



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

## **Economic Impact Analysis**

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*Concentrated Animal Feeding Operation  
General Permit*

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# **Economic Impact Analysis**

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## **Concentrated Animal Feeding Operation General Permit**

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# Executive Summary

The Concentrated Animal Feeding Operations (CAFO) National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit (combined permit) and CAFO State Waste Discharge Permit (state permit) are statewide general permits that covers discharges of pollutants (the addition of manure, litter, process wastewater, and other pollutants to the waters of the state) associated with operating CAFOs within the State of Washington. The combined permit conditionally authorizes discharges to surface and groundwater while the state permit conditionally authorizes discharges to groundwater (and agricultural stormwater).

Permit requirements include:

- Manure, litter, process wastewater, and feed storage.
- Management of mortalities.
- Diversion of clean water.
- Prevention of direct animal contact with water.
- Chemical handling.
- Conservation practices to control nutrient loss.
- Manure, litter, process wastewater, and soil sampling.
- Protocols for the land application of waste.
- Record keeping.

The estimated costs for complying with the draft general permit, based on best available data and current requirements for compliance with other regulatory frameworks (e.g. RCW 90.64) for facilities covered under the draft general permit range from \$11,407 to \$19,092 for the state only permit and \$18,010 to \$25,695 for the combined permit, depending on the baseline considered. There may be additional costs on Permittees due to buffers, however, these costs are site-specific and cannot be estimated with any level of reliability.

While the vast majority of covered businesses are small businesses (having less than fifty employees), there are both small and large businesses in the CAFO industry. Overall, CAFOs average 7.9 employees. Among the small CAFOs, the average is 6.8 employees, and the large CAFOs average 79 employees.

It is likely that the costs of complying with the permit are disproportional.

To mitigate the burden on the smallest businesses, Ecology has included a lower threshold of animal numbers below which a CAFO does not have to apply for a permit unless Ecology determines the small CAFO is a significant contributor of pollutants.



# Chapter 1 Overview

## 1.1 Purpose of the analysis

The Concentrated Animal Feeding Operations (CAFO) National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit (combined permit) and CAFO State Waste Discharge Permit (state permit) are statewide general permits that cover discharges of pollutants (the addition of manure, litter, process wastewater, and other pollutants to the waters of the state) associated with operating CAFOs within the State of Washington. The combined permit conditionally authorizes discharges of waste to surface and groundwater while the state permit conditionally authorizes discharges to groundwater (and agricultural stormwater). The Washington State Department of Ecology's (Ecology) Waste Discharge General Permit Program rule (Washington Administrative Code (WAC) 173-226-120) requires an economic analysis of any draft wastewater general permit intended to directly cover small businesses. This analysis is required to include:

- A brief description of the compliance requirements of the draft general permit.
- The estimated costs for complying with the draft general permit, based on existing data and current requirements for compliance with other regulatory frameworks (e.g. RCW 90.64) for facilities covered under the draft general permit.
- A comparison, to the greatest extent possible, of the cost of compliance for small businesses, with the cost of compliance for the largest ten percent of businesses covered under the draft general permit.
- Discuss what mitigation the draft general permit provides to reduce the effect on small businesses (if a disproportionate impact is expected), without compromising the mandated intent of the draft general permit.

The Regulatory Fairness Act (RCW 19.85.020(3)) defines a small business as any business entity, including a sole proprietorship, corporation, partnership, or other legal entity, that is owned and operated independently from all other businesses, and that has fifty or fewer employees.

Under WAC 173-226-120, reductions in compliance costs for small businesses may be achieved by:

- Establishing different compliance and reporting requirements for small businesses.
- Clarifying, consolidation, or simplification of compliance and reporting requirements.
- Establishing performance standards instead of design standards.
- Exempting small businesses from parts of the draft general permit.

This analysis does not include benefits (of the permit) or environmental impacts. It only estimates the additional costs borne by expected Permittees resulting from compliance with the requirements of the draft general permit.

## 1.2 Permit history

The Federal Clean Water Act (CWA) establishes water quality goals for navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES) of permits. The United States Environmental Protection Agency (EPA) has delegated responsibility for administering the NPDES permit program in the state of Washington to Ecology. The delegation of authority is based on Chapter 90.48 RCW, which defines Ecology's authority and obligations in administering the NPDES permit program. When developing and issuing NPDES permits Ecology must comply with the federal Clean Water Act and EPA's implementing regulations. Ecology does not have the authority to issue NPDES permits to federal facilities or on federal and Tribal Lands.

The Concentrated Animal Feeding Operations (CAFO) general permit covers the animal and animal product industry and its supporting activities. This covers:

- Milk cows
- Beef
- Veal
- Raising heifers
- Pigs
- Poultry (chickens, turkeys, and ducks)
- Sheep
- Horses

Other animal types may be covered if Ecology determines the facility is a significant contributor of pollutants and meets the definition of a CAFO.

Only CAFOs that discharge pollutants into surface or ground waters are required to obtain a permit. All CAFOs have the ability to avoid the necessity of a permit by not discharging to state waters. For the 2005 general permit, there were only 12 permitted CAFOs, and one individually permitted CAFO. Based on data available on dairies, the universe of CAFOs is much larger, however – upwards of 450 operations.

CAFOs are defined as a point source of pollution in the CWA, Section 502(14) if there is a discharge to surface waters. Sources of pollution from CAFOs include, but are not limited to:

- Manure and litter generated by livestock.
- Process waste water from production (e.g. milk parlor wash water, egg wash water)
- Run-off from composting or silage leachate.

Manure, litter, and process wastewater contain nitrogen and phosphorus compounds (which feed the growth of algae and bacteria) as well as fecal coliform bacteria. The content is variable depending on animal type, feeding regime, and other facility practices.

The combined permit and state permit are a reissuance of the 2005 CAFO General Permit that expired July 21, 2011. The CAFO permit is a general permit, which covers a category of dischargers that have the same or similar discharge characteristics. All dischargers covered under

a general permit receive the same permit conditions. This reduces the overall workload associated with writing and administering general permits.

The primary change to the proposed draft general permit, compared to Ecology's 2005 CAFO general permit, is the inclusion of groundwater discharges in addition to the surface water discharges previously covered. This is likely to increase the number of permitted CAFOs by 250-300, primarily dairies.

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## Chapter 2 Requirements of the Draft General Permit

WAC 173-226-120 describes the costs that Ecology is required to examine in this economic impact analysis. However, there are certain requirements that Ecology does not include in the analysis, and these requirements are discussed in this section.

The baseline for an economic analysis is the regulatory context of an industry in the absence of the proposed general permit. When adopting a state CAFO general permit, at a minimum Ecology must meet the federal requirements. Ecology must also meet any state rules.

For many types of CAFOs, this baseline is the existing state and federal water quality protection regulations (e.g. Clean Water Act, State Water Pollution Control Act). The dairy segment may be the largest CAFO industry segment that is covered by either the combined permit or state permit. Being the largest industry segment, costs to dairies above baseline (RCW 90.64 requirements) are used to represent costs to CAFOs from permit requirements.

Existing baseline requirements for dairy operations in Washington are set in chapter 90.64 RCW, the Dairy Nutrient Management Act, outside of any Ecology permit program.

RCW 90.64.026(1) requires all dairies have a dairy nutrient management plan (DNMP). RCW 90.64.026(2) requires that the DNMP contain the elements established by a technical advisory committee<sup>1</sup>.

Many of the elements of a DNMP are incorporated into the combined and state permits. Because dairies are likely to be the primary industry segment covered by the combined and state permits, current requirements under chapter 90.64 RCW, the dairy nutrient management act are considered part of the baseline for analyzing additional permit related costs to CAFOs.

Even if the CAFO general permit did not exist, CAFOs operating in Washington State would be required to comply with the federal and state rules. If the combined and state permit requirements are not more stringent than the federal or state laws and rules, they are not considered as additional costs in this economic impact analysis because they would still be incurred in order to comply with the law.

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<sup>1</sup> The elements established by the committee can be found at: <http://agr.wa.gov/FoodAnimal/Livestock-Nutrient/DairyNutrientMgmtPlans.aspx>

As such, this economic impact analysis will only analyze the additional costs resulting from the general permit that are more stringent than those in the federal rules or other state laws and rules. In addition to the federal CAFO rule, other pertinent standards set in state and federal law/rule are:

- Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201A WAC).
- Ground Water Quality Standards (Chapter 173-200 WAC).
- Sediment Management Standards (Chapter 173-204 WAC).
- Human health based criteria in the National Toxics Rule (40 CR 131.36).
- Dairy Nutrient Management Act (Chapter 90.64 RCW).

Where a rule states requirements that must be met, these are used as the baseline. Requirements in Ecology's draft general permit that are more stringent are analyzed.

Some requirements of the federal CAFO rule are non-specific. For example, the federal rule states that CAFOs must maintain "adequate" waste storage, but is non-specific about what is "adequate" or how to achieve adequacy. Even if certain requirements are partially due to the directives of the federal rule, they are not separable from the proposed general permit's specific requirements.

Where the federal CAFO rule or chapter 90.64 RCW explicitly state requirements that must be met, these are used as the baseline. Requirements in Ecology's draft general permit that are more stringent are analyzed. However, if the federal CAFO rule mandates a requirement, but is not specific about how to meet that requirement, we compare to two baselines (both including the requirements of Chapter 90.64 RCW):

- **Baseline 1: The EPA's Idaho CAFO general permit.**  
Certain Ecology requirements are more stringent in comparison to the EPA-set requirements for CAFOs in Idaho.  
We present estimates using EPA's Idaho CAFO general permit as a baseline, because in the absence of Ecology as a permitting authority, the permitting authority for the state would be the EPA. In cases where the EPA CAFO rule is non-specific about its requirements, we compare to the EPA CAFO general permit in Idaho as a proxy for how the EPA might permit in Washington State. The EPA is the permitting authority in Idaho. Washington State and Idaho have different characteristics, however, and the EPA would not necessarily mandate the same requirements.
- **Baseline 2: No federal mandate.**  
The entirety of the cost is then attributed to Ecology's discretion, because, in such a situation, there would be no law or statute specifying what Ecology must put in a permit and requirements would be based solely on Ecology's discretion. Discretion refers to the requirements Ecology chose to include in the general permit that are more stringent than the baseline (no permit requirement).

## **2.1 Permit requirements**

Permit requirements include:

- Manure, litter, process wastewater, and feed storage.
- Management of mortalities.
- Diversion of clean water.
- Prevention of direct animal contact with water.
- Chemical handling.
- Conservation practices to control nutrient loss.
- Manure, litter, process wastewater, and soil sampling.
- Protocols for the land application of waste.
- Record keeping.

The impact, if any, on Permittees of each requirement is discussed below.

## **2.2 Waste storage**

The EPA CAFO rule does not give specifics beyond that the CAFO must have adequate storage. The requirements for waste storage are identical to those mandated by the EPA CAFO rule and largely similar to chapter 90.64 RCW requirements. As such, they are not analyzed in this document.

## **2.3 Management of mortalities**

Ecology's general permit requirements are the same as the federal rule, with the exception of additional state requirements mandated by RCW 16.36, 70.95, and WAC 16-25, 173-350, 246-121. The state rules dictate, for example, burial or composting setbacks away from well heads, property lines, and flood plains.

Because these additional state requirements are mandated by existing law or rule they are considered as part of the baseline and as a result they are not analyzed in this document.

Chapter 90.64 RCW does not include requirements for management of mortalities.

## **2.4 Diversion of clean water**

The requirements for diversion of clean water are identical to those mandated by the EPA CAFO rule and largely similar to chapter 90.64 RCW requirements. These include diverting clean water away from facilities through the use of gutters, berms, or other methods. Because they are mandated by federal rule, they are not analyzed in this document.

## **2.5 Prevent direct animal contact with water**

For the combined permit, the requirements for preventing direct animal contact with water are identical to those mandated by the EPA CAFO rule. As such, they are not analyzed in this document.

Chapter 90.64 RCW does not include requirements for preventing direct animal contact with water. Therefore, for the state only permit, some additional costs may be incurred due to this requirement, however they would be minimal.

## **2.6 Chemical handling**

For the combined permit, the requirements for chemical handling are identical to those mandated by the EPA CAFO rule. As such, they are not analyzed in this document.

For the state only permit, Chapter 90.64 RCW does not include requirements for chemical handling; therefore, Permittees will likely incur additional costs in this area. However, it is not possible to estimate likely costs with any level of certainty, as costs will be site-specific and will likely be small in magnitude.

## **2.7 Conservation practices to control nutrient loss**

For the combined permit, the requirements for conservation practices to control nutrient loss (the addition of waste to the waters of the state) in the draft Ecology general permit are identical to those mandated by the EPA CAFO rule.

For the state only permit, under Chapter 90.64 RCW, buffers are in place, however, they are less restrictive than those in the draft permit. This will result in more land being removed from application. This land will not necessarily be removed from production, as commercial fertilizers are allowed. This will increase the cost of production on these lands.

## **2.8 Manure, litter, process wastewater, and soil sampling**

The EPA CAFO rule does not provide specific guidance on manure, litter, process wastewater, and soil sampling.

Chapter 90.64 RCW does not directly require that manure and soil sampling occur. The RCW requires that a dairy have a dairy nutrient management plan that contains elements specified by a technical advisory committee<sup>2</sup>. One of the elements in the checklist is whether manure and soil sampling are required (by the DNMP) and if testing procedures are required. The checklist does not specify the testing procedures for manure and soil sampling, however Ecology chose to use

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<sup>2</sup> Available on the Washington State Dairy Association's Website at:  
<http://agr.wa.gov/foodanimal/livestock-nutrient/dairynutrientmgmtplans.aspx>

those guidance documents currently in use<sup>3</sup>. Though the soil and manure sampling is not specified in the DNMP, based on discussion with producers, industry representatives, and comments on the preliminary draft, the sampling based on the listed guidance documents should be considered the baseline for a dairy operation under 90.64 only.

In general, soil sampling that are part of DNMPs is limited to a single representative 0-12 inch soil depth sample per crop field in the fall after harvest. Some operations may voluntarily have more sampling done. Sample analysis is done for total nitrogen (which is nitrate+nitrite, organic nitrogen, and ammonia/ammonium), but it is not required that analysis be done by an accredited lab as it is in the CAFO permit.

In comparison with Idaho's CAFO general permit, Ecology's draft general permit specifies CAFOs must sample at one to three different depths<sup>4</sup> twice per year:

1. Before applying manure, litter, or process wastewater onto fields.
2. After the harvest of crops.

This results in a total of two to six samples per year. Samples must be representative of the fields being sampled. Therefore, the number of required samples varies substantially depending on the characteristics of the fields in question.

Idaho's general permit requires permittees to sample once a year.

Ecology's draft general permit specifies the CAFO must sample for:

- Nitrate + Nitrite
- Organic Nitrogen
- Ammonia/Ammonium N
- Phosphorus

Idaho's general permit only requires the CAFO to sample for:

- Nitrogen
- Phosphorus

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<sup>3</sup> Bary, A., Cogger, C., Sullivan, D. (2000). *Fertilizing with Manure*. Pacific Northwest Extension, WSU Food and Farm Connections Team; Moore, A., de Haro-Marti, M., Chen, L. (2015). *Sampling Dairy Manure and Compost for Nutrient Analysis*. Pacific Northwest Extension, University of Idaho; Staben, M. L., et. al. (2003). *Monitoring Soil Nutrients Using a Management Unit Approach*. Pacific Northwest Extension. Pub. No. PNW 570E; Sullivan, D., Cogger, C. (2003). *Post-Harvest Soil Nitrate Testing for Manured Cropping Systems West of the Cascades*. Oregon State University Extension Service. Pub. No. EM 8832E.

<sup>4</sup> Areas with 25 inches or less of annual precipitation are required to sample at 0-12 inches and at 12-24 inches. In some cases, they may need to take an additional sample at 25-36 inches. Areas with more than 25 inches of precipitation are required to sample at 0-12 inches.

## **2.8.1 Comparison to Idaho permit baseline**

Compared to Idaho's general permit, Ecology's draft general permit requires CAFOs to:

- Provide a greater number of analyses on each sample.
- Take samples more frequently.

## **2.8.2 Comparison to no federal mandate baseline**

In comparison with the federal rule, Ecology's draft permit requires a full set of analyses (4 tests) at one to three depths, twice a year, for eight to twenty-four analyses total per year for each sampling location. We therefore assume that in the absence of Ecology's draft general permit, permittees would not need any sampling.

## **2.9 Protocols for the land application of waste**

The EPA CAFO rule requires Ecology to develop technical standards for the land application of waste, but does not provide specific guidance on how. Ecology's draft general permit also prohibits waste application to:

- Fields that do not have crops on them or that are not being prepped for crops.
- Fields where the P-Index (phosphorus level) rating is high or excessive.
- Field buffers and setbacks.

Chapter 90.64 RCW has a number of requirements for land application. Ecology discussions with industry representatives indicate that there is adequate storage to accommodate the amount of manure, litter, and process wastewater generated.

## **2.10 Record keeping**

For the combined permit, the federal CAFO rule (40 CFR 122.42(e)(4) and 40 CFR 122.41) requires permittees prepare and submit an annual report that provides the field budget (the part of the nutrient management plan (NMP) that budgets nutrients for specific fields) for the next year, as well as non-compliance notification. The conditions for terminating coverage under the general permit is mandated by federal rule 40 CFR 122.22, 122.64, and state rule WAC 173-226-240.

For the combined permit, Chapter 90.64 RCW has a number of requirements for record keeping, including soil and manure tests, application of the solid and liquid components of the manure, cropping, and other significant factors and practices. While conducting visual inspections of clean and wastewater lines is required, documenting the inspections is not currently required. This documentation is required under the draft permit. Ecology will provide a template for recording these inspections. Costs will be minimal, as the inspections are already occurring.

Similarly, while collecting and retaining relevant information is required under Chapter 90.64 RCW, annually reporting that information is not required. This reporting is required under the draft permit. Costs should be minimal, as the information should be readily available.

# Chapter 3 Overview of Analysis

This Economic Impact Analysis (EIA) estimates the costs of complying with the draft CAFO general permit. It also compares the costs of complying with the draft CAFO general permit for small businesses, to the costs of compliance for large businesses, to determine whether the requirements of the draft CAFO general permit disproportionately impacts small businesses.

The scope of the analysis deals only with the direct compliance costs imposed by the draft CAFO general permit to the CAFO industry. Ecology is not required in an Economic Impact Analysis to evaluate benefits and therefore does not do so in this document.

## 3.1 Small and large businesses

RCW 19.85.020(4) defines a small business as any business entity, including a sole proprietorship, corporation, partnership, or other legal entity, that is owned and operated independently from all other businesses, and that has fifty or fewer employees. There are both small and large businesses in the CAFO industry. Overall, CAFOs average 7.9 employees. Among the small CAFOs, the average is 6.8 employees, and the large CAFOs average 79 employees.

Ecology must compare the cost of compliance for small businesses with the cost of compliance for the 10 percent of CAFOs that are the largest businesses required to comply.

We note that we have defined our demarcation at fewer than fifty employees, while the definition of “small business” is inclusive of fifty employees (fifty or fewer). Our definition is different than the definition of “small business” in rule (fifty or fewer) due to data limitations - the Washington State Employment Security Department (WSESD) data is only defined by employment size categories, such as firms with 50-99 employees and firms with 20-49 employees. We therefore cannot tell how many firms in the category 50-99 have exactly fifty employees, and how many have more than fifty. Because of these data limitations, if any of our currently permitted firms have exactly fifty employees, we will have mistakenly categorized them as a “large business” when they should in fact be a “small business”.

We also note that while small businesses as defined in WAC 19.85.020 refer to businesses with 50 or fewer employees, the size definitions of CAFOs for all available cost data are based on the number of animals in the operation<sup>5</sup>. Therefore, a business that meets the definition of a “small business” may be a large CAFO, and incur the costs of a large CAFO. Below we proportion out currently permitted CAFOs by CAFO size, delineated by the number of animals at each CAFO. The definitions of CAFO size based on type of animal can be found in the Cost Methodology document for the 2002 EPA Guidelines for CAFOs<sup>6</sup>. The cost data used in Chapter 4 are all for the Pacific region, found in the 2002 Cost Methodology, averaged between Veal, Dairy, Beef, and Heifer CAFOs.

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<sup>5</sup> United States Environmental Protection Agency (2002) Cost Methodology for the Final Revisions to the National Pollutant Discharge Elimination System Regulation and the Effluent Guidelines for Concentrated Animal Feeding Operations

<sup>6</sup> EPA, *ibid.*

**Table 1: CAFO size by number of dairy animals**

CAFO Size	Number of Animals	Number of Dairies
Small	<200	102
Medium 1	200 - 349	60
Medium 2	350 - 524	58
Medium 3	525 - 699	45
Large	700 +	140

If a CAFO has less than 200 mature dairy animals, it is not required to apply for a permit unless Ecology determines that it is a significant contributor of pollutants and requires that the CAFO apply for a permit (through a formal, appealable process). Other animal types have different animal number thresholds based on 40 CFR § 122.23(b) below which the CAFO is not required to apply for a permit unless Ecology determines that it is a significant contributor of pollutants.

### **3.2 Compliance costs included in the EIA**

According to WAC 173-226-120, the EIA must estimate the costs of the following:

- Minimum treatment technology
- Monitoring
- Reporting
- Recordkeeping
- Plan submittal
- Equipment
- Supplies
- Labor
- Administrative costs

### **3.3 Compliance costs excluded from the EIA**

The cost of complying with the following laws and rules as they relate to complying with general permit conditions are not included in the EIA's analysis of compliance costs:

1. Dairy Nutrient Management Act (RCW 90.64)
2. State Groundwater Quality Standards (WAC 173-200)
3. State Surface Water Quality Standards (WAC 173-201)
4. State Sediment Management Standards (WAC 173-204)
5. Federal law and rules, in particular the Clean Water Act and federal NPDES rules.

The justification for excluding compliance costs related to these laws and rules is that permit holders cannot be exempt from these laws through the permit process and, therefore, any cost impacts of these laws and rules cannot be mitigated. Permit holders must comply with existing rules independent of permit requirements.

RCW 90.64 applies to dairies only and would not be applicable to other types of CAFOs.

### **3.4 State and federal water pollution rules**

The federal Clean Water Act (CWA) requires those that discharge to surface waters obtain a National Pollutant Discharge Elimination System (NPDES) permit. NPDES rules establish technology-based effluent standards. At a minimum, Ecology's CAFO NPDES general permit must impose a level of pollution control that is at least as strict as that set by federal laws and rules.

In addition, all permits issued by Ecology must ensure dischargers do not violate the state:

- Water quality standards for surface waters of the state (WAC 173-201A)
- Water quality standards for ground waters of the state (WAC 173-200)
- Sediment management standards (WAC 173-204)

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# Chapter 4 Estimated Costs of Compliance with Draft General Permit

The costs for CAFOs to comply with Ecology's draft CAFO general permit depend somewhat on the number of acres the CAFO encompasses due to sampling requirements. The number of animals is usually proportional to the acreage. While it seems appropriate to assume that CAFOs with less acreage will be those with fewer employees, this is not always the case. In this chapter, Ecology estimated ranges of costs for most requirements based on the size of the CAFO in terms of the number of animals. We only give estimates for Medium 1, Medium 2, Medium 3, and Large CAFOs because CAFOs with less than a threshold number of animals (Small CAFOs based on EPA rule definition in 40 CFR § 122.23(b)) are not required to apply for a permit unless Ecology determines they are a significant contributor of pollutants<sup>7</sup>.

## 4.1 Manure, litter, process wastewater, and soil sampling

The EPA CAFO rule does not provide specific guidance on waste and soil sampling. In comparison with Idaho's CAFO general permit, Ecology's draft general permit specifies CAFOs must sample at one to three different depths twice per year:

1. Before applying waste onto fields.
2. After the harvest of crops.

Idaho's general permit requires permittees to sample once a year.

Ecology's draft general permit specifies the CAFO must sample for:

- Nitrate + Nitrite
- Organic Nitrogen
- Ammonia/Ammonium N
- Phosphorus

EPA's Idaho general permit only requires the CAFO to sample for

- Nitrogen
- Phosphorus

Ecology's draft general permit requires CAFOs to both provide a greater number of samples, as well as sample more frequently compared to the EPA Idaho general permit. It also requires more analyses (4) be done for each sample than the EPA Idaho permit (2).

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<sup>7</sup> Cost estimates for Small CAFOs are not available. Estimates for Medium 1 CAFOs may be used to conservatively estimate the upper bound for Small CAFO costs.

From the 2002 EPA Cost Methodology we find a one-time capital cost for soil sampling to be \$55 (to purchase sampling equipment)<sup>8</sup>. There is also an average cost of \$25 per sample<sup>9</sup> based on a survey of costs by state Natural Resource Conservation Service (NRCS) laboratories.

Sampling must be representative of the field(s) which will receive the manure. The number of samples required is directly related to the size and landscape of the area being sampled. Currently, an average of 12.7 fields per farm are sampled.<sup>10</sup> Relative to the Idaho general permit, Permittees in Washington State must gather 25 to 75 samples total per year and perform a total of 100 – 300 analyses on these samples, as opposed to 135 samples per year under the Idaho general permit with a total of 25 analyses performed on these samples. The Ecology draft general permit therefore requires 12 to 62 additional samples and 75 – 238 additional analyses compared to the Idaho general permit.

In comparison to a baseline of no federal mandate, as the CAFO rule does not provide specifics, the cost of all 25 to 75 samples per year is attributed to Ecology discretion. The cost per CAFO compared to the Idaho general permit is \$1,565 to \$7,675, and the cost per CAFO compared to no federal mandate ranges from \$3,150 to \$9,250. These are costs over 5 years, using a 1.18-percent discount rate<sup>11</sup>.

## 4.2 Lagoon inspection

The draft permit requires a one-time lagoon inspection be conducted and reported. This report must be certified by an engineer and contains information on design and construction, structure site characteristics, and operation and maintenance. While some of the required information may be readily available to the permittee, we conservatively assume that all of the required information must be acquired. This results in our cost estimate being the upper bound of likely costs. The actual costs are likely below our estimate. Estimated costs are per lagoon inspected. If a Permittee has more than one lagoon, costs would increase accordingly.

The lagoon inspection is estimated to cost permittees \$7,400. This is based on an estimated 40 hours of work by an environmental engineer at an hourly wage of \$185<sup>12</sup>.

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<sup>8</sup> This equipment is for both manure and soil sampling.

<sup>9</sup> This is the average cost of manure and soil sampling.

<sup>10</sup> Email correspondence with Fred Likkel July 5, 2016.

<sup>11</sup> US Treasury Department (2016). Historic average real rate of return on US Treasury Department I-Bonds. Associated historic average inflation rate is approximately 2 percent.

<sup>12</sup> Wage rate based on average of rates for environmental engineers in recent work contracted by Ecology.

## 4.3 Permit Fees

Permit fees vary by type of CAFO and the number of animal units served by the CAFO. Table 2 summarizes the fee schedule.

**Table 2: Permit Fees**<sup>13</sup>

Category	Year	
	FY 2016	FY 2017
Non-Dairy CAFO		
<200 animal units	\$236	\$248
200 - <400 animal units	\$592	\$623
400 - <600 animal units	\$1,186	\$1,248
600 - <800 animal units	\$1,777	\$1,871
800 animal units and up	\$2,373	\$2,498
Dairies - \$0.50 per animal unit subject to listed maximums	\$1,586	\$1,670

## 4.4 Total compliance costs

This EIA compares the quantified costs of compliance for small and large businesses to determine if the general permit disproportionately impacts small businesses. Ecology compares costs by looking at the cost per employee, where businesses with fewer than 50 employees are considered small businesses.

**Table 3: Summary of estimated compliance costs per farm**

Baseline for Comparison (2015\$)	Cost			
	State Only Permit (low)	State Only Permit (high)	Combined Permit (low)	Combined Permit (high)
Idaho general permit	\$ 11,407	\$ 17,517	\$ 18,010	\$ 24,120
No federal mandate	\$ 12,992	\$ 19,092	\$ 19,595	\$ 25,695

These costs represent an average number of samplings, the cost of a single lagoon inspection, and permit fees<sup>14</sup>. Low estimates indicate fewer additional samples were needed. High estimates indicate more additional samples were needed. These are costs over 5 years, using a 1.18-percent discount rate<sup>15</sup>.

There are additional costs on permittees due to buffers, however, these costs are site-specific and cannot be estimated with any level of reliability.

<sup>13</sup> Animal units are defined in WAC 173-224-030.

<sup>14</sup> The permit fee for non-dairy CAFOs was used for the combined permit, using 700 animal units to estimate permit fees. The permit fee for dairy CAFOs was used for the state only permit. The state-wide average of roughly 1,000 cows per dairy was used to approximate permit fees, with the understanding that one animal unit is not equivalent to one cow. Fees for FY 2018 and beyond were assumed to remain at FY 2017 levels.

<sup>15</sup> US Treasury Department (2016). Historic average real rate of return on US Treasury Department I-Bonds. Associated historic average inflation rate is approximately 2 percent.

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# Chapter 5 Proportionality and Mitigation

## 5.1 Comparison of compliance costs for large and small businesses

The purpose of the economic impact analysis is to provide a comparison of the cost of compliance for small businesses and large businesses.

There are both small and large businesses in the CAFO industry. Small businesses average 6.8 employees, and large businesses average 79 employees. Table 4, below, shows the cost per employee for small and large businesses under each baseline.

**Table 4: Cost per employee for small versus large businesses**

Baseline for Comparison (2015\$)	Cost Per Employee			
	State Only Permit (low)	State Only Permit (high)	Combined Permit (low)	Combined Permit (high)
<b>Small Businesses</b>				
Idaho general permit	\$1,678	\$2,576	\$2,649	\$3,547
No federal mandate	\$1,911	\$2,808	\$2,882	\$3,779
<b>Large Businesses</b>				
Idaho general permit	\$144.39	\$221.73	\$227.97	\$305.32
No federal mandate	\$164.46	\$241.67	\$248.04	\$325.25

While there is likely correlation between the size of a CAFO in terms of employees and land area it encompasses, it is unclear whether this would mean larger CAFOs needing to take more samples, as sampling requirements depend on the specific lands being sampled. However, given that large businesses in this industry have more than ten times the number of employees that small businesses do, and greater costs due to increased sampling are unlikely to be ten times larger.

There is also likely correlation in the number of animals serviced and the number of employees, however this is not universal. More animals serviced would lead to larger permit fees, however, as the fees are capped, fees for large businesses would be significantly less than ten times greater than those for small businesses.

Costs due to buffers may increase as the size of the operation (in acres) increases<sup>16</sup>. However, these costs are site-specific and depend on many factors. A CAFO with fewer employees could face greater buffer costs than a CAFO with more employees.

It is likely that the costs of complying with the permit are disproportional.

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<sup>16</sup> As noted above, there is likely correlation between the size of a CAFO in terms of the number of employees and the area it encompasses.

## 5.2 Mitigation

The general permit rule (WAC 173-226-120) requires that disproportionate economic impacts of general permits on small businesses be reduced, when it is both legal and feasible to do so.

Legality and feasibility are determined by the legal context of existing state and federal rules, such as the State Water Pollution Control Act (Chapter 90.48 RCW) and the federal Clean Water Act. Cost impacts on small businesses are reduced by modifying the conditions of the permit.

Mitigation involves one or more of the following:

- Establishing differing compliance or reporting requirements or timetables for small businesses.
- Clarifying, consolidating, or simplifying the compliance and reporting requirements under the general permit for small businesses.
- Establishing performance rather than design standards.
- Exempting small businesses from parts of the general permit

To mitigate the burden on the smallest businesses (small CAFOs), Ecology has included a lower threshold of animal numbers below which a CAFO does not have to apply for a permit unless Ecology determines the small CAFO is a significant contributor of pollutants. The lower threshold of animal numbers depends on the type of animals and is pulled from the federal CAFO rule (40 CFR § 122.23(b)). For example, the lower threshold for mature dairy cows is less than 200 cows while the lower threshold for chickens is less than 37,500 laying hens.

# References

RCW 34.05.272 directs agencies taking significant actions in the Water Quality Program to categorize citations as follows in bold headings, with citations for this analysis categorized into each section.

**(i) Independent peer review: Review is overseen by an independent third party;**

Bary, A., Cogger, C., Sullivan, D. (2000). *Fertilizing with Manure*. Pacific Northwest Extension, WSU Food and Farm Connections Team.

Moore, A., de Haro-Marti, M., Chen, L. (2015). *Sampling Dairy Manure and Compost for Nutrient Analysis*. Pacific Northwest Extension, University of Idaho.

Staben, M. L., et. al. (2003). *Monitoring Soil Nutrients Using a Management Unit Approach*. Pacific Northwest Extension. Pub. No. PNW 570E.

Sullivan, D., Cogger, C. (2003). *Post-Harvest Soil Nitrate Testing for Manured Cropping Systems West of the Cascades*. Oregon State University Extension Service. Pub. No. EM 8832E.

**(ii) Internal peer review: Review by staff internal to the department of ecology;**

**(iii) External peer review: Review by persons that are external to and selected by the department of ecology;**

**(iv) Open review: Documented open public review process that is not limited to invited organizations or individuals;**

WA Department of Ecology (2011). Water quality program permit Writer's Manual. Publication no. 92-109.

United States Environmental Protection Agency (2002) Cost Methodology for the Final Revisions to the National Pollutant Discharge Elimination System Regulation and the Effluent Guidelines for Concentrated Animal Feeding Operations

**(v) Legal and policy document: Documents related to the legal framework for the significant agency action including but not limited to:**

**(A) Federal and state statutes;**

**(B) Court and hearings board decisions;**

(n/a)

**(C) Federal and state administrative rules and regulations; and**

**(D) Policy and regulatory documents adopted by local governments;**

**(vi) Data from primary research, monitoring activities, or other sources, but that has not been incorporated as part of documents reviewed under the processes described in (c)(i), (ii), (iii), and (iv) of this subsection;**

U.S. Census Bureau (2014). North American Industry Classification System.  
<http://www.census.gov/eos/www/naics/>

U.S. Department of Commerce: Bureau of Economic Analysis (2016). Gross National Product: Implicit Price Deflator. <http://research.stlouisfed.org/fred2/data/GNPDEF.txt>

U.S. Treasury (2016): Historical I-bond Rates: <https://www.treasury.gov/resource-center/data-chart-center/Pages/index.aspx>

**(vii) Records of the best professional judgment of department of ecology employees or other individuals; or**

(n/a)

**(viii) Other: Sources of information that do not fit into one of the categories identified in this subsection (1)(c).**

(n/a)