



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

Dr. John L. Festa
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Re: 2006 Inventory Update Reporting (IUR) Associated with the Pulping Cycle

Dear Dr. Festa:

This letter is in reply to your letter dated October 31, 2006, and the subsequent meeting on November 16, 2006, between staff from the Office of Pollution Prevention and Toxics (OPPT), you, and other members of the American Forest & Paper Association (AF&PA). As agreed to during that meeting, EPA has reviewed the information related to Inventory Update Reporting (IUR) for the pulping cycle.

It is clear to EPA that the pulping cycle involves the manufacture of a variety of different chemical substances. These substances, and how the major pulping cycle is considered in relation to IUR reporting, are addressed below. Note that, due to variations in an individual process, the actual reporting requirements may vary from one manufacturing site to another.

Spent Pulping Liquors (Black Liquor)

Spent pulping liquors, also called black liquor, is a byproduct of the pulping process. This byproduct is used to produce smelt, which is produced using an oxidation/reduction reaction in the furnace. As explained below, the byproduct is considered to be a feedstock used to produce smelt and, as such, is reportable under the IUR.

In your letter dated July 12, 2005, you referenced 40 CFR 710.4(d), which identifies chemical substances excluded from the TSCA Inventory. The regulation includes a description of when byproducts are considered to be excluded from the TSCA Inventory – a byproduct with no commercial value or

A byproduct which has commercial value only to municipal or private organizations who (i) burn it as a fuel, (ii) dispose of it as a waste, including in a landfill or for enriching soil, or (iii) extract component chemical substances which have commercial value, may

be reported for the inventory, but will not be subject to premanufacture notification under section 5 of the Act if not included.

In addition, you identified portions of the 1977 Federal Register notice associated with the inception of the TSCA Inventory and specifically quoted the following:

In proposing to exempt from the reporting requirements such byproducts which have some commercial purpose. [*sic*] EPA intends to encourage conservation and recycling of the energy and resources contained in the waste material that otherwise may be discarded because of reporting burdens under TSCA. 42 FR 39186

As you noted, the same Federal Register notice also contained the following:

Comment 55: Persons who extract component chemical substances from byproducts should not be required to report those chemical substances.

Response: The Administrator agrees with this comment. Persons who recover chemical substances from byproducts of the manufacture or processing of other chemical substances, mixtures or articles would be processors of the chemical substances and need not report for the inventory. There is no requirement that these persons report any chemical substance which is extracted or separated from a product, including by means of heat or a chemical reaction, if the chemical substance that is recovered is actually present in the byproduct or was an intermediate used in the manufacture of the byproduct and if also, to the best of the knowledge of the person recovering the substance, the manufacturer of the substance is reporting the substance for inclusion in the inventory. 42 FR 64587

All three of the above refer to the initial compilation of the TSCA Inventory, rather than to IUR reporting. The purpose of the TSCA Inventory is to list the TSCA chemical substances in commerce in the United States. The Agency's response to comment 55 was intended to eliminate duplicative reporting of substances that would already be reported to the Inventory (note the end of the last sentence of the comment response). Therefore, if a substance existed in a byproduct or was an intermediate in the manufacture of the byproduct and was otherwise being reported for inclusion in the TSCA Inventory, then the Agency did not require the duplicative reporting of the substance(s). Comment 55 does not address the reporting status of chemicals under the IUR.

EPA continues to encourage conservation and recycling of the energy and resources contained in the waste material that otherwise may be discarded. This is reflected in 40 CFR 710.50(c), which provides that the manufacturer of a substance manufactured in a manner described in 40 CFR 720.30(g) is not subject to IUR reporting for that substance. 40 CFR 720.30(g) states that this reporting exclusion applies to:

Any byproduct if its only commercial purpose is for use by public or private organizations that (1) burn it as a fuel, (2) dispose of it as a waste, including in a landfill or for enriching soil, or (3) extract component chemical substances from it for

commercial purposes. (This exclusion only applies to the byproduct; it does not apply to the component substances extracted from the byproduct.)

As stated in (3) above, any byproduct for which the sole commercial purpose is for use by public or private organizations to extract component chemical substances from it for commercial purposes is not reportable under the IUR. A component chemical substance is a substance that already exists in the byproduct prior to extraction. The term "component substance" does not include any substances that are manufactured via chemical reaction from the byproduct or any additional manufactured volume of a component substance. In the case of black liquor, chemical reaction is used to manufacture the smelt. While some substances, or quantities of substances, in the smelt are components of black liquor, it is clear that the smelt also includes additional volumes of component substances manufactured via reaction as well as other substances manufactured via reaction. Because the manufacture of the smelt involves more than the extraction of component substances from black liquor, black liquor does not fall within the byproduct exemption at 40 CFR 720.30(g).

EPA believes that the Agency's current interpretation of the byproduct exemption, specifically the portion associated with the idea of extracting component chemical substances from the byproduct for commercial purposes, is consistent with past Agency interpretations. Heat or chemical reactions can be used to extract a component chemical substance, but the substance extracted must be a component substance. If the resulting extracted substance is not the same substance that is in the byproduct, then the extracted substance is not a component substance. This is the case with black liquor and the resulting smelt.

Black liquor is identified on the TSCA Inventory as follows:

Sulfite liquors and Cooking liquors, spent (CASRN 66071-92-9). Definition: Spent pulping liquor. The aqueous solution resulting from the reaction of lignocellulosic substances (wood or other agricultural fiber sources) with one or more pulping chemicals including those used in the Kraft, sulfite, semichemical or other pulping processes. Composition is highly variable and includes excess pulping chemicals, dissolved and degraded cellulose, hemicellulose and lignin.

Green and White Liquor

Green liquor is an intermediate chemical substance formed by mixing sodium sulfate, smelt, and water. It is further reacted to form white liquor. Because the green liquor is a chemical substance with a commercial purpose, it is reportable under IUR. Green liquor is identified on the TSCA Inventory as follows:

Sulfite liquors and Cooking liquors, green (CASRN 68131-30-6). Definition: A solution obtained by dissolving the chemicals recovered in the alkaline pulping process in water.

White liquor is a chemical substance used as a pulping (cooking) chemical, which is a specific end use. Because it is intentionally made for an end use and not to manufacture another

chemical, it is not an intermediate. White liquor is reportable under IUR. White liquor is identified on the TSCA Inventory as follows:

Sulfite liquors and Cooking liquors, white (CASRN 68131-33-9). Definition: The solution formed by reacting the sodium salts of green liquor with calcium hydroxide.

Non-Isolated Intermediates

Non-isolated intermediates are exempt from IUR. The non-isolated intermediate definition provided in the regulatory text at 40 CFR 720.43, as well as at 710.3, and 704.3, is:

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.

Note that this definition includes the statement "...but not including tanks or other vessels in which the substance is stored after its manufacture."

Because it is an intermediate, if green liquor is non-isolated, it is exempt from reporting under IUR. However, the process descriptions that were provided to EPA by the pulp and paper industry or that the Agency identified in the general literature clearly indicate that green liquor is stored after its manufacture. Therefore, EPA finds it unlikely that green liquor meets the definition of "non-isolated intermediate." Note that the fact that material is moved into and out of the tank at the same time does not negate the storage component. However, manufacturing facilities do differ, and there may be some pulping processes where storage does not occur. Also, in order for a substance to be non-isolated, the manufacturing system must be enclosed. This means that all of the vessels and the interconnecting lines are enclosed and that there is no release or exposure involved in the use of the non-isolated intermediate. The exception to this last statement is for maintenance or repair operations.

Calcium Carbonate and Calcium Oxide

Calcium carbonate, also referred to as lime mud, is the byproduct of causticizing the green liquor to form white liquor. The calcium carbonate byproduct is used to manufacture calcium oxide and does not fall within the exemption at 720.30(g). Therefore it is a non-exempt byproduct with a commercial purpose. The calcium carbonate is reportable under IUR.

Calcium oxide, also referred to as lime or re-burned lime, is a chemical substance manufactured by the calcination of calcium carbonate and used for a commercial purpose as a causticizing agent. The calcium oxide is reportable under IUR.


Alternate method of reporting Pulp and Paper Pulping Cycle Chemicals

An alternate method of reporting these substances was presented by Dr. Someshwar in *Quantification of IUR Reporting Chemicals Generated Within the Kraft Recovery Cycle* (dated May 16, 2005) (Quantification paper). This method suggests reporting only the amount generated from the make-up chemicals (i.e., the chemicals added to the pulping cycle to "make up" for chemical losses during the pulping cycle) and, as such, does not accurately capture the quantity of the manufactured substances. The full amounts manufactured are the correct values to use for reporting under the IUR.

In summary, the pulping cycle results in the manufacture of a variety of chemical substances that are subject to reporting for IUR. Black liquor, or spent pulping liquors, is a reportable byproduct when it is used to produce smelt. Other substances subject to reporting include green liquor, white liquor, calcium carbonate, and calcium oxide. In addition, the full production volume for these substances is to be reported, not just the amount manufactured from the make-up chemicals.

I trust that the EPA's position regarding reporting of pulping cycle chemicals for IUR is now clear. Please let me know if I can provide additional assistance.

Sincerely,


for

Jim Willis
Director, Chemical Control Division
Office of Pollution Prevention and Toxics