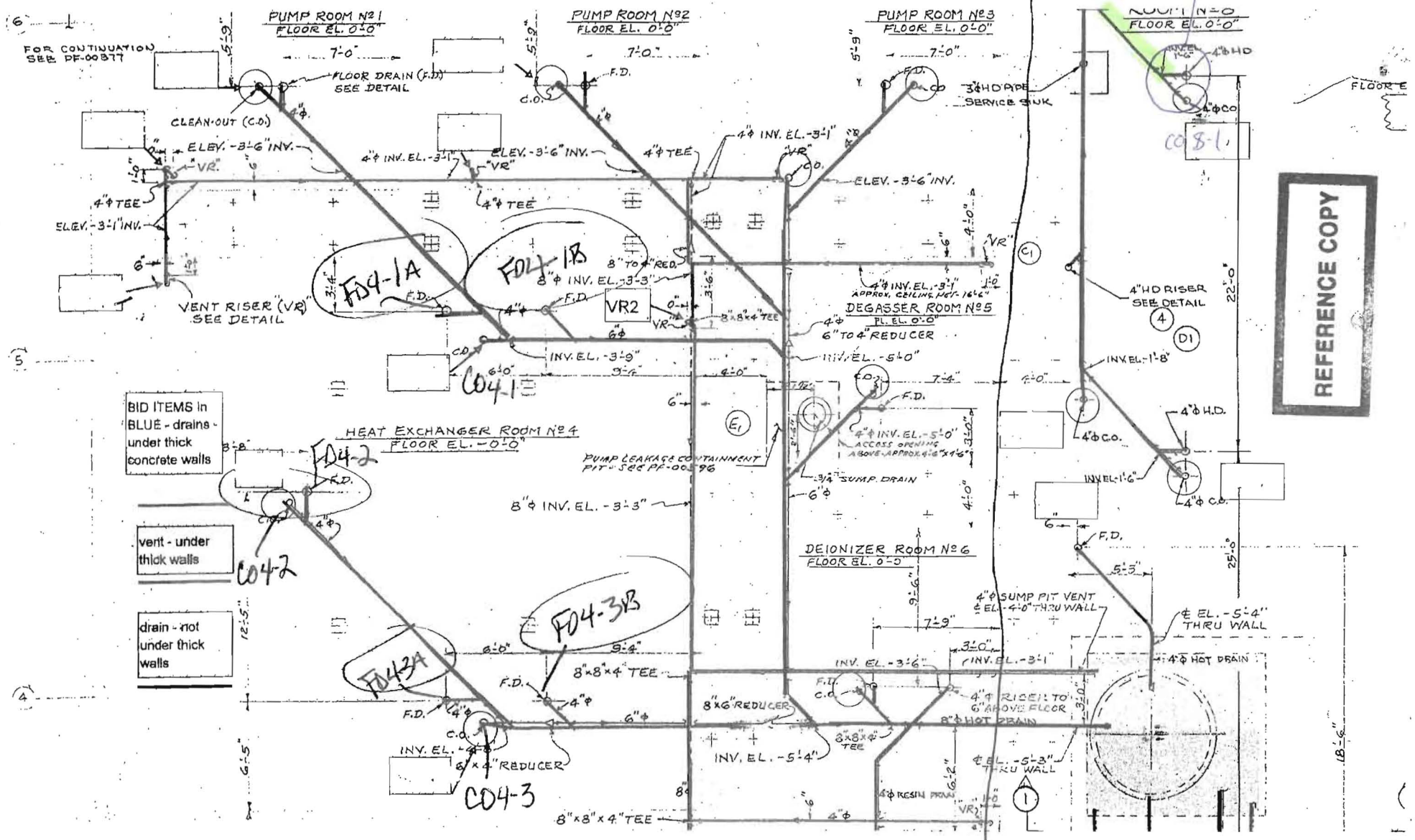
FD8-3 and CO8-1 were core bored out



2 of 2

Pipe Interior Radiological Survey Form

Date: 3-26-08 Time: 1450

Pipe ID#: PPH C08-2 Pipe Diameter: 4" Access Point Area: PPH Rm 8

Building: PPH Elevation: 0 System: FD

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

Gross _____ Co60 ✓ Cs _____

Detector ID# / Sled ID# LVS-1 / 101

Detector Cal Date: 1-25-08 Detector Cal Due Date: 1-25-09

Instrument: 2350-1 Instrument ID #: 203438

Instrument Cal Date: 10-16-07 Instrument Cal Due Date: 10-16-08

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

Background Value 3 cpm

$MDCR_{static}$ 9 cpm

Efficiency Factor for Pipe Diameter 0.00039 (from detector efficiency determination)

MDC_{static} 2366 dpm/ 100 cm^2

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

Comments: FD8-2 is completly Bored out and C08-2 Drop is completly bored out

Technician Signature Russel A. Phelps

Pipe Interior Radiological Survey

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm²
1	1	1	16	16		
2	2	(	13	13		
3	3	(	16	16		
4	4	(	14	14		
5	5	1	18	18	N	A
6						
7						
8		N	A			
9						
10						

Package Page 1 of 2

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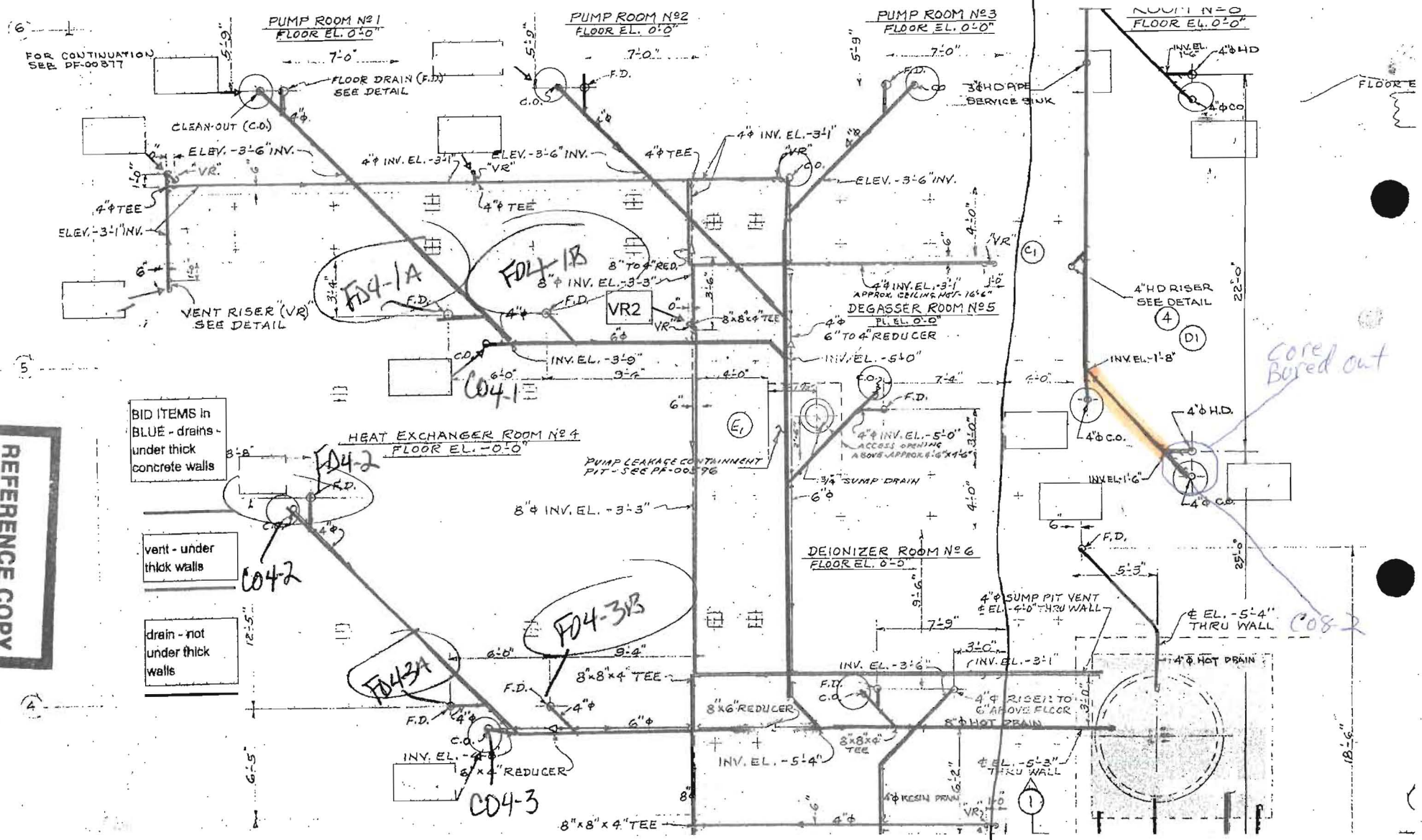
PUMP ROOM Nº 1
FLOOR EL. 0'-0"
PUMP ROOM Nº 2
FLOOR EL. 0'-0"
PUMP ROOM Nº 3
FLOOR EL. 0'-0"
FOR CONTINUATION SEE PF-00877
FLOOR DRAIN (F.D.) SEE DETAIL
CLEAN-OUT (C.O.)
ELEV. -3'-6" INV.
4"φ INV. EL. -3'-1"
4"φ TEE
ELEV. -3'-1" INV.
VENT RISER (VR) SEE DETAIL
3"φ HD PIPE
SERVICE SINK
4"φ INV. EL. -3'-1"
APPROX. CEILING HGT. 16'-6"
DEGASSER ROOM Nº 5
FL. EL. 0'-0"
8"φ INV. EL. -3'-3"
8" TO 4" RED.
8"x8"x4" TEE
6" TO 4" REDUCER
INV. EL. -5'-0"
INV. EL. -3'-9"
FD4-1A
FD4-1B
VR2
C04-1
HEAT EXCHANGER ROOM Nº 4
FLOOR EL. -0'-0"
PUMP LEAKAGE CONTAINMENT PIT - SEE PF-00596
4"φ INV. EL. -5'-0"
ACCESS OPENING ABOVE APPROX. 6'-6"x4'-6"
3/4" SUMP DRAIN
FD4-2
C04-2
DEIONIZER ROOM Nº 6
FLOOR EL. 0'-0"
4"φ SUMP PIT VENT
℄ EL. -4'-0" THRU WALL
℄ EL. -5'-4" THRU WALL
4"φ HOT DRAIN
FD4-3B
FD4-3A
8"x8"x4" TEE
8"x6" REDUCER
4"φ RISER TO 6" ABOVE FLOOR
8"φ HOT DRAIN
INV. EL. -5'-4"
6"x4" REDUCER
C04-3
4"φ RESIN DRAIN
℄ EL. -5'-3" THRU WALL
4"φ HD
4"φ CO
4"HD RISER SEE DETAIL
INV. EL. -1'-8"
INV. EL. -1'-6"
4"φ H.D.
4"φ C.O.
FLOOR E
Core Bored out
C08-2
BID ITEMS in BLUE - drains - under thick concrete walls
vent - under thick walls
drain - not under thick walls
REFERENCE COPY
2 of 2

Pipe Interior Radiological Survey Form

Date: 3·26·08 Time: 1352

Pipe ID#: C08-3 Pipe Diameter: 4" Access Point Area: PPH Rm 8

Building: PPH Elevation: 0 System: FD

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

Gross ____ Co60 ✓ Cs ____

Detector ID# / Sled ID# LVS-1 / 101

Detector Cal Date: 1·25·08 Detector Cal Due Date: 1·25·09

Instrument: 2350-1 Instrument ID #: RP ~~203488~~ 203438

Instrument Cal Date: 10·16·07 Instrument Cal Due Date: 10·16·08

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

Background Value 3 cpm

$MDCR_{static}$ 9 cpm

Efficiency Factor for Pipe Diameter 0.00039 (from detector efficiency determination)

MDC_{static} 2366 dpm/ 100 cm^2

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

Comments: Did Header pipe H01 H02 H03 were core bored completly out

Technician Signature Russell A. Phelps

Pipe Interior Radiological Survey

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm²
1	1	1	24	24		
2	2		28	28		
3	3		17	17		
4	4		30	30		
5	5		16	16	N	A
6	6		22	22		
7	7		26	26		
8	8		18	18		
9	9		18	18		
10	10	1	20	20		

Package Page 1 of 3

REFERENCE COPY

Pipe Interior Radiological Survey Form (Continuation Form)

Date: 3·26·08
Pipe ID#: CO8-3 Pipe Diameter: 4" Access Point Area: PPH Rm 8
Building: PPH Elevation: 0 System: FD

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm^2
11	11	1	10	10		
12	12		12	12		
13	13		21	21		
14	14		21	21		
15	15		26	26		
16	16		35	35		
17	17		11	11		
18	18		17	17		
19	19		24	24		
20	20		21	21		
21	21		21	21		
22	22		16	16		
23	23		28	28		
24	24		12	12		
25	25	1	12	12		
					N/A	
		N/A				

Package Page 2 of 3

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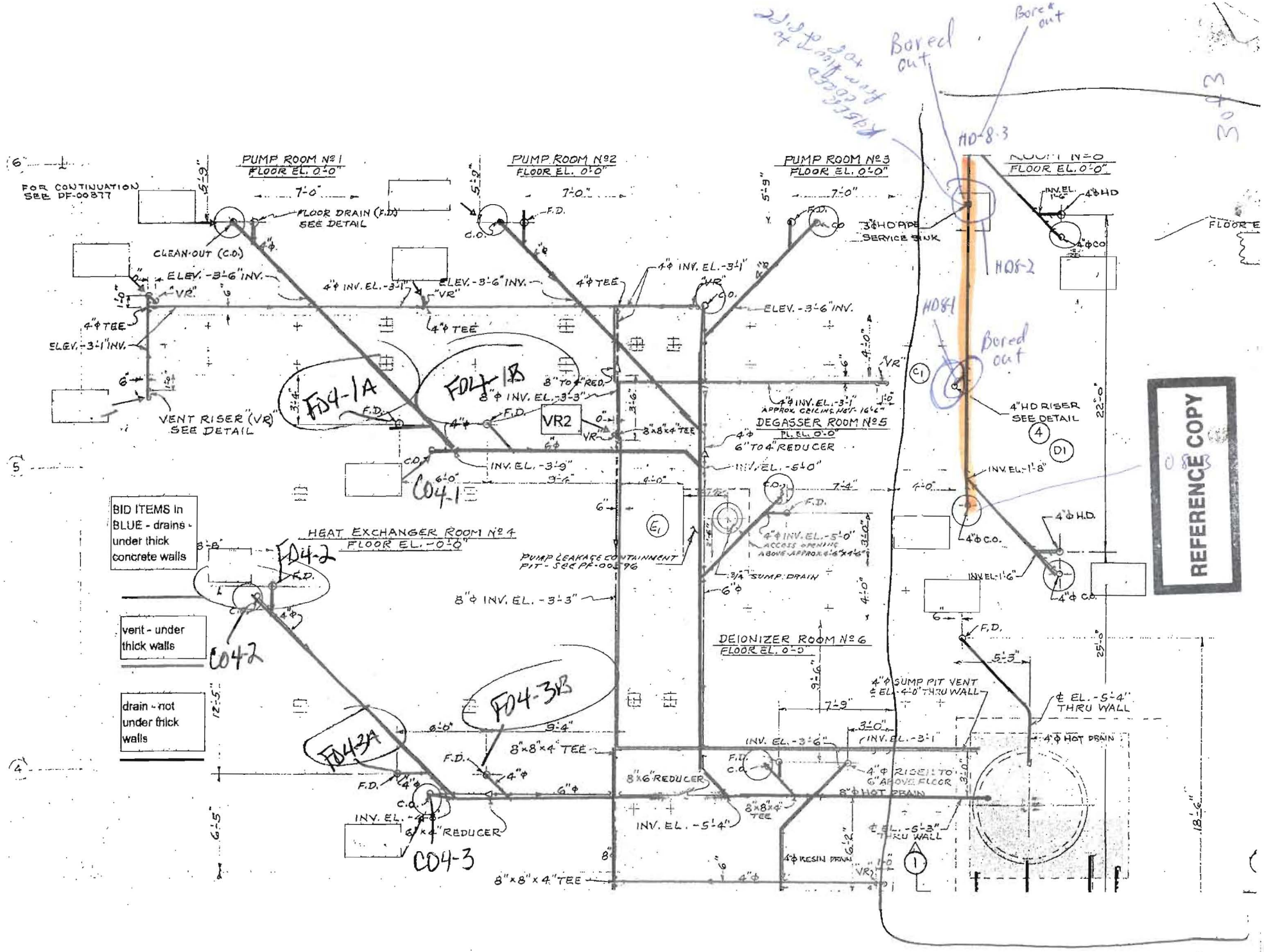
PUMP ROOM Nº 1
FLOOR EL. 0'-0"
PUMP ROOM Nº 2
FLOOR EL. 0'-0"
PUMP ROOM Nº 3
FLOOR EL. 0'-0"
FOR CONTINUATION SEE PF-00877
FLOOR DRAIN (F.D.) SEE DETAIL
CLEAN-OUT (C.O.)
ELEV. -3'-6" INV.
ELEV. -3'-1" INV.
4"ϕ TEE
4"ϕ INV. EL. -3'-1"
VENT RISER (VR) SEE DETAIL
FD4-1A
FD4-1B
8"ϕ INV. EL. -3'-3"
8" TO 4" RED.
VR2
8"x8"x4" TEE
INV. EL. -3'-9"
C04-1
DEGASSER ROOM Nº 5
PL. EL. 0'-0"
6" TO 4" REDUCER
INV. EL. -5'-0"
4"ϕ INV. EL. -3'-1" APPROX. CEILING HGT. 16'-6"
4"ϕ INV. EL. -5'-0" ACCESS OPENING ABOVE APPROX. 6'-6"x4'-6"
3/4" SUMP DRAIN
PUMP LEAKAGE CONTAINMENT PIT - SEE PF-00296
HEAT EXCHANGER ROOM Nº 4
FLOOR EL. -0'-0"
FD4-2
C04-2
FD4-3A
FD4-3B
8"x8"x4" TEE
8"x6" REDUCER
6"x4" REDUCER
C04-3
INV. EL. -4'-8"
INV. EL. -5'-4"
DEIONIZER ROOM Nº 6
FLOOR EL. 0'-0"
4"ϕ SUMP PIT VENT ℄ EL. -4'-0" THRU WALL
℄ EL. -5'-4" THRU WALL
4"ϕ HOT DRAIN
4"ϕ RISER TO 6" ABOVE FLOOR
8"ϕ HOT DRAIN
℄ EL. -5'-3" THRU WALL
4"ϕ RESIN DRAIN
3"ϕ HD PIPE SERVICE SINK
HD-8-3
HD8-2
HD8-1
Bored out
Bore* out
4"HD RISER SEE DETAIL
INV. EL. -1'-8"
INV. EL. -1'-6"
4"ϕ HD
4"ϕ CO
4"ϕ H.D.
4"ϕ C.O.
FLOOR E
BID ITEMS In BLUE - drains - under thick concrete walls
vent - under thick walls
drain - not under thick walls
REFERENCE COPY

Pipe Interior Radiological Survey Form

Date: 4-2-08 Time: 1440

Pipe ID#: FD 8-1 Pipe Diameter: 4" Access Point Area: PPH Rm 8

Building: PPH Elevation: 0 System: FD

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

Gross ____ Co60 ✓ Cs ____

Detector ID# / Sled ID# LVS-1 / 101

Detector Cal Date: 1-25-08 Detector Cal Due Date: 1-25-09

Instrument: 2350-1 Instrument ID #: 203438

Instrument Cal Date: 10-16-07 Instrument Cal Due Date: 10-16-08

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

Background Value 3.6 cpm

$MDCR_{static}$ 10 cpm

Efficiency Factor for Pipe Diameter 0.00039 (from detector efficiency determination)

MDC_{static} 2366 dpm/ 100 cm^2

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

Comments: ~~Riser core bored down to PD Tee only surved 6' of pipe~~
Riser core bored down to Tee Surveyed the Remaining 6' of pipe

Technician Signature Russel A. Phelps

Pipe Interior Radiological Survey

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm²
1	1	1	21	21		
2	2	1	15	15		
3	3	1	17	17		
4	4	1	12	12		
5	5	1	30	30		
6	6	1	25	25		
7						
8						
9						
10						

N/A

Package Page 1 of 2

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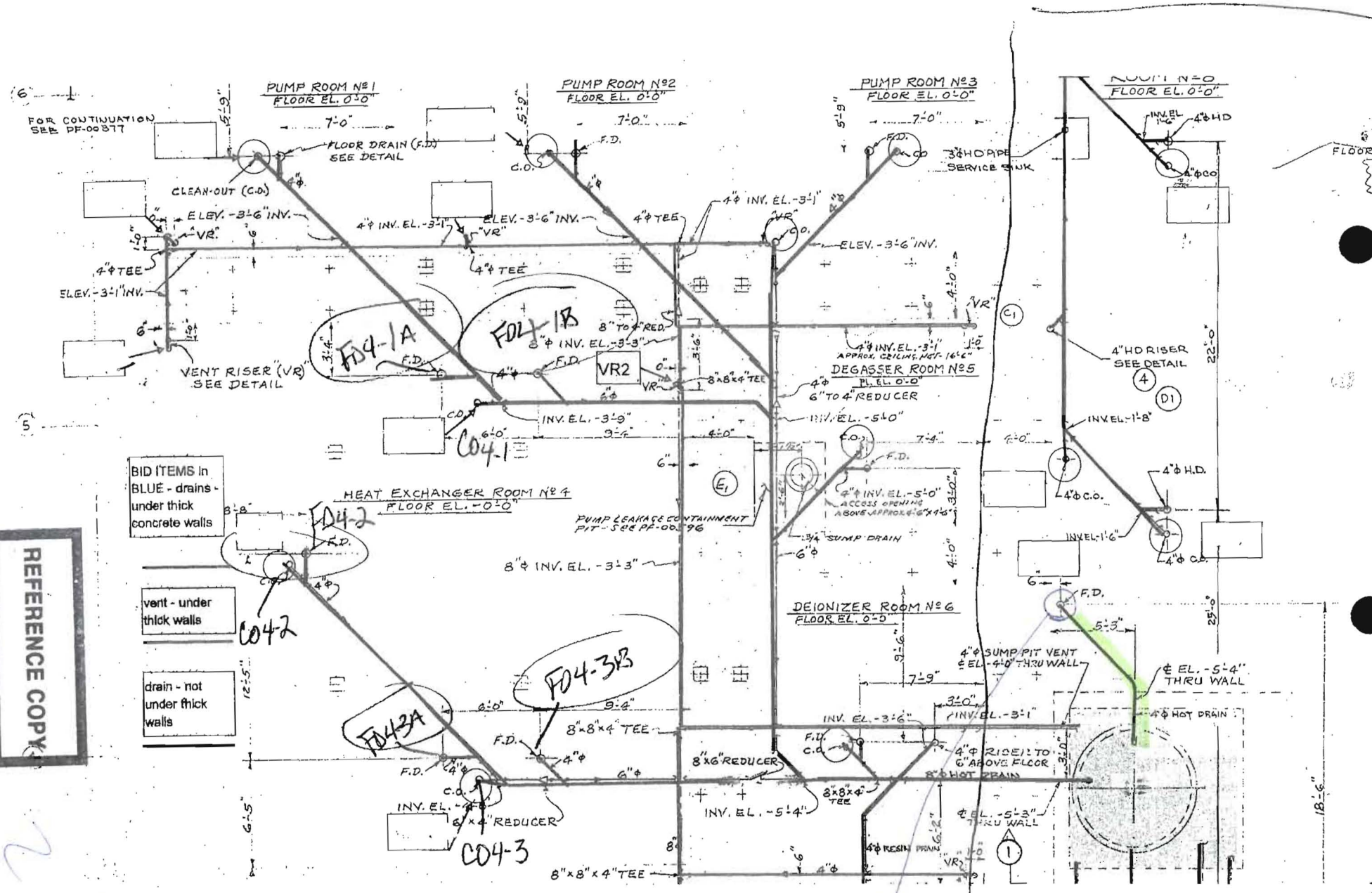
PUMP ROOM Nº 1
FLOOR EL. 0'-0"
PUMP ROOM Nº 2
FLOOR EL. 0'-0"
PUMP ROOM Nº 3
FLOOR EL. 0'-0"
FOR CONTINUATION SEE PF-00877
FLOOR DRAIN (F.D.) SEE DETAIL
CLEAN-OUT (C.O.)
ELEV. -3'-6" INV.
4"φ INV. EL. -3'-1"
4"φ TEE
ELEV. -3'-1" INV.
VENT RISER (VR) SEE DETAIL
FD4-1A
FD4-1B
8"φ INV. EL. -3'-3"
8" TO 4" RED.
VR2
8"x8"x4" TEE
4"φ INV. EL. -3'-1" APPROX. CEILING HGT. 16'-6"
DEGASSER ROOM Nº 5
PL. EL. 0'-0"
6" TO 4" REDUCER
INV. EL. -3'-9"
INV. EL. -5'-0"
C04-1
BID ITEMS in BLUE - drains - under thick concrete walls
vent - under thick walls
drain - not under thick walls
HEAT EXCHANGER ROOM Nº 4
FLOOR EL. -0'-0"
FD4-2
C04-2
PUMP LEAKAGE CONTAINMENT PIT - SEE PF-00896
4"φ INV. EL. -5'-0" ACCESS OPENING ABOVE APPROX. 4'-6"x4'-6"
3/4" SUMP DRAIN
6"φ
8"φ INV. EL. -3'-3"
DEIONIZER ROOM Nº 6
FLOOR EL. 0'-0"
4"φ SUMP PIT VENT ℄ EL. -4'-0" THRU WALL
℄ EL. -5'-4" THRU WALL
4"φ HOT DRAIN
FD4-3B
FD4-3A
8"x8"x4" TEE
8"x6" REDUCER
4"φ RISER TO 6" ABOVE FLOOR
8"φ HOT DRAIN
INV. EL. -5'-4"
6"x4" REDUCER
C04-3
8"x8"x4" TEE
4"φ RESIN PRIMS
℄ EL. -5'-3" THRU WALL
3"φ HD PIPE SERVICE SINK
4"φ HD
4"φ CO
4" HD RISER SEE DETAIL
INV. EL. -1'-8"
INV. EL. -1'-6"
4"φ H.D.
4"φ C.O.
Core bored out FD8-1 Riser
REFERENCE COPY