KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 ▪ FAX/377-7158

KA 124-00-05

August 8, 2002

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BUREAU OF AIR REGULATION

Mr. Syed Arif, P.E.
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: IMC Phosphates MP, Inc. (New Wales)
Multifos Plant - Kiln C Permit Revision
No. 1050059-~~024~~-AC, PSD-FL-244 A
033

Dear Mr. Arif:

This is in response to FDEP's letter dated May 22, 2002, requesting additional information on the above referenced project. The issues raised in that letter are addressed below.

1. Previously, only a summary of equipment costs was submitted, as presented in Attachment 1. The detailed information requested by FDEP is being submitted under separate cover. The vendor has quoted the cost of installing a venturi scrubber upstream of the cross flow scrubber without the Kimre panels. As previously indicated in our letter dated November 9, 2001, these costs indicated that these alternatives are cost prohibitive. IMC proposes the use of the existing equipment as BACT.

2. The requested summary of all the available emission testing information on Kiln C, has been previously submitted, and is presented in Attachment 2 for the sake of convenience. The fluorides performance tests included 11 scenarios:

- initial compliance test;
- second compliance test;
- test while using dried feed;
- test with caustic flow in SO2 scrubber;
- test without caustic flow in SO2 scrubber;
- test with fresh water to demist section;
- test under less erratic operation levels;
- test and vary the source of pond water;
- test and add steam;
- pre-test before use as dryer;
- test while operating as dryer.

Mr. Syed Arif, P.E.
Florida Department of
Environmental Protection

August 8, 2002

Please note that the source of pond water was changed; the source of pond water was varied; and, steam was introduced in the scrubber (the scenarios suggested by FDEP). As the test data indicate, it was not possible to achieve the level of emissions expected by FDEP despite IMC's best efforts.

3. Based on all the testing conducted, IMC requests a fluoride emission limit of 0.6 lb/ton P2O5. The summary and calculations are presented in Attachment 3.

The testing for sulfur dioxide emissions from the Multifos A/B Kilns has been scheduled for August 29, 2002.

If you have any questions, please call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

John B. Koogler, Ph.D., P.E.

JBK:par
encl.

c: C. Dave Turley, IMC
Q. Kissel, SWD

ATTACHMENT 1

REVISED VENDOR LETTER ON SCRUBBER COST

PENN PRO
Engineering & Technical Services

Mr. George Bien
IMC Phosphates
P.O. Box 2000
Mulberry, FL 33860-100

12/17/01

REF: PENN PRO estimate for "C" Kiln Fluorine Scrubber Replacement
Revision 3

In accordance with your request, I have developed an additional estimate for the scrubber modifications to "C" Kiln.

The scope of this new estimate was to reuse the existing scrubber body and install Kimre panels. Based on the scope from Kimre for the scrubbing requirements, I have estimated new stainless steel support frames to be installed in the existing scrubber. The system allows for changing panels "on the run" and still maintaining scrubbing requirements.

Because the existing scrubber body is carbon steel, rubber-lined, the support frames have been estimated to be installed against the rubber lining (bolted in). Rubber lining repairs are included to prepare the areas where the panel support frames are installed, if it is necessary.

I have also revised the estimate to compress the Kiln downtime.

The estimate of Kiln downtime is 4 weeks on a premium time basis. The job will require 1-2 weeks before to prep and start electrical and piping additions and 1-2 weeks after to install the monorail system to pull the Kimre panels. This is field time only.

The estimated cost for this project is $ 500,000.00. The cost estimate is attached.

If you have any questions, please call

Sincerely,

Robert A. Herz, P.E.
Project Manager

5925 Imperial Parkway, Suite 217 • Mulberry, Florida 33860 • Phone 863-648-9990 • Fax 863-648-4988

PENN PRO
CAD Design & Technical Services

Mr. George Bien
IMC Phosphates
P.O. Box 2000
Mulberry, FL 33860-100

12/14/01

REF: PENN PRO estimate for "C" Kiln Fluorine Scrubber Replacement
Revision 2

After our review of the revised order of magnitude cost estimate for "C" Kiln Fluorine Scrubber replacement with a DR Technology Venturi scrubber on 12/12/01, I am providing these additional comments to clear up the apparent confusion with this estimate.

I apologize for the mix-up between the cost estimate and the letter that was attached. The second page of that memo was from the previous estimate. I have no explanation how that occurred. I have attached the report and cost estimate from 10/11/01, with the proper second page, as it should have been sent. This should clear up part of the confusion.

The addition of the venturi scrubber section resulted in replacing the existing fan with a larger fan. DR Technology had advised us that the existing SO2 scrubber could withstand the new suction pressure conditions. The packed cross flow scrubber most probably will not as it is rectangular. Because it is carbon steel, rubber lined, adding additional external bracing will required stripping rubber internally, welding bracing and then re-installing the rubber lining, if it is reused. This would have caused extended kiln downtime. To shorten the plant downtime, I estimated a new scrubber body designed based on the new suction pressure.

Also, as stated in the original letter, this design would have reused the existing saddle packing.

I have included the original letter and cost estimate from 10/11/01.

If you have any questions, please call

Sincerely

Robert A. Herz, P.E.
Project Manager

5925 Imperial Parkway, Suite 217 ♦ Mulberry, Florida 33860 ♦ Phone 863-648-9990 ♦ Fax 863-648-4988

Mr. George Bien
IMC Phosphates
P.O. Box 2000
Mulberry, FL 33860-100

10/11/01

REF: PENN PRO estimate for "C" Kiln Fluorine Scrubber Replacement
Revision 2

I have completed the revised order of magnitude cost estimate for "C" Kiln Fluorine Scrubber replacement with a DR Technology Venturi scrubber.

The DR Technology Venturi Scrubber data was provided to PENN PRO by IMC and reviewed with Richard Swartz at DR technology by me. Richard advised me that the existing SO2 scrubber can be used "as is" with the new operating and fan conditions.

This should be verified in writing by DR technology should this project proceed before finalizing the capital cost. I have not included any funds for any SO2 scrubber modifications.

In addition, the existing pond water supply has been deemed sufficient for the new scrubber conditions by IMC. The existing "hot" system will be converted to a "cold" system as we discussed. PENN PRO has not checked this system. Funds for the piping modifications are included in the estimate.

I faxed the scrubber fan data for the new conditions, provided by you, to Robinson Fan, Pete Beringer. His reply indicates that a new fan will be required with the new conditions. I have attached the revised fan curve proposal provided by Robinson Fan. This is just a preliminary review by Robinson Fan. It the project does become a reality; the local office will have the factory engineers run the calculations for official verification. A new 250 HP motor will be required as well as foundation modifications.

The Cross Flow Scrubber body will need to be replaced to withstand the new suction conditions as well as the modifications for inlet ductwork to the venturi.

I have also assumed that IMC would re-use the existing packing in the new scrubber body.

I have based the revised estimate on a compressed schedule for Kiln downtime.

The estimate of Kiln downtime is 3 weeks on a premium time basis. The job will require 2-3 weeks before to prep and start electrical and piping additions and 1-2 weeks after to install the monorail system to pull the overhead piping. This is field time only.

The estimated cost for this project is $ 839,000.00

If you have any questions, please call

Sincerely

Robert A. Herz, P.E.
Project Manager

ATTACHMENT 2

MULTIFOS PLANT – KILN C TEST SUMMARY

BEST AVAILABLE COPY

Source Sampling Summarys for SO2 and NOx Testing done on C Kiln

IMC (NW) - Multifos Plant

Parameter	Unit	Run 1	Run 2	Run 3	Average		Run 1	Run 2	Run 3	Average		Run 1	Run 2	Run 3	Average	
Date:		7/11/00	7/12/00	7/13/00			8/8/00	8/8/00	8/8/00			11/01/00	11/01/00	11/01/00		
Time Start:		1145	1402	847			840	1000	1114			910	1035	1222		
Time End:		1250	1509	951			945	1105	1220			1039	1157	1326		
Barometric Pressure:	Inch Hg	30.10	30.10	30.12			30.15	30.15	30.15			30.10	30.10	30.10		
Static Pressure:	Inch H2O	0.32	0.32	0.32			0.32	0.32	0.32			0.30	0.30	0.30		
Stack Pressure:	Inch Hg	30.124	30.124	30.144			30.174	30.174	30.174			30.122	30.122	30.122		
Average Sqrt Delta P:	Inch HOH 1/2	0.692	0.664	0.688			0.583	0.589	0.602			0.574	0.581	0.587		
Average Delta H:	Inch HOH	1.817	1.504	1.592	1.638		1.767	1.813	1.858	1.813		1.804	1.867	1.942	1.871	
Maximum Run Vacuum:	Inch Hg	10.0	13.0	9.0			10.0	9.0	12.0			8.0	11.0	11.0		
Meter Box Number:	Unity	3187	3187	3187			3187	3187	3187			3187	3187	3187		
Average Meter Temp:	Degrees F	84.5	92.9	88.1			84.0	89.3	85.7			77.0	82.1	81.0		
Average Stack Temp:	Degrees F	114.0	112.7	110.8	112.5		111.6	112.6	112.3	112.2		100.1	101.3	101.8	101.2	
Metered Sample Volume:	Cubic Feet	47.06	42.95	43.63			46.67	48.44	47.84			46.12	46.56	47.79		
Standard Meter Volume:	Cubic Feet	43.95	41.27	42.33			45.69	45.24	43.91			45.06	45.67	46.98		
Moisture Measured:	%	0.0911	0.0728	0.0737			0.0906	0.0891	0.0894			0.0563	0.0570	0.0581		
Moisture Saturation:	%	0.0964	0.0932	0.0880			0.0902	0.0928	0.0951			0.0644	0.0672	0.0677		
Moisture Used for Calculations:	%	0.0911	0.0728	0.0737	0.0798		0.0902	0.0891	0.0894	0.0895		0.0563	0.0570	0.0581	0.0571	
Pitot Coefficient:	Unity	0.84	0.84	0.84			0.84	0.84	0.84			0.84	0.84	0.84		
Nozzle Diameter:	Inch	0.250	0.250	0.250			0.28	0.28	0.28			0.28	0.28	0.28		
Stack Area:	Square Feet	7.07	7.07	7.07			7.07	7.07	7.07			7.07	7.07	7.07		
Traverse Points:	Unity	24	24	24			24	24	24			24	24	24		
Sampling Time:	Minutes	60	60	60			60	60	60			60	60	60		
Stack Gas Molecular Weight:	lb/lb-mol	27.970	28.171	28.139			27.980	27.992	27.989			28.352	28.344	28.331		
Actual Stack Velocity:	Feet/sec	41.811	39.179	40.534	40.548		34.432	34.826	35.628	34.969		33.365	33.832	34.180	33.792	
Actual Stack Gas Flow:	ACFM	17385	16608	17191	17061		14604	14763	15103	14823		14143	14341	14489	14325	
Dry Standard Stack Gas Flow:	DSCFM	14634	14293	14809	14579		12377	12304	12768	12350		12667	12802	12912	12793	
Isokinetic Rate:	%	100.33	99.83	98.83			101.78	99.71	98.11			99.35	98.32	100.29		
Sulfur Dioxide Emission:	lb/day	28.51	58.61	76.05	54.41		64.71	73.66	131.71	97.36		55.08	49.61	51.60	52.10	
Sulfur Dioxide Emission:	lb/hr	1.19	2.44	3.17	2.27	0.5332237	2.70	3.07	5.49	4.06	0.6760934	2.30	2.07	2.15	2.17	0.23681243
Nitrogen Oxides:	lb/day	121.20	197.32	155.04	157.92											
Nitrogen Oxides:	lb/hr	5.05	8.22	6.46	6.58	1.5306122										
feed	tph				4.8833333					8					9.1666667	

Parameter	Unit	Run 1	Run 2	Run 3	Average		Run 1	Run 2	Run 3	Average
		Before test of mixed feed drying process test.					After test of mixed feed drying process test.			
Date:		05/07/01	05/07/01	05/07/01			05/23/01	05/23/01	05/23/01	
Time Start:		1005	1250	1400			1100	1225	1345	
Time End:		1137	1350	1505			1208	1334	1459	
Barometric Pressure:	Inch Hg	30.37	30.37	30.37			30.67	30.67	30.67	
Static Pressure:	Inch H2O	0.29	0.29	0.29			0.09	0.09	0.09	
Stack Pressure:	Inch Hg	30.391	30.391	30.391			30.677	30.677	30.677	
Average Sqrt Delta P:	Inch HOH 1/2	0.628	0.624	0.612			0.351	0.342	0.333	
Average Delta H:	Inch HOH	2.279	2.242	2.154	2.225		2.346	2.221	2.138	2.235
Maximum Run Vacuum:	Inch Hg	6.0	7.0	7.0			12.0	11.0	10.0	
Meter Box Number:	Unity	3187	3187	3187			3188	3188	3188	
Average Meter Temp:	Degrees F	82.8	89.3	89.4			83.6	89.4	90.5	
Average Stack Temp:	Degrees F	93.3	94.6	94.4	94.1		94.7	95.1	95.8	95.2
Metered Sample Volume:	Cubic Feet	31.60	30.87	31.06			31.70	30.58	49.40	
Standard Meter Volume:	Cubic Feet	31.54	30.20	30.36			33.87	32.12	30.79	
Moisture Measured:	%	0.0632	0.0617	0.0659			0.0486	0.1285	0.0563	
Moisture Saturation:	%	0.0518	0.0539	0.0536			0.0527	0.0543	0.0555	
Moisture Used for Calculations:	%	0.0518	0.0539	0.0536	0.0531		0.0486	0.0543	0.0555	0.0528
Pitot Coefficient:	Unity	0.84	0.84	0.84			0.84	0.84	0.84	
Nozzle Diameter:	Inch	0.28	0.28	0.28			0.382	0.382	0.382	
Stack Area:	Square Feet	7.07	7.07	7.07			7.07	7.07	7.07	
Traverse Points:	Unity	24	24	24			24	24	24	
Sampling Time:	Minutes	60	60	60			60	60	60	
Stack Gas Molecular Weight:	lb/lb-mol	28.400	28.377	28.381			28.433	28.373	28.360	
Actual Stack Velocity:	Feet/sec	36.122	35.952	35.243	35.773		20.114	19.599	19.218	19.644
Actual Stack Gas Flow:	ACFM	15316	15240	14939	15165		8526	8308	8147	8327
Dry Standard Stack Gas Flow:	DSCFM	14076	13943	13677	13899		7916	7661	7493	7690
Isokinetic Rate:	%	100.91	99.34	101.49	-		100.77	100.74	100.38	
Sulfur Dioxide Emission:	lb/day	72.77	69.34	62.02	68.01		12.30	14.92	13.66	13.63
Sulfur Dioxide Emission:	lb/hr	3.03	2.89	2.58	2.83		0.51	0.62	0.57	0.57
Nitrogen Oxides:	lb/day									
Nitrogen Oxides:	lb/hr									
feed	tph				8.3					31.4

		Source Sampling Summarys for Particulate and Fluoride Testing done on C Kiln							
Test condition or discription:		Initial compliance test					Second Compliance Test		
Parameter	Unit	Run 1	Run 2	Run 3	Average		Run 1	Run 2	Run 3	Average
Date:		07/11/00	07/12/00	07/13/00			08/04/00	08/04/00	08/04/00	
Time Start:		844	853	1020			1224	1430	1555	
Time End:		948	1009	1125			1330	1537	1700	
Barometric Pressure:	Inch Hg	30.10	30.10	30.10			30.11	30.11	30.11	
Static Pressure:	Inch H2O	0.32	0.32	0.32			0.31	0.31	0.31	
Stack Pressure:	Inch Hg	30.124	30.124	30.124			30.133	30.133	30.133	
Average Sqrt Delta P:	Inch HOH 1/2	0.747	0.650	0.635			0.646	0.682	0.690	
Average Delta H:	Inch HOH	1.821	1.413	1.358	1.530		1.363	1.517	1.533	1.471
Maximum Run Vacuum:	Inch Hg	10.0	11.0	10.0			15.0	12.0	10.0	
Meter Box Number:	Unity	3187	3187	3187			3187	3187	3187	
Average Meter Temp:	Degrees F	84.8	81.2	91.7			82.9	83.8	82.2	
Average Stack Temp:	Degrees F	113.8	111.5	110.7	112.0		111.8	112.0	112.7	112.2
Metered Sample Volume:	Cubic Feet	46.51	41.03	40.99			40.02	42.61	43.30	
Standard Meter Volume:	Cubic Feet	45.39	40.27	39.46			39.16	41.65	42.44	
Moisture Measured:	%	0.0894	0.0897	0.0787			0.0886	0.0824	0.0808	
Moisture Saturation:	%	0.0962	0.0900	0.0880			0.0908	0.0912	0.0931	
oisture Used for Calculations:	%	0.0894	0.0897	0.0787	0.0860		0.0886	0.0824	0.0808	0.0839
Pitot Coefficient:	Unity	0.84	0.84	0.84			0.84	0.84	0.84	
Nozzle Diameter:	Inch	0.25	0.25	0.25			0.250	0.250	0.250	
Stack Area:	Square Feet	7.07	7.07	7.07			7.07	7.07	7.07	
Traverse Points:	Unity	24	24	24			24	24	24	
Sampling Time:	Minutes	60	60	60			60	60	60	
Stack Gas Molecular Weight:	lb/lb-mol	27.988	27.985	28.106			27.997	28.066	28.083	
Actual Stack Velocity:	Feet/sec	44.285	38.404	37.416	40.035		38.220	40.275	40.786	39.760
Actual Stack Gas Flow:	ACFM	18772	16279	15861	16971		16201	17072	17289	16854
Dry Standard Stack Gas Flow:	DSCFM	15835	13784	13610	14409		13730	14565	14756	14350
Isokinetic Rate:	%	99.10	101.00	100.23			98.61	98.87	99.44	
Fluoride Emission:	lb/day	7.74	14.05	10.56	10.78		17.54	15.14	8.90	13.86
	lb/hr	0.32	0.59	0.44			0.73	0.63	0.37	
Particulate Emission:	lb/day	13.28	41.58	105.46	53.44		156.02	101.93	65.73	107.89
	lb/hr	0.55	1.73	4.39			6.50	4.25	2.74	
Feed Rate	tph				5.80					7.50
Input P2O5 rate	P2O5 tph				2.05					2.59
Heat input	mmBtu/hr				32.10					40.00
Fluoride allowable	lb/hr				0.078					0.098
Average Fluoride	lb/hr				0.45					0.58
PM allowable	lb/hr				3.08					3.89
Average PM	lb/hr				2.23					4.50

Test condition or discription:		Compliance test for authorization for the use of A or B as dryer for mixed feed. C Kiln was using dried feed.					Test for comparison of results with caustic flow on or off in SO2 scrubber. Samples analyzed by Pixe. This test with caustic ON.				
Parameter	Unit	Run 1	Run 2	Run 3	Average		Run 1	Run 2	Run 3	Average	
Date:		10/31/00	10/31/00	10/31/00			11/30/00	11/30/00	11/30/00		
Time Start:		1130	1307	1430			1100	1241	1438		
Time End:		1244	1412	1536			1216	1400	1544		
Barometric Pressure:	Inch Hg	30.13	30.13	30.13			30.21	30.21	30.21		
Static Pressure:	Inch H2O	0.35	0.35	0.35			0.46	0.46	0.46		
Stack Pressure:	Inch Hg	30.156	30.156	30.156			30.244	30.244	30.244		
Average Sqrt Delta P:	Inch HOH 1/2	0.568	0.570	0.582			0.594	0.604	0.605		
Average Delta H:	Inch HOH	1.088	1.126	1.118	1.111		1.213	1.260	1.319	1.264	
Maximum Run Vacuum:	Inch Hg	9.0	7.0	7.0			10.0	7.0	10.0		
Meter Box Number:	Unity	3187	3187	3187			3187	3187	3187		
Average Meter Temp:	Degrees F	84.2	88.6	79.6			75.9	81.8	82.0		
Average Stack Temp:	Degrees F	102.5	103.8	102.6	103.0		92.8	94.1	92.2	93.0	
Metered Sample Volume:	Cubic Feet	35.84	36.65	37.12			37.80	38.93	39.29		
Standard Meter Volume:	Cubic Feet	34.99	35.49	36.55			37.58	38.29	38.64		
Moisture Measured:	%	0.0717	0.0525	0.0583			0.0570	0.0525	0.0525		
Moisture Saturation:	%	0.0692	0.0717	0.0693			0.0513	0.0534	0.0504		
oisture Used for Calculations:	%	0.0692	0.0525	0.0583	0.0600		0.0513	0.0525	0.0504	0.0514	
Pitot Coefficient:	Unity	0.84	0.84	0.84			0.84	0.84	0.84		
Nozzle Diameter:	Inch	0.248	0.248	0.248			0.248	0.248	0.248		
Stack Area:	Square Feet	7.07	7.07	7.07			7.07	7.07	7.07		
Traverse Points:	Unity	24	24	24			24	24	24		
Sampling Time:	Minutes	60	60	60			60	60	60		
Stack Gas Molecular Weight:	lb/lb-mol	28.210	28.393	28.329			28.406	28.393	28.416		
Actual Stack Velocity:	Feet/sec	33.175	33.224	33.931	33.443		34.229	34.822	34.841	34.631	
Actual Stack Gas Flow:	ACFM	14063	14084	14383	14177		14510	14761	14769	14680	
Dry Standard Stack Gas Flow:	DSCFM	12382	12596	12810	12596		13290	13471	13555	13439	
Isokinetic Rate:	%	99.28	99.00	100.23			99.35	99.87	100.14		
Fluoride Emission:	lb/day	8.76	14.94	21.15	14.95		16.27	9.52	14.59	13.46	
	lb/hr	0.37	0.62	0.88			0.68	0.40	0.61		
Particulate Emission:	lb/day	42.54	73.95	102.40	72.96		106.90	72.64	108.16	95.90	
	lb/hr	1.77	3.08	4.27			4.45	3.03	4.51		
Feed Rate	tph				10.50					7.00	
Input P2O5 rate	P2O5 tph				3.73					2.43	
Heat input	mmBtu/hr				45.20					48.89	
Fluoride allowable	lb/hr				0.142					0.092	
Average Fluoride	lb/hr				0.62					0.56	
PM allowable	lb/hr				5.60					3.65	
Average PM	lb/hr				3.04					4.00	

Test condition or discription:		Test for comparison of results with caustic flow on or off in SO2 scrubber. Samples analyzed by Pixe. This test with caustic OFF.					Test done with fresh water supplied to demist section of packed scrubber before SO2 scrubber.			
Parameter	Unit	Run 1	Run 2	Run 3	Average		Run 1	Run 2	Run 3	Average
Date:		12/01/00	12/01/00	12/01/00			12/08/00	12/08/00	12/08/00	
Time Start:		824	1003	1130			905	1037	1155	
Time End:		930	1107	1234			1011	1149	1305	
Barometric Pressure:	Inch Hg	30.11	30.11	30.11			30.15	30.15	30.15	
Static Pressure:	Inch H2O	0.31	0.31	0.31			0.38	0.38	0.38	
Stack Pressure:	Inch Hg	30.133	30.133	30.133			30.178	30.178	30.178	
Average Sqrt Delta P:	Inch HOH 1/2	0.616	0.616	0.607			0.620	0.632	0.615	
Average Delta H:	Inch HOH	1.355	1.378	1.303	1.345		1.273	1.347	1.275	1.298
Maximum Run Vacuum:	Inch Hg	10.0	7.0	6.0			9.0	10.0	9.0	
Meter Box Number:	Unity	3187	3187	3187			3188	3188	3188	
Average Meter Temp:	Degrees F	66.1	77.8	80.1			73.5	80.8	86.5	
Average Stack Temp:	Degrees F	87.4	88.6	89.9	88.6		86.4	87.9	88.4	87.6
Metered Sample Volume:	Cubic Feet	39.58	39.95	39.70			39.04	40.35	39.95	
Standard Meter Volume:	Cubic Feet	39.97	39.47	39.05			39.90	40.69	39.86	
Moisture Measured:	%	0.0504	0.0552	0.0545			0.0541	0.0498	0.0514	
Moisture Saturation:	%	0.0435	0.0451	0.0470			0.0420	0.0441	0.0448	
oisture Used for Calculations:	%	0.0435	0.0451	0.0470	0.0452		0.0420	0.0441	0.0448	0.0436
Pitot Coefficient:	Unity	0.84	0.84	0.84			0.84	0.84	0.84	
Nozzle Diameter:	Inch	0.248	0.248	0.248			0.248	0.248	0.248	
Stack Area:	Square Feet	7.07	7.07	7.07			7.07	7.07	7.07	
Traverse Points:	Unity	24	24	24			24	24	24	
Sampling Time:	Minutes	60	60	60			60	60	60	
Stack Gas Molecular Weight:	lb/lb-mol	28.492	28.474	28.453			28.508	28.486	28.477	
Actual Stack Velocity:	Feet/sec	35.325	35.392	34.935	35.217		35.470	36.213	35.305	35.663
Actual Stack Gas Flow:	ACFM	14974	15003	14809	14929		15036	15351	14966	15118
Dry Standard Stack Gas Flow:	DSCFM	13912	13885	13647	13815		14039	14263	13881	14061
Isokinetic Rate:	%	100.94	99.86	100.52			99.84	100.23	100.88	
Fluoride Emission:	lb/day	18.37	10.20	7.26	11.94		13.87	40.26	44.62	32.92
	lb/hr	0.77	0.42	0.30			0.58	1.68	1.86	
Particulate Emission:	lb/day	91.41	56.13	30.60	59.38		115.97	196.90	205.91	172.93
	lb/hr	3.81	2.34	1.27			4.83	8.20	8.58	
Feed Rate	tph				7.00					10.00
Input P2O5 rate	P2O5 tph				2.39					3.45
Heat input	mmBtu/hr				48.89					32.10
Fluoride allowable	lb/hr				0.091					0.131
Average Fluoride	lb/hr				0.50					1.37
PM allowable	lb/hr				3.59					5.18
Average PM	lb/hr				2.47					7.21

Test condition or discription:		Test runs done during periods of stable operation to establish base levels.			Test runs done with variations in water used prior to packed scrubber. Flow rate to transition duct was varied.					
					Direct High	Direct Low	Flow	Redirect Low	Redirect High	
		For Calc P2O5								
Parameter	Unit	%HOH	8.17		Run 1	Run 2		Run 1	Run 2	
		%P	16.34							
Date:		12/15/00	12/20/00		01/16/01	01/16/01		01/17/01	01/17/01	
Time Start:		10:00	13:50		13:25	1405		10:00	10:51	
Time End:		10:30	14:20		1355	1435		10:30	11:21	
Barometric Pressure:	Inch Hg	30.32	30.22		30.09	30.09		30.13	30.13	
Static Pressure:	Inch H2O	0.33	0.33		0.30	0.30		0.30	0.30	
Stack Pressure:	Inch Hg	30.344	30.244		30.112	30.112		30.152	30.152	
Average Sqrt Delta P:	Inch HOH 1/2	0.663	0.640		0.615	0.633		0.658	0.652	
Average Delta H:	Inch HOH	1.368	1.500		1.298	1.363		1.486	1.464	
Maximum Run Vacuum:	Inch Hg	9.0	9.0		6.0	6.0		7.0	8.0	
Meter Box Number:	Unity	3188	3188		3188	3188		3188	3188	
Average Meter Temp:	Degrees F	77.4	72.2		81.6	83.9		75.2	83.0	
Average Stack Temp:	Degrees F	105.4	84.1		96.5	96.9		95.8	97.4	
Metered Sample Volume:	Cubic Feet	19.93	20.21		19.46	20.03		20.77	20.92	
Standard Meter Volume:	Cubic Feet	20.34	20.76		19.56	20.04		21.15	21.00	
Moisture Measured:	%	0.0496	0.0323		0.0668	0.0733		0.0549	0.0614	
Moisture Saturation:	%	0.0749	0.0390		0.0577	0.0585		0.0565	0.0593	
oisture Used for Calculations:	%	0.0496	0.0323		0.0577	0.0585		0.0549	0.0593	
Pitot Coefficient:	Unity	0.84	0.84		0.84	0.84		0.84	0.84	
Nozzle Diameter:	Inch	0.248	0.248		0.25	0.25		0.25	0.25	
Stack Area:	Square Feet	7.07	7.07		7.07	7.07		7.07	7.07	
Traverse Points:	Unity	12	12		12	12		12	12	
Sampling Time:	Minutes	30	30		30	30		30	30	
Stack Gas Molecular Weight:	lb/lb-mol	28.425	28.615		28.336	28.328		28.367	28.319	
Actual Stack Velocity:	Feet/sec	38.558	36.431		35.649	36.742		38.063	37.838	
Actual Stack Gas Flow:	ACFM	16345	15443		15112	15575		16135	16039	
Dry Standard Stack Gas Flow:	DSCFM	14712	14660		13596	13992		14598	14402	
Isokinetic Rate:	%	97.13	99.52		99.45	99.04		100.19	100.83	
Fluoride Emission:	lb/day	16.23	29.54		12.83	12.86		27.70	41.29	
	lb/hr	0.68	1.23		0.53	0.54		1.15	1.72	
Particulate Emission:	lb/day	127.11	150.93		99.24	80.82		137.25	194.89	
	lb/hr	5.30	6.29		4.13	3.37		5.72	8.12	
Feed Rate	tph	10.5	10.75		10.25	10.25		10.5	10.5	
Input P2O5 rate	P2O5 tph	3.61	3.70		3.52	3.52		3.61	3.61	
Heat input	mmBtu/hr									
Fluoride allowable	lb/hr	0.137	0.140		0.134	0.134		0.137	0.137	
Average Fluoride	lb/hr	0.68	1.23		0.53	0.54		1.15	1.72	
PM allowable	lb/hr	5.41	5.54		5.28	5.28		5.41	5.41	
Average PM	lb/hr	5.30	6.29		4.13	3.37		5.72	8.12	

Test condition or discription:		Test runs done with steam addition prior to packed scrubber. Source of pond water to spray tower was varied.						Pre test before use as dryer.			
		Redirect	Redirect	pond water	Direct	Direct		Direct	Direct	Direct	
		Off	On	steam	Off	On					
Parameter	Unit	Run 1	Run 2		Run 1	Run 2		Run 1	Run 2	Run 3	Average
Date:		05/03/01	05/03/01		05/03/01	05/03/01		05/11/01	05/11/01	05/11/01	
Time Start:		840	955		1130	1220		923	1120	1306	
Time End:		910	1025		1200	1250		1026	1222	1408	
Barometric Pressure:	Inch Hg	30.27	30.27		30.27	30.27		30.17	30.17	30.16	
Static Pressure:	Inch H2O	0.32	0.32		0.32	0.32		-0.2	-0.18	-0.23	
Stack Pressure:	Inch Hg	30.294	30.294		30.294	30.294		30.16	30.16	30.14	
Average Sqrt Delta P:	Inch HOH 1/2	0.636	0.617		0.612	0.625					
Average Delta H:	Inch HOH	1.433	1.385		1.407	1.373					
Maximum Run Vacuum:	Inch Hg	11.0	10.0		8.0	7.0					
Meter Box Number:	Unity	3187	3187		3187	3187					
Average Meter Temp:	Degrees F	73.4	79.4		82.0	83.0		84.2	91.2	95	
Average Stack Temp:	Degrees F	94.0	96.2		95.0	97.9		101.2	100.5	101.8	101.1667
Metered Sample Volume:	Cubic Feet	20.42	20.02		19.93	20.25		38.298	39.954	39.859	
Standard Meter Volume:	Cubic Feet	20.63	20.00		19.82	20.10		37.488	38.623	38.249	
Moisture Measured:	%	0.0430	0.0411		0.0493	0.0576					
Moisture Saturation:	%	0.0532	0.0568		0.0548	0.0599					
oisture Used for Calculations:	%	0.0430	0.0411		0.0493	0.0576		5.8	5.9	5.7	5.8
Pitot Coefficient:	Unity	0.84	0.84		0.84	0.84		0.84	0.84	0.84	
Nozzle Diameter:	Inch	0.25	0.25		0.25	0.25		0.249	0.249	0.249	
Stack Area:	Square Feet	7.07	7.07		7.07	7.07		7.07	7.07	7.07	
Traverse Points:	Unity	12	12		12	12					
Sampling Time:	Minutes	30	30		30	30		60	60	60	
Stack Gas Molecular Weight:	lb/lb-mol	28.497	28.518		28.429	28.337					
Actual Stack Velocity:	Feet/sec	36.569	35.532		35.283	36.170		34.91	36.13	36.1	
Actual Stack Gas Flow:	ACFM	15501	15062		14956	15332		14806	15323	15311	15146.67
Dry Standard Stack Gas Flow:	DSCFM	14314	13883		13696	13845		13221	13691	13527	13479.67
Isokinetic Rate:	%	99.67	99.62		100.04	100.39		98.8	98.3	98.6	
Fluoride Emission:	lb/day	16.34	15.34		10.26	9.34					
	lb/hr	0.68	0.64		0.43	0.39		0.38	0.59	0.68	0.55
Particulate Emission:	lb/day	67.55	79.25		51.30	52.65					
	lb/hr	2.81	3.30		2.14	2.19		2	2.7	1.9	2.2
Feed Rate	tph	8.5	8.5		8.5	8.5					8.4
Input P2O5 rate	P2O5 tph	2.95	2.95		2.95	2.95					2.90
Heat input	mmBtu/hr										43
Fluoride allowable	lb/hr	0.112	0.112		0.112	0.112					0.110
Average Fluoride	lb/hr	0.68	0.64		0.43	0.39					0.54
PM allowable	lb/hr	4.43	4.43		4.43	4.43					4.35
Average PM	lb/hr	2.81	3.30		2.14	2.19					2.20

Test condition or discription:			Used as dryer.			
			Direct	Direct	Direct	
Parameter	Unit		Run 1	Run 2	Run 3	Average
Date:			05/24/01	05/24/01	05/24/01	
Time Start:			1122	1247	1420	
Time End:			1227	1356	1527	
Barometric Pressure:	Inch Hg		30.27	30.27	30.27	
Static Pressure:	Inch H2O		0.11	0.11	0.11	
Stack Pressure:	Inch Hg		30.27809	30.27809	30.27809	
Average Sqrt Delta P:	Inch HOH 1/2		0.337016	0.33067	0.308012	
Average Delta H:	Inch HOH		2.129167	2.083333	1.729167	1.980556
Maximum Run Vacuum:	Inch Hg		15	14	9	
Meter Box Number:	Unity		3188	3188	3188	
Average Meter Temp:	Degrees F		78.58333	84.91667	89.27083	
Average Stack Temp:	Degrees F		94.66667	94.79167	95.08333	94.84722
Metered Sample Volume:	Cubic Feet		48.747	48.689	45.94	
Standard Meter Volume:	Cubic Feet		50.57048	49.91772	46.68599	
Moisture Measured:	%		0.051324	0.052804	0.050381	
Moisture Saturation:	%		0.054287	0.054496	0.054987	
oisture Used for Calculations:	%		0.051324	0.052804	0.050381	0.051503
Pitot Coefficient:	Unity		0.84	0.84	0.84	
Nozzle Diameter:	Inch		0.382	0.382	0.382	
Stack Area:	Square Feet		7.065	7.065	7.065	
Traverse Points:	Unity		24	24	24	
Sampling Time:	Minutes		60	60	60	
Stack Gas Molecular Weight:	lb/lb-mol		28.40603	28.38979	28.41637	
Actual Stack Velocity:	Feet/sec		19.43532	19.07694	17.76613	18.75946
Actual Stack Gas Flow:	ACFM		8238.632	8086.713	7531.061	7952.135
Dry Standard Stack Gas Flow:	DSCFM		7528.826	7376.803	6883.883	7263.171
Isokinetic Rate:	%		99.46086	100.2006	100.4236	
Fluoride Emission:	lb/day		4.02	4.31	4.13	
	lb/hr		0.17	0.18	0.17	
Particulate Emission:	lb/day		47.5	46.4	52.7	
	lb/hr		1.98	1.93	2.20	
Feed Rate	tph					31.5
Input P2O5 rate	P2O5 tph					11.1
Heat input	mmBtu/hr					4.6
Fluoride allowable	lb/hr					0.42
Average Fluoride	lb/hr					0.17
PM allowable	lb/hr					16.65
Average PM	lb/hr					2.04

ATTACHMENT 3

IMC MULTIFOS KILN C TEST SUMMARY

Scenario	Description	P2O5 input	Fluoride Emissions			Fluoride Emissions			MAX	MAX
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3		
		tph	lb/hr	lb/hr	lb/hr	lb/ton P2O5	lb/ton P2O5	lb/ton P2O5	lb/hr	lb/ton P2O5
1	Initial test	2.05	0.32	0.59	0.44	0.16	0.29	0.21	0.59	0.29
2	Second test	2.59	0.73	0.63	0.37	0.28	0.24	0.14	0.73	0.28
3	Dried feed	3.73	0.37	0.62	0.88	0.10	0.17	0.24	0.88	0.24
4	Caustic on	2.43	0.68	0.4	0.61	0.28	0.16	0.25	0.68	0.28
5	Caustic off	2.39	0.77	0.42	0.3	0.32	0.18	0.13	0.77	0.32
6	Fresh water to demist	3.45	0.58	1.68	1.86	0.17	0.49	0.54	1.86	0.54
7	Base 1	3.61	0.68	NA	NA	0.19	NA	NA	0.68	0.19
7	Base 2	3.7	1.23	NA	NA	0.33	NA	NA	1.23	0.33
8	Source and flow changes	3.52	0.53	0.54	NA	0.15	0.15	NA	0.54	0.15
8	Source and flow changes	3.61	1.15	1.72	NA	0.32	0.48	NA	1.72	0.48
9	steam/water changes (1)	2.95	0.68	0.64	NA	0.23	0.22	NA	0.68	0.23
9	steam/water changes (1)	2.95	0.43	0.39	NA	0.15	0.13	NA	0.43	0.15
10	Pre-test for dryer use	2.9	0.38	0.59	0.68	0.13	0.20	0.23	0.68	0.23
11	Use as dryer	NA	NA	NA	NA	NA	NA	NA	0	0.00
MAXIMUM									1.86	0.54
SUGGESTED PERMIT LIMIT		9.5							5.7	0.6

NOTE: (1) Steam rates were between 8 and 10 pounds per hour.

ATTACHMENT 4

P.E. CERTIFICATION

4. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain a Title V source air operation permit (check here [ ], if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [X], if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ], if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature ______________________ Date 8/8/02

(seal)

* Attach any exception to certification statement.