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JUL 31 2006

STATE OF ILLINOIS
Pollution Control Board

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:)
)
PROPOSED NEW 35 ILL. ADM. CODE 225)
CONTROL OF EMISSIONS FROM)
LARGE COMBUSTION SOURCES (MERCURY))

R06-25
(Rulemaking – Air)

PC#6277

NOTICE

TO: Dorothy Gunn
Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph St., Suite 11-500
Chicago, IL 60601-3218

SEE ATTACHED SERVICE LIST

PLEAST TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution control Board the POST-HEARING COMMENTS OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY a copy of which is herewith served upon you

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: ____________________
John J. Kim
Managing Attorney
Air Regulatory Unit
Division of Legal Counsel

DATED: July 28, 2006

Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-927

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD RECEIVED CLERK'S OFFICE

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STATE OF ILLINOIS Pollution Control Board

IN THE MATTER OF:	)	
	)	R06-25
PROPOSED NEW 35 ILL. ADM. CODE 225	)	(Rulemaking - Air)
CONTROL OF EMISSIONS FROM	)	
LARGE COMBUSTION SOURCES (MERCURY)	)	

POST-HEARING COMMENTS OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

NOW COMES the ILLINOIS ENVIRONMENTAL PROTECTION AGENCY (Illinois EPA), by one of its attorneys, John. J. Kim, and hereby submits comments in the above rulemaking proceeding. The Illinois EPA appreciates the efforts of the Illinois Pollution Control Board (Board) in this rulemaking regarding the request to add 35 Ill. Adm. Code Part 225 to control mercury emissions from coal-fired electric generating unties. Though the Illinois EPA responded to most every issue raised at the first hearing in this matter on the record during those proceedings, some outstanding issues remain to be addressed in these post-hearing comments.

RESPONSES TO QUESTIONS RAISED DURING THE JUNE 12, 2006 HEARING

Question: *Directed to James E. Staudt, Ph.D., CFA question 59 a,b,c from Ameren: With reference to page 156 of the technical support document,*

a. by unit, what are the coal types (bituminous, sub-bituminous) you are assuming IL units will be burning in 2009?

b. by unit, what are the 2009/10 control configuration (SO2, NOx and PM controls) you are assuming?

c. What is the level of co-benefits are you assuming for the 2009/10 control configurations (in pounds) and the removal efficiencies of these control configurations?

Answer: *Response from James E. Staudt, Ph.D., CFA:*

In response to questions 59 a, b, c, I stated at the hearing that I would provide a table that includes my assumptions from the TSD. Since preparing the TSD, my understanding of the configuration of some of the plants has changed. Therefore I am presenting two tables – one that shows what was assumed in the original TSD and the other is based upon my more current understanding. In the more recent one I show the calculated cobenefit in ounces as well as percentage. For the few unscrubbed bituminous units (except for Meredosia), I assumed that 90% removal or 0.008 lb/GWhr was achievable through a combination of cobenefit (around 30-50%) and sorbent injection (additional 85% removal). I assumed no cobenefit mercury removal for any of the PRB fired units, except Baldwin. It is likely that some significant cobenefit removals are achieved at some of these units. This will have the effect of lowering the cost or increasing the amount of mercury removed from the estimates shown here.

Characteristics used for original TSD

Owner	Plant Name	Unit #	Coal	Post-Comb NOx	FGD	PM	Co-benefit %	Comments
Ameren	DUCK CREEK	1	BIT	SCR	Wet FGD	Cold-side ESP	90% or 0.008	
Ameren	NEWTON	1	SUB	None	None	Cold-side ESP	0	
Ameren	NEWTON	2	SUB	None	None	Cold-side ESP	0	
Ameren	E D EDWARDS	1	SUB	None	None	Cold-side ESP	0	
Ameren	E D EDWARDS	2	SUB	None	None	Cold-side ESP	0	
Ameren	E D EDWARDS	3	BIT	SCR	None	Cold-side ESP	30%	
Ameren	COFFEEN	01	BIT	SCR	None	Cold-side ESP	30%	
Ameren	COFFEEN	02	SUB	SCR	None	Cold-side ESP	30%	
Ameren	HUTSONVILLE	05	BIT	None	None	Cold-side ESP	30%	
Ameren	HUTSONVILLE	06	BIT	None	None	Cold-side ESP	30%	
Ameren	MEREDOSIA	01	SUB	None	None	Cold-side ESP	0	
Ameren	MEREDOSIA	02	BIT	None	None	Cold-side ESP	30%	
Ameren	MEREDOSIA	03	SUB	None	None	Cold-side ESP	0	
Ameren	MEREDOSIA	04	SUB	None	None	Cold-side ESP	0	
Ameren	MEREDOSIA	05	SUB	None	None	Cold-side ESP	0	
CWLP	DALLMAN	31	BIT	SCR	Wet FGD	Cold-side ESP	90% or 0.008	
CWLP	DALLMAN	32	BIT	SCR	Wet FGD	Cold-side ESP	90% or 0.008	
CWLP	DALLMAN	33	BIT	SCR	Wet FGD	Cold-side ESP	90% or 0.008	
Dynegy	BALDWIN	1	SUB	SCR	None	Cold-side ESP	80%	To add FF, which reduces sorbent injection rate. Cobenefit based on Dynegy presentation to IL EPA
Dynegy	BALDWIN	2	SUB	SCR	None	Cold-side ESP	80%	
Dynegy	BALDWIN	3	SUB	None	None	Cold-side ESP	80%	
Dynegy	HAVANA	9	SUB	SCR	None	Hot-side ESP	0	To add FF, TOXECON assumed
Dynegy	HENNEPIN	1	SUB	None	None	Cold-side ESP	0	
Dynegy	HENNEPIN	2	SUB	None	None	Cold-side ESP	0	
Dynegy	VERMILION	1	BIT	None	None	Cold-side ESP	0	To add FF, TOXECON assumed
Dynegy	VERMILION	2	BIT	None	None	Cold-side ESP	0	
Dynegy	WOOD RIVER	4	SUB	None	None	Cold-side ESP	0	
Dynegy	WOOD RIVER	5	SUB	None	None	Cold-side ESP	0	
Joppa	JOPPA STEAM	1	SUB	None	None	Cold-side ESP	0	
Joppa	JOPPA STEAM	2	SUB	None	None	Cold-side ESP	0	

Joppa	JOPPA STEAM	3	SUB	None	None	Cold-side ESP	0	
Joppa	JOPPA STEAM	4	SUB	None	None	Cold-side ESP	0	
Joppa	JOPPA STEAM	5	SUB	None	None	Cold-side ESP	0	
Joppa	JOPPA STEAM	6	SUB	None	None	Cold-side ESP	0	
Kincaid	KINCAID	1	SUB	SCR	None	Cold	0	
Kincaid	KINCAID	2	SUB	SCR	None	Cold	0	
Marion	MARION	4	BIT	SCR	Wet FGD	Cold	90% or 0.008	
Marion	MARION	123	BIT	CFB-SNCR	None	Fabric Filter	90% or 0.008	
Midwest	JOLIET 29	71	SUB	None	None	Cold-side ESP	0	
Midwest	JOLIET 29	72	SUB	None	None	Cold-side ESP	0	
Midwest	JOLIET 29	81	SUB	None	None	Cold-side ESP	0	
Midwest	JOLIET 29	82	SUB	None	None	Cold-side ESP	0	
Midwest	JOLIET 9	5	SUB	None	None	Cold-side ESP	0	
Midwest	CRAWFORD	7	SUB	None	None	Cold-side ESP	0	
1Midwest	CRAWFORD	8	SUB	None	None	Cold-side ESP	0	
Midwest	POWERTON	51	SUB	None	None	Cold-side ESP	0	
Midwest	POWERTON	52	SUB	None	None	Cold-side ESP	0	
Midwest	POWERTON	61	SUB	None	None	Cold-side ESP	0	
Midwest	POWERTON	62	SUB	None	None	Cold-side ESP	0	
Midwest	WAUKEGAN	17	SUB	None	None	Cold-side ESP	0	
Midwest	WAUKEGAN	7	SUB	None	None	Hot-side ESP	0	TOXECON assumed
Midwest	WAUKEGAN	8	SUB	None	None	Cold-side ESP	0	
Midwest	WILL COUNTY	1	SUB	None	None	Cold-side ESP	0	
6455Midwest	WILL COUNTY	2	SUB	None	Cold-side ESP		0	
Midwest	WILL COUNTY	3	SUB	None	None	Hot-side ESP	0	TOXECON assumed
Midwest	WILL COUNTY	4	SUB	None	None	Cold-side ESP	0	
Midwest	FISK	19	SUB	None	None	Cold-side ESP	0	

Inputs to revised cost estimate

Owner	Plant Name	Unit #	Coal	Post-Comb NOx	FGD	PM	Co-benefit %	Co-benefit, oz	Comments
Ameren	DUCK CREEK	1	BIT	SCR	Wet FGD	Cold-side ESP	90% or 0.008	2,278	
Ameren	NEWTON	1	SUB	None	None	Cold-side ESP	0	0	
Ameren	NEWTON	2	SUB	None	None	Cold-side ESP	0	0	
Ameren	E D EDWARDS	1	SUB	None	None	Cold-side ESP	0	0	
Ameren	E D EDWARDS	2	SUB	None	None	Cold-side ESP	0	0	
Ameren	E D EDWARDS	3	SUB	SCR	None	Cold-side ESP	0	0	
Ameren	COFFEEN	01	BIT	SCR	None	Cold-side ESP	30%	744	
Ameren	COFFEEN	02	BIT	SCR	None	Cold-side ESP	30%	1,307	
Ameren	HUTSONVILLE	05	SUB	None	None	Cold-side ESP	0	0	Expected to switch to PRB coal as high S coal in inventory is used up
Ameren	HUTSONVILLE	06	SUB	None	None	Cold-side ESP	0	0	
Ameren	MEREDOSIA	01	BIT	None	None	Cold-side ESP	30%	11	Expected to use TTBS. Use TTBS injection rates
Ameren	MEREDOSIA	02	BIT	None	None	Cold-side ESP	30%	10	
Ameren	MEREDOSIA	03	BIT	None	None	Cold-side ESP	30%	19	
Ameren	MEREDOSIA	04	BIT	None	None	Cold-side ESP	30%	20	
Ameren	MEREDOSIA	05	SUB	None	None	Cold-side ESP	0	0	
CWLP	DALLMAN	31	BIT	SCR	Wet FGD	Cold-side ESP	90%	646	
CWLP	DALLMAN	32	BIT	SCR	Wet FGD	Cold-side ESP	90%	631	
CWLP	DALLMAN	33	BIT	SCR	Wet FGD	Cold-side ESP	90%	1,383	
Dynegy	BALDWIN	1	SUB	SCR	None	Cold-side ESP	80%	5,951	To add FF in 2010, TOXECON assumed
Dynegy	BALDWIN	2	SUB	SCR	None	Cold-side ESP	80%	5,767	To add FF in 2011, TOXECON assumed
Dynegy	BALDWIN	3	SUB	None	None	Cold-side ESP	80%	6,409	To add FF in 2012, TOXECON assumed
Dynegy	HAVANA	9	SUB	SCR	None	Hot-side ESP	0	0	To add FF in 2012, TOXECON assumed
Dynegy	HENNEPIN	1	SUB	None	None	Cold-side ESP	0	0	
Dynegy	HENNEPIN	2	SUB	None	None	Cold-side ESP	0	0	
Dynegy	VERMILION	1	BIT	None	None	Cold-side ESP	30%	158	To add FF and SI in 2007, TOXECON assumed
Dynegy	VERMILION	2	BIT	None	None	Cold-side ESP	30%	239	To add FF and SI in 2007, TOXECON assumed
Dynegy	WOOD RIVER	4	SUB	None	None	Cold-side ESP	0	0	
Dynegy	WOOD RIVER	5	SUB	None	None	Cold-side ESP	0	0	
Joppa	JOPPA STEAM	1	SUB	None	None	Cold-side ESP	0	0	

Joppa	JOPPA STEAM	2	SUB	None	None	Cold-side ESP	0	0	
Joppa	JOPPA STEAM	3	SUB	None	None	Cold-side ESP	0	0	
Joppa	JOPPA STEAM	4	SUB	None	None	Cold-side ESP	0	0	
Joppa	JOPPA STEAM	5	SUB	None	None	Cold-side ESP	0	0	
Joppa	JOPPA STEAM	6	SUB	None	None	Cold-side ESP	0	0	
Kincaid	KINCAID	1	SUB	SCR	None	Cold	0	0	
Kincaid	KINCAID	2	SUB	SCR	None	Cold	0	0	
Marion	MARION	4	BIT	SCR	Wet FGD	Cold	90%	1,478	
Marion	MARION	123	BIT	CFB-SNCR	None	Fabric Filter	90%	973	
Midwest	JOLIET 29	71	SUB	None	None	Cold-side ESP	0	0	
Midwest	JOLIET 29	72	SUB	None	None	Cold-side ESP	0	0	
Midwest	JOLIET 29	81	SUB	None	None	Cold-side ESP	0	0	
Midwest	JOLIET 29	82	SUB	None	None	Cold-side ESP	0	0	
Midwest	JOLIET 9	5	SUB	None	None	Cold-side ESP	0	0	
Midwest	CRAWFORD	7	SUB	None	None	Cold-side ESP	0	0	
Midwest	CRAWFORD	8	SUB	None	None	Cold-side ESP	0	0	
Midwest	POWERTON	51	SUB	None	None	Cold-side ESP	0	0	
Midwest	POWERTON	52	SUB	None	None	Cold-side ESP	0	0	
Midwest	POWERTON	61	SUB	None	None	Cold-side ESP	0	0	
Midwest	POWERTON	62	SUB	None	None	Cold-side ESP	0	0	
Midwest	WAUKEGAN	17	SUB	None	None	Cold-side ESP	0	0	
Midwest	WAUKEGAN	7	SUB	None	None	Hot-side ESP	0	0	TOXECON assumed
Midwest	WAUKEGAN	8	SUB	None	None	Cold-side ESP	0	0	
Midwest	WILL COUNTY	1	SUB	None	None	Cold-side ESP	0	0	
Midwest	WILL COUNTY	2	SUB	None	None	Cold-side ESP	0	0	
Midwest	WILL COUNTY	3	SUB	None	None	Hot-side ESP	0	0	TOXECON assumed
Midwest	WILL COUNTY	4	SUB	None	None	Cold-side ESP	0	0	
Midwest	FISK	19	SUB	None	None	Cold-side ESP	0	0	

Question: *What revisions would be made to Dr. Staudt's cost estimates after the information provided in the hearing?*

Answer: *Response from James E. Staudt, Ph.D., CFA:*

I have also prepared revised Tables 8.7, 8.9, and 8.10 that incorporates the following revisions.

- Revisions based upon my understanding of the coal types
- Revisions/Corrections of fly ash costs shown in the original tables in the TSD
- Revisions to sorbent injection rates due to revised coal types and understanding of the configurations
- Revisions/Corrections of sorbent costs assuming that the four Meredosia units use the TTBE

In addition, as requested in the hearing, I have prepared a cost for additional fly ash expense associated with operating the Baldwin units with cold-side ESP's during 2009-2012 and some additional cost for installing the Havana fabric filter earlier than 2012.

As shown in the revised Table 8.7, the costs are close to what was originally estimated, albeit, slightly higher due to the higher cost of sorbent assumed. Importantly, the difference in annual costs between the IL rule and CAMR are in the same range as originally stated in the TSD – about $36 million. Including the additional costs described for Baldwin and Havana associated with the timing of the fabric filters, the annualized cost differential between the IL Rule and CAMR remains below $40 million for the years 2009-2012.

Table 8.7 Estimated Cost for IL Utilities of Complying with IL Mercury Rule and with 2010 CAMR

Cost	Units	IL Rule	2010 CAMR
Capital Cost	$1000	$75,135	$33,558
Annualized Capital Cost (14% CRF)	$1000	$10,519	$4,698
Annual Sorbent Cost	$1000	$46,374	$19,838
Annual Ash Disposal Cost	$1000	$13,461	$10,041
Annualized TOXECON O&M (excluding sorbent)	$1000	$425	$0
Total Annual Cost	$1000	$70,779	$34,577
Ounces Hg removed *	1000 ounces	124**	90
Cost per oz Hg removed *	$/ounce	$572**	$385
Cost per lb Hg removed *	$/lb	$9,158 **	$6,161

NOTE: columns may not add due to rounding

*No credit is taking for Hg reductions from cobenefits (-28,000 oz) because these would happen regardless of IL rule or CAMR

** This is estimated from 90% removal. As described in Revised Table 8.9, expected removal is higher than shown here and therefore expected cost per ounce or pound is actually lower

Revised Table 8.9

Owner	Plant Name	Technology	Cost, $1000	Sorbent Cost $1000/yr	TOXECON O&M	Ash disposal, $1000	Estimated Annual Coal Use (1000 tons)	90% removal*		Expected removal*	
								Hg reduced, oz/yr	Hg Output, oz/yr	Hg reduced, oz/yr	Hg Output, oz/yr
Ameren	DUCK CREEK	Cobenefit	$0	$0	$0	$0	989	2,278	253	2,278	253
Ameren	NEWTON	SI	$1,543	$2,062	$0	$2,550	2,220	6,394	710	6,608	497
Ameren	NEWTON	SI	$1,543	$2,129	$0	$0	2,172	6,254	695	6,463	486
Ameren	E D EDWARDS	SI	$340	$372	$0	$0	449	1,295	144	1,338	101
Ameren	E D EDWARDS	SI	$703	$800	$0	$0	909	2,618	291	2,705	204
Ameren	E D EDWARDS	SI	$903	$1,186	$0	$0	1,211	3,486	387	3,603	271
Ameren	COFFEEN	SI	$973	$2,574	$0	$0	968	2,231	248	2,306	174
Ameren	COFFEEN	SI	$1,543	$4,536	$0	$0	1,702	3,922	436	4,052	305
Ameren	HUTSONVILLE	SI	$190	$167	$0	$0	187	538	60	556	42
Ameren	HUTSONVILLE	SI	$193	$211	$0	$0	236	681	76	704	53
Ameren	MEREDOSIA	SI	$78	$54	$0	$0	14	32**	4	33**	3
Ameren	MEREDOSIA	SI	$78	$54	$0	$0	13	31**	3	32**	2
Ameren	MEREDOSIA	SI	$78	$109	$0	$0	25	58**	6	60**	4
Ameren	MEREDOSIA	SI	$78	$109	$0	$0	27	61**	7	63**	5
Ameren	MEREDOSIA	SI	$598	$681	$0	$0	721	2,077	231	2,147	162
CWLP	DALLMAN	Cobenefit	$0	$0	$0	$0	281	646	72	646	72
CWLP	DALLMAN	Cobenefit	$0	$0	$0	$0	274	631	70	631	70
CWLP	DALLMAN	Cobenefit	$0	$0	$0	$0	600	1,383	154	1,383	154
Dynegy	BALDWIN****	TOXECON	$1,558	$353***	$0	$0	2,324	6,694	744	6,917	521
Dynegy	BALDWIN****	TOXECON	$1,588	$365***	$0	$0	2,253	6,487	721	6,704	505
Dynegy	BALDWIN****	TOXECON	$1,588	$406***	$0	$0	2,504	7,211	801	7,451	561
Dynegy	HAVANA****	TOXECON	$1,220	$575	$0	$0	1,190	3,428	381	3,542	267
Dynegy	HENNEPIN	SI	$185	$243	$0	$625	276	795	88	822	62
Dynegy	HENNEPIN	SI	$578	$797	$0	$0	874	2,517	280	2,601	196
Dynegy	VERMILION****	SI	$0****	$126	$0	$0	206	474	53	490	37
Dynegy	VERMILION****	SI	$0****	$200	$0	$0	311	716	80	740	56
Dynegy	WOOD RIVER	SI	$283	$309	$0	$1,200	351	1,010	112	1,044	79
Dynegy	WOOD RIVER	SI	$930	$1,060	$0	$0	1,048	3,017	335	3,117	235
Joppa	JOPPA STEAM	SI	$458	$802	$0	$0	819	2,360	262	2,439	184
Joppa	JOPPA STEAM	SI	$458	$802	$0	$0	814	2,345	261	2,423	182

Joppa	JOPPA STEAM	SI	$458	$802	$0	$0	822	2,366	263	2,445	184
Joppa	JOPPA STEAM	SI	$458	$822	$0	$0	842	2,424	269	2,505	189
Joppa	JOPPA STEAM	SI	$458	$852	$0	$4,350	875	2,519	280	2,603	196
Joppa	JOPPA STEAM	SI	$458	$852	$0	$0	869	2,503	278	2,586	195
Kincaid	KINCAID	SI	$1,650	$1,808	$0	$0	1,824	5,252	584	5,427	408
Kincaid	KINCAID	SI	$1,650	$2,169	$0	$0	2,122	6,110	679	6,314	475
Marion	MARION	Cobenefit	$0	$0	$0	$0	642	1,478	164	1,478	164
Marion	MARION	Cobenefit	$0	$0	$0	$0	422	973	108	973	108
Midwest	JOLIET 29	SI	$825	$723	$0	$0	766	2,206	245	2,280	172
Midwest	JOLIET 29	SI	$825	$886	$0	$0	939	2,703	300	2,793	210
Midwest	JOLIET 29	SI	$825	$904	$0	$0	958	2,758	306	2,850	215
Midwest	JOLIET 29	SI	$825	$904	$0	$0	958	2,758	306	2,850	215
Midwest	JOLIET 9	SI	$900	$1,578	$0	$2,625	1,420	4,089	454	4,225	318
Midwest	CRAWFORD	SI	$598	$668	$0	$825	755	2,175	242	2,248	169
Midwest	CRAWFORD	SI	$895	$1,020	$0	$0	1,119	3,223	358	3,331	251
Midwest	POWERTON	SI	$1,116	$1,468	$0	$0	1,520	4,376	486	4,522	340
Midwest	POWERTON	SI	$1,116	$1,370	$0	$0	1,418	4,085	454	4,221	318
Midwest	POWERTON	SI	$1,116	$1,370	$0	$0	1,418	4,085	454	4,221	318
Midwest	POWERTON	SI	$1,116	$1,345	$0	$0	1,393	4,012	446	4,145	312
Midwest	WAUKEGAN	SI	$303	$398	$0	$636	446	1,284	143	1,327	100
Midwest	WAUKEGAN	TOXECON	$19,680	$539	$241	$0	1,106	3,185	354	3,185	354
Midwest	WAUKEGAN	SI	$888	$1,206	$0	$0	1,217	3,504	389	3,621	273
Midwest	WILL COUNTY	SI	$470	$257	$0	$250	286	824	92	851	64
Midwest	WILL COUNTY	SI	$460	$302	$0	$0	343	988	110	1,021	77
Midwest	WILL COUNTY	TOXECON	$17,940	$409	$183	$0	858	2,472	275	2,472	275
Midwest	WILL COUNTY	SI	$1,495	$1,638	$0	$0	1,653	4,762	529	4,921	370
Midwest	FISK	SI	$935	$1,004	$0	$400	996	2,869	319	2,964	223
Total	0	0	**$75,135**	**$46,374**	**$425**	**$13,461**	**53,953**	**151,657**	**16,851**	**156,277**	**12,230**

** Over 90% overall removal has been shown, particularly on PRB fired units, at injection rates of about 3 lb/MMacf. Nearly all of the unscrubbed units in IL fire PRB coal. As a result, slightly better than 90% removal is expected at the costs shown here.*

*** Because Meredosia 1-4 are using high sulfur coal at this time and are not – as far as I know – planning to change coals, 90% removal at these small units may not be achieved. However, because of their small size and limited use, they have little impact on the overall mercury removal state-wide.*

**** Baldwin is already reportedly achieving 80% removal of mercury. There is a good chance that with the addition of a fabric filter the Baldwin units will achieve adequate removal without any sorbent. Therefore, this cost may go to zero.*

***** For 2009-2012 Baldwin and Havana will likely have additional costs since the fabric filters will not be installed prior to 2009. Fabric filters at Baldwin, Havana and Vermillion are installed due to Consent Decree, as is SI at Vermillion. Capital cost of fabric filters is not attributed to IL rule, but sorbent injection is in the case of Baldwin and Havana.*

Revised Table 8.10

Owner	Plant Name	Capacity MW	Technology	Cost, $1000	Sorbent Cost $1000/yr	TOXECON O&M	Ash disposal, $1000	Estimated Annual Coal Use (1000 tons)	Hg reduced	Hg Output
Ameren	DUCK CREEK	441	Cobenefit	$0	$0	$0	$0	989	2,278	253
Ameren	NEWTON	617		$0	$0	$0	$0	2,220	0	7,105
Ameren	NEWTON	617	SI	$1,543	$887	$0	$1,275	2,172	4,864	2,085
Ameren	E D EDWARDS	136	SI	$340	$155	$0	$0	449	1,007	432
Ameren	E D EDWARDS	281	SI	$703	$334	$0	$0	909	2,036	873
Ameren	E D EDWARDS	361	SI	$903	$494	$0	$0	1,211	2,712	1,162
Ameren	COFFEEN	389	SI	$973	$1,716	$0	$0	968	1,736	744
Ameren	COFFEEN	617	SI	$1,543	$3,024	$0	$0	1,702	3,050	1,307
Ameren	HUTSONVILLE	76	SI	$190	$213	$0	$0	130	233	100
Ameren	HUTSONVILLE	77	SI	$193	$270	$0	$0	165	295	127
Ameren	MEREDOSIA	31		$0	$0	$0	$0	20	0	64
Ameren	MEREDOSIA	31		$0	$0	$0	$0	19	0	61
Ameren	MEREDOSIA	31		$0	$0	$0	$0	36	0	115
Ameren	MEREDOSIA	31		$0	$0	$0	$0	38	0	122
Ameren	MEREDOSIA	239	SI	$598	$284	$0	$0	721	1,616	692
CWLP	DALLMAN	87.5	Cobenefit	$0	$0	$0	$0	281	646	72
CWLP	DALLMAN	86	Cobenefit	$0	$0	$0	$0	274	631	70
CWLP	DALLMAN	207	Cobenefit	$0	$0	$0	$0	600	1,383	154
Dynegy	BALDWIN**	623	TOXECON	$1,558	$353*	$0	$0	2,324	6,694	744
Dynegy	BALDWIN**	635	TOXECON	$1,588	$365*	$0	$0	2,253	6,487	721
Dynegy	BALDWIN**	635	TOXECON	$1,588	$406*	$0	$0	2,504	7,211	801
Dynegy	HAVANA**	488	TOXECON	$1,220	$575	$0	$0	1,190	3,428	381
Dynegy	HENNEPIN	74	SI	$185	$101	$0	$625	276	619	265
Dynegy	HENNEPIN	231	SI	$578	$332	$0	$0	874	1,958	839
Dynegy	VERMILION**	74	TOXECON	$0	$126	$0	$0	206	474	53
Dynegy	VERMILION**	109	TOXECON	$0	$200	$0	$0	311	716	80
Dynegy	WOOD RIVER	113	SI	$283	$129	$0	$1,200	351	786	337
Dynegy	WOOD RIVER	372	SI	$930	$442	$0	$0	1,048	2,346	1,006
Joppa	JOPPA STEAM	183	SI	$458	$334	$0	$0	819	1,836	787
Joppa	JOPPA STEAM	183	SI	$458	$334	$0	$0	814	1,824	782
Joppa	JOPPA STEAM	183	SI	$458	$334	$0	$2,900	822	1,840	789
Joppa	JOPPA STEAM	183	SI	$458	$342	$0	$0	842	1,885	808
Joppa	JOPPA STEAM	183		$0	$0	$0	$0	875	0	2,799
Joppa	JOPPA STEAM	183		$0	$0	$0	$0	869	0	2,781

1Kincaid	KINCAID	660	SI	$1,650	$753	$0	$0	1,824	4,085	1,751
Kincaid	KINCAID	660	SI	$1,650	$904	$0	$0	2,122	4,753	2,037
Marion	MARION	170	Cobenefit	$0	$0	$0	$0	642	1,478	164
Marion	MARION	120	Cobenefit	$0	$0	$0	$0	422	973	108
0Midwest	JOLIET 29	330	SI	$825	$301	$0	$0	766	2,206	245
Midwest	JOLIET 29	330	SI	$825	$369	$0	$0	939	2,703	300
Midwest	JOLIET 29	330	SI	$825	$377	$0	$0	958	2,758	306
Midwest	JOLIET 29	330	SI	$825	$377	$0	$0	958	2,758	306
Midwest	JOLIET 9	360	SI	$900	$657	$0	$2,625	1,420	4,089	454
Midwest	CRAWFORD	239	SI	$598	$278	$0	$825	755	2,175	242
Midwest	CRAWFORD	358	SI	$895	$425	$0	$0	1,119	3,223	358
Midwest	POWERTON	446.5	SI	$1,116	$611	$0	$0	1,520	4,376	486
Midwest	POWERTON	446.5	SI	$1,116	$571	$0	$0	1,418	4,085	454
Midwest	POWERTON	446.5	SI	$1,116	$571	$0	$0	1,418	4,085	454
Midwest	POWERTON	446.5	SI	$1,116	$561	$0	$0	1,393	4,012	446
Midwest	WAUKEGAN	121		$0	$0	$0	$0	446	0	1,427
Midwest	WAUKEGAN	328		$0	$0	$0	$0	1,106	0	3,539
Midwest	WAUKEGAN	355		$0	$0	$0	$0	1,217	0	3,894
Midwest	WILL COUNTY	188	SI	$470	$107	$0	$191	286	824	92
Midwest	WILL COUNTY	184	SI	$460	$126	$0	$0	343	988	110
Midwest	WILL COUNTY	299		$0	$0	$0	$0	858	0	2,747
Midwest	WILL COUNTY	598	SI	$1,495	$682	$0	$0	1,653	4,762	529
Midwest	FISK	374	SI	$935	$418	$0	$400	996	2,869	319
Total				**$33,558**	**$19,838**	**$0**	**$10,041**	**53,859**	**117,794**	**50,275**

**Baldwin is already reportedly achieving 80% removal of mercury. There is a good chance that with the addition of a fabric filter the Baldwin units will achieve adequate removal without any sorbent. Therefore, this cost may go to zero.*
*** For 2009-2012 Baldwin and Havana will likely have additional costs since the fabric filters will not be installed prior to 2009. Fabric filters at Baldwin, Havana and Vermillion are installed due to Consent Decree, as is SI at Vermillion. Capital cost of fabric filters is not attributed to IL rule, but sorbent injection is in the case of Baldwin and Havana.*

Baldwin and Havana

During the hearing it was pointed out that the costs of fly ash disposal would be higher than what was shown for the Baldwin plant due to the installation of a fabric filter after the 2009 start date for the IL rule. As a result, this plant would not fully realize the benefits of a TOXECON system until the fabric filters were installed.

For Baldwin, the costs associated with additional ash disposal costs (in $1000's) for each year can be estimated. The table below shows estimated costs assuming that the differential costs are $25/ton for ash that was sold and must be disposed of as a result of sorbent injection. However, according to Table 8.8 of the TSD, which shows that Baldwin is able to dispose of fly ash in ash ponds at little or no cost, the $25/ton cost for disposal of ash used is probably very high. The actual cost is likely a small fraction of what is estimated at $25/ton, and is likely to be closer to what is shown for the estimated costs using only the lost revenue from Table 8.8. Since this estimate assumes that the fabric filters are installed on the last day of the year, and they are likely to be installed prior to that, these costs are the highest that they can be. Therefore, I expect that these estimates of ash disposal cost for these years are very high. After 2012, these costs would not apply since the TOXECON systems would be installed. For these years, sorbent costs would also be higher since they would be injecting upstream of an ESP instead of a fabric filter. And, the additional cost of sorbent over what is shown in revised Table 8.9 is shown below.

Estimated fly ash costs	2009 (half year)	2010	2011	2012
at $25/ton, $1000	1,263	2,525	1,680	840
at cost of lost fly ash revenue from Table 8.8, $1000	6	11	7	4
Estimated additional sorbent costs at $0.90/lb, $1,000	205	410	273	137

The Havana unit would have to install their fabric filter early since the proposed rule does not provide a TTBE for units with a hot-side ESP. As a result, they would incur an additional cost associated with early installation. This would be equal to a cost of capital times the installed cost. At 488 MW, if the cost of the fabric filter is $60/kw, the cost of a fabric filter would be about $29 million. At a 5.69% annual yield (current 5 year AAA corporate yield, per Bloomberg on 7/12/06), this is an annual cost of $1.66 million for the years 2009-2012 (actually, $0.83 million in 2009 since it's half a year). Although Dynegy probably uses a higher cost of capital than AAA bond yields when it builds a power plant or buys one, it is customary for corporations to match the cost of capital to the risk of a project. In this case Dynegy would simply be performing an environmental project a few years earlier, which does not bear nearly the same risk as a project that has far more business risk. Moreover, the cost of capital effects would actually be mitigated by the effects of escalation of labor and material. In fact, there would be a net financial benefit to performing the project earlier if material and labor escalation is at a higher rate than the cost of capital.

Further Amendment/Clarification to Hearing testimony from James E. Staudt, Ph.D., CFA:

During the hearing I was questioned on my contribution to an article published in Environmental Science and Technology titled "Control of Mercury Emissions from Coal-Fired Electric Utility Boilers" coauthored with Ravi Srivastava, Nick Hutson, Blair Martin and Frank Princiotta of US EPA. At the time of the hearing I did not properly recall when I contributed to this article. Since the hearing, I have had the opportunity to check the timing of my work on this. This article originates from work I performed for US EPA in late 2004. US EPA used this work in its White Paper entitled "Control of Mercury Emissions from Coal Fired Electric Utility Boilers: An Update" issued on February 18, 2005 by US EPA's Office of Research and Development that is referenced in the TSD. The material in this White Paper as well as work by others at US EPA was subsequently used to form a basis of the Environmental Science and Technology journal article that was entered into evidence. That the article took until spring of 2006 to get published probably reflects the slow process of integrating other peoples work, the slow process of getting an article published in a prestigious journal and the slow process of getting such an article through US EPA administrative review on such a sensitive issue as mercury. For this reason, I believe that the article does not accurately reflect the current state of technology, which has advanced rapidly in the time since 2004 when I originally did the work for US EPA.

To be clear, my work with US EPA is specifically limited to technology and cost studies. Any conclusions of a policy nature in the White Paper or in the journal article, such as regarding the timing of availability of technology for complying with regulations, better reflect the official policy position of the US EPA than my opinion. The section of the journal article "Outlook for technology availability" clearly states that the opinions expressed regarding technology availability are those of US EPA. These statements in the article that I coauthored are correct statements because they are, in fact, US EPA's official policy position. Whether I agree or disagree with US EPA's policy position is another matter. It is my opinion that the US EPA positions in the Environmental Science and Technology article regarding technology availability should not be taken to mean that technology is not yet available for the applications we are discussing in Illinois, although technology may or may not currently be available for other applications. It is my opinion that the technology is available as described in the TSD and as I have described in my other testimony.

Question: *What is the average daily flow from all NPDES permits?*

Answer: Based on our information, the average daily flow from all NPDES permittees is 21,140 million gallons per day. This includes cooling water flows from power plants (they intake river water, run it past hot equipment and then discharge it back to the river) which are very voluminous.

ADDITIONAL DOCUMENTS REQUESTED DURING THE JUNE 12, 2006 HEARING

Attachment 1:	Scope of Work Proportion from ICF Contract
Attachment 2:	Scope of Work Proportion from Richard Ayres' Contract
Attachment 3:	Scope of Work Proportion from Gerald Keeler's Contract
Attachment 4:	Control Configuration Inspections at Illinois Coal-Fired Power Plants – 2006 (provided to the Board as complete copies and redacted copies for the public record)
Attachment 5:	Illinois Environmental Protection Agency comments to the U. S. Environmental Protection Agency regarding Proposed National Emission Standards for Hazardous Air Pollutants; and in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Untis, Proposed Rule; Propose Rule (69 *Federal Register* 4652, January 30, 2004) ("Proposal") and Supplemental Notice for the Proposal (69 *Federal Register* 2397, March 16, 2004)
Attachment 6:	IPM modeling data (Compact Disk, provided only to Board and Counsel for: Ameren, Dynegy, Midwest Generation, Kincaid, Chicago Legal Clinic, and Environmental Law and Policy Center)
Attachment 7:	"Blood and Hair Mercury Levels in Young Children and Women of Childbearing Age --- United States 1999"
Attachment 8:	Prairie State comments to the Illinois Environmental Protection Agency on the Temporary Technology Based Extension – Beginning with email from Dianna Tickner to Laurel Kroack

Respectfully submitted,

By: ____________________

Charles E. Matoesian
Assistant Counsel
Division of Legal Counsel

Dated: July 28, 2006

Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

STATE OF ILLINOIS)
) **SS**
COUNTY OF SANGAMON)
)

CERTIFICATE OF SERVICE

I, the undersigned, an attorney, state that I have served the attached POST-HEARING COMMENTS OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY upon the person to whom it is directed, by placing a copy in an envelope addressed to:

Dorothy Gunn, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph St., Suite 11-500
Chicago, IL 60601-3218
(Overnight Mail)

SEE ATTACHED SERVICE LIST
(First Class Mail)

and mailing it Springfield, Illinois, with sufficient postage affixed, as indicated above.

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: ______________________
Charles E. Matoesian
Assistant Counsel
Division of Legal Counsel

DATED: July 28, 2006

Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

SERVICE LIST 06-25

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Hearing Officer
Illinois Pollution Control Board
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ICF
CONSULTING

February 17, 2006

Mike Koerber
Executive Director
Lake Michigan Air Directors Consortium/
Midwest Regional Planning Organization
2250 East Devon Avenue, Suite 250
Des Plaines, Illinois 60018

Jim Ross
Division of Air Pollution Control, Bureau of Air
Illinois EPA
P.O. Box 19276,
1021 N. Grand Ave., East,
Springfield, IL 62794-9276

Re: Request for Proposal: Illinois EPA Modeling of Mercury Rule

Dear Mike and Jim:

ICF is pleased to provide the Lake Michigan Air Directors Consortium (LADCO) with the attached proposal for providing additional modeling and other work in support of the Illinois Mercury Rule. The scope of work outlined here is based on the Illinois EPA's (IEPA) scope outlined in a memo dated 1/26/06 and a conversation between ICF and Illinois EPA on February 1, 2006.

Task 1 Modify NEEDs and 3 IPM runs and Supporting Parsings

Illinois EPA would like to make additional modifications to the VISTAS/LADCO case in order to incorporate new information on specific unit characterizations. IEPA has already forwarded those changes to ICF for review. ICF will discuss any issues related to the date with IEPA and incorporate the changes as appropriate. In addition, IEPA would like to incorporate new mercury control technology data.

Once this new information is incorporated, Illinois EPA requires three new IPM runs:

- A. A base case run based on the modified VISTAS/LADCO case without CAIR or CAMR in place, but including Title IV and NOx SIP Call requirements.
- B. A Base Case Run with CAIR and CAMR in place.
- C. A Policy run with the CAIR in place, the Illinois Mercury Rule (specified in your email of February 1) for Illinois plants, and CAMR for non-Illinois plants.

We will provide you with run specs for your review and approval before implementing these runs. Full implementation, QA/QC for the first of these runs could be completed by February 27. We would expect to complete the third run By March 3. Summary data will be developed to report on the impacts of the CAIR mercury rule in isolation (Run C vs. Run A) as well as the incremental impacts of the Illinois rule (Run C vs. R run B). The total impacts of the Illinois Rule would be a cost comparison of Run C vs. Run A.

Task 2: Parsing of Runs Expanded IPM Run Data and Other Cost Information for LADCO (Item 1-4)

In support of its work, LADCO would like some additional information on cost and other impacts. We have budgeted for three runs, three years each (9 parsings). These will be completed by March 8

Key information to be provided in addition to the parsed results would be the impacts on costs per kWh of the Illinois rule. We will provide information on the change in average production cost per kWh for Illinois due to the rule as well as the change in the marginal cost of production (i.e., the IPM wholesale energy price). Impacts of coal plants (retirements and retrofits) and emissions data will also be provided

We will also provide impacts on costs from the Illinois Rule vs. the CAMR Rule (Run C vs. Run B) in terms of average and marginal cost per kWh. The other indicators -- $/month to the different consuming sectors will require some discussion with IEPA. As we have indicated, IPM provides forecast at the wholesale level, and therefore forecast wholesale marginal power prices. In order to estimate retail price impacts we could (1) apply the tool that EPA uses to produce these estimates at the regional (the MANO region) average level for all sectors, or (2) implement a simpler approach to get at retail sectors. Option 1 could be implemented for this work, but the result will not have any sectoral detail, and will be based on the current EPA tool. There is insufficient time to update this tool to more recent data (i.e., AEO 2006). Option 2 will require some estimate of the total expenditures at the average household or establishment level, and an estimate of the relationship between changes in wholesale prices and retail rates (e.g., wholesale prices represent x percent of retail; or all marginal prices will be added to a base forecast).

Other questions related to impacts on health benefits, jobs, pollution control industry, and the economy at large is something we could potentially assist you with, but not within the timeframe that you require. Therefore, we have not included this in the current scope.

Task 3. Reduced Permits for RE/EE Set Aside

This run is a simple reduction in the available NO_X allowances under the CAIR rule for Illinois units. This run would be done off of the existing VISTAS/LADCO CAIR/CAMR run (LADCO_IL_BC_02e) with revised CAIR annual and summer NOx caps and the NOx allowance supplementary pool. The NOx caps and the NOx allowance supplementary pool will be adjusted to reflect a retirement of 30% of the IL NOx budget. As we understand, this run would not need to be parsed and state level outputs will be provided. This run would be completed by February 24.

Task 4 Reporting

You have asked for an executive level summary that highlights and explains the summary results in addition to a more lengthy report. We envision a report with an executive summary of 3-5 pages addressing key issues such as the cost of the mercury rule (with CAIR/CAMR for the rest of the nation) vs. the CAIR/CAMR, the implications of the rule for key system indicators identified (e.g., retirements, generation, rates, coal consumption) with a focus on Illinois results. The focus would be on the difference between the Illinois rule vs. the CAIR/CAMR. The goal would be to hit the highlights of the findings.

The remainder of the report would provide more in depth results. We would expect this to be a 20 to 30-page report that goes into more depth into the modeling platform, the inputs, outputs, and results, with the focus on explaining the impacts of the Illinois rule. The expected audience would be someone u unfamiliar with the modeling and therefore, the need for more detailed discussion of findings and explanation of the results. We would develop a draft report by March 8. We would feed you preliminary background material as we develop it so you have some time to absorb and process it. However, the first full draft of a report you would see would be March 8h. I have not budgeted for revisions beyond that first draft.

Next Steps

Please call if you have questions. If you would like to proceed, you may sign the attached form in duplicate and return it to my attention. We look forward to working with the LADCO and Illinois EPA on this project.

Sincerely,

Juanita M. Haydel
Senior Vice President

I hereby authorize ICF Consulting to proceed according to the scope of work described above.

Accepted* (including Attachments A and B) *for	***Accepted for***
Lake Michigan Air Directors Consortium	**ICF Resources, LLC**
Signature: ______________________	*Signature* ______________________
Printed Name: ______________________	*Printed Name:* ______________________
Title: ______________________	*Title:* ______________________
Date: ______________________	*Date:* ______________________

Ayres Law Group

January 17, 2006

Mr. Michael Koerber, President
Lake Michigan Air Directors Consortium
2250 East Devon Ave. Suite 250
Des Plaines IL, 60018

Re: State of Illinois, Environmental Protection Agency: Mercury Emissions Control Regulation

Dear Mike

I am extremely pleased that the Lake Michigan Air Directors Consortium (LADCO) wishes to retain Ayres Law Group (Ayres) to provide advice and counsel concerning the Illinois EPA, Bureau of Air Bureau's forthcoming regulation to control emissions of mercury from electric power generating units.

This letter and the accompanying Client Representation Memorandum set out the terms of this engagement, including the fee arrangement that we have agreed upon. As we discussed, my fees for this matter will be paid by LADCO , and will be billed at a reduced governmental trade association rate. Ayres will keep the appropriate person at the Bureau up to date with respect to fees billed to LADCO. Ayres will not under this agreement state or indicate in any other way that it represents, or speaks for, the member states of LADCO, other than Illinois.

If you agree with the terms as described in these two documents, please sign this engagement letter and return the original to me in the enclosed envelope.

I appreciate the opportunity to provide counsel to LADCO and its member State in this important matter, and I will do my best to deliver a positive outcome as efficiently as possible.

Sincerely yours,

Richard Ayres

Richard E. Ayres
Ayres Law Group

[illegible] Street, N.W. • Suite [illegible] • Washington, DC [illegible]
Phone [illegible] • Fax [illegible] • [illegible]

Agreed:

Paul Dubenetzky, Chair
Lake Michigan Air Directors Consortium

Kevin Kessler, Treasurer
Lake Michigan Air Directors Consortium

3-10-06

Date

Ayres Law Group

MEMORANDUM REGARDING PROFESSIONAL SERVICES

This Memorandum sets forth the terms and conditions under which Ayres Law Group ("Ayres") undertakes to provide professional services to the Lake Michigan Air Directors Consortium ("LADCO") to assist the Illinois Environmental Protection Agency ("Illinois EPA") in the matter described in the accompanying engagement letter.

1 **Scope of Services.** Ayres undertakes to provide services to LADCO to assist the Illinois EPA solely in connection with the matter described in the accompanying engagement letter. In the event that LADCO requests Ayres to undertake additional matters or the scope of work is expanded, such additional work will not be governed by the terms and conditions of this agreement unless mutually agreed otherwise. Except as provided in Section 6 of this Agreement, Ayres' services will be deemed concluded at the time that Ayres has rendered its final bill for services on the matter described in our engagement letter or any such additional matters.

Ayres' services are limited to LADCO and the State of Illinois.

February 16, 2006

Gerald Keeler, Ph.D.
Professor, Environmental Health Sciences
Professor, Atmospheric, Oceanic and Space Sciences
University of Michigan
1530 SPH I
109 South Observatory
Ann Arbor, Michigan 48109-2029

Dear Gerald:

On behalf of the Lake Michigan Air Directors Consortium (LADCO), I wish to award you a contract to provide technical support for the State of Illinois in developing a rule for controlling mercury emissions from power plants. Specific support shall include the following activities, as directed by the State of Illinois (or LADCO):

- preparation and review of technical documents;
- participation in stakeholder meetings, as needed;
- testimony at hearings;
- technical assistance to key staff; and
- other technical support agreed to by you and Illinois (or LADCO).

Control Configuration Inspections at Illinois Coal-Fired Power Plants - 2006

<u>**TABLE OF CONTENTS**</u>

2. SO_3 injection

A pilot SO_3 injection project was undertaken in autumn 2004 and abandoned in spring of 2005. Midwest Generation official claimed it had no quantifiable results. Another said it had "mixed results... but they didn't see an impact." The goal of the project was to reduce the resistivity of PRB coal. The pipes and headers were abandoned in place. These are located at the 7th floor at approximately the 116-foot elevation. Gaseous SO_3 was injected at the economizer. The SO_3 generation process was located at ground level.

Fisk also constructed a polymer injection system, which introduced liquid polymer into the ducts after the preheater and upstream of the ESP. The polymer injection system included a header pipe and four spray nozzles installed per duct (16 altogether.) The polymer was supposed to combine with and agglomerate particles in the flue gas to facilitate collection by the ESP. This was done in the time period around 2000. The project was discontinued as the injections accumulated in the ducts producing a series of "stalagmites." The header system and injection ports are still in place.

2. Flue gas conditioning

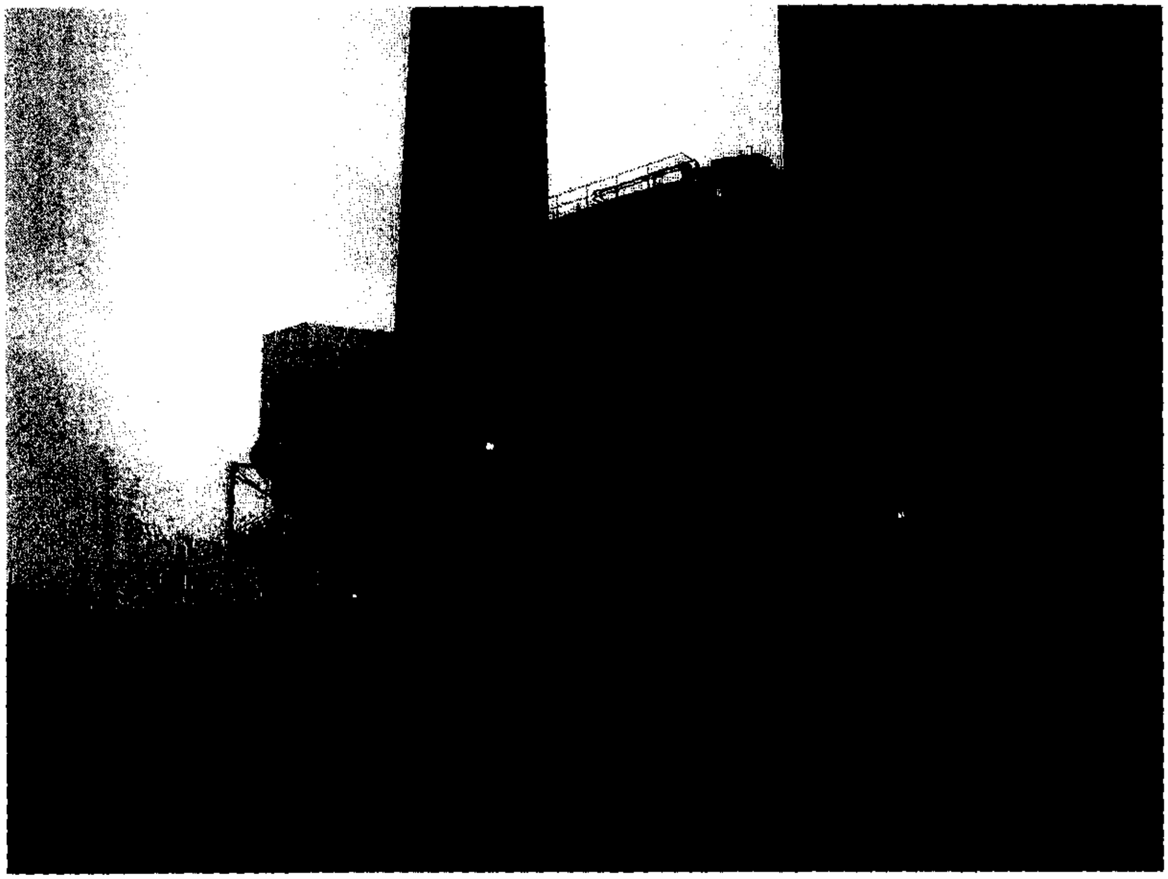
No direct flue gas conditioning is performed. Sodium carbonate, anhydrous is added to the coal at the mine to achieve 3.25-3.75 wt%. The sodium is added to decrease resistivity of the fly ash. Wt % sodium is provided in the quarterly coal analysis reports.

3. Other Information

Fisk Unit 19 is a 3,379 mmBtu/hr electric generating unit consisting of two boilers, a superheater boiler (or "furnace") and a reheat boiler (furnace). This arrangement is known as a "dual furnace." They are basically identical except for the arrangement of tubes in the fireboxes. Each furnace cannot be run separately.

Low sulfur Powder River Basin coal is utilized to achieve sulfur dioxide limits. Unit 19 utilizes low NO_x burners and overfire air for NO_x control.

The ESPs are considered "cold side" since they are located after the preheaters.



This is a view of the west ESP at Fisk with breeching exiting the ESP and entering the stack. (In the background is the bottom of the Sears tower.) The air preheaters are inside the large building to the right. The preheaters are about 4 feet from the wall at about the same elevation as the ESP. The section of dark transition before the silver ESP pictured and the building is about 25 feet long. It probably houses perforated plates which distribute air into the ESP in a laminar type flow. Total distance of ductwork from exit of preheater to ESP is about 29-35 feet.

2. SO$_3$ injection

The facility does not use SO_3 injection.

3. Flue gas conditioning

No direct flue gas conditioning is performed. Sodium carbonate, anhydrous is added to the coal at the mine to achieve 3.25-3.75 wt%. The sodium is added to decrease resistivity of the fly ash. Wt % sodium is provided in the quarterly coal analysis reports.

4. Other Information

Crawford Unit 7 is a 216 MW electric generating unit consisting of two boilers, a superheater boiler (or "furnace") and a reheat boiler (furnace). This arrangement is known as a "dual furnace." They are basically identical except for the arrangement of tubes in the fire box. Each furnace cannot be run separately. The superheater furnace supplies high pressure steam to the high pressure turbine, the steam is then routed to the reheat furnace. The turbine on the reheat furnace operates at a lower pressure and utilizes a condenser to extract remaining energy from the steam.

Low sulfur Powder River Basin coal is utilized to achieve sulfur dioxide limits. Unit 7 utilizes low NO_x burners and overfire air for NO_x control.

The ESPs are considered "cold side" since they are located after the preheaters.

ESP collection area is given in what is called "specific collection area," the units of which are ft^2/acfm. The design flow rate (acfm) was not given. The specific collection areas (for units 7 and 8) were taken from stack test reports. Originally the SCA was given as 118.3 and it was suggested by Midwest Generation that to get the individual SCA per ESP to divide the number by two.

A further note about the ducts: There did not appear to be any obvious large open areas near the superheater duct. At low elevations, there is a considerable amount of electrical equipment to the west. At slightly higher elevations, a number of prominent vessels for the feedwater system are placed close to the duct. Then the wall of the building runs adjacent to the duct on the west side of it. On the east side, there is not much room between the down coming duct (hot gas to the air preheater) and the outgoing duct. At one elevation, there did appear to be a large "patch" placed into the side, approximately 25 feet by 6 foot tall section may have been welded into place (see photo.) There is also a steel beam truss section which could support a pad at this approximate 77-foot elevation. We did not see any convenient places in which large equipment (baghouses/ storage silos) could be easily placed. The reheat furnace duct had an adjacent approximately 400 sq foot area open to the East and some windows were within 20 feet east.

ADDENDUM

Date: May 16, 2005
To: Ed Bakowski
From: Joe Kotas

RE: Mercury VIP
SCA CORRECTION

Source:	Midwest Generation, LLC; Crawford Generating Station
I.D. #:	031600 AIN
Address:	3501 S. Pulaski Road; Chicago, IL 60623-4987
Contact/Title:	Luke Ford/EH&S Specialist,John Kennedy/Station Director; David Gladem/Production Manager
Phone/Fax:	773-650-5489
Inspector(s):	Joe Kotas and Emilio Salis

Following an inquiry, further information was gathered concerning the specific collection area ("SCA") of the ESPs at Crawford Unit 7. The SCA for Crawford unit 7 was originally given as 59.15 in the report dated 05/06/06. The correct SCA (as provided by contacts at Midwest Generation) for Crawford Unit #7 is 118.3 ft^2/kacfm. Please adjust your records accordingly.

The facility does not use SO_3 injection.

3. Flue gas conditioning

No direct flue gas conditioning is performed. Sodium is added at the mine as stated above (which is true for all Midwest Generation plants in the Chicago area.)

4. Other Information

Crawford Unit 8 is a nominal 326 MW electrical generating unit consisting of a dual furnace arrangement connected to a single stack.

Low sulfur Powder River Basin coal is utilized to achieve sulfur dioxide limits. Unit 8 utilizes low NO_x burners and overfire air for NO_x control.

The ESPs are considered "cold side" since they are located after the preheaters.

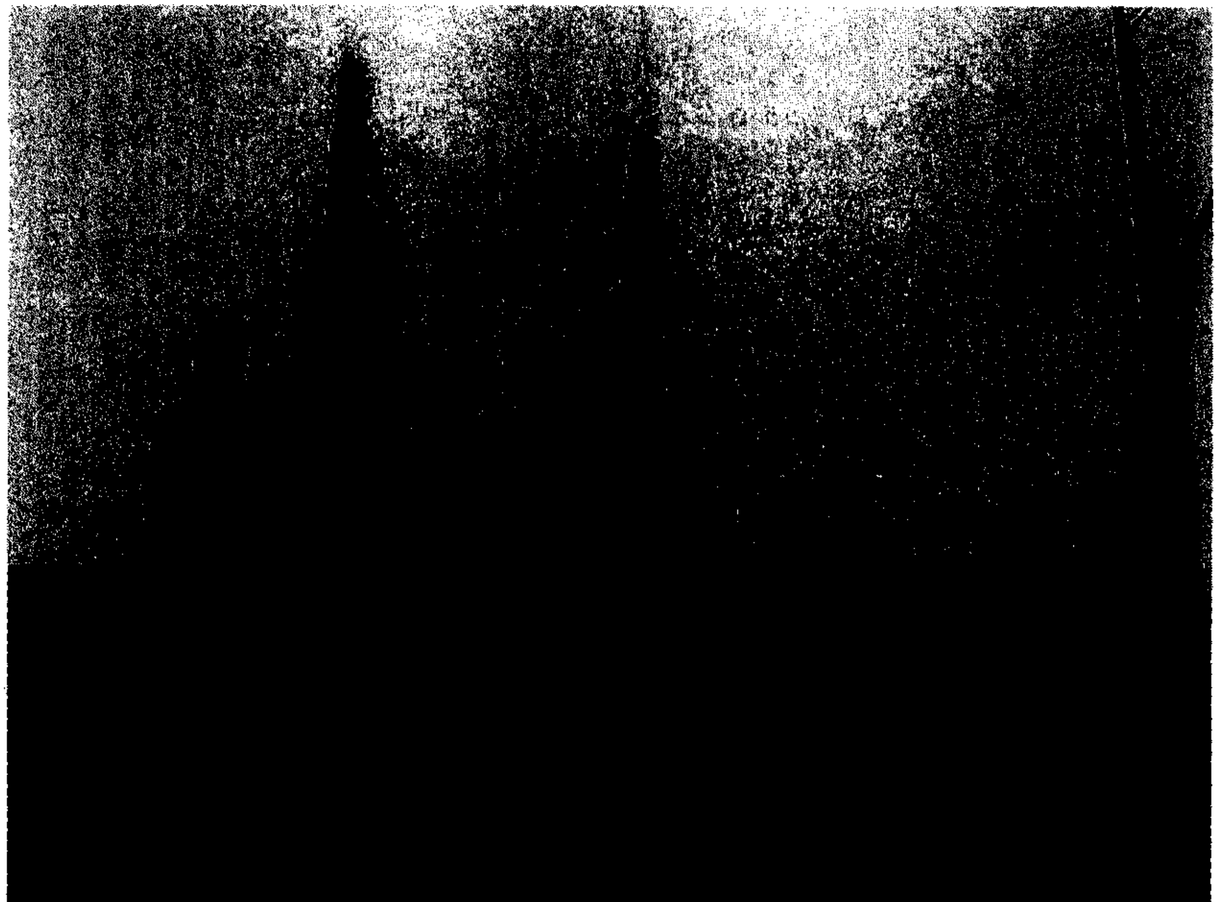
The preheaters are of a "Ljungstrom" design. They consist of cylindrical metal drums with fins. The axis of rotation is between the inlet (cold) and outlet (hot) air streams. The unit rotates to allow the preheated fins to come in contact with the incoming combustion air. The temperature of the flue gas is 600-700 degrees F entering the preheater and 300 degrees F out.

5. Attachments

   a. Photos. (Midwest Generation Crawford Generating Station photos)

   b. Side view schematic Crawford 7. (Crawford block)

Midwest Generation Crawford Generating Station
031 600 AIN
05/01/06
Photos by J. Kolas



View of Crawford power plant looking south. Unit 7 has two electrostatic precipitators (ESPs) on the roof and an orange and white striped stack. The unit 8 stack is in the foreground.

2. SO3 injection

The facility does not use SO3 injection in any of the boilers.

3. Flue gas conditioning

No flue gas conditioning is utilized.

4. Other Information

This facility is an electric-powered generating station with two units, 5 and 6, each consisting of two crushed coal-fired boilers controlled by ESP units and a turbine-driven generator. Unit 5 covers boilers number 51 and 52 and Unit 6 covers boilers number 61 and 62. The ductworks for all these boilers are identical. Each boiler has a nominal capacity of 4116 mmBtu/hr each and are served by a single shared stack. NOx emissions are controlled by low-NOx overfire air systems and the PM emissions are controlled by ESP. Generators for units 5 and 6 are permitted for 851 MW and 846 MW, respectively.

Coal is received by rail into a car dumper and coal crushers and then moved by conveyor to the stockpile or surge bins. From the surge bins, coal is fed by a conveyor to the conditioners and then to the silos. All sources, including the fly ash bins; with uncontrolled emission rates greater than the allowable rate are controlled by bag houses. The coal silo for unit 5 also has a wet dust extractor system and there are dry fogger systems on the traveling tripper car and at some tripper room transfer points. Other sources are an auxiliary oil-fired boiler for facility heating and start-up steam for units 5 and 6, several insignificant storage tanks, a gasoline dispensing station, coal storage pile, and roadways.

Emissions Unit Information

Emission Unit	Description	Emission Control Equipment
Unit 5 Boiler BLR 51	Babcock and Wilcox Dual Cyclone fired Nominal 4116 mmBtu/hr (1973)	Low NOx, Overfire Air and ESP
Unit 5 Boiler BLR 52	Babcock and Wilcox Dual Cyclone fired Nominal 4116 mmBtu/hr (1973)	Low NOx, Overfire Air and ESP
Unit 6 Boiler BLR 61	Babcock and Wilcox Dual Cyclone fired Nominal 4116 mmBtu/hr (1976)	Low NOx, Overfire Air and ESP
Unit 6 Boiler BLR 62	Babcock and Wilcox Dual Cyclone fired Nominal 4116 mmBtu/hr (1976)	Low NOx, Overfire Air and ESP

In addition, the facility supplied flow diagram of the boilers operation.

3. Flue gas conditioning

No other flue gas conditioning is utilized.

4. Other Information

Low sulfur coal is utilized. All boilers incorporate low NOx technology and over-fired air.

2. An SO_3 flue gas conditioning system has been installed on Units 1 and 2. A 3,000 molten sulfur tank supplies sulfur that is used to make SO_2 for both units. The SO_2 is forced into SO_3 and put into the flue gas. With a letter dated August 2, 2001, Steve Whitworth notified the Agency that the flue gas conditioning system for Unit 1 was placed into service on July 16, 2001 and released to operations on July 17, 2001. The flue gas conditioning system for Unit 2 was placed in service on July 10, 2001 and released to operations on July 13, 2001. During the inspection, both units were operating and the SO_3 injection rate for Units 1 and 2 was 9ppm and 10ppm, respectively. The facility burns Powder River Basin coal and East Hornsby Coal. The SO_3 injection system is used for both.

3. No other flue gas conditioning is performed.

4. The coal-fired boilers are designated as Unit 1 (CB-1) and Unit 2 (CB-2). They have a steam production capacity of 2.5 million pounds per hour and 4.159 million pounds per hour, respectively. Both are Babcox and Wilcox subcritical cyclone-fired units. Unit #1 and Unit #2 have overfire air systems for reducing NOx emissions. According to an email from the facility dated May 16, 2002, "full utilization of the overfire air systems on Unit #1 and Unit #2 was not realized until late in 2001 and early 2002". The overfire air systems did not have full capability until the fine grind crushers were installed. The overfire air systems operate all year.

   The facility installed selective catalytic reduction (SCR) systems on both units. The manufacturer will not guarantee the catalyst in the SCR during ozone season while burning low sulfur coal. The SCR mixes ammonia with the exhaust gas. It is located before the precipitator on the hot side. There are two 50,000 gallon anhydrous ammonia tanks for supplying the SCR units. The SCR system operates May through September. It needs to operate at about 800 degrees Fahrenheit for optimum performance. The SCR on Unit #2 initially started up on April 9, 2002. The SCR on Unit #1 was in service May 1, 2003.

2. The facility performs SO_3 injection on Boiler #5. Boiler #5 (unit 3) is a 220 MW coal-fired boiler equipped with a low NOx burner system. It has an electrostatic precipitator and a sulfur dioxide monitor. The boiler is burning Powder River Basin coal which contains low sulfur. A flue gas conditioning system was installed on boiler #5. It was needed for burning the low sulfur coal. The flue gas conditioning system burns molten sulfur making SO_2. The system oxidizes the SO_2 into SO_3. The SO_3 is put into the flue gas which lowers the resistivity of the fly ash making it easier for the precipitator to collect. The system was place in service on March 22, 2003 and was operating reliably April 14, 2003. During the inspection, SO_3 was being injected at a rate of 7.98 ppm. The system has the capability of injecting SO_3 at a rate of 6 to 14 ppm.

3. Flue gas conditioning is also performed on Boiler #4. A non-sulfur liquid conditioning agent called Arkay is used. The facility was issued a construction permit (#06010047) on February 16, 2006 to do a "pilot evaluation of an alternative flue gas conditioning agent" on Boilers #1-5. The facility has immediate plans to install the Arkay flue gas conditioning systems on Boilers #1-3 after receiving the construction permits. They plan to make the Arkay system on Boiler #4 a permanent system and no longer a "pilot evaluation".

4. The Meredosia power station has a total of six boilers divided into four units. There are two coal-fired boilers (#1 and #2) with a generating capacity of 32 MW each. There are also two coal-fired boilers (#3 and #4) with a generating capacity of 30 MW each. The boilers #1-#4 have a common stack. The units are equipped with SO2, NOx, and opacity monitors. Boiler #5 (unit 3) is a 220 MW coal-fired boiler equipped with a low NOx burner system. It has an electrostatic precipitator Boiler #5 has a separate stack.

This facility is an electric generating station with one boiler, a pulverized coal, wall fired boiler rated at 3,713 million BTU per hour or about 400 MW.

For NOx control there are low NOx burners on the boiler and a SCR system with ammonia injection. Particulates are controlled by two parallel, cold side, ESP's with flue gas conditioning by means of SO_3 injection. Sulfur dioxides are controlled by a limestone wet scrubber system.

The SO_3 injection system was just started up in March 2006. The proper permits were obtained. The coal presently being used can be described as a medium sulfur content coal of up to 2%. This amount is high enough to continue to require the use of the wet scrubber for SO_2 control, but low enough to require flue conditioning with SO3 injection for proper ESP performance. The ESP's were designed for use with high sulfur coal, but with the lower sulfur coal, SO_3 needs to be injected to modify the resistivity of the flyash particles for proper ESP operation.

The current scrubber is reaching the end of its life. The company is currently investigating whether rebuilding the scrubber or replacing the scrubber is most economic. If the scrubber system needs to be shutdown while a new one is built or rebuilt, then low sulfur will be temporarily used to meet the SO_2 emission limits.

The SCR was put into service in about June 2003 and presently operates from May through September, the ozone season. New rules may require year round operation by 2009. The SCR system produces a little SO_3 so the SO_3 injection system is operated at a reduced rate in proportion to the amount from the SCR to maintain about 10 ppm of SO_3 in the flue gas.

The duct between the air heater and the ESP's is about 212 feet long but is not in a straight line. The single duct connection at the pre-heater is 14 x 25 feet (352 sq. ft.) and it splits into two sections, one for each ESP. Each connection to the ESP's is 7 x 33 feet (464 sq. ft.) The specific collection area (both ESP's combined) is 291.

Rizwan Syed and Wayne Kahila, both from the Peoria Regional Office, did this inspection.

cc: W.Kahila
R.Syed
ID: 057 801 AAA

Sulfur dioxide is controlled by burning coal with the proper sulfur content. The average SO_2 emissions from all three boilers are limited to 4.71 lbs. SO_2/million BTU. Any one boiler may have up to 6.6 lbs. SO_2/million BTU as long as the overall average is not exceeded. Also, on a plant wide basis, the 24-hour average for SO_2 emissions shall not exceed 34,613 lbs. SO_2/hour. Reports of coal analyses have been submitted to the Agency in a timely manner. Quarterly reports of the sulfur dioxide monitoring have been submitted in a timely manner.

Unit 1:

The ESP is a cold side one. The duct from the air pre-heater to the ESP is a twin duct. Each section is 7 x 20 feet (274 sq. ft.) at the outlet of the pre-heater and 16 x 34 feet (1088 sq. ft.) at the inlet to the ESP. The total duct length is about 61 feet; however, this is not a straight line distance. There are many curves and angles in this length of duct. The equipment is tightly squeezed together.

The ESP specific collection area is 138.

The only flue gas conditioning is SO_3 injection. Elemental sulfur is burned to make SO_2 and a catalyst converts the SO_2 into SO_3. The injection averages about 10 ppm of SO_3. The SO_3 system is necessary for the ESP to work properly with low sulfur coal since the ESP was designed to operate with high sulfur coal.

Unit 2:

The ESP is a cold side one. The duct from the air pre-heater to the ESP is a twin duct leaving the pre-heater but is combined into a single inlet at the ESP. Each section is 11 x 28 feet (612 sq. ft.) at the outlet of the pre-heater and 27 x 74 feet (1968 sq. ft.) at the inlet to the ESP. The total duct length is about 46 feet; however, this is not a straight line distance. There are many curves and angles in this length of duct. The equipment is tightly squeezed together.

The ESP specific collection area is 170.

The only flue gas conditioning is SO_3 injection. Elemental sulfur is burned to make SO_2 and a catalyst converts the SO_2 into SO_3. The injection averages about 8 ppm of SO_3. The SO_3 system is necessary for the ESP to work properly with low sulfur coal since the ESP was designed to operate with high sulfur coal.

Unit 3:

The ESP is a cold side one. The duct from the air pre-heater to the ESP is a twin duct. Each section is 12 x 29 feet (638 sq. ft.) at the outlet of the pre-heater and 32 x 49 feet (3056 sq. ft.) at the inlet to the ESP. The total duct length is about 31 feet; however, this is not a straight line distance. There are many curves and angles in this length of duct. The equipment is tightly squeezed together.

The ESP specific collection area is 178.

The only flue gas conditioning is SO_3 injection and SCR system. Elemental sulfur is burned to make SO_2 and a catalyst converts the SO_2 into SO_3. The injection averages about 12 ppm of SO_3. The SO_3 system is necessary for the ESP to work properly with low sulfur coal since the ESP was designed to operate with high sulfur coal.

Unit 3 also has a SCR system with ammonia injection. Data from the catalyst manufacturer indicates that the catalyst in the SCR converts about 1% of the entering SO_2 into SO_3. The rate of the SO_3 injection system is adjusted to account for the SO_3 from the SCR system so that the total SO_3 is about 12 ppm. Presently the SCR system operates only during the ozone season, which is May through September. It may go to year round operation in 2009.

Rizwan Syed and Wayne Kahila, both of the Peoria Regional Office, did this inspection.

cc: W.Kahila
R.Syed
ID: 143 805 AAG

Emissions Unit Information

Emission Unit	Description	Emission Control Equipment
Boiler 9	Babcock & Wilcox Radiant Coal-Fired Boiler 447 MW Nominal Rating (1978). (pulverized coal wall fired)	Overfire Air System, Low NOx burners, In-duct Selective Catalytic Reduction System and ESP with Flue Gas Conditioning

2. SO3 injection
The facility does not use SO3 injection in the boiler.

3. Flue gas conditioning
The facility does use flue gas conditioning and is done between the boiler and the agglomerator. The flue gas additive used is manufactured by ADA and is sodium based and ADA proprietary.

4. Other Information

The Havana Power Station is located on the Illinois River approximately one mile south of Havana, Illinois. The facility has six major fossil-fuel-fired generating units, which are essentially divided into two parts.

The original plant was the first generating station built by Illinois Power. Station construction planning began in 1944 with the five units coming on-line between 1947 and 1950. These original units are steam powered by eight # 6 fuel-oil-fired boilers. # 2 fuel oil is used to ignite the # 6 fuel oil. All eight boilers are connected to a common steam header that supplies the five turbine generators, each rated at 48 MW. All eight boilers are connected to a common exhaust header, which in turn is connected to three exhaust stacks.

The second plant houses Havana Unit # 6 (Boiler # 9), which is rated at approximately 490 MW and is fired with low-sulfur pulverized coal and is wall fired. Construction began on this unit in 1975, and the unit came on-line in 1979. Coal is transported to the station either by barge or rail car where it is unloaded, stored, crushed, elevated to the coal silos in the Unit # 6 building, pulverized, and blown into the boiler for combustion. Upgrades to the existing coal handling and processing system, including a new crusher, new fly ash transport and loadout systems, flue gas conditioning system and a temporary portable coal conveying system were made and the new coal crusher and associated conveyors began operation on January 9, 2005 and achieved maximum production rates on February 1, 2005. The temporary portable coal conveying system was removed once the main conveyors began operation. Exhaust gases from the boiler pass through an electrostatic precipitator to remove fly ash and then pass through a selective catalytic reduction (SCR) unit to control NOx emissions. The facility is installing a agglomerator between the boiler and the ESP which is hot side. The agglomerator has a series of charge plates to collect small particles to attract to each other and assist in enhancing the efficiency of the ESP. The agglomerator by itself is not an emission source or a control equipment. According to the Dynegy staff, the Agency's office in Springfield was notified about this installation. From the SCR, the exhaust gas flows through the air heater then up the stack Prior to installation of the SCR over-fire air fans were installed and began operation on March 03, 2003 to provide some NOx control. The SCR system began operation on August 04, 2003. The boiler has started burning low-sulfur sub bituminous coal in place of low-sulfur bituminous coal on January 19, 2005.

Presently, about 12 startups of Unit # 6 occur per year. Dynegy has changed the station's operating status to a base load unit. Prior to the change, about 150 startups per year occurred.

#15 – Dynegy Midwest Generation (Hennepin)

Division of Air Pollution Control – Field Operations Section

ID# 155 010 AAA
Dynegy Midwest Gen.
Field Inspection Report

Special Inspection Memorandum

Date: May 4, 2006 (revised) **Date of Inspection:** April 28,2006

To: E. Bakowski **Last Inspection:** not relevant

From: J. Krolak & W. Kahila **ID:** 155 010 AAA **R/D:** 203

County: Putnam **SIC:** 4911

Source: Dynegy Midwest Generation, Inc.
Address: R.R.1, Box 200A, Hennepin, IL 61327

Contact: Jim Dodson **Title:** Plant Manager
Phone: 815-339-9212 **Fax:**

Contact: John Augspols **Title:** Environmental Coordinator
Phone: 815-339-9218 **Fax:** 815-339-2772

Contact: Michelle Chestnut **Title:** Environmental Specialist (Decatur)
Phone: 217-872-2367 **Fax:** 217-876-7475
Cell: 217-714-4794

Description: This facility is a coal-fired electric generating station that now burns western sub-bituminous low-sulfur coal to meet federal acid-rain prevention requirements. Dynegy Midwest is the successor (for fossil-fuel power generation) to Illinois Power Company.

2. SO$_3$ Injection

Dynegy's Hennepin Station burns only low-sulfur Powder River Basin (PRB) coal, and uses SO_3 injection after the air heater exhaust to enable the ESPs to function properly. The sulfur use rate and resultant SO_3 concentration are not directly measured; the optimum concentration is dependant on exhaust gas parameters and is determined by observing the ESP power levels and the plume opacity and appearance. Inadequate SO_3 results in excess emissions and opacity, while a slightly bluish plume indicates too much SO_3.

3. Flue gas conditioning

No other flue gas conditioning is utilized beyond the furnace NO_x controls.

4. Other Information

The station is located in an agricultural/ industrial area within the corporate limits of Hennepin in Putnam County, and is an electric utility. The two coal- or natural gas-fired units at this station are capable of generating a total of about 316 megawatts. No other commercial generating units are located here.

Under Board Regulations, the station's combined SO_2 emission limit is 17,050lbs/hr due to the 264foot stack height. Burning PRB coal, actual emissions do not approach this limit.

The station is located on the south bank of the Illinois River, and coal is delivered to the site by barges.

Construction of Unit 1 was begun about 1950, followed by the larger Unit 2 about 1956. Due to the lack of space at the site, the ESPs for both units are located above the respective ID fans, with the common stack between them. Unit 2's ESP is located higher above the ID fans to allow space for the larger ductwork and breeching underneath it.

When considering how to reduce sulfur emissions to meet acid rain restrictions, the owner (formerly Illinois Power Company) determined that it was not economically feasible to install additional flue-gas control systems such as scrubbers, or to increase the size of the ESPs. The only means left was the use of low-sulfur coal and SO_3 injection.

It is apparent that emission control systems requiring enlarged or additional structures could not be fitted between the furnaces and the river. Lateral expansion might be accommodated, probably at a considerable expense.

The Unit 2 ESP was refurbished in 2003, as described in Dynegy's letter of January 29, 2003 to Don Sutton of the Agency. The Collection Plate Area and SCA information on form 260-CAAPP, page 164 of the original CAAPP application submitted in September 1995, is no longer correct. Information received from Dynegy on May 4, 2006 states that the collection plate area is now 109,200sq ft, and the Specific collector Area (SCA) is 125.5.

CC: Dean Hayden
Wayne Kahila

3. SO_3 Injection:
The facility presently utilizes SO_3 injection, however, the system may or may not be utilized in conjunction with new mercury/PM baghouse control.

4. Flu Gas Conditioning:
The plant previously tried flue gas conditioning when using high sulfur coal. The boilers have been switched to Powder River Basin coal (PRB) and this system will no longer be used.

5. General Boiler Description:

3.2 Unit #1 Boiler with ESP and low NOX combination system

Dynegy has two Combustion Engineering tangentially fired pulverized coal boilers (Units #1 and #2). Unit #1 has a maximum rated capacity of 84 MW (785 mmbtu/hr). Each Unit has 4 pulverizers and 16 burners. Each pulverizer feeds 4 burners that are located at each corner of the boiler. The pulverized coal is injected at four levels of the boiler. Each pulverizer corresponds to a different height at which coal is injected into the boiler. The emissions from each unit are exhausted through an electrostatic precipitator and then through a common stack.

Electrostatic precipitators (ESP) control the particulate matter emissions from the boilers. The ESP for Unit #1 is a Buell with 4 sections (4 TRs). The ESPs uses a hammer/anvil type rapper to remove particulate matter from the plates. Particulate matter emissions from Unit 1 are limited to 0.12 lbs/mmbtu per 35 Ill. Adm. Code 212.203(b).

Sulfur dioxide (SO_2) emissions from Units #1 are uncontrolled. SO_2 emissions are limited to 8.5 lb/mmbtu by 35 Ill. Adm. Code 214.184. In addition, SO_2 emissions from both units #1 and #2 are limited to 16,805 lbs/hr by permit special condition. Construction permit PN05030030 was granted 4/6/05 to install new SO_3 gas conditioning system for ESP unit to burn low-sulfur coal (PRB) and reduce PM and SO_2 emissions. SO_3 concentration in the flue gas will be approximately 20 ppm as needed by volume.

Carbon monoxide emissions from the boilers are subject to 35 Ill. Adm. Code 216.121 (200 ppm corrected to 50 percent excess air).

Dynegy has SO_2, NOX, CO_2, flow and opacity continuous emissions monitors (CEM/COM) located in the stack. Dynegy installed these monitors because of the Acid Rain regulations, 40 CFR Part 75. However, Dynegy is required by permit special condition to submit quarterly reports of excess opacity and SO_2.

Unit #1 and its ESP are permitted in CAAPP operating permit 95090050 and state operating permit 73020064.

3.3 Unit #2 Boiler with ESP and low NOX combination system

Dynegy has two Combustion Engineering tangentially fired pulverized coal boilers (Units #1 and #2). Unit #2 has a maximum rated capacity of 113 MW (1,167 mmbtu/hr). Each Unit has 4 pulverizers and 16 burners. Each pulverizer feeds 4 burners that are located at each corner of the boiler. The pulverized coal is injected at four levels of the boiler. Each pulverizer corresponds to a different height at which coal is injected into the boiler. Unit #2 is equipped with low NOx burners, installed in 1993. The burners take a portion of the airflow that is injected into the bottom and injects the air above the highest burner. The emissions from each unit are exhausted through an electrostatic precipitator and then through a common stack.

Electrostatic precipitators (ESP) control the particulate matter emissions from the boilers. The ESP for Unit #2 the ESP is a Western-Precipitation with 10 sections (5 TR=s). The ESPs uses a hammer/anvil type rapper to remove particulate matter from the plates.

Particulate matter emissions from Unit 2 are limited to 0.1 lbs/mmbtu per 35 Ill. Adm. Code 212.202.

Sulfur dioxide (SO_2) emissions from Unit #2 are uncontrolled. SO_2 emissions are limited to 8.5 lb/mmbtu by 35 Ill. Adm. Code 214.184. In addition, SO_2 emissions from both units #1 and #2 are limited to 16,805 lbs/hr by permit special condition. Construction permit PN05030030 was granted 4/6/05 to install new SO_3 gas conditioning systems for ESP unit to burn low-sulfur coal (PRB) and reduce PM and SO_2 emissions. SO_3 concentration in the flue gas will be approximately 20 ppm as needed by volume.

Carbon monoxide emissions from the boilers are subject to 35 Ill. Adm. Code 216.121 (200 ppm corrected to 50 percent excess air).

Dynegy has SO_2, NOX, CO_2, flow and opacity continuous emissions monitors (CEM/COM) located in the stack. Dynegy installed these monitors because of the Acid Rain regulations, 40 CFR Part 75. However, Dynegy is required by permit special condition to submit quarterly reports of excess opacity and SO_2.

Unit #2 and its ESP are permitted in CAAPP operating permit 95090050 and state operating permit 73020063/construction permit PN05030030.

6. The information concerning ductwork dimensions was received from Dynegy personnel (Rick Dieriex) and is not listed or documented in any permit application or official Dynegy drawing. The actual layout of the new construction of mercury baghouse, associated ductwork, and auxiliary equipment may not be as presented by FOS in this document. The drawings are not to scale.

#18 – Kincaid Generation (Kincaid)

TIER I INSPECTION MEMORANDUM

Date	May 2, 2006	Date of Inspection:			May 1, 2006
To:	E. Bakowski				
From:	E. Kierbach	I.D. #:	021814AAB	R/D	204

Source: Kincaid Generation, L.L.C.

Address: PO Box 260; 4 miles west of Kincaid Rt. 104 Kincaid, Il 62540

Contact/Title: Anu Singh, PE/Sr. Environmental Compliance Engineer

Phone: 217-237-4311 x 2291 / 217-237-5519

Inspector(s): Steve Youngblut/Ernie Kierbach

Purpose: Coal fired power plant equipment verification/clarification

1. Block Diagram

The block diagram depicts boilers unit 1 and 2 along with ductwork and controls.

Unit 1 boiler is equipped with over fire air for NOx reduction. The unit exhausts to an ammonia injection selective catalytic reduction system (SCR). From the SCR exhaust travels thru an air heater to an electrostatic precipitator (ESP). The ESP has two main compartments each with a specific collection area (SCA) of 327.5. From the ESP the exhaust travels to a common stack.

Unit 2 boiler is equipped with over fire air for NOx reduction. The unit exhausts to an ammonia injection selective catalytic reduction system (SCR). From the SCR exhaust travels thru an air heater to an electrostatic precipitator (ESP). The ESP has two main compartments each with a specific collection area (SCA) of 327.5. From the ESP the exhaust travels to a common stack.

In either configuration the estimated distance from the air heater discharge to the ESP is 325 feet. There would appear to be ample room for add on control in this section of ductwork.

2. SO3 injection

The facility does not use SO3 injection. A SO3 injection has never been used at the facility.

3. Flue gas conditioning

No flue gas conditioning is utilized.

4. Other Information

Kincaid Generation utilizes two coal-fired boilers in conjunction with steam turbine generators to generate electricity. Electricity generated by Kincaid Generation is sold on the "grid". Coal combusted at this facility is low sulfur Powder River Basin coal (Black Thunder, North Antelope, and Antelope).

The facility, in general, consists of coal receiving/storage, coal processing/crushing systems, a water treatment plant, an auxiliary boiler, and two coal-fired units each controlled by an SCR and electrostatic precipitator (ESP) vented to a common stack.

Each boiler is also equipped with an over fire air system (OFA) to reduce emissions of NO_x to aid in complying with the Acid Rain Program requirements of 40 CFR 76. In general, this is accomplished by reducing airflow (oxygen) in the furnace region resulting in a reduction of NO_x formation.

Additionally, the facility has installed a selective catalytic reduction (SCR) system to each unit. The SCR taps in at the economizer exit and vents to the air heater. The air heater section then vents to the ESP. The SCR systems provide NO_x reductions during the ozone season. The SCR systems will utilize ammonia as a reducing agent to convert nitrogen oxide emissions from the combustion process to nitrogen and water.

Steam from each boiler is fed to a turbine set. A turbine set consists of one high-pressure turbine, one intermediate-pressure turbine, and two low-pressure turbines. The turbine sets are connected to generators that complete the conversion of chemical energy to electric power.

Emissions Unit Information

Unit	Manufacturer	Firing Type	Design Heat Input	Control Equipment	Date Constructed
Unit 1	Babcock & Wilcox	Cyclone	6,634 mmbtu/hr	OFA, SCR, ESP	1967
Unit 2	Babcock & Wilcox	Cyclone	6,406 mmbtu/hr	OFA, SCR, ESP	1968
Aux Unit	Babcock & Wilcox	-	165 mmbtu/hr	-	1984

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
Division of Air Pollution Control--Field Operations Section

TIER II MEMORANDUM

Date: February 27, 2006
To: Ed Bakowski, FOS Manager
From: Scott Arnold, FOS

Date of Inspection: February 9, 2006
Last Insp. Date: February 15, 2005
I.D.#: 127 855 AAC **R/D:** 304
County: Massac **SIC:** 4911

Source: Electric Energy, Inc.
Address: Joppa Steam Station, 2100 Portland Rd., Joppa, IL 62953
Contact/Title: Bruce Parker, Environment Engineer
Phone: 618/543-7531, Ext.: 458
Fax: 618/543-7420

Purpose:

FY06 Workplan Inspection. Also witnessed RATA.

Description:

Electric Energy's - Joppa Generating Station, located near Joppa, Illinois consists of six coal-fired generating units, which supply electricity for the U.S. DOE - Paducah, Kentucky uranium enrichment facility, as well as supply the grid. The facility is a CAAPP source.

Units 1-6 are all Combustion Engineering pulverized coal-fired units rated at 181 MW (1653 mmbtu/hr) capacity. The units started operation between 1953 and 1955. The units are each equipped with Research - Cottrell 5 section (3 TR's) ESP's installed in 1971 and 1972. The ESP's were upgraded in 1993-94 to handle particulate emission from western coal. The units are vented through three 525' stacks, two units per stack. Continuous emission monitoring equipment was installed at the station, as per 1990 Clean Air Act amendment.

The station receives western coal by rail from the Powder River Basin in Wyoming with less than 1% sulfur. The facility burns approximately $4.6x10^6$ tons of coal per year.

Following is a summary of station design data

Unit	MW	MMBTU/hr	Type	Age	Equipment	Age	Height
1	181	1653	C-E, P-C	1953	R-C, ESP	1971	525
2	181	1653	C-E, P-C	1953	R-C, ESP	1972	
3	181	1653	C-E, P-C	1954	R-C, ESP	1972	525
4	181	1653	C-E, P-C	1954	R-C, ESP	1972	
5	181	1653	C-E, P-C	1955	R-C, ESP	1972	525
6	181	1653	C-E, P-C	1955	R-C, ESP	1972	

The station's SO_2 limit is 38,865 lb/hr. based on a 3-hour block average.

Findings

I arrived at Electric Energy, Inc. at roughly 10:25 a.m. on the date of inspection. I met with Bruce Parker, Environmental Engineer, and Mike Mercer, Chemist. We began the inspection with a walk through of the facility. On this day, a gas RATA was being finished up on the SO_x, NO_x and CO_2 monitors on all three stacks. They were presently on stack #3, units #5 and #6. Unit #6 was operating at roughly 180 MW. Unit #5 was in start up running at about 100 MW. After Unit #5 reached 180 MW, stack #3 would undergo its' RATA. The RATAs on stacks #1 and #2 were done yesterday with both operating at 360 MW. All the boilers operate at about 180 MW or high load normally, and there are two units vented to each stack.

The RATA was finished yesterday on stacks #1 and #2, Unit #1 and #2 and Units #3 and #4. The RATA was being done by G.E. Mostardi Platt. The stack testing crew chief was Greg Rock. Mr. Rock told me they were doing Methods 6C, 7E and 3A for SO_x, NO_x and CO_2, respectively. Mr. Rock said they were using a dilution extraction system for testing, since Electric Energy, Inc. has the same type CEM system. They were sampling 3 pts., 7 minutes/pt. For 21 minute RATA runs. They were using a Teflon probe. They were doing a minimum of 9 runs on each stack at high load, which is also normal operating conditions.

We next checked out the coal handling system. I observed the dumping of a train. I noted little, if any, opacity. Ron Thompson, the coal-handling supervisor stated that the coal being dumped on this day was going to storage. The #25 stacker was the only one operating. Stackers #23 and #24 were down at this time. I noted opacity in the 5% range from the #25 stacker. I noted no other VE from the storage area or coal piles.

We proceeded to the control room. All units were operating at full load or about 180 MW each, except the #5 unit which was operating at 100 MW and in start up mode. I asked for an received a copy of the CEM data for each stack (attached).

We returned to the office and Mr. Parker provided me with a copy of the "used oil disposal log" (copy) and the "used oil" analysis (copy in general file).

I next asked for coal burned in 2005 (attached). I also asked if any chemical waste had been burned in 2005. Mr. Parker stated there had. There is a chemical waste quantity and analysis in the company's general file. They burned roughly 15,000 gallons of chemical cleaning waste in 2005.

Finally, I asked for and received a copy of 2004 and 2005 emissions (attached).

This completed this inspection. Recommendations will be made.

SAA:jkb/233a/02-28-06

cc: BOA/Marion
Electric Energy, Inc.

Conclusions & Recommendations

The company appears to be in compliance with Agency regulations. Also, I photographed all three stacks. There is no equipment after the ESP and before the stack. All three ESPs are cold side ESP's.

SAA:jkb/233a/02-28-06

cc: BOA-Marion

is a dry-fly ash handling system. This system is controlled by a baghouse designated as LS BH. The system has not been operated for several years.

The Dallman station consists of coal receiving/storage, coal processing/crushing system, and three coal-fired boilers (units 31, 32, and 33). Units 31 and 32 are each controlled by a separate ESP (EP 31 and EP 32, respectively) then by a common flue gas desulfurization (FGD) system venting to a common stack. Exhaust from Unit 33 is first vented to an ESP (EP 33) then to a FGD system. From the FGD system the exhaust is directed to the Unit 33 stack. Additionally, the facility has installed selective catalytic reduction systems (SCR) to each of the three Dallman Units.

The FGD systems are used to remove sulfur dioxide from the boiler exhaust. Limestone received at the Dallman station is crushed using ball mills. From the ball mills the crushed limestone is mixed with water creating slurry. The slurry is misted through the boilers exhaust via spray towers. Pumps at the bottom of the spray towers move the spent slurry to a settling tank. Settled material is pumped to a de-watering station. In the de-watering stage a rotating vacuum drum is used to pick up the by product (gypsum). As the drum rotates an edge is used to scrape the gypsum from the drum. The de-watered gypsum is conveyed to a temporary storage area prior to off-site distribution. The cement and agricultural industries currently use this material.

The dry ash handling system located at the Lakeside Station is not currently utilized. Ash from the slag tank of each unit is dropped to a slag tank hopper that feeds to a grinder. The ground ash is sluiced to separate settling ponds located north of the Spaulding Dam. After the ash has settled the material is distributed off-site for use in the construction industry as backfill or as a component in the manufacturing of roofing materials. Currently fly ash and bottom ash are not separated.

Three diesel generators are located just south of the Lakeside Station. These generators were added to the facility for the purpose of black start capability (back up power for the stations). Initial operation began in June of 2002.

Emissions Unit Information

Unit	Manufacturer	Firing Type	Design Heat Input (Output)	Control Equipment	Date of Construction
Unit 7	Babcock & Wilcox	Cyclone	415 mmBtu/hr (33 MW)	EPLS	1959
Unit 8	Babcock & Wilcox	Cyclone	415 mmBtu/hr (33 MW)	EPLS	1964
Unit 31	Babcock & Wilcox	Cyclone	882 mmBtu/hr (88 MW)	EP31/FGD/SCR	1967
Unit 32	Babcock & Wilcox	Cyclone	882 mmBtu/hr (88 MW)	EP32/FGD/SCR	1971
Unit 33	Combustion Engineering	Pulverized	2,120 mmBtu/hr (192 MW)	EP33/FGD/SCR	1975

In addition, the facility supplied drawings of the exhaust systems.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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April 22, 2004

EPA Docket Center (Air Docket)
U. S. Environmental Protection Agency West
Mail Code 6102T
Room B-108
1200 Pennsylvania Ave, NW
Washington, DC 20460

Attn: Docket ID No. OAR-2002-0056

Re: Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units, Proposed Rule; Proposed Rule (69 *Federal Register* 4652, January 30, 2004) ("Proposal") and Supplemental Notice for the Proposal (69 *Federal Register* 2397, March 16, 2004)

Ladies and Gentlemen:

The Illinois Environmental Protection Agency (Illinois EPA) appreciates this opportunity to comment on the U.S. Environmental Protection Agency's (U.S. EPA's) "Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units; Proposed Rule" referred to herein as the "Mercury Proposal" and the Supplemental Notice to the Mercury Proposal, referred to as "Supplemental Notice." These comments supplement the testimony that I presented on behalf of the Illinois EPA at the public hearing held in Chicago on February 26, 2004.

We have stated publicly that Illinois is very committed to substantially reducing mercury in the environment, and the State is aggressively encouraging clean-coal technology that will allow Illinois' abundant coal reserves to be used in the most environmentally responsible manner. The proposals as set forth in the January 30, 2004 and March 16, 2004, *Federal Registers* will impede these efforts.

In brief, our comments on the Mercury Proposal will focus on the following: 1) Mercury is a highly toxic pollutant that needs to be regulated; 2) Mercury must be regulated under the Clean Air Act (CAA) section 112(d), Maximum Available Control Technology (MACT) standard; 3) Under section 112(d), the mercury limits must be more stringent than set forth in the proposals; 4) The final rule must be fuel neutral, without favoring coal from any particular region of the country; 5) Emissions trading of mercury allowances is not appropriate unless each affected unit involved in a trade can demonstrate that mercury hot spots are prevented; and 6) Mercury emissions can and should occur by 2010, and section 112 of the Clean Air Act has sufficient provisions to accommodate this timeframe. Attached please find Illinois EPA's specific comments on the proposal.

Coal-fired power plants are a major source of air pollutants, but their pollution can be significantly reduced using cost-effective technology that is available now, and which will be improved even further in the next few years. Further reductions will reap tremendous benefits in terms of environmental protection. It is imperative that U.S. EPA promulgate rules that will set the tone and direction for the power plant emission reductions that are long overdue and put the Nation on a path to better protect the health of our citizens and its future generations. To shirk its responsibility in this matter would have devastating consequences that will not be able to be fully compensated through State action alone.

If you have any questions regarding our comments, please contact Laurel L. Kroack, Manager of the Division of Air Pollution Control at (217) 524-7636.

Sincerely,

Renee Cipriano
Director

Attachment

cc: Bharat Mathur
Acting Regional Administrator
U.S. EPA Region V

Comments of the Illinois EPA on the Mercury Proposal

Environmental Concerns

Mercury is a highly toxic, persistent, bioaccumulative pollutant that can cause long lasting health problems. It is especially harmful to unborn babies, where exposure can result in a number of neurological deficiencies, including delayed developmental milestones, reduced test scores and cerebral palsy. A National Research Council study commissioned by Congress and published in 2000 estimated that each year about 60,000 children born in the United States could have neurological problems because they were exposed to mercury before birth.

The high levels of mercury found in fish that populate the waters of our State are also of great concern to us. Mercury contamination is widespread throughout Illinois, causing fish consumption advisories to be issued for every waterbody in the State. Illinois is counting on a strong federal mercury reduction program to help us achieve the goal of reducing the amount of mercury deposited into waterbodies in the State. U.S. EPA's proposed rule is unlikely to realize either sufficient reductions or reductions in a timely enough manner to protect our citizens.

The Clean Water Act requires States to identify impaired waters, to determine what reductions in loading need to occur to restore water quality (i.e., develop a Total Maximum Daily Load or TMDL) and to develop and implement plans to accomplish that restoration. When fish from a waterbody are so contaminated with mercury that we must advise our citizens to limit their consumption of fish or face an increased risk of adverse health consequences, that waterbody must be listed as impaired. Under the Clean Water Act, States are expected to have clean-up plans (TMDLs) in place and working by 2015 to address impaired waterbodies. To achieve this goal, substantial reductions in ambient mercury levels and mercury deposition must be initiated in 2010. We believe it is only prudent, sensible public policy that this proposal should also address our obligations under the Clean Water Act.

Moreover, a strong mercury control program would provide significant co-benefits for sulfur dioxide and nitrogen oxide reductions, both of which are important in attaining the fine particulate matter and 8-hour ozone National Ambient Air Quality Standards (NAAQS). We encourage U.S. EPA to require substantial mercury control by 2010, when most ozone and fine particulate nonattainment areas are required to reach attainment under the Clean Air Act.

Coal-fired electrical generating units (EGUs) represent the largest domestic source of mercury emissions, as well as the largest source of emissions of nitrogen oxides and sulfur dioxide. In order to mitigate the significant health impacts of mercury, sulfur dioxide, and nitrogen oxides, and meet our obligations under the federal Clean Air Act and Clean Water Act, we urge U.S. EPA to adopt a more stringent rule that reduces mercury emissions from coal-fired EGUs to the greatest possible extent and within the timeframes states are required to address program compliance under these federal statutes.

Rulemaking Approach

Although U.S. EPA attempts to justify how it can properly regulate mercury emissions from EGUs under either sections 111(d) or 112(n) of the Clean Air Act, Illinois EPA believes that those units must be regulated under section 112(d).

U.S. EPA chooses to interpret part of the language in section 112(n), requiring U.S. EPA to evaluate "alternative control strategies," to justify an approach to regulation of hazardous air pollutants (HAPs) from EGUs other than a listing under section 112(c), standard setting under section 112(d), and compliance deadlines established under section 112(g). U.S. EPA does not provide legislative history or case law that would support such an approach or interpretation.

Nothing in section 112(n) indicates any intent of Congress to allow U.S. EPA to regulate emissions of hazardous air pollutants (as opposed to other air contaminants) from EGUs under any other section than 112, nor does the language in section 112(n) evince any intent of Congress to allow U.S.EPA to exempt EGUs from the multiple requirements of other subsections of section 112. Indeed, if Congress had intended to give U.S. EPA that authority, it could have done so when it drafted section 112(n).

Moreover, regulation under section 111(d) would be inconsistent with the structure of the Clean Air Act itself, i.e., section 112 for the regulation of hazardous air pollutants, sections 108 to 110 for the regulation of sources as necessary to attain a NAAQS, and section 111 to set standards of performance for new stationary sources.

Also, regulation of emissions of hazardous air pollutants from EGUs under section 111(d) would be inconsistent with U.S. EPA's previous findings. Pursuant to section 112(n) of the CAA, U.S. EPA was required to study the hazards to public health that result from the emissions of EGUs and to provide a report to Congress. If the section 112(n) study and report to Congress found that regulation of these sources were necessary and appropriate, U.S. EPA is then required to regulate under section 112. This proposal essentially proposes to rescind the findings U.S. EPA reported to Congress, which concluded that controlling emissions of hazardous air pollutants from EGUs are necessary under section 112. Instead, U.S. EPA now proposes to change to a section 111 finding that it is only "appropriate" to control emissions from these sources. After negating its own conclusion, U.S. EPA then, without resubmitting the report to Congress, has proposed rules pursuant to the authority of section 111, and in the form of a trading program. To regulate EGUs under a section other than section 112, U.S. EPA would be required to delist EGUs under section 112(c). U.S. EPA has not undertaken this process, and cannot, in light of their own report to Congress, do so by claiming they erred in listing under section 112(c) initially.

Finally, U.S. EPA's conclusions that it erred in listing EGUs under section 112(c) cannot be supported by its actions in regards to the proposed maximum achievable control technology (MACT) standards for industrial boilers "National Emission Standards for Hazardous Air Pollutants for Industrial Commercial/Institutional Boilers and Process Heaters" (40 CFR part 63, subpart DDDD) ("Industrial Boiler MACT"). In the Industrial Boiler MACT, U.S. EPA proposes to regulate mercury, nickel and other HAPS from these sources, based on a finding that exposure to these HAPS have adverse health impacts, even though they emit these HAPS in smaller quantities than EGUs.

We do not believe that the rule proposed by U.S. EPA for the control of mercury emissions from EGUs under section 111(d) or 112(n) complies with the requirements of the Clean Air Act.

Although U.S. EPA constructs an elaborate interpretation that allows it to promulgate a trading program under sections 111(d) and 112(n), neither section provides specific authority for promulgating a trading program. Sections 111(b)(1)(B) and (d) and section 112(d) require U.S. EPA to promulgate either a "performance standard" or an "emissions standard." A performance standard as defined by section 111(a)(1) of the CAA means an emissions standard that reflects the "best system of reduction." And, an "emissions standard" under section 112(d)(2) is required to reflect "the maximum degree of reduction that is achievable" (MACT). A trading program does not, by its very structure, require a source to achieve any particular level of emissions reduction. U.S. EPA asserts that a cap and trade program is the best system of reduction because it provides incentives to sources to make early reductions and to go beyond compliance. However, the safety valve and banking features without flow control of the proposed trading program negate the very incentives of a market-based program. For these and other reasons discussed more thoroughly below, we believe that the appropriate and legally required approach for regulating mercury is under section 112(d) of the CAA that requires USEPA to set an emissions standard that each unit would be required to comply with based on MACT, and each EGU would then be required to meet that standard.

We are also very concerned that other important section 112 requirements will be avoided under a section 111(d) approach. As noted in a publication of the Washington, D.C. law firm of VanNess Feldman entitled "EPA's December 15, 2003 Proposed Rule to Regulate Mercury Emissions from Electric Utilities: Summary and Analysis":

> Also of importance is that the alternative cap-and-trade option (under either sections 112 or 111) would include the removal of the electric utility steam generating units from the section 112(c) list. Such an action would shield the affected utility boilers from the more prescriptive MACT standard-setting process related to MACT floors, regulation of all HAPs, the form of standards, and unit specific compliance obligations. In addition, such an action would spare electric utilities from further regulation under section 112, specifically additional tightening of the MACT standards under section 112(d)(6) or residual risk standards under section 112(f), eight years after promulgation of the initial MACT standard.

We are concerned that the timeline in the Proposal is too long, and controls must be required much more quickly. U.S. EPA gives insufficient support for its extended compliance deadline of 2018, which it has acknowledged, based on the elements of the trading program, could extend to 2025 or 2030. Based on the Florida Everglades experience in which stringent controls were applied to incineration sources in the 1990's, resulting in a steep decline in fish tissue levels of mercury within less than a decade, we can conclude that the quicker we start a reduction program, the quicker the risk to our citizens can be reduced. A 2018 compliance date under the section 111(d) proposal would be far too late for Illinois to use the federal mercury rule as part of a plan to restore an impaired waterbody under the Clean Water Act. And, we would be looking at 2028 before substantial fish tissue reductions could occur in the best of cases. That's 25 years before a current public health risk even begins to resolve, and that's too long.

Under section 112(g), the compliance deadline would be three years after the rule adoption, likely in 2007. There is evidence that requiring strict levels of reduction by 2007 would be very difficult, if not impossible, for all EGUs to meet and still ensure electric reliability. However, we believe that mercury reductions can and should be required under the timeframes allowed for by section 112(g), and the final compliance date should be no later than 2010. Although this date is three years beyond the date specified under section 112(g)(3)(A), sufficient authority under section 112 exists to extend this date. The U.S. EPA Administrator, or a State with an approved program under Title V of the Clean Air Act, may extend the compliance date by one year under section 112(g)(3)(A) if the additional period is necessary for the installation of controls. Under section 112(g)(4), the President may exempt any stationary source from compliance with any standard for a period of not more than two years, which period may be extended, if the technology to implement the standard is not available, and if it is in the national security interest to extend the date.

Also as discussed more thoroughly below, we believe that the limits should be much tighter than those proposed by U.S. EPA and the rule should be fuel neutral, i.e., it should not set different reduction levels based on coal type.

Mercury Emission Limits

We believe that for existing coal-fired EGUs an input-based (or input-based equivalent) limit of two pounds per trillion British Thermal Units (lb/TBTU's) or a reduction of 80% should be the MACT standard. This limit should be adopted and required within a timeframe that is legally allowed for under section 112 of the CAA. Various studies, including a U.S. EPA report "Control of Mercury Emissions from Coal-Fired Electric Utility Boilers," which was posted on U.S. EPA's website on February 27, 2004, indicate that these levels of control have been achieved and are projected to be achievable for the types of units and types of coal utilized. Indeed, if the MACT had been properly set as an average of the best performing 12% of EGUs, the MACT standard would have been set at 2.0 lbs/TBTU.

In setting the MACT floor, U.S. EPA looked at emission test results from approximately 80 EGUs. However, there were not enough units tested nor enough test runs to completely rely on this data. While it may be appropriate to apply a statistical analysis to generate a confidence level when working with less than an ideal set of data, the statistical analyses used by U.S. EPA cannot be completely determined or replicated by Illinois. From what Illinois EPA staff have been able to determine, the data have been selected to reflect the worst-case scenario, and then some. This approach is fundamentally inconsistent with MACT standard setting under section 112(d) which is technology-forcing--hence the requirement that the MACT floor be based on the best performing 12% of sources.

U.S. EPA has recommended that under section 111(d) new EGUs that burn bituminous coals achieve a 94% removal efficiency for mercury. The recommended efficiencies for sources burning sub-bituminous and lignite coals are 74% and 68%, respectively.

We recommend that new EGUs should be required to reduce mercury emissions by 90% regardless of fuel type. U.S. EPA determined that the average of the best 12% of 411 plants was 94% control and the average of the best 12% of the select 80 test runs was 93%. Notably, Illinois EPA has recently issued a construction permit for one coal-fired power plant and has proposed to issue a construction permit for another coal-fired power plant. At this point in time, Illinois EPA has found that the permittees have not been able to obtain performance guarantees from equipment manufactures at levels above 90% removal at this time.

The State and local Agency stakeholders, as well as the equipment manufacturers, as part of the October 2002 FACA report, recommend that 90% removal efficiency was appropriate based on their review of pilot plant and large unit testing of new technologies.

Also, various studies, including a U.S. EPA report "Control of Mercury Emissions from Coal-Fired Electric Utility Boilers," which was posted on U.S. EPA's website on February 27, 2004, indicate that these levels of control have been achieved and are projected as achievable in 2010 across all types of units and types of coal.

Rule Should Be Fuel Neutral

We urge U.S. EPA to adopt a rule that treats all types of coal equally in setting the standards for mercury and that requires state-of-the-art control equipment. While the overarching goal of this proposed environmental control program is to greatly reduce the emissions of hazardous mercury, the proposed levels for sub-bituminous and lignite coals would require no, or very minimal, mercury reduction from EGUs burning these coals. In fact, U.S. EPA's own contractor (RTI International) has been quoted as admitting that the proposed rule would necessitate installation of control equipment at 78% of the EGUs using bituminous coal, while only 29% of the EGUs burning sub-bituminous coal and 21% of those burning lignite coals would have to add controls. We also note that U.S. EPA's proposed approach in this proposal to require less mercury reduction from lignite and sub-bituminous coals is counter to the recommendations of its own working group for this issue that met from August 2001 through March 2003 under the Federal Advisory Committee Act (FACA). Moreover, we do not believe the approach that distinguishes between coal rank is either legal or technically supportable. Sections 111 and 112 limit U.S. EPA's authority when developing regulations for a source category to simply distinguishing between the classes, types, and sizes of boilers, or, in other words, they are allowed to make a technical distinction. As has already been discussed, an EGU can burn both the sub-bituminous or bituminous coal with minimal or no change to the boiler. In addition, as some states have found, mercury emissions from sub-bituminous coal decreases with the blending of it with bituminous coal. If U.S. EPA's proposal was fuel neutral, users of sub-bituminous coal may have an incentive to blend with bituminous coal. A similar blending has taken place for years with respect to the Acid Rain and NOx Trading Programs, where users of primarily bituminous coal are blending sub-bituminous coal to meet more stringent NOx and SO_2 emission limits.

Moreover, there does not appear to be a technological issue to prevent EGUs that burn bituminous coal from switching to or blending sub-bituminous coal. Therefore, the proposal provides an incentive that could result in an overall increase in current mercury levels within the State. As illustration, the estimate of 2.99 tons of mercury attributed to the State of Illinois did not account for blending/mixing of coal types and coal switching that resulted in a substantial increase in the use of sub-bituminous coals that has occurred since the implementation of the Acid Rain program. As such, Illinois' mercury emissions from EGUs are approximately 25% higher than U.S. EPA's estimate. With different mercury emission standards for each type of coal, companies will likely continue to experiment with different coal blend scenarios which could further delay the reduction of mercury to the environment. Furthermore, Illinois' mercury emissions could actually increase as EGUs take advantage of less stringent emission limits if they were to switch from bituminous to sub-bituminous coal.

This rulemaking should not provide a justification for power plants that choose to use lignite or sub-bituminous coals to continue to pollute. The provisions of the Clean Air Act and U.S. EPA implementing regulations are basically fuel neutral. Although we note that some minimal attempt was made in the Clean Air Act Title IV Acid Rain program to give relief for EGUs in states that relied more heavily on high-sulfur bituminous coals, the Acid Rain program still had an extremely deleterious effect on bituminous eastern and Mid-western coal industry, although it achieved significant environmental gains. The U.S. EPA mercury reduction rule must also provide a fuel neutral approach to reducing the emissions of mercury.

This approach to fuel neutrality is evidenced by U.S. EPA's recently proposed, but not yet published, Industrial Boiler MACT, which does not distinguish between coal ranks. (40 CFR part 63, subpart DDDD)

The U.S. EPA should establish a fuel neutral approach for mercury reductions that achieves environmental gain without creating additional economic distortions in the coal market. We urge U.S. EPA to recognize the importance of adopting standards that will result in real reductions of mercury to the environment without unfairly pitting the regions of the country against each other. We strongly oppose the proposed approach in reducing mercury emissions from utility boilers based on coal types. The mercury proposal should be uniform for all fuel types nationwide, consistent with the Clean Air Act's policy of fuel neutrality. We urge U.S. EPA to revise the Proposal, as it appears to indirectly promote certain coal fuel types.

Determining Compliance

Under the Mercury Proposal, a company could elect to blend coals from different types and ranks as a means to achieve compliance with the rule. Although, U.S. EPA discussed the possibility of blending different coal ranks (69 *Fed. Reg.* 4674), there is no industry-wide uniform blending procedures. In fact, sources may adopt irregular blending frequencies due to their own economic situation, the coal quality of their supplies, or to achieve their own optimization goals. The determination of the weighted mercury allowable emissions limit would then become a case-by-case compliance determination for most, if not all, EGUs. We believe this lack of specificity by U.S. EPA will lead to an inaccurate accounting of mercury emissions and may well lead to an increase of uncontrolled mercury emissions to the atmosphere. For the aforementioned reasons, determining or verifying compliance could be a very cumbersome procedure. States would face extreme difficulty in enforcing such a rule. Again, Illinois supports a fuel neutral rule.

Technical Issues

As stated previously, we found it very difficult to assess the statistical analyses that were used as the basis for setting the MACT floor values based on the information provided in the *Federal Registers* and in the various supporting materials.

Our concerns regarding the analyses that were used to set the MACT floor include the following: 1) It has not been established that the best performing 12% of sources were selected to establish the MACT floor; 2) Since the testing of emissions units was not random, we cannot be sure that the data used to set the MACT floor properly represents the variability of the mercury emissions; 3) Only one test per unit does not seem sufficient to use as the basis in setting the MACT floor; 4) We cannot tell which emissions variables are most sensitive in determining the MACT floor; and what the model indicated when variability was accounted for; 5) We question why a hot side electro-static precipitator (HESP) was selected as one of the best-controlled sources for setting the MACT floor for sub-bituminous coal; and 6) There was inadequate justification for not examining more control technologies/options in setting the MACT for new sources. These concerns add further to the lack of confidence in the MACT levels values that USEPA has proposed.

Other Hazardous Air Pollutants

We also urge U.S. EPA to take steps to move forward with emissions standards for all non-mercury HAPs that are emitted from EGUs. In its December 2000 "Notice of Regulatory finding for Emissions of HAPs from EGUs", U.S. EPA indicated that a significant number of the 189 HAPs included in the section 112(b) list are being emitted by coal and oil fired utility units. In fact, in the final utility report ("Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units, Final Report to Congress, Volume I", referenced as "Utility Report to Congress") containing the study on exposure and risk assessment from a number of HAPs from EGUs, U.S. EPA estimated that in addition to mercury and nickel, as much as 143,000 tons of hydrogen chloride (HCL), 20,000 tons of hydrogen fluoride and an appreciable tonnage of heavy metals such as arsenic (61 tons), chromium (73 tons), lead (75 tons), acrolein (25 tons) and manganese (164 tons) were emitted to the atmosphere in 1990 from these units. The same report predicted that these HAP emissions would increase during the period of 1990 to 2010.

The Utility Report to Congress recommended that a risk assessment analysis be performed on emissions from coal combustion for the following HAPs: acrolein, arsenic, beryllium, cadmium, chromium, dioxin/furans, radionucleides, hydrogen chloride (HCL), hydrogen fluoride (HF), and lead. Heavy metals like arsenic, nickel, chromium and cadmium are the heavy metals prioritized for further risk assessment because of the higher potential concern for carcinogenic effects. Also recommended for further assessment were hydrogen chloride, hydrogen fluoride and acrolein because these HAPs are of greatest potential concern for public health due to short-term exposure.

Although the preliminary screenings indicate that cancer risks are not high, our concern is based on the fact that U.S. EPA could not eliminate these heavy metals as posing no risk to public health. We believe that U.S. EPA should include emission standards for acid gases, other HAPs (notably arsenic, cadmium, chromium, and lead) and organics (dioxin) for the very same reasons these heavy metals and HAPs were selected as priorities for further risk assessment, i.e., due to their significant level of emissions, persistency in the environment, tendency to bioaccumulate and potential health threat due to short term exposures. Such standards have been adopted in recent Industrial Boiler MACT and MACT standards for municipal solid waste combustors. Treating EGUs the same as industrial boilers is clearly appropriate and scientifically supportable.

Emissions Trading

Illinois has been recognized as a leader in the area of emissions trading, and based on our experience with a number of emissions trading programs for criteria pollutants, we provided supportive comments to U.S. EPA on their proposed interstate trading program as part of the recent Interstate Air Quality Rule (IAQR) proposal. We are very concerned, however, that the proposed emissions trading program for mercury would cause or perpetuate continued fish consumption advisories for our waterbodies. Because of these concerns, we urge U.S. EPA to refrain from including an emissions trading program in its national mercury reduction strategy for electric generating units, unless EGUs wishing to trade can demonstrate that they do not cause or allow continuation of a mercury "hot spot," or U.S. EPA otherwise ensures that a protective base level of mercury reduction from each unit is achieved, and trading only occurs above this protective limit.

Without strict mercury reduction limits, emissions trading could result in an undetected localized mercury "hot spot" due to an EGU that elects not to reduce its emissions. Unlike NAAQS for criteria pollutants (i.e., particulates, nitrogen dioxide, sulfur dioxide, ozone and lead), there are no NAAQS for mercury that must be maintained to protect against localized atmospheric loading and deposition. Furthermore, the number of ambient mercury monitors is very, very small compared to the criteria pollutant-monitoring program throughout the Nation. In Illinois, for example, we are fortunate to have <u>one</u> continuous mercury monitor; many States do not have any. Our air-monitoring network is therefore <u>not</u> adequate to detect a localized ambient mercury "hot spot."

We have particular concerns about the water quality in our local rivers and streams in the Midwest, and even greater concerns about mercury levels in the Lake Michigan. High levels of mercury deposited in our State's waterways have accumulated in fish tissue, resulting in the issuance of advisories to restrict consumption of predator fish caught from Illinois' lakes and streams. A soon to be published study, "Modeling the Atmospheric Transport and Deposition of Mercury to the Great Lakes,"(to be published in "Environmental Research") shows that Midwest EGUs are substantial contributors to mercury in the Great Lakes. A three-year study of precipitation samples collected in Indiana and analyzed by the U.S. Geological Survey has concluded that the mercury concentration in the precipitation is significantly influenced by nearby mercury emitting sources. (Risch, Martin, U.S. Geological Survey, Briefing for Indiana Department of Environmental Management Mercury Workgroup, "Atmospheric Deposition of Mercury in Indiana and Nearby Emission Sources", April 2004.) Local sources must achieve reductions.

In addition to Illinois' general concerns with a trading program, there are two particular provisions of the U.S. EPA proposal that further exacerbate our concerns for "hot spots." The first is the "safety valve" provision that enables sources to buy additional allowances from a future allocation at a price that is preset in the rule. The proposed rule allows borrowing with no interest or penalty, requiring only a reduction in the State's mercury budget for future years. (*See* 69 *Fed. Reg.* 12445, proposed section 60.4143.) A safety valve provision is counter to a market-based approach to reducing emissions. A local mercury "hot spot" could be the result of applying the "safety valve" to a particular plant or group of plants.

The second provision of concern is the one for banking as proposed in section 60.4135. It allows unlimited banking with no flow control. Such a provision will allow sources that may easily comply with the "limits" set for 2010 to bank allowances for 8 years and to push the final compliance date out at least another decade. The federal NOx SIP Call Trading Program avoided this result by adopting a flow control provision that makes older allowances less valuable. Such a mechanism is even more appropriate for this program, where "hot spots" could appear.

Illinois has these additional concerns about the Supplemental Notice to the U.S. EPA proposal. First, it did not include any proposed language for a section 112(n) trading program. Such a program could be fundamentally different in structure than a program promulgated pursuant to section 111. As proposed in the Supplemental Proposal, under section 111 states are given flexibility over allocation issues as long as they meet their budgets, and so long as they meet certain parameters, but similar authority is not specified under a section 112(n) approach. Moreover, it is unclear, given the mandate under section 111(b)(1)(B) that U.S. EPA is required to regulate new sources, how U.S. EPA can require states to regulate "new" EGUs under section 111(d), because this section requires states to regulate "existing" sources. Illinois prefers that if there is a trading program promulgated, it would have the authority to develop its own system for allowance allocation, flow control, banking, and other trading issues.

Second, the Supplemental Notice provides no State budgets for 2010, nor does it indicate when such budgets would be promulgated by U.S. EPA. This is a critical piece of a program, as the State would be required to promulgate rules no later than 2007.

We ask that U.S. EPA not incorporate mercury emissions trading within its national mercury reduction program, and in the alternative, that such a trading program be carefully designed so that U.S. EPA can insure protection of our waters.

Program Consistency

We urge U.S. EPA to make every effort to ensure consistency, especially with respect to compliance deadlines, between the various federal air quality programs, including the mercury reduction program, the Interstate Air Quality Rule (IAQR), the Regional Haze program, and the NAAQS attainment dates. While it is clear that additional reductions from EGUs are warranted and achievable, we must take all available steps to provide the electric power industry with a reasonable degree of certainty regarding future regulatory requirements, especially the timing of these requirements. The industry must be given the opportunity to plan for the most cost-effective set of compliance options.

Conclusion

It is disappointing that U.S. EPA is not proposing the kind of strong federal mercury reduction program that will result in comparable, reliable, equitable and sufficient reductions to allow States to minimize the risk to their citizens and fulfill their obligations under the Clean Air and Clean Water Acts. U.S. EPA has ultimate statutory responsibility, along with the State of Illinois, for assuring that water quality standards are achieved and impaired waters are restored in a timely manner. If the Mercury Proposal is promulgated as proposed under other section 111(d) or 112(n), Illinois is concerned that the significant adverse health impacts from mercury would continue into the next several decades, and we will be unable to provide reasonable assurance (under the Clean Water Act TMDL rule) that water quality standards will be achieved. Instead, U.S. EPA will be looking to us for a better demonstration of reasonable assurance, and we will ultimately need to develop state-level requirements to solve what is a national-scale water quality problem.

We strongly urge U.S. EPA to establish a mercury reduction program through a MACT standard under section 112(d) and to adopt a fuel neutral program as mandated by the Clean Air Act. We urge a strict program, which results in a mercury limit for all existing coal-fired units of 2 lb/TBTU or an 80% reduction in 2010. New sources should be required to reduce emissions by 90%.

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MMWR

Weekly

March 02, 2001 / 50(08);140-3

Blood and Hair Mercury Levels in Young Childı and Women of Childbearing Age --- United Stat‹ 1999

Mercury (Hg), a heavy metal, is widespread and persistent in the environment. Exposure to hazardous I cause permanent neurologic and kidney impairment (1--3). Elemental or inorganic Hg released into the becomes methylated in the environment where it accumulates in animal tissues and increases in concen through the food chain. The U.S. population primarily is exposed to methylmercury by eating fish. Met exposures to women of childbearing age are of great concern because a fetus is highly susceptible to ad This report presents preliminary estimates of blood and hair Hg levels from the 1999 National Health aı Examination Survey (NHANES 1999) and compares them with a recent toxicologic review by the Nati Research Council (NRC). The findings suggest that Hg levels in young children and women of childbe generally are below those considered hazardous. These preliminary estimates show that approximately women have Hg levels within one tenth of potentially hazardous levels indicating a narrow margin of s some women and supporting efforts to reduce methylmercury exposure.

CDC's NHANES is a continuous survey of the health and nutritional status of the U.S. civilian, noninst population with each year of data constituting a representative population sample. A household intervie physical examination were conducted for each survey participant. During the physical examination, blo collected by venipuncture for all persons aged $\geq$1 year and hair samples, consisting of approximately 1(were cut from the occipital position of the head of children aged 1--5 years and women aged 16--49 ye blood specimens were analyzed for total Hg and inorganic Hg for children aged 1--5 years and women years by automated cold vapor atomic absorption spectrophotometry in CDC's trace elements laborator detection limit was 0.2 parts per billion (ppb) for total Hg and 0.4 ppb for inorganic Hg (4). Hairs of 0.6 cm) closest to the scalp (approximately 1 month's growth) were analyzed for total Hg concentration usi atomic fluorescence spectroscopy (5). The limit of detection for total Hg in hair varied by analytic batcl maximum limit of detection (0.1 parts per million [ppm]) was used in these analyses. Blood Hg levels l limit of detection were assigned a value equal to the detection limit divided by the square root of two fo of geometric mean values.

The geometric mean total blood Hg concentration for all women aged 16--49 years and children aged 1 1.2 ppb and 0.3 ppb, respectively; the 90th percentile of blood Hg for women and children was 6.2 ppb respectively (Table 1). Almost all inorganic Hg levels were undetectable; therefore, these measures indi methylmercury levels. The 90th percentile of hair Hg for women and children was 1.4 ppm and 0.4 ppn respectively. Geometric mean values were not calculated for hair Hg values.

Reported by: Center for Food Safety and Applied Nutrition, Food and Drug Administration. US Enviro Protection Agency. National Energy Technology Laboratory, Dept of Energy. National Marine Fisheri

Laboratory, National Oceanic and Atmospheric Administration. National Center for Health Statistics; , Center for Environmental Health, CDC.

Editorial Note:

The NHANES1999 blood and hair Hg data are the first nationally representative human tissue measure: population's exposure to Hg. Previous estimates of methylmercury exposure in the general population v exposure models using fish tissue Hg concentrations and dietary recall survey data (*1*). The NRC reviev guidance to the Environmental Protection Agency (EPA) for developing an exposure reference dose foı methylmercury (i.e., an estimated daily exposure that probably is free of risk for adverse effects over th person's life) (*3*). The NRC report recommended statistical modeling of results from an epidemiologic s conducted in the Faroe Islands near Iceland, where methylmercury exposures are high because of the la of seafood eaten by the local population. Results of this study were used to calculate a benchmark dose estimate of a methylmercury exposure in utero associated with an increase in the prevalence of abnorm: cognitive function tests in children. The lower 95% confidence limit of the BMD (BMDL*) was recomı calculate the EPA reference dose. The NRC committee recommended a BMDL of 58 ppb Hg in cord bl (corresponding to 12 ppm Hg in maternal hair) (*3*). In the NHANES 1999 sample, there were no measu blood values ≥58 ppb or hair values ≥12 ppm. A margin-of-exposure analysis (i.e., an evaluation of the BMDL to estimated population exposure levels) showed ratios of <10 when comparing BMDL with NI estimates of the 90th percentile for blood and hair Hg levels in women of childbearing age. Margin-of-ϵ measures of this magnitude indicate a narrow margin of safety (*3*) and suggest that efforts aimed at decı human exposure to methylmercury should continue.

The findings in this study are subject to at least three limitations. First, the ratio of Hg in cord and mateı uncertain. The NRC committee summarized some studies that suggest that cord blood values may be 2(higher than corresponding maternal blood levels. However, other studies suggest that the ratio is closer therefore, the NHANES values may not be directly comparable to BMDL recommended by NRC. Seco NHANES cannot provide estimates of Hg exposure in certain highly exposed groups (e.g., subsistence and others who eat large amounts of fish). Published data from studies of highly exposed U.S. populatio that some persons attain Hg tissue levels above BMDL (*1*). Third, the sample size of NHANES 1999 w the 1999 survey was conducted in only 12 locations. More data are needed to confirm these findings.

The long-term strategy for reducing exposure to Hg is to lower concentrations of Hg in fish by limiting into the atmosphere from burning mercury-containing fuel and waste and from other industrial processe basis of data from EPA's National Toxics Inventory, air emissions of Hg decreased approximately 21% -1996, largely because of regulations for waste incineration (*7*). EPA expects this trend to continue as rı implemented for waste incineration and chlorine production facilities and are developed for electric pov (*8,9*). Fish is high in protein and nutrients and low in saturated fatty acids and cholesterol and should be an important part of the diet. The short-term strategy to reduce Hg exposure is to eat fish with low Hg lı avoid or to moderate intake of fish with high Hg levels. State-based fish advisories and bans identify fis contaminated by Hg and their locations and provide safety advice (http://www.epa.gov/ost/fish†). The I Drug Administration advises that pregnant women and those who may become pregnant should not eat swordfish, king mackerel, and tile fish known to contain elevated levels of methylmercury. Information at http://www.fda.gov/bbs/topics/ANSWERS/2001/advisory.html †.

U.S. population estimates of Hg tissue levels by race/ethnicity, region, and fish consumption will becon after 2 additional years of NHANES data collection. NHANES will provide the opportunity to measure levels and to monitor the effectiveness of continuing efforts to reduce methylmercury exposure in the U population.

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*A BMD of 85 ppb Hg in cord blood or 17 ppm Hg in maternal hair was estimated to result in an increase in the proportion scores on the Boston Naming Test for children exposed in utero from an estimated background prevalence of 5% to a preval (*6*). BMDL recommended by NRC is the lower 95% confidence bound of the BMD.

† References to sites of nonCDC organizations on the World-Wide Web are provided as a service to *MMWR* readers and do imply endorsement of these organizations or their programs by CDC or the U.S. Department of Health and Human Services. responsible for the content of pages found at these sites.

Table 1

TABLE 1. Selected percentiles and geometric means of blood and hair mer (Hg) concentrations for children aged 1–5 years and women aged 16–49 ye National Health and Nutrition Examination Survey, United States, 1999

	No.	Geometric mean	(95% CI)	Selected percentiles (95% CI*) 10th		25th		50th		75th		
Blood Hg†												
Children	248	0.3	(0.2–0.4)	<LOD§		<LOD		0.2	(0.2–0.3)	0.5	(0.4–0.8)	1
Women	679	1.2	(0.9–1.6)	0.2	(0.1–0.3)	0.5	(0.4–0.7)	1.2	(0.8–1.6)	2.7	(1.8–4.5)	6
Hair Hg¶												
Children	338	—**		<LOD		<LOD		<LOD		0.2	(0.1–0.4)	0
Women	702	—		<LOD		<LOD		0.2	(0.2–0.3)	0.5	(0.4–0.8)	1

* Confidence interval.
† Parts per billion.
§ Limit of detection.
¶ Parts per million.
** Not calculated. Proportion <LOD too high to be valid.

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Peabody

Dianna Tickner
03/23/2006 04:54 PM

To "Laurel Kroack" <Laurel.Kroack@epa.state.il.us>
cc Colin M. Kelly/STL/Peabody@PeabodyEnergy
bcc
Subject Technology Extension for Mercury

Laurel,
Just wanted to let you know that the Temporary Technology Based Extension is very helpful in addressing the Prairie State Generating Station concerns. We just have a few comments/clarifications for your consideration.
Thanks.
Dianna

IL Mercury reg Temporary Technology Based ext proposal 3-21-06_.doc

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OVERVIEW OF POSSIBLE PROVISIONS FOR A TEMPORARY TECHNOLOGY-BASED EXTENSION (TTBE)

Overview:

To qualify for the Temporary Technology-Based Extension (TTBE), a source must meet the specific criteria identified in the rule. The most significant criterion is use of an appropriate configuration of control devices for effective control of mercury emissions, given the type of coal being fired and the control devices already installed on the unit. (Refer to Tables 1 and 2.) For existing units, the specified configuration is generally use of activated carbon injection for control of mercury emissions along with an appropriate particulate matter control device to assure the effectiveness of carbon injection. In addition, during Phase 1 of the program, existing units equipped with an appropriate suite of control devices for effective control of mercury emissions by co-benefit would be eligible for an extension. For a new unit, the specified configurations for an extension require use of activated carbon for control of mercury emissions along with use of appropriate control devices to minimize emissions by co-benefit.

There needs to be an express waiver during the extension. For example, "If the applicant demonstrates compliance with the five criteria specified under "Contents of a Request," the mercury standards would not apply or the deadline for compliance would be extended so long as the criterion for the extension are met.

Process:

A source must submit a timely application for a temporary technology-based extension, containing information showing that the relevant criteria for such an extension are met. If the application shows that all relevant criteria are met, i.e., the application is not found to be incomplete within a nominal period of time~~,~~ the source can rely on the extension until the Agency takes final action on the application. (We believe "the nominal period of time "for agency review of the application must be defined ie, 30 days)

The Illinois EPA will conduct a technical review to determine whether an extension is given or to establish whether any unit-specific requirements should accompany the extension too assure that the source undertakes optimization measures as required by criterion 3 and that state-of-the-art mercury control be applied as required by criterion 5. There is no opportunity for public participation in the process by which an extension becomes effective.

Timing and Duration

The temporary technology-based extension would be available through December 2018, that is, through Phase 1 and up to the first five years of Phase 2 of the mercury control program. A source would have to submit its application for an extension to the

Illinois EPA no later than three months before compliance needs to be demonstrated. Accordingly, an application for an extension for an existing unit must be submitted by no later than March 31, 2010 for Phase 1 of the mercury control program, and by no later than September 30, 2012 for Phase 2 of the program. What happens if the source has done everything after extension period and still doesn't meet the limits?

If a source obtains an extension for a unit for Phase 1 of the program, the source must reapply for the extension for Phase 2. The source must also reapply for the extension if there will be a change in the control device configuration of the unit and the source plans to change its practices for control of mercury emissions based on the change to the control device configuration.

Contents of a Request

A request for a temporary technology-based extension for a unit must include information showing that the applicable criteria for such an extension are met for the unit, as follows:

1. The owner or operator of the unit submits a formal request for the extension that: 1) Explains why an extension is being requested: 2) Describes the measures that have been taken for control of mercury emissions; 3) Provides a detailed discussion of the factors that currently prevent more effective control of the mercury emissions of the unit, with a summary of relevant mercury emission data for the unit; and 4) Includes a copy of the current action plan describing the measures that will be taken during the term of the extension to improve control of mercury emissions.

2. The configuration of control devices on the unit is one that qualifies for an extension, as listed in Table 1 or 2, and the activated carbon injection system, if one is required, has been properly installed. An alternative sorbent may be used in place of the halogenated activated carbon if the source demonstrates that the alternative sorbent either: 1) Has at least the same effectiveness for control of mercury as halogenated activated carbon; or 2) Will be used in a manner to provide equal or better effectiveness for control of mercury as would be achieved with halogenated activated carbon.

3. For a unit for which injection of halogenated activated carbon is required, injection is occurring at optimal rate(s). For this purpose, a source must either inject halogenated activated carbon at a rate of at least 3 and 10 pounds per million cubic feet of actual exhaust for units fired on sub-bituminous and bituminous coal, respectively, or at rate(s) that reflect the maximum practicable degree of mercury removal, based upon a unit-specific evaluation of the relationship between the injection rate and the removal of mercury, to identify the injection rate at which increased usage of halogenated activated carbon no longer provides proportionate improvements in mercury removal.

4. The owner or operator of the unit has an action plan identifying specific measures that will be taken during the term of the extension to improve control of the mercury emissions from the unit. This plan shall address measures such as evaluation of

alternative forms or sources of activated carbon, changes to the injection system, changes to operation of the unit that affect the effectiveness of mercury absorption and collection, changes to the particulate matter control device to improve the performance of, and changes to other emission control devices. For each measure contained in the plan, the plan shall provide a detailed description of the specific actions that are planned, the reason that the measure is being pursued and the range of improvement in control of mercury that is expected, and the factors that affect the timing for carrying out the measure, with the current schedule for the measure.

5. The owner or operator of a unit utilizing halogenated activated carbon injection (ACI) must include a demonstration that halogenated ACI remains the state-of-the-art for mercury control. If new developments in ACI occur that demonstrate a higher level of mercury control (e.g., use of more effective sorbents), or if other mercury control technologies develop that remove mercury at a cost similar to the cost of halogenated ACI in 2006 dollars, the owner or operator must agree to utilize the more effective means of ACI or other control technology within a reasonable time frame. The provision "if other mercury control technologies develop" causes us concern that it could be a continual moving target and cause great concern with the projects lenders that they could potentially be exposed to hundreds of millions of costs for retrofit if original technology does not work to the regulation level. If this provision is intended just for different sorbents or chemical additives that is acceptable. However, a requirement to install totally new hardware technology, for example if it were determined something like Powerspan was state of the art, it might be impossible to incorporate that technology into the design once the plant is constructed with Table 2 required technology. The costs for the new hardware might be similar, but millions would have already been invested in the original approved technology increasing the plants cost dramatically. We recommend removing "demonstration of state of the art mercury control" and references to "other mercury control technologies" unless there is further clarification on limitations.

Consequences of Obtaining an Extension

Sources that obtain a temporary technology-based extension for a unit would have to continue to operate the unit in accordance with the technology-based criteria that were the basis of the extension, including implementing an action plan for the unit for the period of time that extension is in place. Units operating under an extension could not be included in any compliance demonstrations involving multiple units. When a source determines that a unit can comply with the applicable emissions standards for mercury, the source would notify the Illinois EPA that it is terminating the extension for the unit. Thereafter, the source would no longer be required to implement an action plan for the unit and the unit could be included in compliance demonstrations involving multiple units in subsequent months.

A source that is operating a unit under a temporary technology based extension would be required to submit annual reports describing the activities that are conducted for the unit to further improve control of mercury emissions, including significant measures that were taken during the past year, significant activities that are planned for the current year, and any changes to the action plans for the unit, with explanation.

Table 1: Required Configuration of Control Devices for Existing Units

Primary Type of Coal	Phase of Program	Minimum Control Configuration
Subbituminous	Available for Both Phase 1 and Phase 2	Cold-side Electrostatic Precipitator or Fabric Filter and Injection of Halogenated Activated Carbon
Bituminous	Available for Both Phase 1 and Phase 2	Cold-side Electrostatic Precipitator or Fabric Filter and Injection of Halogenated Activated Carbon
	Available for Phase 1 only	Selective Catalytic Reduction (SCR) System (located prior to the particulate matter control device) and SO_2 Scrubber
		Fluidized Bed Boiler: Selective Non-Catalytic Reduction (SNCR) System and Fabric Filter

Table 2: Required Configuration of Control Devices for New Units

Primary Type of Coal	Minimum Control Configuration
Subbituminous	Pulverized Coal Boiler: SCR, SO_2 Control Device, Fabric Filter, <u>and</u> Injection of Halogenated Activated Carbon
	Fluidized Bed Boiler: SNCR, Supplemental SO_2 Control System, Fabric Filter <u>and</u> Injection of Halogenated Activated Carbon
Bituminous	Pulverized Coal Boiler: SCR, High-efficiency PM Control Device (i.e., subject to a limit of no more than 0.015 lb/million Btu, as measured by USEPA Method 5), SO_2 Scrubber, <u>and</u> Injection of Halogenated Activated Carbon
	Fluidized Bed Boiler: SNCR, Supplemental SO_2 Control System, Fabric Filter <u>and</u> Injection of Halogenated Activated Carbon
	Unit Firing Fuel Gas Produced by Coal Gasification: Processing of the Raw Fuel Gas prior to Combustion With Systems for PM and Sulfur Removal <u>and</u> with Activated Carbon for Removal of Mercury.