

**DRAFT**  
**Total Mercury CEMS Demonstration**

**Summary Table: Holnam, Inc., Cement Kiln, Holly Hill, SC**

**U.S. Environmental Protection Agency  
Office of Solid Waste and Emergency Response (5305)  
401 M Street, SW  
Washington, DC 20460**

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**Summary of Hg CEMS Demonstration Tests**

CEMS Model	Test Date	Performance Achieved							Observed Interference Levels (§4.7)									
		RA		Species	CE	CD	ZD	Data Avail.	CO	CO <sub>2</sub>	O <sub>2</sub>	SO <sub>2</sub>	NO <sub>2</sub>	H <sub>2</sub> O	HCl	Cl <sub>2</sub>	TOTAL	
Proposed Perf. Level (Less than stated value)	RF	<u>±20%</u> of mean	<u>±10%</u> of std		<u>±15%</u> of Ref Conc. at 3 levels	<u>± 10%</u> of std	<u>± 5%</u> of std	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<u>± 10%</u> of std.	
Verewa HM-1400	8/96	1	n/a	n/a	Hg	n/a	n/a	n/a	n/a	-3.3	-7.1	-4.7	-5.4	-3.3	NP	17.2	-2.6	-9.3
			n/a	n/a	HgCl <sub>2</sub>	n/a	n/a	n/a		1.6	0.2	9.1	-4.9	NP	NP	8.1	-10.1	4.1
	12/96	1	-36.4	11.3 B	Hg	P	NP	TBD	86.2									
		.733			HgCl <sub>2</sub>	P	n/a	n/a										
	01/97	1	370.1	44.2 47.6	Hg	P	NP	TBD	67.6									
		.733			HgCl <sub>2</sub>	P	n/a	n/a										
	02/97	1	P	P	Hg	22.7 -46.0 -60.1	NP	n/a	90.1									
		.733			HgCl <sub>2</sub>	7.6 -89.7	n/a	n/a										
	03/97	1	Off		Hg	Off	Off	Off	11.4								NP	
		.733			HgCl <sub>2</sub>	Off	n/a	n/a										
	03/97	1	38.8 37.3	22.4 21.5	Hg	----	----	----	0									
		.733			HgCl <sub>2</sub>	----	----	----										
	04/97	1	Off		Hg	Off	Off	Off	0									
		.733			HgCl <sub>2</sub>	Off	n/a	n/a										
	05/97	1	Off		Hg	Off	Off	Off	0									
		.733			HgCl <sub>2</sub>	Off	n/a	n/a										
	ALL	1	204.5 42.5	39.0 25.6	Hg	22.7 -46.0 -60.1	NP		40.0	-3.3	-7.1	-4.7	-5.4	-3.3	NP	17.2	-2.6	-9.3
		.733			HgCl <sub>2</sub>	7.6 -89.7	n/a	n/a		1.6	0.2	9.1	-4.9	NP	NP	8.1	-10.1	4.1

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CEMS Model	Test Date	Performance Achieved							Observed Interference Levels (§4.7)										
		RA		Species	CE	CD	ZD	Data Avail.	CO	CO <sub>2</sub>	O <sub>2</sub>	SO <sub>2</sub>	NO <sub>2</sub>	H <sub>2</sub> O	HCl	Cl <sub>2</sub>	TOTAL		
Proposed Perf. Level (Less than stated value)		RF	<u>±20%</u> of mean	<u>±10%</u> of std		<u>±15%</u> of Ref Conc. at 3 levels	<u>± 10%</u> of std	<u>± 5%</u> of std	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<u>± 10%</u> of std.		
Perkin Elmer MERCEM	8/96	1	n/a	n/a	Hg	n/a	n/a	n/a	n/a	3.9	0.1	*31.8	-2.8	0.6	NP	0.7	-0.8	32.3	
			n/a	n/a	HgCl <sub>2</sub>	n/a	n/a	n/a		0.8	-11.5	-9.3	-3.7	NP	NP	-2.0	-1.2	-27.0	
	12/96	1	63.1	19.6	Hg	NP	TBD	TBD	94.4										
		2.712	B	B	HgCl <sub>2</sub>	NP	n/a	n/a											
	01/97	1	71.4	8.7	Hg	P	TBD	TBD	89.9										
		2.712	300.0	36.4	HgCl <sub>2</sub>	P	n/a	n/a											
	02/97	1	P	P	Hg-zero	37.8	n/a	n/a	96.8										
		2.712			Hg-mid	13.2													
	03/97	1	50.0	15.5	Hg high	-19.9			83.7										
		2.712			Hg-zero	12.7	<rdl	n/a	n/a										
	03/97	1	87.1	27.0	Hg-mid	-23.7			83.7										
		2.712			Hg high	49.2													
	04/97	1	13.8	5.9	Hg	-----	<rdl	n/a	n/a	81.2									
		2.712			HgCl <sub>2</sub>	-----													
	05/97	1	186.4	79.3	Hg zero	11.3	n/a	n/a	98.9										
		2.712			Hg-mid	-70.7													
	ALL	1	50.5	16.5	Hg high	<rdl	<rdl	n/a	n/a	89.9	3.9	0.1	31.8	-2.8	0.6	NP	0.7	-0.8	32.3
		2.712			HgCl <sub>2</sub>	nrf					0.8	-11.5	-9.3	-3.7	NP	NP	-2	-1.2	-27

NP

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CEMS Model	Test Date	Performance Achieved							Observed Interference Levels (§4.7)									
		RA		Species	CE	CD	ZD	Data Avail.	CO	CO <sub>2</sub>	O <sub>2</sub>	SO <sub>2</sub>	NO <sub>2</sub>	H <sub>2</sub> O	HCl	Cl <sub>2</sub>	TOTAL	
Proposed Perf. Level (Less than stated value)		RF	<u>±20%</u> of mean	<u>±10%</u> of std		<u>±15%</u> of Ref Conc. at 3 levels	<u>± 10%</u> of std	<u>± 5%</u> of std	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<u>± 10%</u> of std.	
See. Hg-MAT2	8/96	1	n/a	n/a	Hg	n/a	n/a	n/a	n/a	0.2	1.8	1.8	58.3	-92.6	NP	-50.4	3.0	-78.0
			n/a	n/a	HgCl <sub>2</sub>	n/a	n/a	n/a		-3.3	-4.9	4.0	0.7	NP	NP	5.2	3.3	3.7
	12/96	1	-24.2	-7.5 B	Hg	NP	TBD	TBD	95.7									
		.805			HgCl <sub>2</sub>	NP	n/a	n/a										
	01/97	1	912.8	110.9 716.4	Hg	P	TBD	TBD	87.6									
		.805			HgCl <sub>2</sub>	P	n/a	n/a										
	02/97	1	P	P	Hg	-1.5 -61.3 -68.8	n/a	n/a	96.0									
		.805			HgCl <sub>2</sub>	0.6 -84.3	n/a	n/a										
	03/97	1	214.1	65.8	Hg	2.2 9.5 113.7	n/a	n/a	88.0									
		.805	152.8		HgCl <sub>2</sub>	<rdl	n/a	n/a										
	03/97	1	68.9	39.8 23.0	Hg	----	---	----	88.0									
		.805	39.8		HgCl <sub>2</sub>	----	----	----										
	04/97	1	206.9	88.0 147.5	Hg-zero Hg-mid Hg high	4.5 -18.3 <rdl nrf	n/a	n/a	65.6									
		.805			HgCl <sub>2</sub> -high	14.6 nrf	n/a	n/a										
	05/97	1	138.6	51.2 22.5	Hg-zero Hg-mid Hg high	-3.6 -42.2 60.6 nrf	n/a	n/a	85.6									
		.805			HgCl <sub>2</sub> -high	-36.3 nrf	n/a	n/a										
	ALL	1	308.1	71.1 47.3	Hg				87.0	0.2	1.8	1.8	58.3	-92.6	NP	-50.4	3	-78
		.805	215.6		HgCl <sub>2</sub>		n/a	n/a		-3.3	-4.9	4	0.7	NP	NP	5.2	3.3	3.7

**TABLE LEGEND**

**NP:** Sequence not performed.

**\***: Data questionable, CEM malfunction

**DNA:** Data not yet available from analytical lab

**Off:** CEM Offline

**B:** Baseline performance: % Accuracy without response factor applied

**nrf:** no response factor applied

**P:** Test postponed

**<rdl:** Analytical data < reporting detection limit

**TBD:** To be determined

**n/a:** Not Applicable to project