



Friends of Toppenish Creek

October 24, 2021

Dear WA Dept. of Ecology,

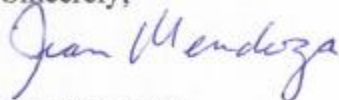
Please consider these comments from the Friends of Toppenish Creek (FOTC) as you prepare a new National Pollutant Discharge Elimination System (NPDES) permit for Concentrated Animal Feeding Operations (CAFOs).

Friends of Toppenish Creek is dedicated to protecting the rights of rural communities and improving oversight of industrial agriculture. FOTC operates under the simple principle that all people deserve clean air, clean water and protection from abuse that results when profit is favored over people. FOTC works through public education, citizen investigations, research, legislation, special events, and direct action.

FOTC participates in good faith, with the hope that our democratic form of government will protect the people of Washington and our environment. Do not consider our comments an endorsement of concentrated animal feeding operations. FOTC believes, and has stated elsewhere, that CAFO farming is not sustainable; that CAFO farming damages the air, water, soil, plants, animals, and people.

Agriculture is just one contributor to global warming and climate change. Agriculture is necessary for human survival. But we can minimize the impact of agriculture on global warming. Strong NPDES permits for CAFOs will help by significantly reducing unhealthy release of nitrogen and phosphorous into the air and waters of Washington State.

Sincerely,



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Friends of Toppenish Creek Comments re WA Ecology’s NPDES General Permits
for Concentrated Animal Feeding Operations

October 24, 2021

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Summary of Environmentalists' Case Before The WA State Court of Appeals

Ecology ignored state and federal law when the agency wrote National Pollutant Discharge Elimination Permits (NPDES) for concentrated animal feeding operations (CAFOs) in 2017. When a coalition of environmental groups appealed the permits, the WA Pollution Control Hearings Board (PCHB) incorrectly approved Ecology's actions.

And so, in November 2020, the environmental groups explained to the WA State Court of Appeals that Ecology:

1. Did not require All Known, Available and Reasonable Technology (AKART) in the permits. For example, the permits do not require synthetic lining of manure lagoons.
2. Did not require actions that bring groundwater and surface water into compliance with WA Water Quality Standards. For example, the permits do not require testing of tile drains that carry water from fields where manure is applied to surface waters.
3. Did not require ground and surface water monitoring. Without measurement, there is no way to know what pollutants enter the waters of the state, whether pollution of the groundwater and surface water is increasing.
4. Permits are issued before CAFOs submit management plans. The public is not allowed to review the plans before permits are issued.
5. Does not address climate change in the permits as required by Washington statutes. CAFOs add large amounts of water pollutants and air emissions to the environment and are major causes of Global Warming. Ecology is required by law to address Global Warming in all their actions and to protect the waters of the state for future generations.

Summary of FOTC opinions regarding the court ruling.

1. Living in harmony with nature is AKART, an available and reasonable technology, the most effective technology for protection of the environment. Many of the problems we now face result from confining too many animals on small acreages and concentrating manure in one place. Spacing smaller dairies across the state would disperse emissions and discharges into quantities that nature could accommodate.
2. Installing synthetic liners for manure lagoons is AKART. It is affordable, especially when balanced against the existential costs of nitrogen leaching to Puget Sound, the rivers, and streams. Extinction of Orcas¹ is too high a price to pay for short term economic benefits.
3. According to federal law CAFOs are point sources. Standard definitions of point sources describe pollution that comes from the end of a pipe. A tile drain is a pipe that discharges to drains and ditches. It is only common sense to test the effluent from tile drains for nitrogen, phosphorous, and pathogens.
4. Problem solving requires sufficient and accurate data. For too long regulators have refused to address water pollution, citing inadequate proof. This must cease. If society insists on

concentrating so many animals in small areas, then we have a duty to measure what happens to pollutants in the manure, to measure pollution in groundwater and surface water.

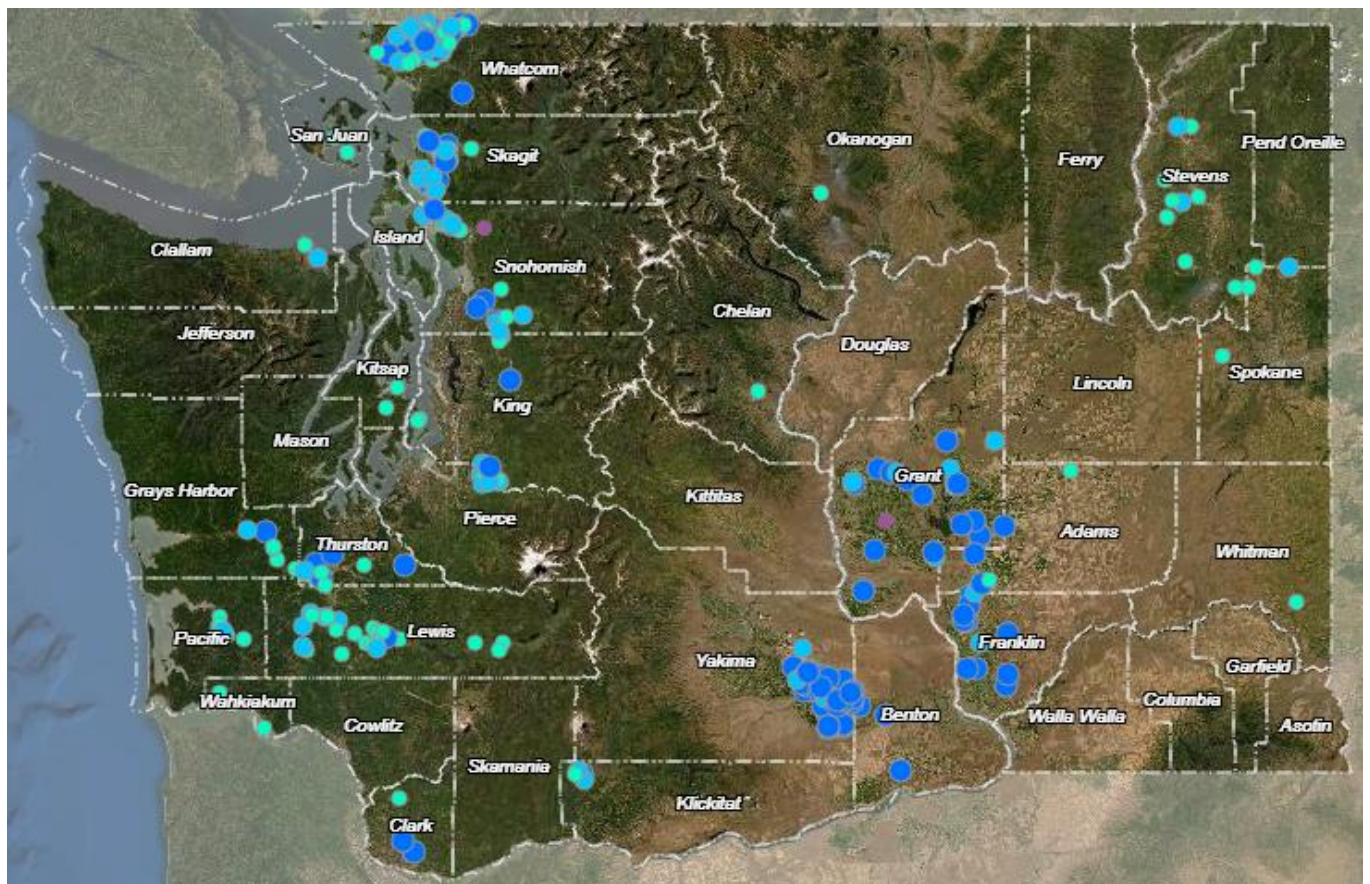
5. Public participation requires agencies to dialogue with all stakeholders, not just a few. It is contrary to the intent of public participation when agencies hold discussions behind closed doors, draft policy, and then solicit public comment a few days before deadlines for policy delivery. Public participation requires agencies to listen to people who live with real life problems and negotiate workable solutions.
6. Climate Change is the most urgent problem facing Washingtonians and mankind today. NPDES permits for CAFOs provide one opportunity to reduce the impact of climate change. To do this well it is necessary to look at discharges from CAFOs in a holistic manner. This means evaluating emissions from CAFOs and re-deposition of pollutants on the land when measuring CAFO impacts. This means considering the consequence when too much groundwater is withdrawn to water cows.
7. Taking actions that are essential for the wellbeing of our planet cannot occur without first having Environmental Consciousness: *the awareness of what Global Warming is and the actions needed to address its harmful impacts*. Studying and learning about Global Warming is the key to developing Environmental Consciousness. Environmental consciousness is therefore an essential power for environmental action.



Overview of Dairy CAFOs in WA State

There are big differences in concentrated animal feeding operations (CAFOs) across Washington State. These facilities tend to be much larger on the eastern side of the state. Dairies may or may not be CAFOs. For WA State Dept of Agriculture purposes, a small dairy ■ has ≤ 199 animals. A medium sized dairy ■ has 200 to ≤ 699 animals and a large dairy ■ has ≥ 700 animals.

Soils are different in different areas. Precipitation is heavier on the westside, and aquifers are often shallower. Aquifers in the Yakima Valley are shallower than aquifers in the Columbia Basin. Water scarcity is a major concern in Eastern Washington.

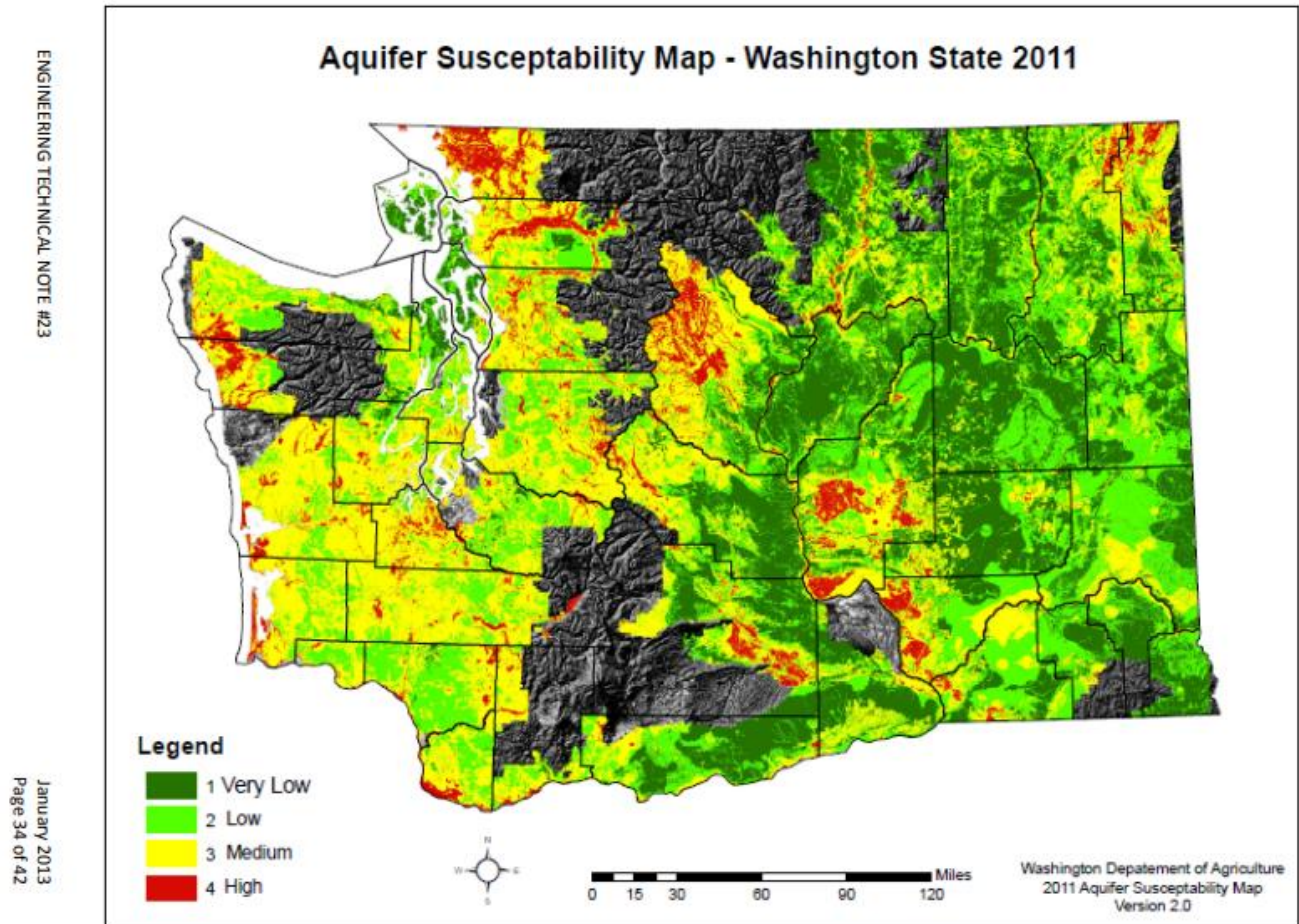


From <https://www.arcgis.com/apps/webappviewer/index.html?id=187a52c48d8047f3b699206c8ae54d38>

Here is the breakdown by size of Washington dairies (No data for Indian Reservations):

County	# Facilities	Large	Medium	Small	Unknown
Adams	3	2	0	1	
Benton	3	3	0	0	
Chelan	1	0	0	1	
Clallam	2	0	1	1	
Clark	3	2	0	1	
Franklin	10	9	1	0	
Grant	24	16	7	0	1
Grays Harbor	6	1	1	4	
Island	1	0	1	0	
King	19	2	8	9	
Kitsap	2	0	0	2	
Klickitat	4	1	2	1	
Lewis	27	1	6	20	
Lincoln	1	0	0	1	
Okanogan	1	0	0	1	
Pacific	6	0	2	4	
Pierce	1	0	1	0	
San Juan	2	0	0	2	
Skagit	20	5	9	6	
Snohomish	19	5	6	7	1
Spokane	4	0	1	3	
Stevens	9	0	2	7	
Thurston	9	4	1	4	
Wahkiakum	2	0	0	2	
Whatcom	75	17	30	27	1
Whitman	1	0	0	1	
Yakima	40	33	6	1	
Totals	295	101	85	106	3
		34%	29%	36%	1%

WSDA has mapped Washington State according to aquifer susceptibility to leaching.



In Washington large CAFO dairies tend to locate in areas where the aquifers are especially vulnerable to nitrate leaching. In Washington most manure lagoons were built prior to 2004, to outdated standards that allow leaching of large amounts of pollutants to groundwater.

Puget Sound

According to the *Puget Sound Nutrient Synthesis Report, Part 2*,² “Puget Sound has areas of low dissolved oxygen that do not meet Washington State Water Quality Standards due to the influence of excess nutrients from anthropogenic sources.” And “The Snohomish and Skagit Rivers have the highest overall total nitrogen loads into Puget Sound. The Stillaguamish, Nooksack, and Snohomish Rivers have the highest total nitrogen yield (load per unit area).”

Table 3, *Total nitrogen load at river mouth by nutrient source*, from the *Puget Sound Nutrient Synthesis Report, Part 2*² describes the impact of manure on nutrient pollution of Puget Sound.

River	Atm. (%)	Urban				Agriculture		Forests	
		Dev. (%)	Point sources (%)	OSS (%)	Power returns (%)	Fertilizer (%)	Manure (%)	Forests (other) (%)	Alder (%)
Skokomish	19	1	3	5	0	11	4	8	49
Elwha	20	0	3	2	0	1	3	23	48
Deschutes	9	17	0	8	0	21	16	2	27
Nisqually	12	5	3	9	0	13	15	3	42
Puyallup	9	13	12	7	21	5	10	2	21
Green-Duwamish	10	27	1	12	0	9	16	1	25
Cedar	9	46	0	17	0	1	2	1	23
Snohomish	19	5	9	8	0	3	12	4	40
Stillaguamish	20	3	4	5	0	7	14	3	44
Skagit	23	2	4	3	0	10	13	8	38
Nooksack	15	2	2	4	0	18	34	2	24

Atm. = atmospheric sources; Dev. = developed land; OSS = on-site septic systems.

Lower Yakima Valley

Since 2010 the U.S. Environmental Protection Agency (EPA) has engaged with five Lower Yakima Valley (LYV) CAFO dairies under an administrative order of consent (AOC), in an effort to reduce pollution of groundwater in that community. EPA studies found that 61% of domestic wells one mile down gradient from this cluster of dairies delivered water with nitrate levels above the safe drinking water standard of 10 mg/L (ppm). One monitoring well had nitrate levels as high as 234 mg/L.³

One of the five dairies, a dairy with a WSDA approved nutrient management plan, applied nitrogen to cropland at seven times agronomic rates. Two of the dairies in the cluster do not have NPDES permits even though deep soil testing beneath abandoned lagoons proves significant leaching and monitoring wells on the property are far above 10 mg/L.

There is another very large LYV dairy conglomerate with three lagoons that were rated in the high risk categories during Tech Note 23 inspections. This conglomerate has been cited for manure discharges and for dumping dead calves into a draw with a seasonal stream. This conglomerate keeps thousands of baby calves in hutches on land upgradient from a small town with a polluted municipal well. The soil beneath the hutches is well drained and there is no monitoring for discharge to the aquifer. There are no NPDES permits for these facilities.

Composting

CAFO dairies increasingly compost manure to dispose of it. Experts state that as much as 75% of dairy manure is composted.⁴ In Yakima County WSDA estimates there are 536 acres dedicated to manure composting.⁵ These are 536 acres that can no longer be used for growing crops without removal of contaminated soils.

RCW 90.64 and WAC 16.611 do not directly address manure composting.

On average over 50% of manure nitrogen is lost during the composting process – to the air and ground.⁶ Large quantities of nitrates leach to soils and aquifers from composting operations.⁷⁻¹⁰

Ecology ignored composting in the 2017 NPDES permits for CAFOs, except for lip service to animal mortalities. WSDA ignored composting in their unapproved LYV GWMA Nitrogen Availability Assessment.¹¹ That study assigned a value of zero to leaching from manure compost operations.

In Yakima County the South Yakima Conservation District has told dairymen that it is acceptable to compost manure on bare ground.¹² The WA State Conservation Commission refuses to intervene.¹³

Composting is addressed in WA law under WAC 173-350-220. Yakima Valley dairies that compost manure ignore the law and do not report to the Yakima Health District as required for exemptions.¹⁴

FOTC submits this as further evidence of the dairy industry’s belief that they are above the law.

Manure Lagoons

1. The 9th Court of Appeals found in CARE v. Cow Palace (2015) that manure lagoons without synthetic liners are designed to leak. The expert witness for Cow Palace agreed in deposition, assuming a seepage flux of 1×10^{-7} cm/s and a one-foot liner, that lagoons would leak 924 gallons of manure per day, per acre of lagoon.¹⁵
2. According to NRCS Conservation Practice Standard 520, Pond Sealing or Lining, Compacted Soil Treatment¹⁶:

The minimum thickness of the finished compacted liner must be the greater of—

- *The liner thickness required to achieve a specific discharge (unit seepage) design value, or*
- *A liner thickness required by State regulations, or*
- *The minimum liner thickness as shown in table 1.*

Table 1. Minimum liner thickness by design storage depth.

Design Storage Depth (ft)	Liner Thickness (in)
≤16	12
16.1–24	18
24.1–30	24

3. According to documents from the WSDA/Ecology Tech Note 23 inspections of Yakima County Dairies¹⁷ officials inspected 130 Yakima County manure lagoons and ponds. They found liner thickness data for only 10 of those lagoons. Officials do not know the thickness of 120 Yakima County manure lagoons and ponds. Therefore, they cannot estimate the amount of manure leakage from those structures.

4. In her Literature Review of Manure and Groundwater Quality¹⁸, Ecology's Melanie Redding found only one lagoon study without evidence of leakage. That lagoon was the seven year old Sheridan Lagoon in Lewis County. She stated that she knew of no studies that say clay lined lagoons do not leak.
5. Hydrogeologist and expert witness for environmentalists, David Erickson, refuted the conclusion that the Sheridan lagoon does not leak during his testimony in Puget Sound Keeper, et al. v. Ecology.¹⁹
6. Lagoons on the LYV "Dairy Cluster" have recently been decommissioned according to standard procedures as part of the dairies' administrative order on consent with the Environmental Protection Agency. The dairies conducted deep soil testing beneath the abandoned lagoons. That testing shows conclusively that clay lined lagoons leak significant amounts of nitrate and ammonia, and that the leakage follows preferential pathways.^{20, 21}
7. With 210 acres of lagoons in Yakima County and a minimum leakage rate of 900 to 5,000 gallons per acre per day, there is leakage of between 189,000 and 1,050,000 gallons of lagoon water/manure every day to the vadose zones above LYV aquifers. This discharge could be eliminated by installing synthetic lagoon liners.

Economic Impact Statement

Ecology's 2017 *Economic Impact Analysis Concentrated Animal Feeding Operation General Permit*²¹ states in bold:

This analysis does not include assessment of economic benefits (of the permit), environmental impacts, or impacts to surrounding communities. It only estimates the additional costs borne by expected Permittees resulting from compliance with the requirements of the final general permit.

FOTC objects to this limited interpretation of the law because concentrated animal feeding operations that pollute the groundwater and surface water have strong negative impacts on neighboring small businesses including family farms, people who fish for a living, and shellfish operations.

Climate Change

Climate change is an existential crisis that impacts all Washingtonians. Any and every action to address climate change must consider activities as those activities impact the whole ecosystem. Ecology has a legal obligation, affirmed by the WA State Court of Appeals, to consider Climate Change when issuing NPDES permits for CAFOs. Three broad categories of concern are:

1. Sending pollutants into the ambient air
2. Depletion of groundwater
3. Pollution of ground and surface waters

The Washington State Dept. of Agriculture estimates that a third of the nitrogen produced by milk cows volatilizes.²³ This is one method of waste disposal, equal in importance to over application of manure to cropland. Reactive nitrogen (NH₃, N₂O) redeposits everywhere, especially on the land and waters near sources. Reactive nitrogen in the air re-deposits on alpine forests where it damages plants that do not tolerate excessive nitrogen. NPDES permits for CAFOs must require estimates of nitrogenous emissions and impose requirements to minimize those emissions.

If there is no water, then pollution is not a concern. There is a CAFO dairy in Yakima County that went to court to force Ecology and the county to issue a permit to place thousands of cows in an area where the aquifers are falling at some of the highest rates in the state. The resulting approval required the dairy to install four monitoring wells to measure leaching of nitrates to the groundwater. After fifteen years three of the monitoring wells have gone dry. End of story. If there is no water then there is no problem, except for the neighbors whose wells have cavitated. There is no legal way to go back and withdraw the permits so now people must deal with an altered environment. Unlimited expansion of CAFOs depletes the aquifers. Can Ecology legally permit discharge to shrinking aquifers?

Clay lined manure lagoons leak to groundwater. Groundwater feeds surface water. Rivers and streams feed the ocean and Puget Sound. There are dead zones along coastal Washington and within Puget Sound directly attributable to nutrient pollution. The *Puget Sound Nutrient Synthesis Report, Part 2*,¹ estimates that 25.4 million kg/yr (27,940 tons) of nutrients are discharged into the sound every year. And 16.7% of this discharge is due to agriculture. Ecology has the power and duty to reduce this percentage at every opportunity. NPDES are potentially strong tools that can nearly eliminate the discharge of pollutants from manure lagoons by requiring synthetic liners.

FOTC recommendations for NPDES permits for CAFOs that we believe will ensure protection of Washington waters.

Over the past twenty five years the dairy industry has secured special privileges under Washington law that give this industry benefits others do not enjoy. One such protection is RCW 90.64.030 (11) which states:

This section specifically acknowledges that if a holder of a general or individual national pollutant discharge elimination system permit complies with the permit and the dairy nutrient management plan conditions for appropriate land application practices, the permit provides compliance with the federal clean water act and acts as a shield against citizen or agency enforcement for any additions of pollutants to waters of the state or of the United States as authorized by the permit.

In other words, if NPDES permits for dairy CAFOs are weak, then Washington dairies have a license to pollute. Based on extensive experience living with dairies, FOTC asks for the strongest possible permit and suggests the provisions below, subject to further consultation and discussion.

Proposed Criteria for Permit Coverage:

This permit conditionally authorizes the discharge of pollutants to land, groundwater, or surface water by concentrated animal feeding operations subject to limitations in the permit. All authorized discharges must be in compliance with the terms and conditions of this permit.

The owner/operator of a new facility or existing facility where animal wastes are generated is required to apply for coverage under this permit if any of the following statements apply:

- a. At any stage of production, the facility discharges animal waste to cropland where it is applied as fertilizer or soil amendments
- b. At any stage of production, the facility discharges animal waste to a lagoon or other liquid storage structure
- c. At any state of production, the facility stockpiles animal waste
- d. The facility transports animal waste through underground or above ground conveyance systems
- e. The facility uses tile drains to remove excess water from fertilized fields
- f. The facility discharges animal waste into the ambient air through manure transport, lagoon treatment, turning of compost, land irrigation, or other methods that result in significant emissions.
- g. The facility is located next to a river or stream
- h. The facility is located in a flood plain, a critical aquifer recharge area, or above a sole source aquifer
- i. The facility is located on soils that are well drained, somewhat excessively well drained or excessively well drains, per NRCS mapping.

Proposed Permit Conditions:

1. Post-harvest soil sampling of all fields shall take place before new manure is applied to ascertain the extent to which there are residual nutrients in the soil. Each field shall have a specific nutrient budget before any further applications are allowed. No immediate application of manure shall occur if post-harvest nitrate plus ammonium exceeds the following numbers for either of the first two feet if no crop is to be immediately planted. If double-cropping is to take place, manure must be applied in the amounts needed for the crop at the appropriate time. For example, if a winter crop is to be planted, only the nutrient needed to support the crop during the winter shall be applied and additional nutrient could be added in the spring, if needed.
 - a. For the first year- no application if soils exceed 45 ppm (nitrate plus ammonium)
 - b. Second year- 35 ppm
 - c. Third year- 30 ppm
 - d. Fourth year- 20 ppm
 - e. Fifth year and thereafter- 15 ppm
2. Application of manure shall occur according to the parameters below if post-harvest phosphorous exceeds these numbers for either of the first two feet.

- a. < 40ppm – Apply manure based on N
 - b. 40.1 to 100 ppm – Apply Phosphorous at no more than 90% of crop extraction rates
 - c. 100.1 to 180 ppm – Apply Phosphorous at no more than 80% of estimated crop extraction rates
 - d. 180.1 ppm to 300 ppm – Apply Phosphorous at no more than 25% of estimated crop extraction rates
 - e. 300 ppm – No Phosphorous application
3. Soil tests shall be performed at the one foot and two levels on the west side and the one, two and three foot levels on the east side.
 4. No manure applications to:
 - a. Fallow fields in the fall that will not be planted until spring.
 - b. Frozen fields (frozen surface crust or soil at or below zero degrees Celsius)
 - c. Snow-covered fields
 - d. Fields with saturated soil, or fields where the precipitation forecast for the next 24 hours for the Facility’s location indicates that a discharge would occur from the Facility’s land application areas
 5. All earthen lagoons shall be upgraded to a synthetically double-lined leak detection system or equivalent technology. Facilities shall begin planning for upgrades within six months of signing the permit and shall meet the following schedule for upgrading the lagoons (AUs determined by USDA definitions):
 - a. Category 1: 280-999 Animal Units (AUs)- within five years
 - b. Category 2: 1000-2499 AUs- within four years
 - c. Category 3: 2500-4999 AUs- within three years
 - d. Category 4: 5000 or more AUs- within two years
 6. At all compost areas facilities shall:
 - a. Re-grade, as necessary, the area to a slope of at least 2% and
 - b. Compact, as may be necessary, the area to 95% of standard proctor compaction to reduce permeability
 - c. Line any swales, low spots, or other leachate collection areas with asphalt or similar surface to direct leachate to the liquid manure containment system
 - d. All composted manure shall be fully cycled annually such that no compost shall remain at the facility for longer than one calendar year.
 - e. No composting shall take place on soil that is excessively drained or somewhat excessively drained.
 7. At all silage storage areas facilities shall:
 - a. Re-grade, as necessary, the area to a slope of at least 2%
 - b. Compact, as may be necessary, the area to 95% of standard proctor compaction
 - c. Redirect leachate to liquid containment storage systems
 - d. Line silage areas if the underlying soil is excessively drained or somewhat excessively drained.

8. Each Facility shall implement a protocol of regularly inspecting for and re-grading all low-lying or wet spots within all the animal pens. Upon identification of any ponding of water the Facility shall promptly take reasonable steps to alleviate such ponding, including, as may be appropriate, vacuuming and removing any ponded water from the pens. The re-grading process shall slope any low-lying or wet spots such that they no longer collect, or have the likelihood to collect, runoff from the animal pens. Such inspection and re-grade shall occur at least monthly as weather conditions allow, and as practical in months where weather conditions make re-grading problematic.
9. Facilities that border rivers and streams shall maintain streamside buffers that provide six major functions related to salmon habitat, as determined by experts in fish habitat. These functions are (1) shade, (2) filtration (3) bank stabilization, (4) organic litter, (5) large woody debris, and (6) microclimate.
10. Facilities that border irrigation canals and irrigation drains shall maintain at a minimum 50 foot vegetative buffers that prevent leaching of pollutants to those canals and drains. Facilities must implement any additional measures necessary to prevent leaching or discharge of pollutants to all irrigation canals and irrigation drains.
11. Each CAFO shall install the number of monitoring wells necessary to evaluate groundwater contamination as determined by an engineer or hydrogeologist with expertise in groundwater monitoring on CAFOs. Groups of dairies in close proximity to one another may create a ground water monitoring network.
12. For the first year, there shall be quarterly sampling for:
 - a. Nitrate (as nitrogen) by EPA Method 300.0
 - b. Nitrite (as nitrogen) by EPA Method 300.0
 - c. Ammonia by EPA Method 350.1
 - d. Total phosphorus by EPA Method 365.3
 - e. Total Kjeldahl nitrogen (TKN) by EPA Method 351.2
 - f. Inorganic anions (chloride, fluoride, sulfate) by EPA Method 300.0
 - g. Metals (calcium, potassium, magnesium, sodium) by EPA Method 200.7
 - h. Alkalinity (total and bicarbonate) by Standard Method 2320B
13. After the first year, the wells shall be tested semi-annually for only nitrate and total phosphorus, unless Ecology identifies extenuating circumstances.
14. Facilities located within 2,500 ft of rivers and streams shall test surface waters according to protocols described in Ecology Publication Number 06-03-015, *Preparing Elements of a Quality Assurance Monitoring Plan to Conduct Water Quality Monitoring Near Dairies and CAFOs*. Surface water testing shall be guided by WAC 173-201A-200 through WAC 173-201A-240, and assess for:

- a. Aquatic life temperature criteria
- b. Aquatic life dissolved oxygen (D.O.) criteria
- c. Aquatic life turbidity criteria
- d. Aquatic life total dissolved gas (TDG) criteria
- e. Aquatic life pH criteria
- f. Water contact recreation bacteria criteria
- g. Pesticides and herbicides as appropriate
- h. All pollutants the facility can reasonably be expected to discharge

15. Facilities with exceedances of surface water criteria are in violation of their NPDES permits.

16. Facilities shall report:

- a. Average numbers of animals (milk cows, dry cows, heifers, calves, beef cows, cattle for slaughter, veal calves, bulls, sheep, lambs, hogs < 55 lbs., hogs \geq 55 lbs. laying hens, broilers, horses, ducks, turkeys)
- b. Maximum numbers of animals (milk cows, dry cows, heifers, calves, beef cows, cattle for slaughter, veal calves, bulls, sheep, lambs, hogs < 55 lbs., hogs \geq 55 lbs. laying hens, broilers, horses, ducks, turkeys)
- c. Cropland available for manure application
- d. If there is insufficient acreage for manure application, facilities must provide a reasonable plan for waste disposal
- e. Acreage in compost
- f. The amount of nitrogen produced (Dairies only, using the formula below)
- g. Estimated emissions of reactive nitrogen (Dairies only, using the formula below)
- h. Nitrogen content of solid manure applied as fertilizer, measured three times per year
- i. Nitrogen content of liquid manure applied as fertilizer, measured three times per year
- j. The amount of nitrogen applied to cropland under the control of the facility
- k. The amount of nitrogen in exported manure
- l. The amount of nitrogen in manure designated for compost
- m. The amount of nitrogen in finished compost
- n. Dimensions of manure storage lagoons and wastewater ponds
- o. Inspection reports for lagoons and ponds
- p. Depth of liquids in lagoons and ponds four times per year
- q. Results of groundwater monitoring well tests
- r. Report all spills and discharges

17. Dairies shall estimate nitrogen production by cows using the following WSDA formulas²²:

- **Annual manure production** is calculated using the following formula:

$$[[(\text{number of milking cows}) (1.4) (108)] + [(\text{number of dry cows}) (1.4) (51)] + [(\text{number of heifers}) (0.97) (56)] + [(\text{number of calves}) (0.33) (83)]] (365)/2000$$

- **Nitrogen production** is calculated using the following formula:

$$[[(\text{number of milking cows}) (1.4) (0.71)] + [(\text{number of dry cows}) (1.4) (0.3)] + [(\text{number of heifers}) (0.97) (0.27)] + [(\text{number of calves}) (0.33) (0.42)]] (365)/2000$$

- **Losses due to volatilization** during storage are estimated at 35 percent. This does not include application losses.

Conclusion

CAFOs in Washington State, and particularly CAFO dairies, pollute the groundwater and surface water. Pollution occurs through poorly lined manure lagoons, over application of manure as fertilizer, composting operations, manure conveyance systems, tile drains, and air emissions.

The cost for addressing and mitigating this pollution is millions of dollars every year. It is in the best interests of Washington State to draft and approve strong NPDES permits for CAFOs and to require all CAFOs to obtain permits.

Government does not have the authority to decide that people shall forego eating fish and drink milk instead. Government abuses power when government sacrifices fish runs in order to protect the dairy industry.

References

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