

EXECUTIVE SUMMARY

ES.1 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) has finalized Clean Water Act effluent limitations guidelines and new source performance standards for aquatic animal production facilities. The regulation establishes for the first time technology-based effluent guidelines for wastewater discharges from new and existing aquatic animal production facilities that discharge directly to U.S. waters. This document summarizes the costs, economic impacts, and the environmental benefits associated with this regulation.

EPA's National Pollutant Discharge Elimination System (NPDES) regulations define when a hatchery, fish farm, or other facility is a concentrated aquatic animal production facility that is a point source subject to the NPDES permit program. See 40 CFR 122.4. In defining "concentrated aquatic animal production (CAAP) facility," the NPDES regulations distinguish between warmwater and coldwater species of fish and defines a CAAP by, among other things, the size of the operation and frequency of discharge. A facility is a CAAP if it meets the criteria in 40 CFR 122 Appendix C or if it is designated as a CAAP by the NPDES program director on a case-by-case basis. For more information, see the preamble of the final regulation.

Aquatic animals raised for commercial and noncommercial purposes are diverse, ranging from species produced for human consumption as food to species raised for recreational purposes. The animals may be raised in a variety of production systems. The choice of a production system is influenced by a variety of factors including species, economics of production, markets, local water resources, land availability, and operator preference. Some production systems, especially those needed to produce species intended for release into the wild or other natural environments, are designed to provide a suitable environment that imitates the natural environment of the species.

Entities potentially regulated by this action include facilities engaged in concentrated aquatic animal production, which may include both commercial (for profit) and noncommercial (public) facilities. By North American Industry Classification System (NAICS), regulated entities include "Finfish Farming and Fish Hatcheries" (NAICS 112511) and "Other Animal Aquaculture" (NAICS 112519).

On December 29, 2003, the Office of the Federal Register published a Notice of Data Availability (USEPA, 2003; 68 FR 75068). In the Notice, EPA summarized the data received since the proposed rule and described how the Agency might use the data for the final rule. The Notice discussed EPA's detailed survey effort. This second phase of data collection involved mailing a survey that asked for more detailed and specific information than the initial screener survey. The detailed survey was a stratified sample population of facilities identified from the screener survey. EPA received responses from 205 facilities. The surveyed population included a statistically representative sample of facilities that reported producing aquatic animals with flow through, recirculating and net pen systems. EPA also surveyed a small number of facilities that would not have been subject to the proposed requirements.

This Economic and Environmental Benefit Analysis (EEBA) summarizes EPA's analysis of the estimated annual compliance costs and the economic impacts that may be incurred by affected operations that are subject to the final rule. The report covers financial impacts to regulated aquaculture

facilities, along with market and other secondary impacts such as impacts on prices, quantities, trade, employment, and output. This report also present EPA’s estimates of the environmental benefits associated with the final regulation. It also responds to requirements for small business analyses under the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) and for cost-benefit analyses under Executive Order 12866 and the Unfunded Mandates Reform Act (UMRA).

Additional information on EPA’s costing methodology and estimated costs are provided in the “*Technical Development Document for the Final Effluent Limitations Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category*” [EPA-821-R-04-012] referred to in this report as the “Development Document.” That document presents the technical information that formed the basis for EPA’s decisions in the final rule. It also describes, among other things, the data collection activities, the wastewater treatment technology options considered by the Agency as the basis for effluent limitations guidelines and standards, the pollutants found in wastewaters, the estimates of pollutant removals associated with certain pollutant control options, and the cost estimates related to reducing the pollutants with those technology options. The Proposal EIA provides a detailed industry profile of the U.S. aquaculture industry (USEPA, 2002b, Section 2).

ES.2 DATA AND METHODOLOGY

ES.2.1 Data Sources

EPA’s economic analysis relied on a wide variety of data and information sources. Data sources used in the economic analysis include EPA’s Screener Questionnaire and EPA’s Detailed Questionnaire for the Aquatic Animal Production Industry, data from the U.S. Department of Agriculture (USDA) and the Joint Subcommittee on Aquaculture (JSA),¹ as well as the academic literature and industry journals.

EPA collected facility-level production data from individual aquatic animal producers through a screener survey administered under the authority of the CWA Section 308 (USEPA, 2001). EPA used response data from the screener survey to classify and subcategorize facilities by production method, species produced and production level, and water treatment practices in place prior to the proposed regulation. EPA used the information from the screener survey to identify a subset of facilities to receive the detailed questionnaire. Details about the use of screener survey data are in the Technical Development document for the proposed rule (USEPA, 2002c).

Like the screener survey, EPA administered the detailed survey under the authority of the CWA Section 308 (USEPA, 2002e). EPA used response data from the survey to classify and subcategorize facilities by production method, species produced and production level, and water treatment practices in place prior to the proposed regulation. For commercial operations, the survey instrument collected financial and economic information at the aquaculture enterprise, the facility, and the company that owned the facility. For public or noncommercial operations, EPA collected financial and economic information on operating costs and funding sources.

¹ JSA is a Federal interagency coordinating group, authorized under the National Aquaculture Act of 1980 and the National Aquaculture Improvement Act of 1985.

More information on the sources of data used for this analysis is provided in Section 1.2 of this report, the rulemaking preamble, and in EPA's *Development Document* (USEPA, 2004).

ES.2.2 Regulated Community

EPA estimates that a total of 242 facilities will be in scope of this final regulation. Table ES-1 summarizes the estimated number and type of facilities affected by the rule, based on the production threshold of 100,000 lb/year. These 242 facilities consist of 101 commercial facilities and 141 noncommercial facilities (Federal, State, Tribal, and Alaska nonprofit organizations). Of the 101 commercial facilities that potentially incur costs under the final rule, 82 are in the Flow Through and Recirculating Subcategory. Of the commercial facilities represented in the detailed summary, 69 are projected to show long-term profitability (estimated by cash flow) prior to the final rule. The remaining 32 facilities are termed "baseline closures" because they are projected to show long-term unprofitability in absence of the final rule. EPA has identified no academic/research facility in the detailed questionnaire that produced more than 100,000 lbs/yr. See Section 4.3 of this report for more information on EPA's cost estimates of this final regulation.

ES.2.3 Cost Methodology

Costs associated with regulatory compliance are used to estimate the economic impact of the effluent limitations guidelines and standards on the aquaculture industry. Economic impacts are a function of the estimated costs of compliance to achieve the requirements, which may include initial fixed and capital costs, and annual operating and maintenance (O&M) costs. EPA's estimation of these costs began by identifying the practices and technologies that could be used as a basis to meet particular requirements. EPA estimated compliance costs for each facility, based on the implementation of the practices or technologies that minimizes the cost to meet particular requirements.

**Table ES-1
Estimated Number of Affected Facilities with Production > 100,000 lbs/yr**

Organization	Estimated Number of Facilities¹		
	Baseline Closures²	Not Baseline Closures³	Total
Commercial	32 (28)	69 (69)	101 (97)
Noncommercial	NA (NA)	141 (141)	141 (141)
TOTAL	32 (28)	210 (210)	242 (238)

Source: Estimated by USEPA.

Source: EPA estimates from detailed survey (USEPA, 2002e).

NA: EPA does not analyze closures for government facilities.

¹ Numbers in (parentheses) are facilities EPA projects are *not* currently achieving the requirements of the final rule.

² Projected baseline closures are estimated using cash flow analysis. When net income analysis is assumed for earnings, the number of commercial baseline closures increases to 43. Baseline closures would not be projected to incur impacts from a new rule in accordance with EPA's Guidelines for Preparing Economic Analyses (USEPA, 2000). Baseline closures (based on cash flow) are therefore not included in estimates of costs for this rule.

³ Total costs and economic impacts for this rule are estimated using incremental compliance costs incurred by the facilities that are not baseline closures and not in compliance with the rule at time of final signature (i.e., 238 facilities are expected to incur costs under this rule: 97 commercial and 141 noncommercial facilities).

EPA developed cost estimates for capital, one-time fixed, land, and annual O&M costs for the implementation and use of the different best management practices and treatment technologies targeted under the regulatory options considered in the Final Rule. EPA developed the cost estimates from information collected during the detailed survey, site visits, sampling events, published information, vendor contacts, industry comments, and engineering judgment. Additional information on how EPA developed the cost models is provided in the *Development Document* (USEPA, 2004). See also EPA's detailed responses to public comments received on proposal and EPA's Notice on the proposed rule. These comments and the Agency's response are in the Comment Response Document that is available in the rulemaking record.

EPA initially estimates compliance costs in 2001 dollars. These costs are translated to 2003 dollars using a Construction Cost Index (ENR, 2004). Total costs for this rule are therefore given in 2003 dollars, but costs used for impact analysis are maintained in 2001 dollars to remain consistent with 2001 revenues in detailed survey responses.

ES.2.4 Economic Impact Methodology

For this final regulation, EPA evaluates the economic impacts on both new and existing commercial and also noncommercial operations. The following is a description of the approach EPA uses to prepare these analyses.

Existing Commercial Facilities

EPA uses several measures to evaluate possible impacts on existing commercial facilities. These measures examine the possibility of business closure and corresponding direct impacts on employment and communities and indirect and national impacts associated with closures.

To evaluate impacts to commercial facilities, EPA conducts a closure analysis that compares projected earnings, with and without cost of compliance with the final regulation, for the period from 2005 to 2015. EPA uses two measures to estimate earnings for the purposes of its closure analysis: cash flow and net income. The difference between the cash flow and net income calculations is depreciation (a non-cash cost). Depreciation is included as a cost in the net income basis but not in the cash flow basis.

Analysis using net income is more likely to identify baseline closures and could demonstrate additional regulatory closures associated with the rule. All other analytical results (for example other measures of economic impacts, costs) presented in this final action reflect discounted cash flow as the basis for earnings; EPA's analyses indicate that use of net income will not materially change results.

For this analysis, EPA calculates the difference between gross revenues and total expenses reported in the detailed questionnaire and reduced the value by the estimated Federal and State taxes to calculate net income. EPA then adds the non-cash expense of depreciation (when it was reported in the questionnaire) to net income to calculate cash flow. This approach is consistent with the guidance from the Farm Financial Standards Council (FFSC, 1997) and several business financial references (Brigham and Gapenski, 1997; Jarnagin, 1996; and Brealy and Myers, 1996). As part of this analysis, EPA examines the possibility of closure under three forecasting methods to project future earnings.

Baseline closures should not be attributed to the rule, but rather should be classified as baseline closures (USEPA, 2000). EPA did not analyze facilities with negative net earnings, under two or three of the forecasting methods before they incur pollution control costs (i.e., baseline closures). EPA determined that 32 out of 101 commercial facilities are baseline closures. Given that no closures are projected to occur under the final rule, there are no employment and other direct and indirect impacts estimated for this rule. EPA also performs additional sensitivity analysis on these results; a total of 43 baseline closures are projected under net income analysis.

In addition to its closure analysis, EPA also prepared additional analyses to assess other potential effects, including an analysis of additional moderate impacts using a sales test, an evaluation of financial health using an approach similar to that used by USDA, and an assessment of possible impacts on borrowing capacity.

For the purposes of assessing economic achievability, EPA assumes that facilities are unable to expand production to cover the cost of the rule and also cannot pass costs on to consumers. The facility, therefore, must absorb all increased costs. If it cannot do so and must remain in operation, all production is assumed lost. More information on EPA's rationale for this approach is provided in Section 3.6. EPA's assumption of no cost pass through is a more conservative approach to evaluating economic achievability among regulated entities. (To evaluate market and trade level impacts, however, EPA assumes all costs are shifted onto the broader market level as a way of assessing the upper bound of potential effect; see Section 5.4.)

See Section 3.2 for more information on EPA’s approach for addressing economic impacts at regulated commercial facilities.

Noncommercial Facilities

For the final rule, EPA collected information on how U.S. Fish and Wildlife Service (FWS) and State agencies make decisions about operating or closing public hatcheries. EPA confirmed that public hatcheries close; the FWS hatchery system once had as many as 250 hatcheries and it now operates fewer than 90 facilities. Closures may result from funding cuts (e.g., Mitchell Act funds and the Willard National Fish Hatchery or General Funds for State hatcheries) or revision of a program’s mission and goals (e.g., increase focus on endangered species versus provision of recreational services). Closures may also result from water quality impacts associated with aquaculture activities. The costs of upgrading pollution control at public hatcheries are not the primary reason for closure, but costs may tip the balance of a particular hatchery toward a closure decision.

In the absence of well defined tests for projecting public facility closures, EPA compares pre-tax annualized compliance costs (in 2001 dollars) to 2001 operating budgets for noncommercial facilities including State, Federal, and Tribal facilities (“Budget Test”). For the purposes of this analysis, EPA assumes a 5 percent and 10 percent threshold value as an indicator of potential financial impacts at noncommercial facilities. Accordingly, costs exceeding 5 percent and 10 percent signal potential “moderate” and “adverse” financial impacts, respectively. For Alaska nonprofit facilities, impacts are estimated by comparing pre tax annualized costs to harvest revenues.

Impacts to noncommercial facilities are expected to be a function of a facility’s ability to access additional funds from user fees. As part of analyses, EPA examines the ability of State-owned hatcheries to recoup compliance costs through increases in funding derived solely from user fees. All States and the District of Columbia have fishing license fees for residents. The license fees are not raised every year even though costs increase through inflation. Instead, when fees are raised or a fish stamp instituted, the raise or new fee is usually a round number such as \$3, \$5, or \$10. A \$3 to \$5 hike in State fishing license fees translates into an increase in fees of about 20 percent to 35 percent. Although all States report having fishing license fees, if a state hatchery reports no funding from user fee sources, EPA considers that facility to be unable to recoup increased costs through increased funding from user fees.

See Section 3.3 for more information on EPA’s approach for addressing economic impacts at regulated noncommercial facilities.

New Commercial Facilities

To assess effects on new businesses, EPA’s analysis considers the barrier that new compliance costs may pose to entry into the industry for a new facility. In general, it is less costly to incorporate waste water treatment technologies as a facility is built than it is to retrofit existing facilities. Therefore, where a rule is economically achievable for existing facilities, it will also be economically achievable for new facilities that can meet the same guidelines at lower cost. Similarly, even where the cost of compliance with a given technology is not economically achievable for an existing source, such technology may be less costly for new sources and thus have economically sustainable costs. It is possible, on the other hand, that to the extent the up-front costs of building a new facility are significantly

increased as a result of the rule, prospective builders may face difficulties in raising additional capital. This could present a barrier to entry. Therefore, as part of its analysis of new source standards, EPA evaluates barriers to entry. If the requirements promulgated in the final regulation do not give existing operators a cost advantage over new source operators, then EPA assumes new source performance standards do not present a barrier to entry for new facilities. See Section 3.5 for more information.

EPA's analysis includes all commercial facilities within scope of the rule, including those that are baseline closures. EPA examines the (1) proportion of commercial facilities that incur no costs, (2) proportion of commercial facilities that incur no land or capital costs, and (3) ratio of incremental land and capital costs to total company assets. The cost to asset ratio is calculated using company data because asset data were collected only at the company level. EPA calculates the ratio for each company and use the average of the ratios, rather than taking the ratio of average debt to average assets.

ES.3 EPA'S ESTIMATE OF REGULATORY COSTS

ES.3.1 Costs to Regulated Facilities

EPA estimates the annual incremental costs of compliance using the capital and recurring costs derived in the *Development Document* (USEPA, 2004). EPA converts these costs to incremental annualized costs. Annualized costs better describe the actual compliance costs that a regulated aquaculture facility would incur, allowing for the effects of interest, depreciation, and taxes. EPA uses these annualized costs to estimate the total annual compliance costs and to assess the economic impacts of the final requirements to each regulated operation. Section 3.1 provides more details on EPA's cost annualization model and methodology.

The final option sets narrative standards for the control of solids based on implementation through operational measures addressing (1) feed management, (2) cleaning and maintenance, (3) storage of feed, drugs and pesticides to prevent spills, (4) record keeping on feed, cleaning inspections, maintenance, and repairs.

Table ES-2 summarizes the total national costs for the final regulation. Estimated annualized cost for the final regulation is \$1.4 million (2003 dollars). Noncommercial facilities account for about 80 percent of the total cost of the rule. This estimated total cost reflects aggregate compliance costs incurred by facilities that produce more than of 100,000 lb/year and will be affected by this final regulation.

These aggregated cost estimates reflect pre-tax costs. However, EPA's model calculates both pre-tax and post-tax costs. The post-tax costs reflect the fact that a commercial regulated operation would be able to depreciate or expense these costs, thereby generating a tax savings. Post-tax costs thus are the actual costs the regulated facility would face. Post-tax costs are also used to evaluate impacts on regulated facilities using a discounted cash flow and net income analysis. Pre-tax costs reflect the estimated total social cost of the regulations, including lost tax revenue to governments. Pre-tax dollars are used when comparing estimated costs to monetized benefits that are estimated to accrue under the final regulations (see Sections 7 and 8 of this report). Estimated costs have been converted from 2001 dollars to 2003 dollars using the Construction Cost Index (ENR, 2004).

**Table ES-2
National Costs: Total by Subcategory and Option**

Production System ¹	Owner	Pre-tax Annualized costs (\$000, 2003 Dollars)
		Final Option
Flow Through and Recirculating	Commercial	\$256
	Noncommercial	\$1,149
Netpen	Commercial	\$36
	Noncommercial	\$0
Total Pre-tax ²		\$1,442

Note: May not sum due to rounding

1. Costs exclude baseline closure facilities; see Table ES-1.

2. Total annual post-tax cost is \$1,362 for the final option. Costs are calculated over the 2005 to 2015 period with a 7percent real discount rate.

ES.3.2 Costs to the Permitting Authority (States and Federal Governments)

All of the aquaculture facilities in the scope of the final rule are currently permitted, so incremental administrative costs of the regulation to the permitting authority are expected to be negligible. However, Federal and State permitting authorities will incur a burden for tasks such as reviewing and certifying the BMP plan and reports on the use of drugs and chemicals. EPA estimates these costs to be \$13,176 for the three-year period covered by EPA’s information collection request, or roughly \$4,392 per year. These results show that the recordkeeping and reporting burden to the permitting authorities is less than two-tenths of one percent of the pre-tax compliance cost for the final rule.

ES.4 EPA’S ESTIMATE OF REGULATORY IMPACTS

ES.4.1 Financial Effects to Regulated Operations

This section describes the results of EPA’s economic analysis of the effects of this final regulation on both new and existing commercial and also noncommercial operations. Based on the results of this and other analyses, EPA concludes that effluent requirements under the final option under this rule is economically achievable. See Chapter 5 of this report for more information.

For the purposes of this analysis, EPA assumes these operations are not able to pass on the compliance costs due to the regulation. EPA’s assumption of “no cost pass through” is a more conservative approach to evaluating economic achievability among regulated entities. See Section 3.6 of this report. (To evaluate market and trade level impacts, however, EPA assumes all costs are shifted onto the broader market level as a way of assessing the upper bound of potential effect; see Section 5.3)

Existing Commercial Facilities

Table ES-3 shows the effects on commercial operations from the final regulation based on EPA's economic analysis. As shown, EPA projects no enterprise or facility closures as a result of the final rule under the cash flow assumptions for earnings. The Agency therefore considers the final rule to be economically achievable for commercial facilities (and companies). For more information see Section 5.1 of this report.

EPA expects some operations will incur additional moderate impacts, based on an analysis that shows that some operations will incur compliance costs in excess of 5 percent of annual revenue. For the final regulation, 4 commercial facilities incur costs greater than 5 percent of sales, affecting about 4 percent of all existing regulated facilities in the continuous discharge subcategory and approximately 6 percent of all existing regulated facilities that are not projected to be baseline closures. No commercial facilities have costs that exceed 10 percent of annual revenue. EPA's analysis also shows one company potentially experience an impact on borrowing capacity. EPA considers these as "moderate" impacts (Section 3.2). EPA's analysis also shows no expected change in financial health for any of the commercial facilities as a result of the final regulation. This is based on EPA evaluation of the companies represented in the Agency's detailed questionnaire.

Noncommercial Facilities

Table ES-3 shows the impacts on noncommercial operations from the final regulation based on EPA's economic analysis. For the final option, 4 facilities incur costs exceeding 10 percent of budget. EPA assumes that those facilities that face costs exceeding 10 percent of their budget would be adversely affected by the final regulation. None of these facilities report user fee funds; EPA could not conduct additional supplemental analyses to determine whether an increase in fees could offset these results. EPA's results, therefore, indicate that 3 percent of all noncommercial operations may be adversely affected by this final regulation. These operations may be vulnerable to closure based on the results of the Agency's budget test but constitute a relatively small percent of the population.

Under a 5 percent budget test, 8 facilities exceed the threshold under the final regulation. Among facilities that experience an increase in costs exceeding 5 percent, EPA assumes these facilities would face moderate financial impacts but would not be adversely affected. These results show that an additional 6 percent of all noncommercial operations (not counting those adversely affected) would experience some moderate impact associated with the costs of the rule. Some of these facilities report user fees revenues. Therefore, EPA conducts additional supplemental analyses to determine whether an increase in user fees could offset these results (see Section 5.1.2.2).

Given that the results of EPA's analysis projects that a small share of regulated noncommercial facilities may incur costs exceeding 10 percent of budget, estimated at 3 percent of facilities, the Agency considers these final technology options to be economically achievable for noncommercial facilities. For more information see Section 5.1 of this report.

**Table ES-3
Economic Effects: Existing Commercial & Noncommercial Operations**

Threshold Test	Estimated Number of In-Scope Facilities	Final Option
Commercial Operations		
Closure Analysis¹	101	0
Sales test >3%	101	4
Sales test >5%	101	4
Sales test >10%	101	0
Change in Financial Health	NA ²	0
Credit test >80%	NA ²	1
Noncommercial Facilities⁵		
Budget test >3% (all facilities)	141	19
State owned only (# with user fees) ⁴	106	12 (8)
Federal owned only	33	7
Alaskan Non-Profit ³	2	0
Budget test >5% (all facilities)	141	12
State owned only (# with user fees) ⁴	106	8 (8)
Federal owned only	33	4
Alaskan Non-Profit ³	2	0
Budget test >10% (all facilities)	141	4
State owned only (# with user fees) ⁴	106	0 (0)
Federal owned only	33	4
Alaskan Non-Profit ³	2	0

Source: Estimated by USEPA using results from facility-specific detailed questionnaire responses, see Chapter 3.

1) Closure analysis assumes discounted cash flow for earnings. A total of 32 facilities are projected to be baseline closures; these facilities cannot be attributed to this rule.

2) Analysis performed at the company level. EPA evaluated 34 unweighted companies representing the 101 weighted facilities from the detailed questionnaire. The statistical weights, however, are developed on the basis of facility characteristics and therefore cannot be used for estimating the number of companies.

3) Two Alaska non-profit organizations are within the scope of this rule, but did not receive a detailed survey. They were costed using screener survey data. Economic impacts were calculated using publically available information.

4) Some State-owned facilities reported that they relied, in part, on funds from State user fee operations. These numbers are reported in parenthesis and are included in the overall numbers as well.

5) EPA maintains that there is potential for Tribal facilities to be present within the population of noncommercial facilities affected by this rule, despite the absence of a line item for Tribal facilities above. EPA, recognizing that the mission of Tribal facilities may differ to some extent from the mission of State and Federally operated facilities, maintains that operating budgets, standardized for production level, are likely to be similar to those presented in Table IX-3 (approximately 3% and 9% respectively).

New Commercial Facilities

EPA estimated that about 4 percent of regulated facilities do not incur any costs under the final regulation and about 76 percent of facilities incur no land or capital costs. The incremental land and capital costs, where they were incurred, represented less than 0.2 percent of total assets. Based on these results, EPA concludes that this final regulation should not present barriers to entry for new businesses. Section 5.2 of this report provides more information.

Small Businesses

The Small Business Administration (SBA) size standard for aquaculture facilities is \$0.75 million per year. Accordingly, a “small business” in the aquaculture sector refers to an operation that generates less than \$0.75 million in annual revenues.²

For this final regulation, EPA identified 37 facilities belonging to a small businesses and 1 facility belonging to a small nonprofit organization. For the purposes of the RFA, Federal, State, and Tribal governments are not considered small governmental jurisdictions, as documented in the rulemaking record (USEPA, 1999). Thus, facilities owned by these governments are not considered small entities, regardless of their production levels. EPA identified no public facilities owned by small local governments in the analysis.

EPA’s economic analysis shows that the final rule will have no adverse economic impacts on commercial facilities, including small businesses. The results of EPA’s economic analysis (presented in Section 5.1 of this report) covers all regulated facilities, including both small business and businesses that do not meet SBA’s small business definition. EPA estimates there are no impacts as measured by EPA’s facility and company closure analysis. EPA projects that no facilities belonging to small businesses will close as a result of this final rule. However, EPA does projects some moderate impacts to facilities owned by small businesses. Four facilities have costs-to-sales ratios in excess of five percent but no facilities have costs-to-sales ratios above 10 percent. All of these 4 facilities use a flow through production system. One small business fails the credit test but does not show a change in financial health.

Given the results of the economic analysis of the effects on small businesses, EPA has certified that this action will not have a significant economic impact on a substantial number of small entities. EPA also conducted outreach to small entities and convened a Small Business Advocacy Review Panel to obtain the advice and recommendations of representatives of the small entities that potentially would be subject to the rule’s requirements. Section 6 of this report provides more detailed information.

² SBA defines a “small business” in the agricultural sectors in terms of average annual receipts (or gross revenue) over a 3-year period.

ES.4.2 Economic Effects to National Markets

EPA was not able to prepare a market model analysis for this rule for reasons described in Section 3.6 of this report. Because EPA was not able to prepare a market model analysis for this rule, the Agency is not able to report quantitative estimates of changes in overall supply and demand for aquaculture products and changes in market prices, as well as changes in traded volumes including imports and exports. Despite this limitation, however, EPA does not expect significant market impacts as a result of this final regulation. EPA's analysis shows that no commercial facilities are projected to close. These estimated impacts coupled with the overall cost of the rule, as compared to the total value of the U.S. aquaculture industry, lead EPA to believe that the effects of this regulation on U.S. aquaculture markets will be modest. Finally, EPA believes that long-term shifts in supply associated with this rule are unlikely given expected continued competition from domestic wild harvesters and low-cost foreign suppliers. Three percent of all noncommercial facilities might experience adverse financial effects associated with the rule.

Foreign trade impacts are difficult to predict, since agricultural exports are determined by economic conditions in foreign markets and changes in the international exchange rate for the U.S. dollar. As discussed in Section 3.6 of this report, the U.S. accounts for about 1 percent of world production by weight. Due to the relatively small market share of U.S. aquaculture producers in world markets, EPA believes that long-term shifts in supply associated with this rule are unlikely given expected continued competition from domestic wild harvesters and foreign suppliers. EPA concludes that the impact of this final rule on U.S. aquaculture trade will not be significant.

The communities where aquaculture facilities are located may be affected by the final regulation if facilities cut back operations; local employment and income may fall, sending ripple effects throughout the local community. As EPA's analysis of this final regulation projects no commercial facility closures as a result of this rule, this indicates that the final rule will have no measurable impact on (1) direct losses in commercial production, revenue, or employment; and (2) local economies and employment rates. Therefore, EPA concludes there will be no measurable local or national impacts in the commercial sector. Should some facilities cut back operations as a result of this final regulation, EPA cannot project how great these impacts would be as it cannot identify the communities where impacts might occur. Even under a worst-case scenario that assumes the total costs of the rule are absorbed by the domestic market, EPA estimates that U.S. aquaculture prices would rise by little more than 1 cent per pound. (Section 5.3 of this report provides more detailed information.) Therefore, EPA does not expect significant market impacts as a result of this final rule.

ES.5 COST-BENEFIT ANALYSIS

Table ES-4 shows the economic value of the environmental benefits EPA is able to monetize (i.e., evaluate in dollar terms). EPA estimates the monetized benefits range from \$66,214 to \$98,616 per year. Monetized benefit categories are primarily in the areas of improved surface water quality (measured in terms of enhanced recreational value). EPA also identified a number of benefits categories that could not be monetized, including reductions in feed contaminants and spilled drugs and chemicals released to the environment, as well as better reporting of drug usage to permitting authorities. These benefits are described in more detail in Sections 7 and 8 of this report and other supporting documentation provided in the rulemaking record.

These estimated benefits compare to EPA's estimate of the total social costs of the final regulations of about \$1.4 million per year. These costs include compliance costs to all regulated facilities and administrative costs to Federal and State governments. EPA estimates the administrative cost to Federal and State governments to implement this rule is about \$4,392 per year (USEPA, 2002a, 57909). There may be additional social costs that have not been monetized. The benefit estimates are also expressed as pre-tax 2003 dollars. See Section 4.3 of this report for more information.

Table ES-4
Estimated Pre-Tax Annualized Compliance Costs and Monetized Benefits

Production System	Pre-tax Annualized Cost (Thousands, 2003 dollars)
Social Cost	
Flow Through and Recirculating	\$1,406
Net Pen	\$36
Subtotal (Industry Costs)	\$1,442
State and Federal Permitting Authorities	\$3
Estimated Total Costs	\$1,445
Monetized Benefits	
	\$66 to \$99
Estimated Total Benefits	\$66 to \$99

Note: Totals may not sum due to rounding

*Monetized benefits are not scaled to the national level.

ES.6 REFERENCES

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