

The Fate of Mercury in Synthetic Gypsum Used for Wallboard Production

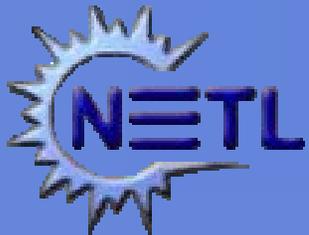
Task 1



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The Fate of Mercury in Synthetic Gypsum Used for Wallboard Production- Project Test Matrix

Task	1	2	3	4	5
Synthetic Gypsum Source:					
Power Plant	A	A	B	C	D
Coal Type	HS Bit	HS Bit	HS Bit	TX lignite	HS Bit
FGD Reagent	Limestone	Limestone	Limestone	Limestone	Lime
Forced Oxidation Mode	In Situ	In Situ	In Situ	In Situ	External
Gypsum Fines Blow Down?	No	No	Yes	No	Yes
SCR Status	On Line	Bypassed	On Line	No SCR	TBD*
USG Wallboard Plant Tested	1	1	2	3	1

*HS Bit – High Sulfur Bituminous; TX Lignite – Texas Lignite; TBD – To be determined

Task Completion

Task	Subtask	Site Test Complete	Report Published	Percent Complete
1	Hg Mass Balance			75
2	Hg Mass Balance			90
3	Hg Mass Balance			90
4	Hg Mass Balance			60
5	Hg Mass Balance	Early Fall '05		0

The Fate of Mercury in Synthetic Gypsum Used for Wallboard Production- Task 1

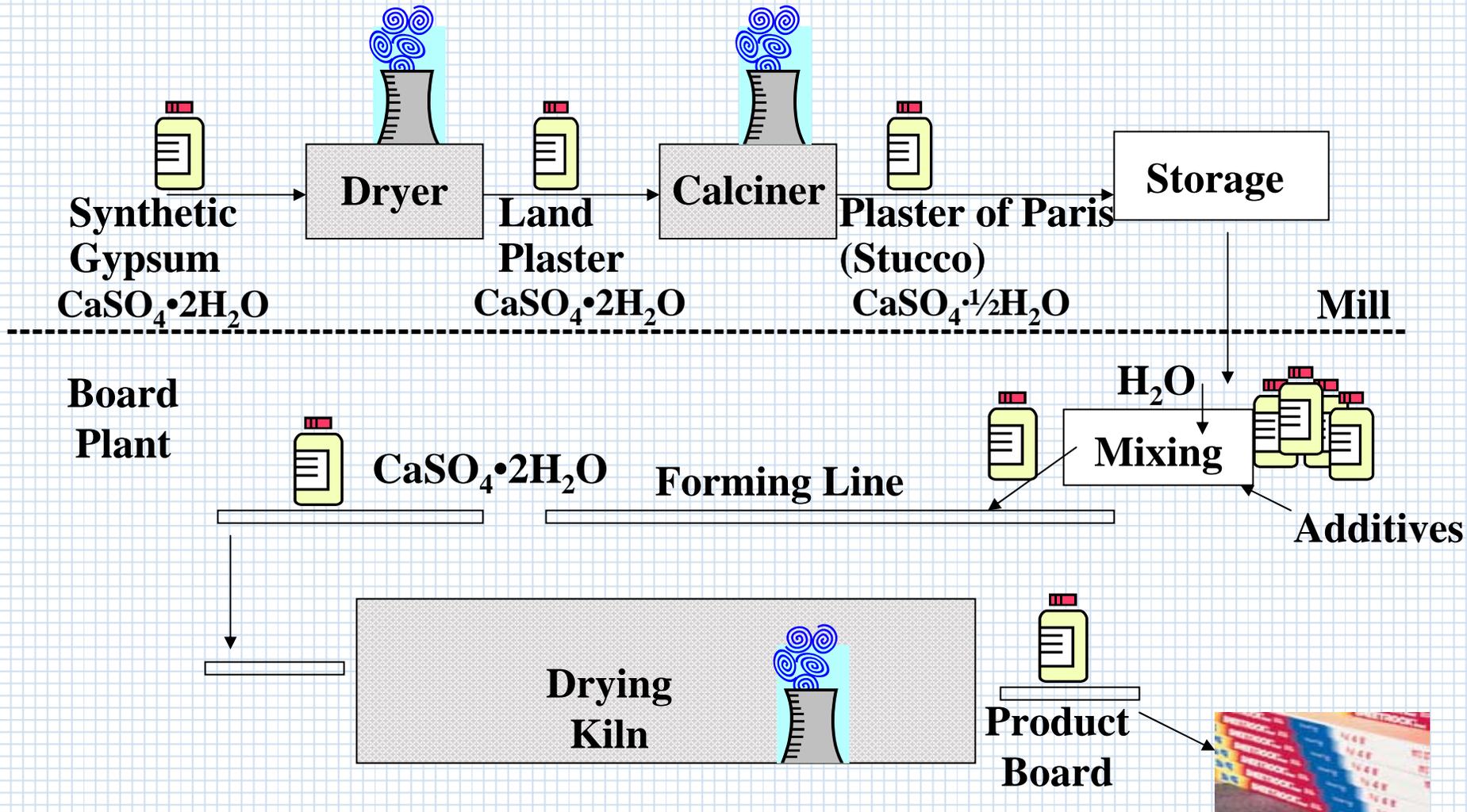
Task	1
Synthetic Gypsum Source:	
Power Plant	A
Coal Type	HS Bit
FGD Reagent	Limestone
Forced Oxidation Mode	In Situ
Gypsum Fines Blow Down?	No
SCR Status	On Line
USG Wallboard Plant Tested	1
* HS Bit – High Sulfur Bituminous	



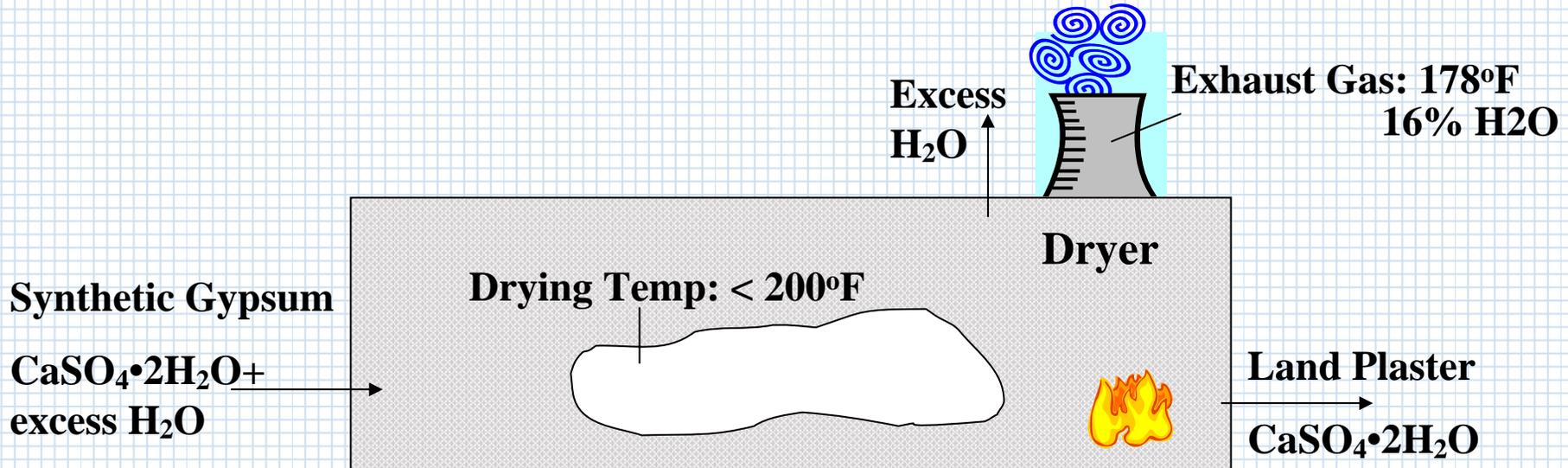
Based on 2003 and 2004 Industry Statistics, USG Wallboard Plant 1 uses approximately 8 -12% of the amount used in U.S. production.

Typically blend synthetic gypsum from various sources, however during testing only synthetic gypsum from Power Plant A was processed.

Simplified Flow Sheet for Processing Synthetic Gypsum for Wallboard



Dryer

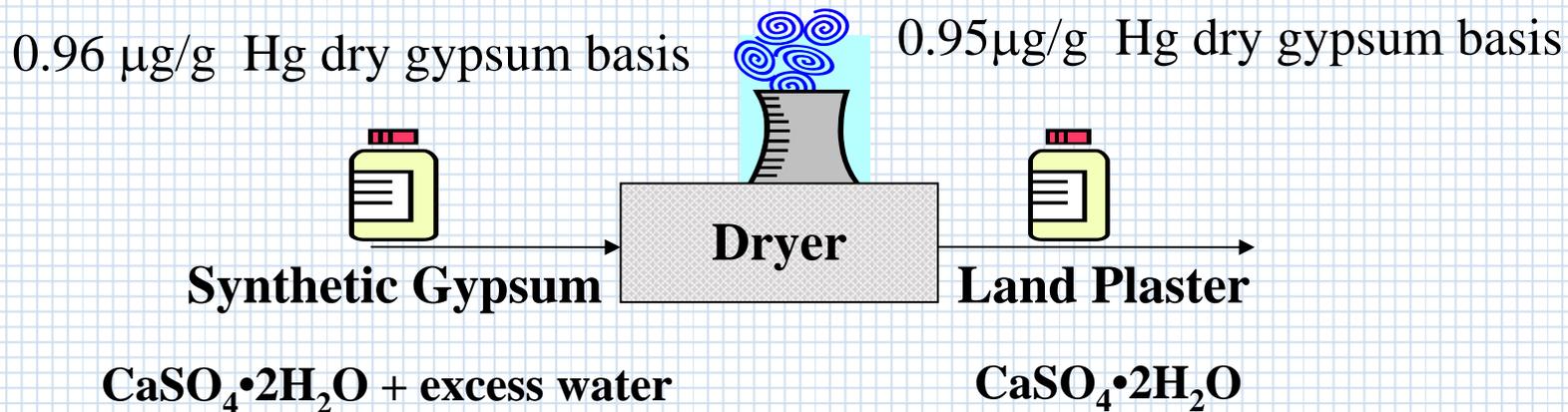


Ontario Hydro Results – Dryer (1 of 2)

Speciation		Total Mercury Emission Rate	
		Grams per Hour	Pounds per Year*
Particle-Bound, Hg^{P}	3%	Mean (of 3 runs) $\pm 95\%$ Confidence Interval	7.3 \pm 6.7
Oxidized, Hg^{+2}	-		
Elemental, Hg^0	97%		

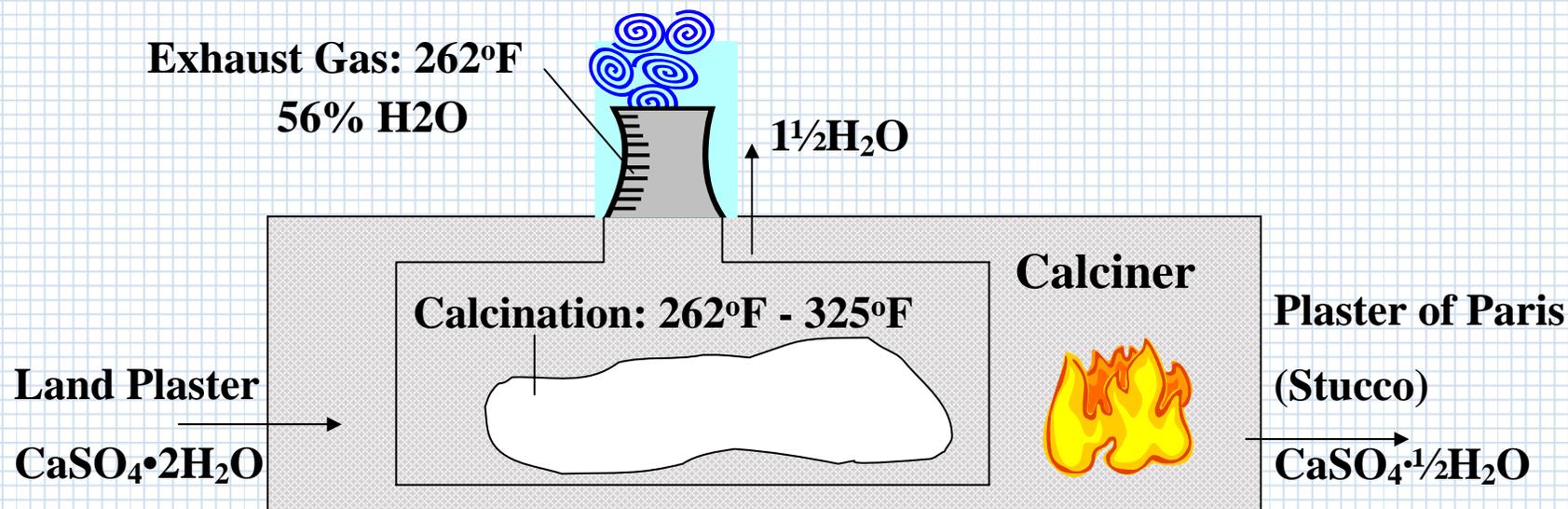
*Based on 2004 operation hours processing 100% Power Plant A synthetic gypsum. In normal operations synthetic gypsum is blended from various suppliers. Synthetic gypsum obtained from Power Plant A is consistently higher in mercury content than other sources currently used at Wallboard Plant 1. 2005© USG Corporation

Solids Analysis vs Ontario Hydro - Dryer



	% Mercury Loss	95% Confidence Interval
Ontario Hydro	1.1	0.9
Solids Analysis	1.3	4.0

Calciner

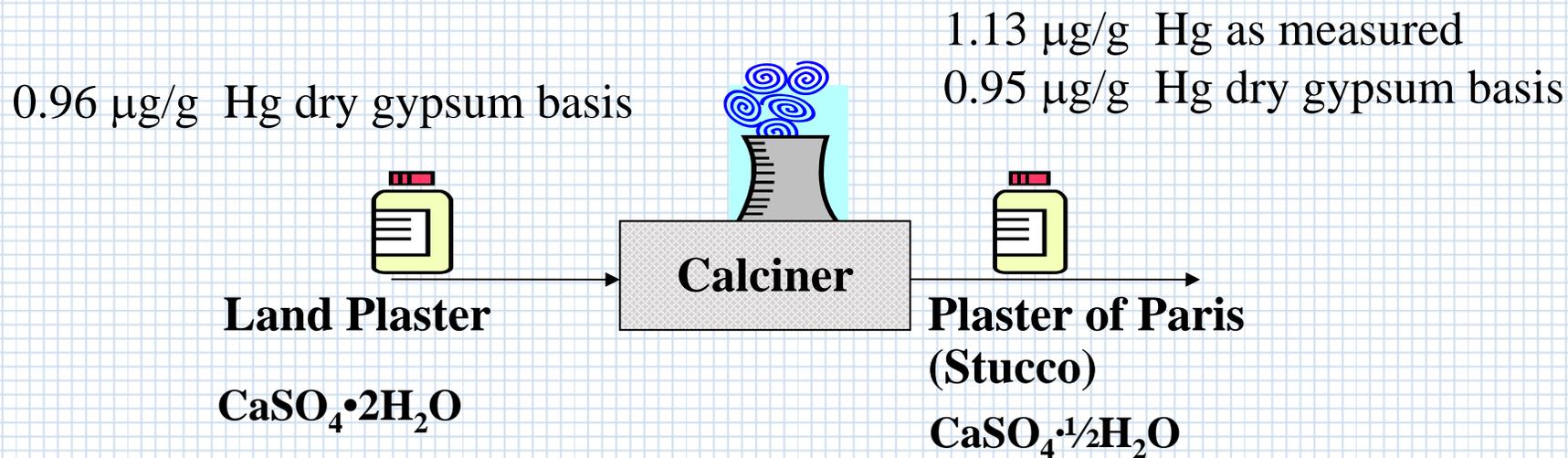


Ontario Hydro Results – Calciner (1 of 2)

Speciation		Total Mercury Emission Rate	
		Grams per Hour	Pounds per Year*
Particle-Bound, Hg ^P	3%	Mean (of 3 runs) ± 95% Confidence Interval	0.90 ± 0.37
Oxidized, Hg ⁺²	5%		
Elemental, Hg ⁰	92%		
			15.7 ± 6.5

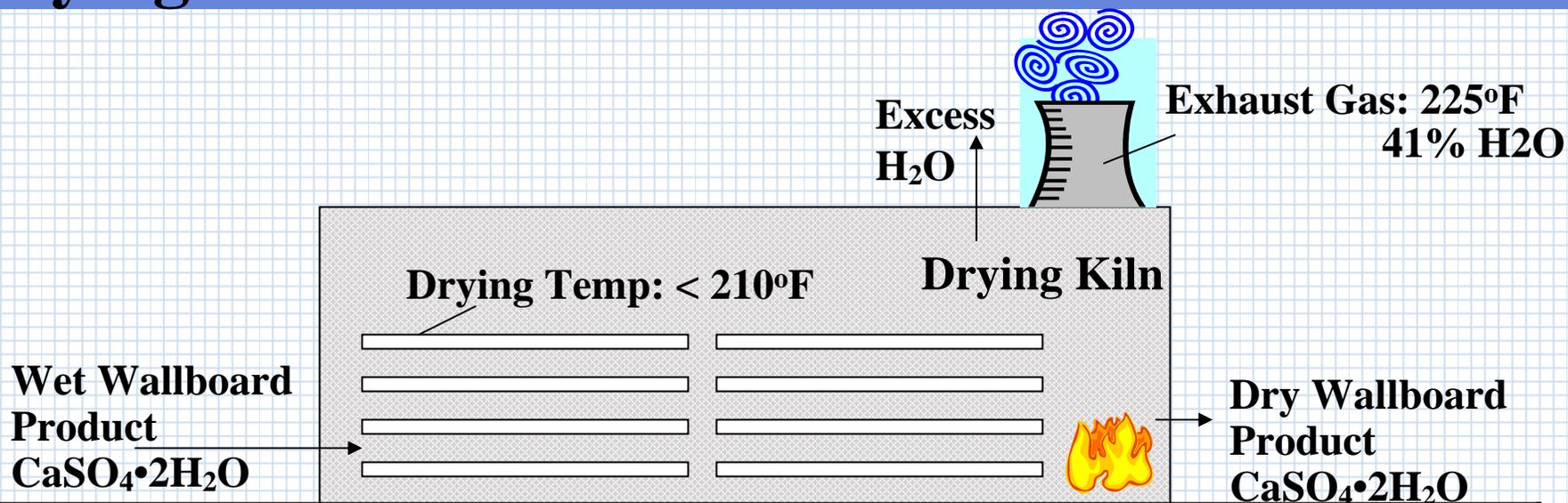
*Based on 2004 operation hours processing 100% Power Plant A synthetic gypsum. In normal operations synthetic gypsum is blended from various suppliers. Synthetic gypsum obtained from Power Plant A is consistently higher in mercury content than other sources currently used at Wallboard Plant 1.

Solids Analysis vs Ontario Hydro - Calciner



	% Mercury Loss	95% Confidence Interval
Ontario Hydro	2.3	1.0
Solids Analysis	1.4	2.5

Drying Kiln

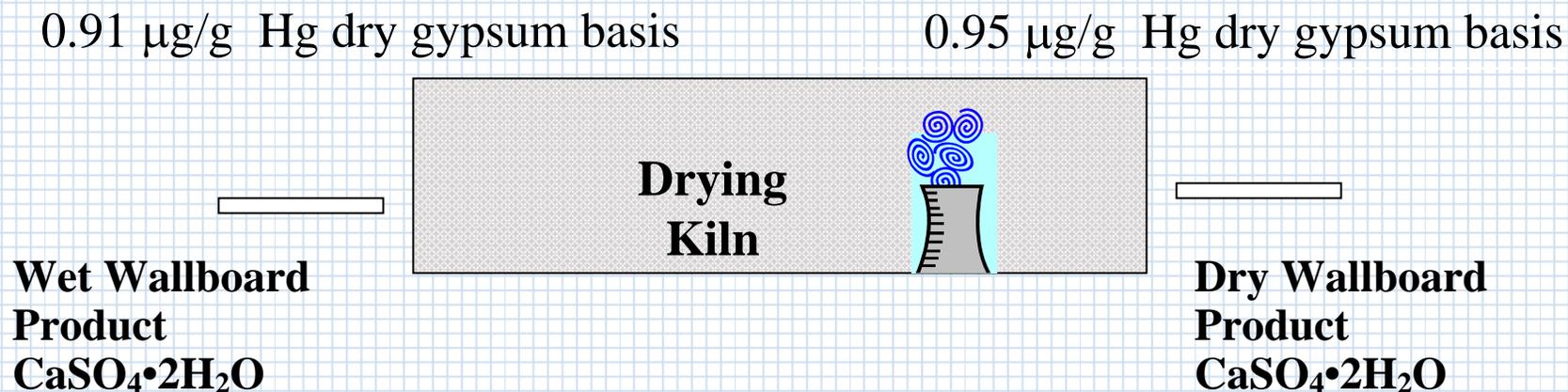


Ontario Hydro Results – Drying Kiln (1 of 1)

Speciation		Total Mercury Emission Rate	
		Grams per Hour	Pounds per Year*
Particle-Bound, Hg ^P	2%	Mean (of 3 runs) ± 95% Confidence Interval	1.48 ± 0.45
Oxidized, Hg ⁺²	7%		
Elemental, Hg ⁰	91%		

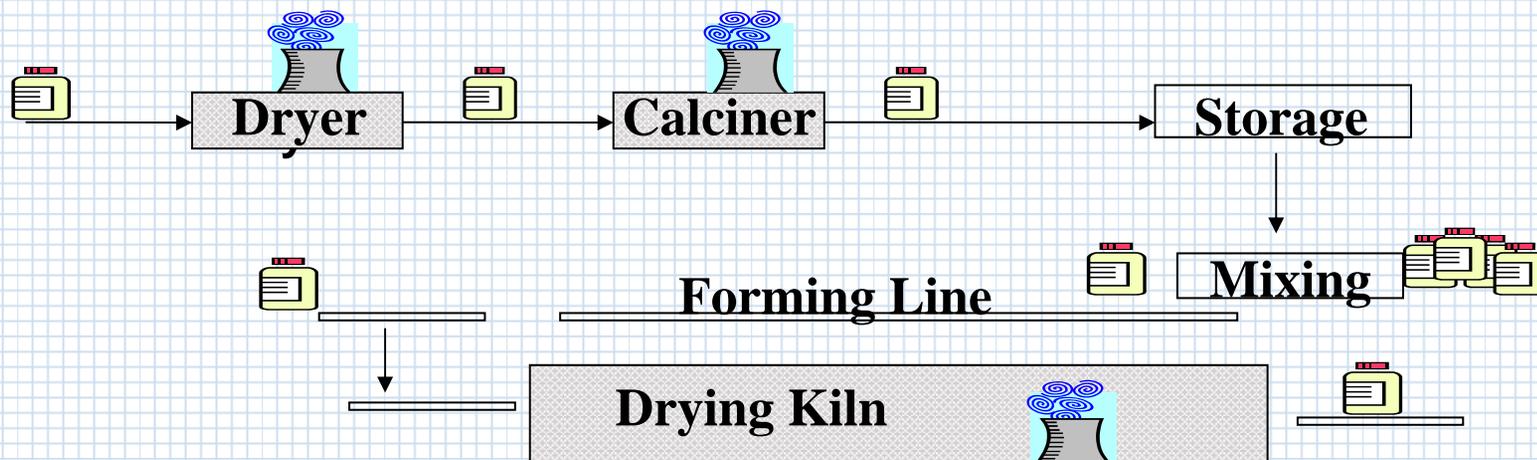
*Based on 2004 operation hours processing 100% Power Plant A synthetic gypsum. In normal operations synthetic gypsum is blended from various suppliers. Synthetic gypsum obtained from Power Plant A is consistently higher in mercury content than other sources currently used at Wallboard Plant 1. 2005© USG Corporation

Solids Analysis vs Ontario Hydro - Kiln



	% Mercury Loss	95% Confidence Interval
Ontario Hydro	1.9	0.6
Solids Analysis	-0.9	6.8

Total Wallboard Plant

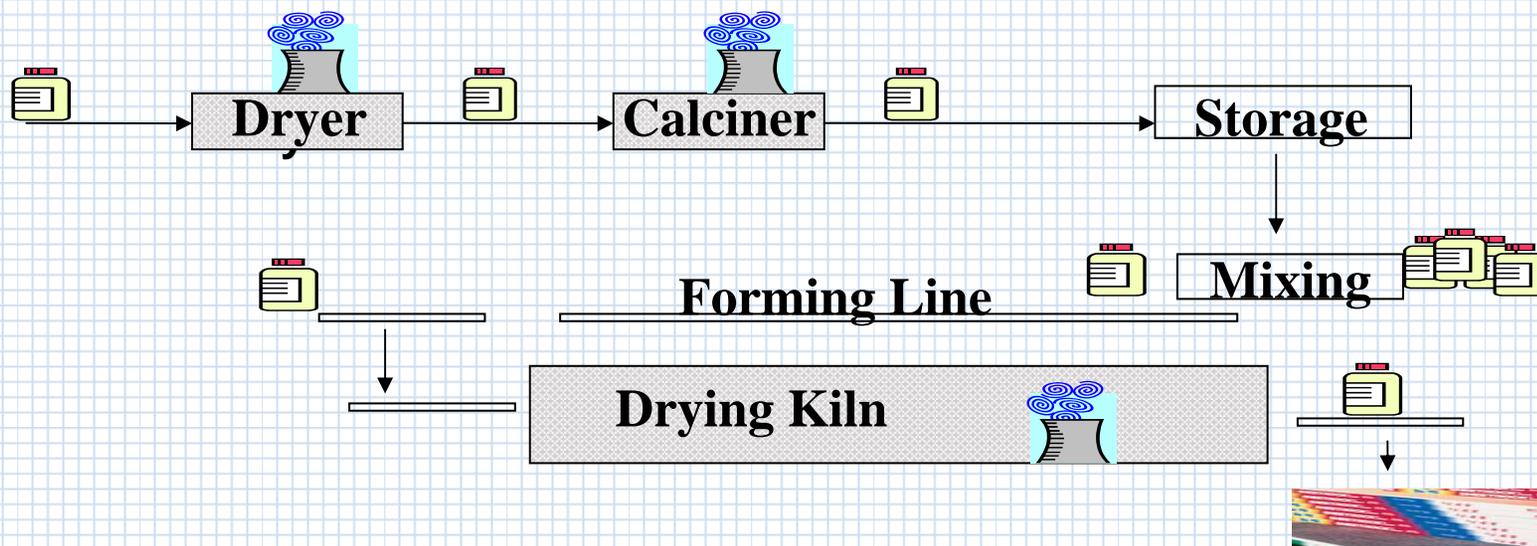


Summation of Ontario Hydro Results – Total Wallboard Plant

Speciation		Total Mercury Emission Rate	
		Grams per Hour	Pounds per Year*
Particle-Bound, Hg ^P	3%	Mean (of 3 runs) ± 95% Confidence Interval	4.1 ± 1.7
Oxidized, Hg ⁺²	4%		
Elemental, Hg ⁰	93%		

*Based on 2004 operation hours processing 100% Power Plant A synthetic gypsum. In normal operations synthetic gypsum is blended from various suppliers. Synthetic gypsum obtained from Power Plant A is consistently higher in mercury content than other sources currently used at Wallboard Plant 1.

Solids Analysis vs Ontario Hydro - Total



	% Mercury Loss	95% Confidence Interval
Ontario Hydro	5.1%	1.7%
Solids Analysis*	2.0%	5.0%

* Corrected for Hg added with additives and paper

Emission Results

Task 1 Results	Approximate Industry Production Rates (2004)
Less than 0.1 lb of mercury emitted per million square feet of wallboard produced	9,000 million square feet of wallboard using synthetic gypsum
0.045 grams of mercury per ton of dry gypsum processed	7.5 – 9 million ton of dry synthetic gypsum processed