

Memorandum

To: Public Docket for the 2006 Preliminary Effluent Guidelines Program Plan, EPA Docket Number OW-2004-0032

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Subject: **Tobacco Products Processing**

Section 304(b) of the Clean Water Act requires EPA to annually review and, if appropriate, revise its technology-based regulations, called “effluent limitations guidelines” or “effluent guidelines,” that limit the discharge of pollutants to waters of the U.S. from various categories of industrial facilities. Every other year, Section 304(m) of the Clean Water Act requires EPA to publish a plan establishing a schedule for the annual review and revision of effluent guidelines required by Section 304(b). This plan must also identify industries discharging more than trivial amounts of toxic or “non-conventional” pollutants, such as nutrients, for which the Agency has not yet promulgated effluent guidelines. EPA must establish a schedule for completing effluent guidelines for these industries within three years. Section 304(m) also requires EPA to take public comment on its plan prior to issuing a final plan.

During the comment period for the proposed 2004 Effluent Guidelines Plan (Plan), EPA received public comment that it should consider wastewater discharges from the tobacco manufacturing industry for effluent guidelines rulemaking. In specific, the commenter questioned the quantity of carcinogens in wastewater discharges associated with cigarette manufacturing. Because this industry is not currently subject to an effluent guideline, EPA is conducting a study of the Tobacco Products industrial sector to determine whether this sector is discharging more than trivial amounts of toxic or “non-conventional” pollutants. EPA’s decision to conduct a detailed study on this industry does not mean that EPA is required to select this industry for an effluent guidelines rulemaking. EPA will make such a decision as part of the final 2006 Plan.

During this study, EPA plans to, at a minimum, collect information on the following as they relate to tobacco products manufacturing:

- a. source and types of process wastewaters;
- b. volume of process wastewaters;
- c. pollutant concentrations in untreated process wastewaters;
- d. applicable treatment and pollution prevention (flow and pollutant) technologies;
- e. effectiveness of applicable treatment and pollution prevention technologies;

- f. cost information related to applicable treatment and pollution prevention technologies;
- g. pollutant concentrations in discharges to surface waters or to Publicly Owned Treatment Works (POTWs);
- h. typical discharge destination (i.e., direct to surface water or indirectly to POTW); and
- i. typical permit restrictions.

For additional information on study objectives, see the Tobacco Products Processing Detailed Study Plan [1] (DCN 01827).

Industry Profile

The Tobacco Products Processing industry includes facilities within the following four SIC codes:

- SIC code 2111 (Cigarettes) - establishments primarily engaged in manufacturing cigarettes from tobacco or other materials.
- SIC code 2121 (Cigars) - establishments primarily engaged in manufacturing cigars.
- SIC code 2131 (Chewing and Smoking Tobacco and Snuff) - establishments primarily engaged in manufacturing chewing and smoking tobacco and snuff.
- SIC code 2141 (Tobacco Stemming and Redrying) - establishments primarily engaged in the stemming and redrying of tobacco or in manufacturing reconstituted tobacco.

Based on information in the 2002 Economic Census, EPA estimates there are 114 tobacco products facilities in the United States. The U.S. Economic Census reports data by NAICS code while EPA's Toxics Release Inventory (TRI) and Permit Compliance System (PCS) databases report data by SIC code. For this reason, the 2002 Census data have been converted to the equivalent SIC code to standardize the results. Table 1 shows the number of facilities in each SIC Code as reported in the 2002 Census.

Table 1. Number of Tobacco Products Establishments, 2002

NAICS code	Description	SIC Code	2002 Census
312-221	Cigarette manufacturing	2111	15
312-229	Other tobacco products	2121 (cigars)	83
		2131 (chewing & smoking tobacco)	
312-210	Tobacco stemming and re-drying	2141	16
total			114

source: U.S. Economic Census, 2002 [2]

Tobacco Manufacturing facilities are located throughout the United States with a concentration in Florida, North Carolina, Pennsylvania and Virginia. [3] Based on information in the 2002 Census, over half of the facilities have fewer than 20 employees. In fact, six facilities account for about 60% of the industry employment. That is, the industry is marked by a few very large facilities that account for the bulk of the production with a plethora of small widely-dispersed facilities accounting for the rest. In addition, five of the six largest facilities in terms of employment are in cigarette manufacturing (SIC Code 2111). The sixth is a cigar manufacturer.

For additional information and a more detailed industry profile, see Industry Profile for Tobacco Manufacturing Facilities [3] (DCN 02281).

Tobacco Facilities Included in EPA Databases

Table 2 presents the number of tobacco facilities with information in EPA's TRI and PCS databases.

Industrial or commercial facilities that discharge wastewater directly to surface waters are required to obtain an NPDES discharge permit from EPA or state permitting authorities. Permitting authorities classify discharges as major based on, among other factors, the potential for the discharge of toxic pollutants and the discharge flow. Facilities with major discharges must report compliance with NPDES permit limits via monthly Discharge Monitoring Reports (DMRs) submitted to the permitting authority. The permitting authority enters the reported DMR data into PCS. EPA does not require permitting authorities to input monitoring data for minor dischargers. For this reason, the PCS database includes data only for a limited set of minor dischargers when the states choose to include these data. Based on information collected to date, only one direct discharging tobacco products processing facility is classified as a major discharger.

As shown in Table 2, nine of the 114 tobacco facilities enumerated by the 2002 census have active NPDES permits. The remaining facilities either discharge no wastewater or discharge their wastewater to a city sewer and POTW. Table 2 also shows that PCS includes

discharge monitoring data for only one major facility (Reynolds American, Hanmer Plant, Chester, VA).

The TRI database includes information reported by facilities that meet certain requirements: They must have operations in SIC codes 20 through 39, or seven additional SIC codes outside this range; they must have 10 or more full-time employees; and they must manufacture, process or otherwise use each TRI-listed chemical at or above the appropriate activity threshold (specified for each chemical). In TRI, facilities report annual loads released to the environment of each toxic chemical or chemical category that meets reporting requirements. For this review, EPA focused on the amount of chemicals facilities reported either discharging directly to a receiving stream or discharging indirectly by transfer to a POTW.

As shown in Table 2, a total of 20 of the 114 tobacco facilities enumerated by the 2002 census reported wastewater discharges of TRI-listed chemicals. Facilities that did not report to TRI may not discharge any wastewater or may discharge wastewater, but fail to meet the TRI employment or chemical-use reporting requirements. Most reporting facilities either manufactured cigarettes or conducted tobacco stemming and re-drying operations. No cigar manufacturers reported discharges.

Table 2. Number of Tobacco Facilities with Information in EPA Databases.

SIC Code	Description	2002 PCS		2002 TRI			
		Active Permits	Major Dischargers with DMR data in PCS	Total	Direct	Indirect	Both ²
2111	Cigarette manufacturing	2	0	7	1	5	1
2121	Cigars	1	0	0	0	0	0
2131	Chewing and Smoking Tobacco	1	0	4	0	4	0
2141	Tobacco stemming and re-drying	5	1	9	1	6	2
		9	1	20	2	15	3

Sources: EPA's Envirofacts database [4], *PCSLoads2002* and *TRIRelases2002* [see 5]

One of the toxic chemical categories that facilities are required to report to TRI is "nicotine and salts." Table 3 presents the nicotine discharges reported by 19 of the 20 tobacco facilities that reported wastewater discharges to TRI in 2002. More than 90% of the nicotine

discharges are reported by cigarette manufacturers. Most of the rest are reported by facilities that report SIC code 2141, tobacco stemming and re-drying, as their primary SIC code.

Table 3. Nicotine Wastewater Discharges (pounds), by SIC Code

SIC Code	Description	2002 Nicotine Discharges Reported to TRI	
		pounds	% of total
2111	Cigarette manufacturing	552,397	93.46%
2121	Cigars	0	0
2131	Chewing and Smoking Tobacco	7,567	1.28%
2141	Tobacco stemming and re-drying	31,079	5.26%
total		591,042	

source: *TRIRelases2002* [5]

Note: discharges include transfers to POTWs and account for an average POTW removal efficiency for nicotine of 1.91%

Most facilities that report SIC code 2141 as their primary SIC code conduct stemming and re-drying operations: grading, blending, and removing stems from the tobacco leaves then re-drying the leaves to remove moisture and ensure they can be stored. Both stems and leaves are shipped to the end product manufacturer [3]. Some facilities that report SIC code 2141 produce reconstituted tobacco sheet which is used by other facilities owned by the same company to manufacture cigarettes. The Philip Morris Park 500 plant is an example. This facility processes the remainders left over from the cigarette production at other facilities into a product known as reconstituted tobacco. This paper-like tobacco is shipped to other Philip Morris plants, where it is blended with virgin tobacco to make cigarettes. [3]

Wastewater Discharge

Cigarette Manufacturing and Reconstituted Tobacco

Based on information collected to date, EPA believes that primary processing at cigarette manufacturers and their related reconstituted tobacco operations are the only significant wastewater dischargers in this industry in terms of volume. Cigarette manufacturing accounts for 62% of the employment in the tobacco products industry. [3] Philip Morris USA, a subsidiary of the Altria Group, controls 49% of the U.S. market while Reynolds America (formed by R.J. Reynolds' purchase of the Brown and Williamson division of British American Tobacco in 2004) owns 32% of the domestic market. The next largest company, in terms of market share, is Lorillard Tobacco Company (part of Loews) with 9% of the market. [3]

EPA contacted each of these companies to collect information on wastewater generation, characteristics, control, and discharge at their facilities. These companies collectively operate

six cigarette manufacturing facilities and two reconstituted tobacco facilities, two of which are direct discharges and four of which discharge indirectly to POTWs. One of the cigarette manufacturing facilities also performs reconstituted tobacco operations. According to these companies, these three represent all of the reconstituted tobacco operations in the United States. Information submitted Philip Morris, Reynolds American, and Lorillard can be found in DCN 01834, 01835, and 01830, respectively.

EPA conducted site visits at four cigarette manufacturing facilities and two dedicated reconstituted tobacco facilities. For notes of pre-visit discussions with these facilities, see DCNs 01912 to 01917. In addition to collecting information on processes and wastewater generation, EPA also collected grab samples of wastewater during these site visits. EPA collected these wastewater samples to 1) further characterize wastewater generated and/or discharged at these facilities and 2) evaluate treatment effectiveness, as applicable. EPA expects to place non-CBI information and data regarding these site visits and sampling episodes in the public record (EPA Docket No. OW-2004-0032) by December 2005.

Tobacco Stemming and Redrying

In its raw form, tobacco is a highly perishable product. It must be processed soon after harvest to create a product that can be stored until it is needed for use in cigarettes, cigars, and smokeless tobacco. Stemming and re-drying facilities that process green—recently harvested—tobacco are the “middle man” between farmers and manufacturers. Stemming and re-drying companies purchase tobacco to meet the specific needs of end-product manufacturers with whom they have long standing relationships. After purchase, the company grades, blends, and removes the stems from the leaves then re-dries the leaves to remove moisture and ensure they can be stored. Both stems and leaves are shipped to the end product manufacturer.

EPA estimates that there are 16 tobacco stemming and redrying facilities in the United States. They are primarily located on the East Coast - near tobacco farmers. EPA contacted one of the two primary companies that dominate this industrial sector. During processing, the only water usage is for misting. All of the water sprayed onto the tobacco during misting is absorbed by the tobacco; there is no wastewater discharge from this phase of the operation. The main wastewater source at these facilities results from rain that may come in contact with materials from baghouses, which are used for air controls. Therefore, based on information collected to date, EPA believes that very little process-related wastewater, if any, is generated and/or discharged from tobacco stemming and redrying facilities. See DCN 01921 for additional information on tobacco stemming and redrying.

Cigars

There are three categories of cigars: premium cigars, large cigars, and little cigars. Premium cigars are hand-made from the best tobacco and sell for \$1 to more than \$25 dollars each. The Congressional Research Service estimates that 99% of premium cigars are imported. Based on information collected to date, EPA believes that the remainder are made in very small shops. Outside of these small shops, the only other premium cigars manufactured in the United States are produced in Puerto Rico.

Large cigars are mass produced by machines from lower quality tobacco and sell for under a dollar each. Small cigars are machine made and defined as cigars that weigh less than three pounds per thousand. In 1997, approximately 2.3 billion large cigars were manufactured in the United States—about 61% of cigars—while small cigars made up about 39% of the market. In terms of production, cigarettes dwarf cigars. For comparison, it would take the Philip Morris cigarette manufacturing plant in Richmond less than 7 days to make 3.8 billion cigarettes, the number of cigars manufactured in the United States in all of 1997. In addition, some small cigar companies have recently moved manufacturing operations from the United States to other countries such as the Dominican Republic. For some locations, it is difficult to ascertain whether they only import tobacco or manufacture products from imported tobacco.

Because the vast majority of cigar manufacturing is conducted outside of the United States and/or at a few small facilities, EPA does not believe that cigar manufacturing in the United States produces significant amount of wastewater discharges. As shown in Table 2, no cigar manufactures reported to TRI wastewater discharges of toxic chemicals in 2002.

Other Tobacco Products Processing

This category includes a number of very different tobacco products. The most important are smokeless tobacco and smoking tobacco (roll your own cigarettes and pipe tobacco). Overall, Census [3] reports 70 companies in this sector.

The smokeless tobacco category includes dry snuff, moist snuff, plug/twist, and loose leaf chewing tobacco. According to the Federal Trade Commission, in 2001, moist snuff accounted for over 83% of smokeless tobacco sales, followed by loose leaf chewing tobacco with more than 13% of sales. All other smokeless tobacco products account for less than 4% of sales. [3]

References

1. Tobacco Products Processing, Draft Detailed Study Plan. November 10, 2004.
2. U.S. Economic Census. 2002. Available online at: <http://www.census.gov/econ/census02>.

3. James Covington, III, EPA/OW/OST. Memorandum: Tobacco Manufacturing Industry: Economic Profile. August 10, 2005.
4. U.S. EPA, Envirofacts, Available online at: <http://www.epa.gov/idea/>
5. U.S. EPA, Screening-Level Analysis Report. August 2005.