decompose to carbon disulfide, dialkylamine, and dialkyldithiocarbamate.

2. Listing Obligations

Commenters also took issue with the inclusion of all the four chemical types of carbamates under the scope of the statutory obligation of HSWA and that of the proposed consent decree in EDF v. Browner (Civ.No. 89-0598, District of Columbia Circuit).² Specifically commenters believed that thiocarbamates and dithiocarbamates should not be included with carbamates and that the listing determination should have been limited to the specific compounds identified in the proposed consent decree. Several commenters believe EPA is obligated only to make hazardous waste listing determinations for production wastes from those specific dithiocarbamates, thiram, ziram and ferbam, listed in the proposed consent decree. Other commenters believe that the scope of the listings should be limited to pesticide products.

Sections 3001(e) and 3001(b) give the Agency the authority to list any waste as hazardous provided it satisfies 40 CFR 261.11. Furthermore, Section 3001(e)(2) of RCRA as amended mandates that the Agency make a determination whether or not to list as hazardous wastes from the manufacture of carbamates. Since the statute gives no further definition of carbamates, it is left to the Agency to determine the scope of the wastes subject to the mandate. The Agency believes that the mandate was to make hazardous waste listing determinations for wastes generated from the manufacture of carbamates. Neither the congressional mandate nor the EDF consent decree limited the Agency's authority to consider the range of wastes subject to this rulemaking

One commenter suggested that EPA limit the scope of the listings to wastes from the manufacture of pesticide products. The Agency disagrees with the commenter. The Agency's industry study focused on the four distinct groups of chemicals. This study was designed to evaluate the wastes from the production of these chemicals and the potential of the products to pose a hazard to human health or the environment when discarded. Thus, the end use of the product was not considered to be relevant, only the

wastes. For dithiocarbamates which are used as both pesticides and rubber processing chemicals, the Agency found that the processes used, the wastes generated, the management practices, and the mismanagement scenarios were similar regardless of the end use. The Agency thus feels that regulating wastes from the production of dithiocarbamates without regard to end use is appropriate. For P and U listings, the Agency considered the toxicity of the material. The Agency feels that the end use is not an appropriate consideration because these listings regulate the disposal of the chemical as a waste.

3. Specific Substances

Commenters requested specific guidance in determining whether a given product fell within the scope of the listing. Commenters noted that the chemical definition of carbamate includes all salts and esters of carbamic acid. As such, commenters stated that carbamates could be viewed to include such substances as ammonium carbamate (a carbamic acid salt) and polyurethanes (polymers of linked carbamate ester structures). In order to narrow the scope of the proposed listing to the particular carbamate structures studied, it was suggested the Agency either list specific products to which the listing would apply, or restrict the listing applicable to pesticide products.

In response, the Agency believes the toxicity of carbamates, carbamoyl oximes, thiocarbamates, and dithiocarbamates to be a function of the bioavailability and reactivity of the chemicals as a waste, and therefore product use should not be a limiting factor, as bioavailable and reactive carbamates used for industrial purposes other than pesticides are assumed to have the potential to exhibit toxicity. With regard to the specific chemicals mentioned above, polyurethanes are large biologically unavailable molecules not within the scope of this rulemaking. Isotoic anhydride contains a -N-(C=O)-O- sequence, but chemically the substance is an acid anhydride and is not within the scope of this rulemaking. Furthermore, carbamates that are not isolated during production (i.e., transient intermediates and not removed from a process) are not included in the scope of the listing. Processes which include the brief formation of a carbamate intermediate which is not separated from the process or transported to another facility or process train and is converted to a noncarbamate is not included in the scope of the listing.

In the case of ammonium carbamate, the material is sold or transferred as a product for use in the production of urea. The Agency believes that wastewaters from the production of ammonium carbamate fall under the K157 listing unless they meet the specified exemption. The Agency also notes that ammonium carbamate is currently regulated as a CERCLA hazardous substance with a final reportable quantity (RQ) of 5000 pounds.

4. Definition of Production

Several commenters stated that the definition of production should be clarified to limit the rule to the chemical synthesis of a carbamate, carbamoyl oxime, thiocarbamate or dithiocarbamate as an isolated product and propose a definition that does not include operations which isolate noncarbamate product for which there is otherwise a commercial market. Several commenters also wanted clarification on whether wastes from use or formulation were included in the scope of the proposed listings.

In studying the carbamate manufacturing industry, the Agency analyzed current carbamate manufacturing processes. In order to focus the study, the Agency determined the raw materials, processes and reactions that were unique to the carbamate manufacturing industry. The Agency concludes that carbamate production begins with the synthesis of non-carbamate intermediates, chemicals which have no other use except for the production of a carbamate product or carbamate intermediate, and includes all subsequent processes involved with the production of the respective carbamate. Therefore, wastes from chemical processes which produce noncarbamate basic or specialty chemicals, which have multiple uses, are not subject to the K156-K161 hazardous waste listings. For example, wastes from the production of phosgene or methyl isocyanate which are used in numerous chemical production activities would not be included in the scope of the listing. In the case of non-carbamate intermediates, which have no other use but the production of carbamate intermediates or final products, wastes from the production of such intermediates would be subject to the listing. Such wastes are properly classified as carbamate production wastes and within the scope of RCRA § 3001(e)(3), regardless of whether or not the production occurred at the ultimate site of manufacture of the carbamate chemical. Thus, wastes from the production of bendiocarb phenol, A-2213 (intermediate in oxamyl production), and carbofuran phenol, all

² The Environmental Defence Fund (EDF) sued the Agency for *inter alic*, failing to meet the statutory deadlines of section 3001(e)(2) for making a hazardous waste listing determination for carbamates. The resulting consent decree (entered December 9, 1994) establishes a number of deadlines, including a January 31, 1995, deadline for this action.