

IX. Water Quality Analysis and Environmental Benefits

A. Introduction and Overview

This section presents EPA's estimates of the national environmental benefits of the final MP&M effluent guidelines. The benefits occur due to the reduction in facility discharges described in section VII. The methodologies used in the estimation of benefits of the final rule are largely similar to those used for estimating benefits of the proposed rule (*see* 66 FR 424). The Notice of Data Availability (*see* 67 FR 38752) and section IV.B of today's final rule discuss revisions made to these methodologies after the publication of the proposed rule. The EEBA provides EPA's complete benefit assessment for the final rule.

EPA estimated national benefits from the regulation on the basis of sample facility data. The Agency extrapolated findings from the sample facility analyses to the national level using two alternative extrapolation methods: (1) traditional extrapolation and (2) post-

stratification extrapolation. Section A.2 of today's final rule and Appendix G of the EEBA discuss the extrapolation methods used in the benefits analysis in detail.

To supplement the national level analysis performed for the final MP&M regulation, EPA also conducted a detailed case study of the expected State-level costs and benefits of the MP&M rule in Ohio. For several important reasons, EPA judges that the Ohio case study is more robust than the national benefit analyses that EPA undertakes in support of effluent guideline development. These reasons include: (1) Use of more detailed data on MP&M facilities than is possible at the national level; (2) use of more detailed and accurate water quality data than are usually available; (3) more accurate accounting for the presence and effect of multiple discharges to the same reach; (4) inclusion of data on non-MP&M discharges in the baseline and post compliance; (5) use of a first-order decay model to estimate in-stream concentrations in downstream water

bodies; and (6) inclusion of an additional recreational benefit category (swimming) in the analysis.

Sections B through G of today's final rule discuss the national level benefits analyses; section H presents the Ohio case study. These sections include results only for the final rule; however, the EEBA presents results for additional options evaluated.

1. Benefit Overview

Table IX-1 summarizes the benefits categories associated with the regulation and notes which categories EPA was able to quantify and monetize. The benefits include three broad classes: human health, ecological, and economic productivity benefits. Within these three broad classes, EPA was able to assess benefits with varying degrees of completeness and rigor. Where possible, EPA quantified the expected effects and estimated monetary values. Data limitations and limited understanding of how society values certain water quality changes prevented monetizing some benefit categories.

TABLE IX-1.—BENEFIT CATEGORIES ASSOCIATED WITH WATER QUALITY IMPROVEMENTS RESULTING FROM THE METAL PRODUCTS AND MACHINERY EFFLUENT GUIDELINE

Benefit Category	Quantified and monetized	Quantified and nonmonetized	Nonquantified and nonmonetized
Human Health Benefits:			
Reduced cancer risk due to ingestion of chemically-contaminated fish and unregulated pollutants in drinking water	X		
Reduced non-cancer adverse health effects (e.g., reproductive, immunological, neurological, circulatory, or respiratory toxicity) due to ingestion of chemically-contaminated fish and unregulated pollutants in drinking water		X	
Reduced non-cancer adverse health effects from exposure to lead from consumption of chemically-contaminated fish	X		
Reduced health hazards from exposure to contaminants in waters used recreationally (e.g., swimming)			X
Ecological Benefits:			
Reduced risk to aquatic life		X	
Enhanced water-based recreation, including fishing, boating, and near-water (wildlife viewing) activities	X		
Other enhanced water-based recreation, such as swimming, waterskiing, and white water rafting			X
Increased aesthetic benefits, such as enhancement of adjoining site amenities (e.g., residing, working, traveling, and owning property near the water)			X
Non-user value (i.e., existence, option, and bequest value)	X		
Reduced contamination of sediments			X
Economic Productivity Benefits: ^a			
Benefits to tourism industries from increased participation in water-based recreation			X
Improved commercial fisheries yields			X
Reduced water treatment costs for municipal drinking water, irrigation water, and industrial process and cooling water			X

^a The final rule regulates direct dischargers only. Therefore the selected option does not affect POTW operation. EPA, however, includes this benefit category when analyzing alternative options which considered the regulation of indirect dischargers (See Chapter 19 of the EEBA for the benefits analysis of alternative options).

2. Extrapolation Methods

EPA traditionally estimates national level costs and benefits by extrapolating analytic results from sample facilities to the national level using sample facility

weights. EPA's traditional sampling approach relies on information about the economic and technical characteristics of the regulated community. Although important for

understanding the technical requirements and costs of a regulation, this sampling approach does not incorporate information that could significantly affect the occurrence and