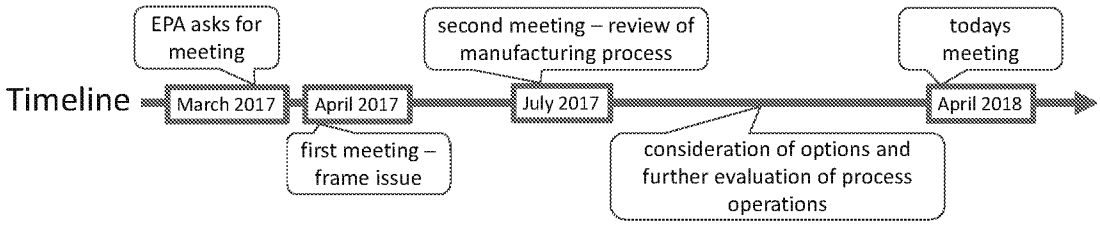
Continuation of Discussions:

TSCA Chemical Data Reporting for Pulping Liquors and Lime

April 5, 2018

Background and Findings



1. Continuously recovered and recycled pulping chemicals on site at pulp mills meet the non-isolated intermediate exemption.
2. If any fraction of the black, green and white liquor, calcium carbonate or reburned lime is "isolated" from the process and stored in tanks and vessels for purposes other than those that have a "clear technical relationship to the needs of the overall manufacturing process," then those volumes would be reportable under CDR.
   (EPA 2016 CDR Fact Sheet on Non-Isolated Intermediates - see slide 6)
3. EPA's affirmation of these determinations would be helpful.

Basis and Detail

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"Non-Isolated Intermediate (NII) Exemption"

- The CDR rule provides an exemption for "non-isolated intermediate" chemicals.
- From 40 CFR §704.3 Definitions (7-1-14 edition):
  - *Non-isolated intermediate* means any intermediate that is not intentionally removed from the equipment in which it is manufactured, including the reaction vessel in which it is manufactured, equipment which is ancillary to the reaction vessel, and any equipment through which the substance passes during a continuous flow process, but not including tanks or other vessels in which the substance is stored after its manufacture." Mechanical or gravity transfer through a closed system is not considered to be intentional removal, but storage or transfer to shipping containers "isolates" the substance by removing it from process equipment in which it is manufactured. **(emphasis added).**

"NII Exemption", continued

From 40 CFR §704.3 Definitions (7-1-14 edition):

- *Intermediate* means any chemical substance that is consumed, in whole or in part, in chemical reactions used for the intentional manufacture of other chemical substances or mixtures, or that is intentionally present for the purpose of altering the rates of such chemical reactions.

"Holding" between process units does not nullify the NII exemption?

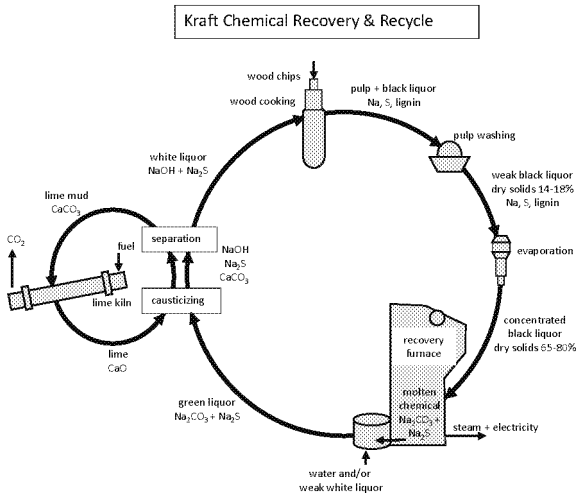
A chemical intermediate held for purposes that have a clear technical relationship to the needs of the overall manufacturing process does not negate the non-isolated status of the chemical.

EPA's CDR Fact Sheet on Non-Isolated Intermediates (EPA 2016) states the following:

> Examples of holding that EPA would generally consider to have a clear technical relationship to the needs of the overall manufacturing process are:
>
> - holding to accommodate different reaction rates and varying flow rates or transfer times;
> - holding during repair or maintenance of the intermediate's manufacturing equipment; and
> - holding that is necessary for analytical sampling

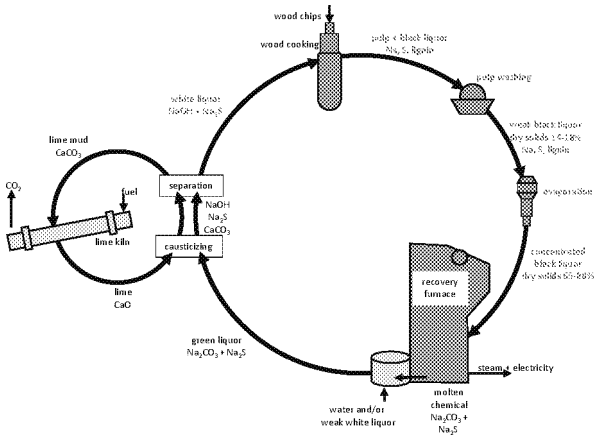
Kraft Chemical Recovery & Recycle

- designed and operated as a continuous process
- operates 24 hrs/day, 7 days/wk, 350+ days per year
- associated process equipment is flow-through under normal operation
- chemical storage outside of the definition of *"equipment in which it is manufactured"* is not common.



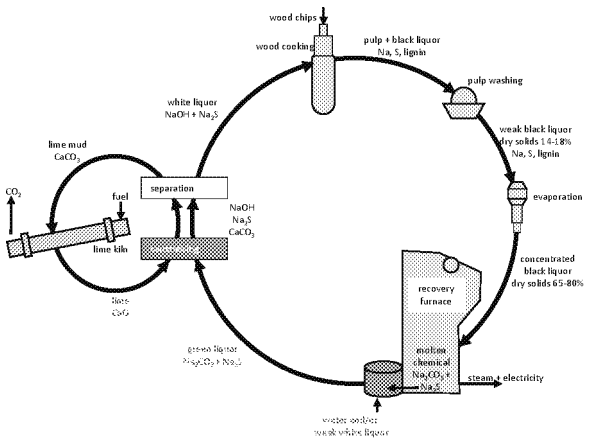
Process Description (continued)

- wood is pulped in the digester using white liquor (NaOH, Na_2S)
- After the cook, the liquid biomass [black liquor] is separated from the pulp in brownstock washers from where it is <u>continuously</u> concentrated to strong black liquor before being fired in a kraft recovery furnace.



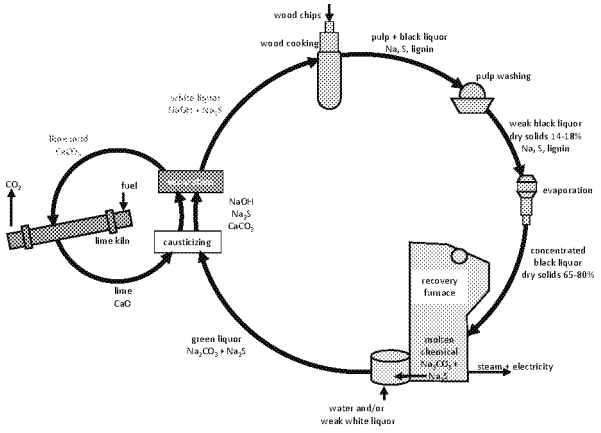
Process Description (continued)

- inorganic chemicals (Na_2S + Na_2CO_3) are <u>continuously</u> extracted in the form of a "smelt product" by burning the liquid biomass in a recovery furnace.
- chemicals are then dissolved in water to make green liquor which is then <u>continuously</u> pumped to a green liquor clarifier.
- From the clarifier, the clarified green liquor is <u>continuously</u> sent to a series of causticizers where it is reacted with lime (CaO).



Process Description (continued)

- Calcium carbonate ($CaCO_3$) is separated and continuously pumped from the bottom of the white liquor clarifier to a washer and then is continuously dewatered
- dewatered $CaCO_3$ is fed to the lime kiln(s)
- Reburned lime (CaO) product is continuously generated from the $CaCO_3$. The lime product is continuously withdrawn from the kiln, slaked with water, and returned to causticizing
- The clarified white liquor product is sent continuously to the digester area to cook the wood.



Legitimate "storage" would nullify the NII Exemption

- To use the NII exemption, each mill would have to determine whether isolation of any of these five byproduct streams occurs under normal operating conditions during the year for reasons other than those noted in EPA 2016 CDR Fact Sheet on Non-Isolated Intermediates. (see slide 6)
- If isolation does occur, the chemicals that are isolated would be subject to CDR reporting.
- Intentional removal from the equipment for storage is the key factor for determining isolation of chemicals.

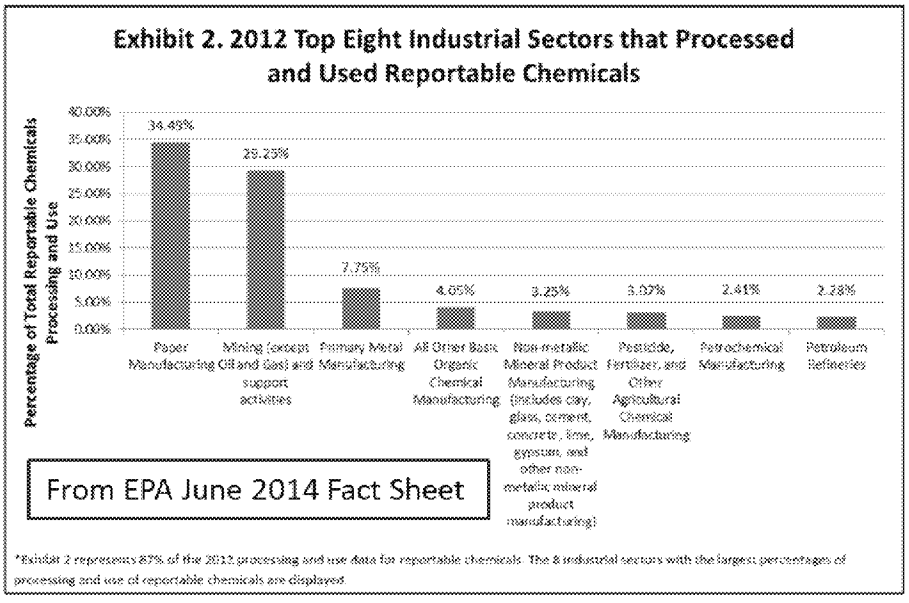


Exhibit 2. 2012 Top Eight Industrial Sectors that Processed and Used Reportable Chemicals
Percentage of Total Reportable Chemicals Processing and Use
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
34.49%
29.25%
7.75%
4.05%
3.25%
3.07%
2.41%
2.28%
Paper Manufacturing
Mining (except Oil and Gas) and support activities
Primary Metal Manufacturing
All Other Basic Organic Chemical Manufacturing
Non-metallic Mineral Product Manufacturing (includes clay, glass, cement, concrete, lime, gypsum, and other non-metallic mineral product manufacturing)
Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing
Petrochemical Manufacturing
Petroleum Refineries
From EPA June 2014 Fact Sheet
*Exhibit 2 represents 87% of the 2012 processing and use data for reportable chemicals. The 8 industrial sectors with the largest percentages of processing and use of reportable chemicals are displayed.

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