



Economic Impact Analysis

2002 NPDES and State Waste Discharge General Permit for Stormwater Discharges Associated with Industrial Activities

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EXECUTIVE SUMMARY

The proposed general permit for stormwater discharges associated with industrial activities will have a disproportionate impact. However, there is little mitigation that that can be effected without violating requirements of state or federal water pollution control laws. Furthermore, in all the cases analyzed here, compliance costs are no higher than 0.5% of sales, and they only reach as high as that in a scenario with a combination of conservative assumptions.

INTRODUCTION

WAC 173-226-120 requires an economic analysis of any proposed water-quality permit that is intended to directly cover small businesses, to serve three purposes. First, it must explain the compliance requirements of the permit. Second, it must estimate the economic impact on small and large businesses and, to the extent possible, determine whether the permit is expected to have a disproportionate impact on small businesses. Third, if a disproportionate impact is expected, it must discuss what mitigation the permit provides to reduce the effect on small businesses, without compromising the mandated intent of the permit.

PERMIT REQUIREMENTS

General

The permit requirements can be divided into: capital expenses; operations and maintenance of pollution control measures; monitoring and analysis; and record keeping and reporting. As explained below, the first two categories, though they are spelled out below, do not figure into the calculation of disproportionate impact. Those calculations include only on the third and fourth categories (monitoring & analysis; record keeping & reporting).

All facilities covered under the permit must comply with both state and federal water pollution legislation and regulation. In practice this means that they must implement AKART, an acronym for “all known, available, and reasonable methods of prevention, treatment, and control.” The department’s *stormwater management manual* (SWMM) spells out AKART in the form of best management practices (BMPs) for specific industries. The SWMM for western Washington is already available; facilities in eastern Washington are to be guided by relevant sections of the western Washington SWMM until the manual for the eastern part of the state is available.¹

Capital expenditures themselves fall into two groups: source control and treatment. Source control refers to those measures designed to prevent contact between potential contaminants and stormwater. This can be as simple as a roof over a storage area so that stored materials are not exposed to rain. It can also be the installation of an impermeable surface where activities such as fueling and oil changing occur, so that spills and drips cannot seep into the ground and contaminate groundwater.

¹ Facilities may also use another guide to BMPs, such as a local document, but it is their responsibility to assure that the alternative used is functionally equivalent to the requirements in the department’s SWMM.

Treatment measures aim to remove contamination that has already occurred before stormwater is released from a facility to surface or ground waters. Examples include settlement ponds to allow suspended particles to settle and separate from stormwater, and oil/water separators to remove oil. Between the two types of measures, source control is the higher priority, as prevention is typically more effective than treatment.

Operation and maintenance measures are regular activities which keep the capital measures functioning properly. This ranges from inspection for unexpected failures of the measures, to predictable tasks such as cleaning of an oil/water separator.

Monitoring involves quarterly visual inspections and grab sampling of discharge waters. Analysis is a formal laboratory analysis of the collected samples. All facilities must analyze their samples for four parameters: turbidity, pH, total zinc, and petroleum. Zinc is chosen as an indicator of probable problems with copper and lead as well, so exceedences of zinc standards trigger a requirement to test for the other two metals along with the “hardness” of the water, which affects the impact dissolved metals have on ecosystems and human health.

In addition, various industrial groups must test for potential pollutants that are more prevalent in their line of work. These are:

Timber products and Paper and allied products:
Biological oxygen demand

Air transportation:²
Ammonia
Nitrate/Nitrite as N
Biological oxygen demand

Chemical and allied products, food and kindred products:
Nitrate/Nitrite as N
Phosphorus (TP)
Biological oxygen demand

Primary metals, metals mining, automobile salvage, scrap recycling, metals fabricating:
Must test for copper, lead and hardness without being triggered by high zinc levels

“Consistent attainment of benchmark values” is defined as eight consecutive quarters in which parameters do not exceed the levels specified in the permit. Consistent attainment on any given set of monitoring parameters (basic; other metals and hardness; industry-specific) exempts the facility from sampling and analysis on that set of parameters for the remaining term of the permit.

² The contamination is from deicing/anti-icing operations, so sampling is to occur 4 times between the beginning of December and the end of February. Testing for ammonia and nitrate/nitrite is required only if urea is applied.

The basic record keeping requirement is three years for all monitoring results. These include reports required by the permit, calibration and maintenance records and original recordings for continuous monitoring instrumentation, and records of data used to complete the application for the permit. The retention period is extended during the course of unresolved litigation regarding the Permittee's discharge. Ecology can also request an extension of the retention period.

Monitoring data must be submitted to the department no later than one month after the end of the relevant quarter.

Tying together all the BMPs is the Stormwater Pollution Prevention Plan (SWPPP) that facilities must create to gain coverage under this general permit. A SWPPP is a comprehensive document that describes all relevant aspects of a facility and details the BMPs to be used and the monitoring activities to be carried out. Permittees must conduct self-inspections, and if they identify inadequate BMPs or poorly described pollutant sources, the SWPPP must be modified to correct the problems.

Included vs. excluded

According to WAC 173-226-120(3)(b)(i), the economic analysis of a draft general permit *shall* include the minimum technology based treatment requirements identified as necessary under WAC 173-226-070. WAC 173-226-120(4)(a) says that the analysis *shall not* include the costs necessary to comply with chapters 173-200, 173-201³, 173-204, and 173-224 WAC nor costs associated with compliance with federal law or regulation.

For the purposes of the present analysis, physical measures – source control, contamination prevention, and treatment BMPs – are considered compliance with the listed WAC chapter, federal law or regulation, or both. As such, they are not included in this analysis.

Four other cost categories, while necessary to assure compliance with the BMPs referred to above, do not directly prevent any water quality impairment. These are:

- Monitoring
- Recordkeeping
- Reporting
- Creation and updating of the SWPPP

As such, these compliance costs are the subject of the current analysis.

ECONOMIC ANALYSIS

Definition of small business

For the purposes of this study, a small business is an independent entity with fewer than 50 employees organized for the purpose of making a profit. Enterprises that are owned by larger corporations are excluded, as are not-for-profit and government enterprises.

³ This presumably refers to chapter 173-201A WAC.

Sectors for analysis and sales estimates

As the permit involves five different levels of monitoring for different groups of industries, we analyze a representative sector in each of these five groups. The criteria for “representative” are as follows:

- 1) The analysis requires the use of data sources built on the old Standard Industrial Classification system (SIC) together with sources that use the new North American Industry Classification System (NAICS). Therefore, there must be a reasonable “mapping” between a given SIC sector and some corresponding NAICS sector(s);
- 2) The sector must have a mix of large and small businesses in Washington; and
- 3) Within the previous two criteria, the sector should be as highly represented as possible among current holders of the stormwater general permit (permit-holders are still classified by SIC).

The five sectors and the levels of monitoring they represent are:

- 4953 Refuse Systems (basic level of monitoring)
- 2421 Sawmills and Planing Mills, General (timber industries etc.)
- 4581 Airports, Flying Fields, and Airport Terminal Services (air transportation)
- 2092 Prepared Fresh or Frozen Fish and Seafoods (chemical and food industries)
- 5093 Scrap and Waste Materials (primary metals etc.)

The first step in the calculation is to estimate a range of sales for small and large firms within the given sector. For each sector chosen, sales and total number of employees are taken from the Economic Census of 1997 (which uses NAICS). These figures yielded an average level of sales per employee in the sector. Firm-size data are then gathered from the County Business Patterns (CBP), also for 1997 (which use SIC). The CBP data give numbers of firms in certain size ranges defined by the number of employees (for instance, how many firms in an industry have 1 to 4 employees, or 5 to 9 employees, and so on). By taking the low- and mid-points of these employee ranges, we can derive a range of typical sizes for both small and large firms. Multiplying these firm sizes by the sales-per-employee numbers derived in the first step of calculation described above, we get low and high estimates of typical sales by small and large firms in the sector.

Cost estimates

The three major cost components are lab fees, labor, and equipment.

In 1998, Ecology’s Lab Accreditation Program surveyed environmental laboratories regarding their fees for various water-quality parameters. This provided average fee levels for each of the parameters for which the stormwater general permit requires monitoring. We bring these fees up to 2002 price levels using the implicit Gross Domestic Product deflator between the third quarter of 1998 and the fourth quarter of 2001. Small firms are assumed to have one sample analyzed for each parameter, while large firms are assumed to have two samples analyzed for each parameter, to reflect the probability that sampling in more than one location would be necessary to capture the impact of a large installation.

Water Quality Program staff provided estimates of employee time required to carry out each of the major tasks required by the permit, divided into time of professional or supervisory personnel

and time of other employees. The economic analysis of the 1995 stormwater general permit used labor costs of \$50/hr for professional or supervisory personnel and \$16/hr for employees. These costs included salaries, benefits and overhead. For the present study, the costs are brought up to date by applying an inflationary factor for 1995-2001 from the Bureau of Labor Statistics, drawing specifically on the series for total compensation for private industry. The figures are quarterly and are not seasonally adjusted. We calculate the total inflation over the given span for each quarter-on-quarter, then average the four quarterly results for a total inflation of 27%. Applying this to the labor costs listed above yields hourly rates of \$60.30 for professional or supervisory personnel and \$20.32 for employees. For activities associated with monitoring (such as sample collection, recordkeeping, reporting), large firms are assumed to require twice as much labor as small firms, to reflect increased sampling activity described above.

This economic analysis carries over the assumptions made in the 1995 analysis regarding low and high costs of updating the SWPPP, at 1 and 4 hours of professional time respectively.

The Lab Accreditation Program also provided information on equipment requirements for pH testing, which needs to be done immediately after a sample is drawn in order to be valid. A suitable pH meter and probe was assumed to cost \$200, with annual replacement parts costs of \$50.⁴ For the low cost estimate, firms were assumed to already own the equipment, leaving only the annual purchase of replacement parts. Large firms were assumed to have double the replacement parts costs, to reflect increased sampling. The high cost estimate for both large and small firms included the cost of the machine, annualized using a 10% interest rate and spread over 5 years. Because pH testing is assumed to be done on-site, no lab fee is included for it in the analysis.

Conclusion on disproportionate costs

Tables V. and VI. in the Appendix give costs of compliance as a percentage of costs, for small and large businesses respectively. As the numbers there demonstrate, the draft general permit for stormwater does have disproportionately high costs for small businesses, even when comparing the low cost percentage for small firms with the high percentage for large ones. (Details of the cost and sales calculations are given in Tables I. – IV.) However, three points are important to keep in mind with regard to this conclusion.

- 1) At its highest, the permit represents 0.5% of sales.
- 2) All of the “high” numbers represent a set of conservative assumptions meant to show the worst case scenario. These assumptions minimize the size of small firms, which magnifies the impact of the permit; they exclude the possibility of volume discounts from environmental laboratories for multiple tests performed at once; and they make generous assumptions about the time required to perform the tasks specified by the permit.
- 3) The underlying factor is that permit compliance costs do not scale up in line with the size of a firm. The numbers presented in this study show that the typical large firm is an order of magnitude larger than the typical small firm. At the same time, while a big establishment plausibly requires more sampling than a small one, it does not need

⁴ The vast majority of facilities are not subject to pH limits and can therefore use litmus paper rather than having to use a meter. This is a considerable savings, so the inclusion of the meter cost in the analysis is a conservative assumption, tending to make the estimated compliance costs higher than the actual compliance costs.

ten times as much. As long as this is true, it is hard to avoid disproportionate costs for smaller firms and still have the assurance of compliance with water quality standards that monitoring provides.

MITIGATION OF SMALL BUSINESS IMPACT

WAC 173-226-120 requires that general permits reduce the burden on small businesses, where this can be done consistent with the stated objectives of the federal water pollution control act and the state water pollution control act (chapter 90.48 RCW). There is in general no reason to believe that small businesses are less responsible for stormwater impacts than are large ones. There is therefore no basis on which to allow more relaxed compliance with the permit without an unreasonable risk of violating water quality legislation.

There are, nonetheless, two elements of mitigation in the permit, one available to all entities, the other to a subset of small businesses. The first is the suspension of sampling requirements for those firms that demonstrate “consistent attainment” as discussed above in the section on “Permit Requirements.”⁵

There is also an Extreme Hardship waiver. Any industrial facility required to pay a permit fee may apply for a fee reduction if it meets certain conditions (see WAC 173-224-090), among them that it has less than \$1,000,000 in revenue from the process which necessitates the permit. A further reduction may be available if revenues from the permitted process are less than \$100,000 and the firm demonstrates that the permit fee represents an extreme hardship. Under the stormwater general permit, firms that qualify for this “extreme hardship” reduction may also be eligible to have their monitoring requirements reduced, if Ecology determines that stormwater from their facility represents no significant environmental risk.

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⁵ In the case of air-travel firms testing for effects of deicing, the threshold for suspension of monitoring is eight consecutive tests, since the testing period covers only the months of December, January and February.

APPENDIX: Tables

Table I. Annual Laboratory Fees				
Sector	SIC	Testing group	Small	Large
Refuse Systems	4953	Basic	\$345	\$690
Sawmills and Planing Mills, General	2421	Timber Products etc.	\$635	\$1,269
Airports, Flying Fields, and Airport Terminal Services	4581	Air transportation	\$439	\$878
Prepared Fresh or Frozen Fish and Seafoods	2092	Chemicals and food	\$611	\$1,221
Scrap and Waste Materials	5093	Primary metals etc.	\$535	\$1,070

Table III. Labor Costs for Small Businesses				
	Low		High	
Time	Prof/Sup	Staff	Prof/Sup	Staff
SWPPP	1	0	4	0
Sampling	1	6	2	12
Training	0	0	2	0
Reporting	1	2	2	4
Recordkeeping	0	2	0	4
Total Time	3	10	10	20
Cost	\$191	\$203	\$635	\$406
Total Labor Cost	\$394		\$1,041	
Note: Professional/Supervisory cost calculated as \$63.50/hr Staff cost calculated as \$20.32/hr				

Table III. Labor Costs for Large Businesses				
	Low		High	
Time	Prof/Sup	Staff	Prof/Sup	Staff
SWPPP	1	0	4	0
Sampling	2	12	4	24
Training	0	0	4	0
Reporting	2	4	4	8
Recordkeeping	0	4	0	8
Total Time	5	20	16	40
Cost	\$318	\$406	\$1,016	\$813
Total Labor Cost	\$724		\$1,829	
Note: Professional/Supervisory cost calculated as \$63.50/hr Staff cost calculated as \$20.32/hr				

Table IV. Equipment Costs		
<u>Small businesses</u>	Low	High
Initial cost, annualized	\$0	\$53
Annual replacement cost	\$50	\$50
Total annual cost	\$50	\$103
<u>Large businesses</u>	Low	High
Initial cost, annualized	\$0	\$53
Annual replacement cost	\$100	\$100
Total annual cost	\$100	\$153

Table V. Cost-to-sales comparisons, Small businesses							
Sector	SIC	Sales Range (\$1000)		Cost Range		Costs as % of sales	
		Low	High	Low	High	Low	High
Refuse Systems	4953	\$1,435	\$2,356	\$852	\$1,743	0.036%	0.122%
Sawmills and Planing Mills, General	2421	\$3,780	\$6,244	\$1,142	\$2,033	0.018%	0.054%
Airports, Flying Fields, and Airport Terminal Services	4581	\$398	\$677	\$946	\$1,837	0.140%	0.462%
Prepared Fresh or Frozen Fish and Seafoods	2092	\$3,632	\$6,038	\$1,118	\$2,009	0.019%	0.055%
Scrap and Waste Materials	5093	\$386	\$637	\$1,042	\$1,933	0.164%	0.500%

Table VI. Cost-to-sales comparisons, Large businesses							
Sector	SIC	Sales Range (\$1000)		Cost Range		Costs as % of sales	
		Low	High	Low	High	Low	High
Refuse Systems	4953	\$40,346	\$54,555	\$1,641	\$3,180	0.003%	0.008%
Sawmills and Planing Mills, General	2421	\$42,634	\$70,365	\$2,220	\$3,759	0.003%	0.009%
Airports, Flying Fields, and Airport Terminal Services	4581	\$10,667	\$13,300	\$1,829	\$3,368	0.014%	0.032%
Prepared Fresh or Frozen Fish and Seafoods	2092	\$31,959	\$52,325	\$2,172	\$3,711	0.004%	0.012%
Scrap and Waste Materials	5093	\$3,981	\$6,337	\$2,021	\$3,560	0.032%	0.089%