

The effective operation of microscreen filters require that they be enclosed in heated buildings to prevent freezing when located in cold climates. EPA's revised estimates of costs for Option 3 are not based on the application of microscreen filters unless the detailed survey response indicated that such a structure existed at the site. When the detailed survey did not indicate a structure at the site, EPA estimated costs for a second stage settling structure rather than a microscreen filter. Based on data from two of EPA's sampling episodes at CAAP facilities, this technology will achieve the proposed limits for Option 3.

EPA agrees with concerns raised in comments that the cost associated with enclosing the filter in a heated structure would be prohibitive. Option B would allow facilities to choose between solids polishing treatment (*e.g.*, second stage settling) and solids control BMPs. For estimating compliance costs, EPA assumes that facilities will choose the least costly method which, in all cases, proved to be using the BMPs. Thus, EPA based Option B costs on the application of solids control BMPs.

To estimate costs for the drugs and chemical component of the BMP plan, EPA first looked at the detailed survey to determine if the facility reported using drugs, chemicals, or medicated feed. The detailed survey also asked if the facility has adopted health management BMPs. Although responses indicated that nearly half of the regulated population has some form of health management practices, we do not have information on the specific activities associated with these practices. Therefore, EPA assumed that all facilities reporting drugs and chemicals would incur additional costs to implement management practices (except in Idaho and Washington). These States have already issued NPDES permits that include requirements for drug and chemical management BMPs similar to those in our cost estimates. (EPA found evidence of other states with similar requirements, but no facilities in these states were in the group of in-scope facilities that responded to the detailed survey.) Costs include staff time for:

- Initial and annual plan review.
 - Weekly inspections of storage facility.
 - Completion of an application program worksheet (recordkeeping).
 - Completion of a disposal worksheet (for out-of-date drugs or chemicals).
 - Marking of production units being treated.
 - Annual training sessions.
- Management activities include:

- Initial plan development.
- Annual review and update of plan.
- Review of application worksheets.
- Leading facility training sessions.
- Quarterly inspections of entire facility.
- Management of veterinary assistance (*e.g.*, implementing vet recommendations).
- Biweekly review of drug and chemical records.
- Staff management consults.

Because therapeutic treatments vary considerably at a facility from year-to-year and also among facilities, EPA estimated the BMP costs based on monthly drug applications throughout the year. We estimated costs for a few hatcheries that produce only eggs and larvae for regular treatments to control fungus during the egg incubation period.

We also considered the use of activated carbon filtration to treat and remove drug or pesticide active ingredients from wastewater. Research indicates that this technology is effective at treating these compounds, and at least one aquatic animal production facility installed this technology. EPA estimated the costs for activated carbon treatment as a stand-alone technology. We estimated costs on a site-specific basis for facilities which reported using drugs and then added these costs for options A, B, 2, and 3 (*see* Section V.C.) to assess the economic achievability of this technology.

EPA estimated the costs to develop and implement escape management practices at facilities where (1) the cultured species was not commonly produced or regarded as native in the State, (2) the facility was a direct discharger, and (3) the species was expected to survive if released. (In contrast, producers of a warm water species in a cold climate, such as tilapia producers in Minnesota or Idaho, would not incur costs for this practice.) Costs for escape prevention include staff time for production unit and discharge point inspections and maintenance of escape prevention devices. We applied these costs to facilities that installed equipment conforming with State requirements for facilities producing non-native species (identified by the State). Management time includes quarterly production unit and discharge point inspections, eight hours a year to review applicable State and Federal regulations, and quarterly staff consultations.

EPA revised estimates for all labor costs using the employee and wage information supplied in the detailed surveys. For those facilities indicating

they use unpaid labor for all or part of the facility operation or did not supply useable wage information, we used average State or regional wages.

B. Revisions to Assumptions and Methodology Used in Loadings Analyses

1. Proposed Approach

To estimate the baseline discharge loadings and load reductions for the proposal, EPA used the same model approach described in Section V.A.1. for the costing analyses. We first estimated pollutant loadings for untreated wastewater based on several factors for each model facility. Feed offered to the CAAP species contributed to pollutant discharges in three ways: feces, urine-contributing dissolved ammonia, and uneaten feed (dissolved and particulate forms). These byproducts of feed contribute to the pollutant load in the untreated culture water. EPA used typical efficiency rates of removing specific pollutants from water for the technology options and BMPs we are considering. Using the same frequency factors for technologies in place that were used to estimate costs, we estimated the baseline pollutant loads discharged. We then calculated load reductions for the options.

2. Revised Loadings Approach

Rather than using the proposed model approach, EPA revised the loadings approach to incorporate a facility-level approach using data primarily from the detailed surveys, but also taking into account suggestions concerning appropriate feed conversion ratios (FCRs) provided by commenters. EPA also applied statistically-derived survey weights to get national estimates.

Since pollutant loads are proportional to feed inputs, improving feeding efficiency and reducing wasted (uneaten) feed will reduce pollutants discharged from CAAP facilities. EPA expects that using feed management BMPs will reduce pollutant loads by improving the efficiency of converting feed to the final product (*i.e.*, less feces and uneaten feed). EPA determined pollutant loadings from revised estimates of pollutant loads for a unit of feed input. EPA's re-evaluation of the baseline or current practices changed the loading estimates, reflecting survey responses on practices or treatment-in-place at facilities. The revised results also reflect the estimated FCRs we used in the facility-level analyses (*see* Section III.H).

In its evaluation of data from the facilities responding to the detailed survey, EPA found no apparent relationships that explain why some