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# **The Contribution of Dairy Farms to Nutrient Loading in South Florida**

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In 2016, Florida and the nation were confronted with a [massive blue-green algae bloom](#) that seemed to blanket Florida's inland waterways, particularly the St. Lucie and Caloosahatchee River basins. The impact was sudden and severe, causing [concerns](#) ranging from health effects to negative effects upon Florida's tourist-based economy. Two years later, blue-green algae [has returned](#) to Florida's waterways with a vengeance. Consequently, the Florida, Department of Environmental Protection (FDEP) has devoted resources to aid the public in [understanding](#) and [reporting on the bloom](#) and its effects. As the FDEP [notes](#), “[blue-green algae, or cyanobacteria, is a type of algae found naturally in freshwater environments. This algae is a microorganism that functions like a plant in that it feeds through photosynthesis and derives its energy from the sun.” The FDEP has further [warned the public](#) that these blooms can produce harmful toxins, yet even those that are non-toxic to humans can have negative effects on aquatic life in affected waterbodies. This year's bloom is so severe that Governor Scott has declared a [state of emergency](#) in Florida.

Algae blooms are not new to Florida, of course. Each year the state is, to varying degrees, plagued with red tide, a different type of algae bloom that, unlike blue-green algae, typically affects Florida's coastline. These blooms are quite common, to the point that the Florida Fish and Wildlife Conservation Commission (FFWCC) issues regular [status updates](#) for the public. These blooms, perhaps due to their frequency, typically receive comparatively less “publicity” unless they become particularly large. 2018 is once again seeing a significant red tide bloom that is [having negative impacts](#), particularly along Florida's southwest coastline. But this year's blue-green blooms seem to be having a disproportionate impact upon Florida's [environment](#) and [economy](#). As such, a significant amount of attention has been focused upon that bloom and its

causes (at least until recently when the size of Florida's red tide grew and has been demanding additional attention).

On a superficial level the conditions that brought about the 2018 blue-green algae bloom are [well known](#). Hurricane Irma produced extensive rainfall totals that caused a rise in the water levels in Lake Okeechobee, an event that (together with [record May rainfall](#)) ultimately resulted in the U.S. Army Corps of Engineers (ACOE) releasing some of this water into the St. Lucie and Caloosahatchee Rivers and their tributaries. According to the ACOE, the releases were required to [prevent potential flooding](#) to communities that could have otherwise occurred were the Herbert Hoover Dike to fail.

For his part, Governor Scott has tried to lay the blame for the 2018 algae bloom at the doorstep of the federal government, declaring that the bloom is the result of the federal government's failure to "[fix the Dike that they operate](#)." This approach is not new to Governor Scott. He asserted the [same thing](#) in 2016, when the state was hit by that bloom, but it is a position that has [not been shared](#) by his colleagues.

Further, the Governor's position doesn't answer the fundamental question of [why](#) the releases of this "Lake O" water, as it is often called, are triggering these massive blooms. The answer is not hard to find. When excessive rainfall falls on Lake Okeechobee, particularly in conjunction with tropical events such as Hurricane Irma, it [churns the bottom sediment](#) in the lake and surrounding rivers. And this sediment is laden with nutrients that feed algae. Nowadays, much of the discussion continues to center around the ways to [solve](#) the harm caused by the release of these nutrients from Lake Okeechobee. And much of that discussion ultimately ends up in addressing the prospects of [purchasing land](#) south of Lake Okeechobee from the sugar

industry so that the land can be used to construct reservoirs that can serve as repositories of nutrient-laden water from the lake.

While the issue of how to handle the massive discharges of water from Lake O is critically important, we submit that the issue of how these nutrients ended up in the lake is equally important. And the fact is that scientists have long known that the offending nutrients have multiple sources. Thus far [sugar farming](#) has gotten much of the attention in the press, and perhaps deservedly so. However, “Big Sugar” is not the only offender.

Sea Grant Florida, a university-based program that works in conjunction with the University of Florida and NOAA recently issued an article that points out that there are currently enough nutrients in Lake Okeechobee that these levels would remain high “[for the next 50 years, even if farming stopped today.](#)” The source of these nutrients has been, and continues to be, a mixture of farming, residential and corporate fertilizer usage, leaking septic tank systems and cattle ranches to the north of Lake Okeechobee. These discharges have seen only limited regulation and recent attempts by the EPA to curtail them have met fierce resistance from the business community, the FDEP and Florida’s elected officials. As *Florida Phoenix* recently [pointed out](#), the State of Florida, lead by Governor Scott, Attorney General Bondi, and Commissioner of Agriculture Putnam, went so far as to sue the EPA to prevent the EPA from finalizing an agreement to help restore the Chesapeake Bay. The EPA had reached this [agreement](#) with six states and the District of Columbia. The impetus behind the lawsuit was the concern that such an agreement could result in efforts by the EPA to take a more aggressive approach in forcing Florida to curb the discharge of nutrients that have been plaguing Lake Okeechobee.

The resistance to efforts to require a reduction on the discharge of nutrients is, as it has most always been, lodged in the [concern](#) that new or expanded regulations would be too costly for the regulated community. Consequently, what has developed over the years is a patchwork of what is realistically described as “suggestions” that initially originated out of Florida’s Department of Agriculture & Consumer Services (FDAC), since it had statutory authority over the agricultural and ranching communities. That authority was provided by Chapter 500, Florida Statutes. However, with the growth of environmental concerns the FDEP was also given statutory authority to regulate these communities. Chapter 403, Florida Statutes, was the vehicle that provided that authority. The FDEP has taken that authority and developed administrative rules that address agricultural and ranching discharges. Those rules are found in Chapter 62 of the Florida Administrative Code.

In this report we are considering the impacts to Lake Okeechobee from one section of the agricultural and ranching industries, that section being concentrated animal feeding operations, known in the industry as “CAFOs.” The CAFO operations with which this report is concerned are dairy farms. By rule, the FDEP has defined them as dairy farms having at least “700 mature dairy cattle (whether milked or dry cows).” (62-670.200(3)(b), F.A.C.

#### A. An Overview of CAFOs

What are CAFOs and why should anyone care about their operations in South Florida? According to the Natural Resources Conservation Service (NRCS), a division of the United States Department of Agriculture (USDA), [CAFOs are farms](#) that house large numbers of

animals such as dairy cows in confined situations.<sup>1</sup> Setting aside the issue of the conditions under which these dairy cattle are housed, the bottom line is that these are factories for the production of a product, as opposed to open fields over which cattle are allowed to roam and graze. The USDA points out that, by definition, even the smallest CAFOs have at least 700 dairy cows.

From a pollution standpoint, these farms produce huge amount of animal waste.

*Extension*, a trade publication, [puts it this way](#):

Dairy cattle generally generate larger manure volumes per live weight than swine, beef, or poultry. A mature dairy cow weighing 1,400 pounds can generate around 14 gallons (about 120 pounds or 1.9 cubic feet) of feces and urine each day with an average as-excreted solids content of around 12 percent.

The Grace Communications Foundation, citing the USDA, [notes that](#):

- ◆ Over 335 million tons of “dry matter” waste is produced on these farms every year in the United States.
- ◆ A single dairy farm “with 2,500 cows produces as much waste as a city with around 411,000 residents.”
- ◆ And while human waste is treated before being released back into the environment, laws typically require no such treatment for waste produced by livestock.

The Sierra Club has also [reported](#) that “even the smallest CAFO” produces an amount of urine and feces that is the equivalent in volume to the amount produced by 16,000 human beings. In the same report, the Sierra Club also points out that the effluent produced by CAFOs, in addition to animal waste, typically contains things such as antibiotic-resistant bacteria, chemicals

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<sup>1</sup> The animals being used in CAFOs are not limited to dairy cows. They sometimes include other livestock such as beef cattle, chickens and hogs.

used in caring for cattle, cleaning agents, ammonia, heavy metals, milkhouse waste, and fermented fodder.

In terms of waste production, therefore, even the more conservative figure used by the Sierra Club in its report points to a single dairy cow producing the equivalent volume of waste as roughly **23** human beings. And as the statutes and rules that we will discuss below indicate, unlike municipal wastewater treatment plants, these dairy farms are required to provide very little “treatment” of this waste. Further, what little requirements for treatment do apply are applicable only to these larger farms, i.e. farms with 699 dairy cattle or less have no similar restrictions. The single exception to this rule is that the FDEP Secretary can designate a smaller operation as being a CAFO if there is a showing of what amounts to extenuating circumstances.<sup>2</sup> Such designations are unlikely, particularly given the FDEP’s historic reticence to impose permitting requirements on even those farms that had, for years been deemed to be CAFOs by the federal government.

#### B. The Statutory and Administrative Framework Governing CAFO Discharges

In order to understand where we are as a state, we must understand the legal umbrella under which the FDEP and its permittees operate. This begins with the granting of authority to the FDEP to regulate discharges of wastes through the adoption of rules. This authority is found in § 403.061(7), Fla. Stat., although the Department’s authority is strategically limited on a point that is particularly important to dischargers of animal waste. Specifically, included in this grant is the [following limit](#): “Rules adopted pursuant to this act shall not require dischargers of waste into

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<sup>2</sup> See, 62-670.400(3), F.A.C.

waters of the state to improve natural background conditions.” “Natural background conditions” is not defined in § 403.031, Fla. Stat., meaning that it is questionable whether cattle dischargers can be made to significantly clean up waters that, as we know, have been highly contaminated for decades before the statutes were even written.

The fact that much of the land north of Lake Okeechobee is highly polluted partially lays directly at the feet of the FDEP. Dairy farms have, for decades, been known producers of copious amounts of nutrient-laden waste. They have been regulated for years by the EPA under the federal Clean Water Act (CWA). However, in Florida, it took court action to force the FDEP to issue and administer “CAFO permits” that would hopefully serve to limit these discharges. The court case, *Save Our Suwannee, Inc., Manasota-88, Inc., The Conservation Alliance of St. Lucie County, Inc., and Linda L. Young vs. State of Florida, Department of Environmental Protection*, (Leon County Circuit Court, Case No. 201-CA-001266, March 3, 2004) resulted in a scathing order<sup>3</sup> (Order) being issued against the FDEP, ordering it to begin the permitting process for CAFOs. The Order acknowledged that the FDEP had entered into some agreements with CAFOs, however, in its Order, the trial court also found that:

“DEP has accorded the dairy industry a degree of control over the resolution of water pollution problems posed by CAFOs that is not contemplated by the statutory requirements of this state, and which undermines a proper regulatory system required to abate water pollution and conserve and protect the natural resources of this state. The State’s responsibility for such abatement, conservation and protection is not optional, or discretionary. It is mandated by the Florida Constitution. . .”

(Order, Page 2) the trial court continued:

“The DEP’s implementation of constitutional and statutory duties to abate pollution and protect natural resources from pollution from CAFOs is so inadequate as to closely resemble a delegation

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<sup>3</sup> Judge Smith’s Order is attached as Exhibit A.

of its duties to the industry it is required to regulate. Such agency action can not (sic) continue. . .”

(Order, Pages 3-4) Indeed, in 2004, when this order was issued, “[n]o dairy [had] ever been required to apply for a permit specified in the National Pollutant Discharge Elimination System (‘NPDES’) permitting program adopted pursuant to the federal Clean Water Act (‘CWA’) as provided in 33 U.S.C. §1311(a) and §1342...”<sup>4</sup> (Order, Page 5) As a result of his findings, the trial judge ordered the FDEP to set up a permitting program and to require that all dairies in Florida with more than 700 cattle apply for and obtain a permit prior to operation. Further, and importantly, the court also ordered the FDEP to “[d]evelop an enforcement program to identify and bring actions to control water pollution from unpermitted CAFOs.” (Order, Page 8) Unfortunately, the order was silent on requiring the FDEP to structure its CAFO permits so that they would be enforceable. Nevertheless, it was a step forward.

Since 2004, the FDEP has used the statutes, together with its own rules and agreements with the EPA to require cattle ranches, particularly dairy farms in Florida, to obtain a permit from the FDEP authorizing their discharges into Florida’s waterways. The FDEP has used § 403.061(7), Fla. Stat., as authority to adopt administrative rules to regulate CAFOs. It has further used §§ 403.087 and 403.0885, Fla. Stat., as its basis for requiring CAFOs to obtain permits prior to operation. Each of these statutes existed well before the issuance of Judge Smith’s 2004 Order.

The administrative rules primarily relied upon by the FDEP in issuing CAFO permits are 62-620 (Wastewater Facility and Activities Permitting), F.A.C., 62-302 (Surface Water Quality Standards), F.A.C., and 62-670 (Feedlot and Dairy Wastewater Treatment and Management

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<sup>4</sup> Prior to the issuance of the Order, the FDEP had been relying on § 403.0611, Fla. Stat., as authority to avoid requiring permits in some situations. Instead, the FDEP was entering into unenforceable agreements with some industry groups in an alleged effort to minimize the discharge of pollutants.

Requirements). F.A.C. 62-670.200(3)(b), F.A.C., defines a CAFO as having at least 700 mature dairy cattle.

Although 62-670.200(3)(b), F.A.C. defines a CAFO as having at least 700 mature dairy cattle, this does not mean that the designation automatically results in curtailing wastewater discharges. To the contrary, the rules effectively presume that these farms will eventually discharge to surface and ground waters.<sup>5</sup> Nevertheless, if a dairy is able to convince the FDEP that no surface water discharge<sup>6</sup> will occur, even as a result of a 25-year, 24-hour storm event, then it will not be “considered a concentrated animal feeding operation regardless of the number of animals at the facility.” 62-670.200(3), F.A.C. Consequently, this is a significant issue that is addressed when the dairies apply for permits to the FDEP. Further, it follows that whenever a permit is issued it is an acknowledgment by the FDEP that the facility will, in fact, discharge to surface waters at some point in time.

A close review of 62-670 reveals that the FDEP has recognized that acreage surrounding Lake Okeechobee needs additional restrictions, presumably due to the impacts to the lake associated with nutrient contamination. 62-670.200(8), F.A.C. defines the area impacting Lake Okeechobee as the “Lake Okeechobee Drainage Basin” and it, in turn, is made up of roughly 14 sub-basins.

The heightened requirements for these CAFOs are found in 62-670.500, F.A.C.<sup>7</sup> A close review of this provision shows that:

- ◆ They are not allowed to “cause or contribute to” any violations of water quality standards. (62-670.500(3), F.A.C.)

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<sup>5</sup> For example, Rule 62-670.500(1), F.A.C., states that “[t]he discharge of untreated wastewater and runoff from dairy farms may reasonably be expected to be a source of pollution to waters of the state. The purpose of Rule 62-670.500, F.A.C., is to control pollution of waters of the state due to the discharge of wastewater and runoff from dairy farms in the Lake Okeechobee Drainage Basin to surface and ground water.”

<sup>6</sup> The rule is silent on ground water discharges.

<sup>7</sup> Non-Lake Okeechobee Drainage Basin CAFOs need only comply with 62-670.400, F.A.C., which has no requirements beyond the obligation to apply for a permit.

- ◆ If the CAFOs follow all rule requirements they are presumed to be meeting water quality requirements. (62-670.500(4), F.A.C.)
- ◆ The rule requirements that CAFOs must meet in order to be presumed to be meeting water quality requirements include:
  - Keeping cattle fenced and way from waterways and drainage ditches. (62-670.500(5)(a), F.A.C.)
  - The central collection of animal waste and retention of effluent in lagoons/storage ponds for longer periods. (62-670.500(5)(c)1., F.A.C.)
  - The periodic cleaning of storage facilities. (62-670.500(5)(c)2., F.A.C.)
  - The maximization of water quality benefits from plant uptake of nutrients when wastes are applied via land application. (62-670.500(5)(d), F.A.C.)
  - The analyses of nutrient content on a quarterly basis. (62-670.500(5)(d)1., F.A.C.)
  - The limitation of nutrients applied from waste to the amount required by grasses and/or crops in the area. (62-670.500(5)(d)2., F.A.C.)
  - The prohibition of applying wastes in areas in which the water table is less than 18 inches deep.<sup>8</sup> (62-670.500(5)(d)3., F.A.C.)
  - The prohibition of applying wastes in any form to surface waters of the state. (62-670.500(5)(d)4., F.A.C.)
  - Maintaining specific setback distances. (62-670.500(6), F.A.C.)
  - The quarterly monitoring of groundwater for levels of Total Nitrogen, Nitrate Nitrogen, Total Phosphorus and Ortho Phosphorus. In addition, background water quality must be monitored and not exceeded. (62-670.500(7), F.A.C.)

There are three important takeaways from looking at the regulatory framework within which CAFOs operate. First, while CAFOs are known to be polluters of both surface and groundwaters, the FDEP gives them a way out by presuming them to not be polluting the environment if they follow the FDEP’s rules. Second, the FDEP has allowed CAFOs to build and operate waste management systems that are fully capable of failing in major storm events, e.g. hurricanes and floods, knowing that they will not be held liable for environmental destruction that can occur during these events. Third, while there are supposed safeguards in place to prevent contact with surface waters, there are few safeguards, by rule, that address the

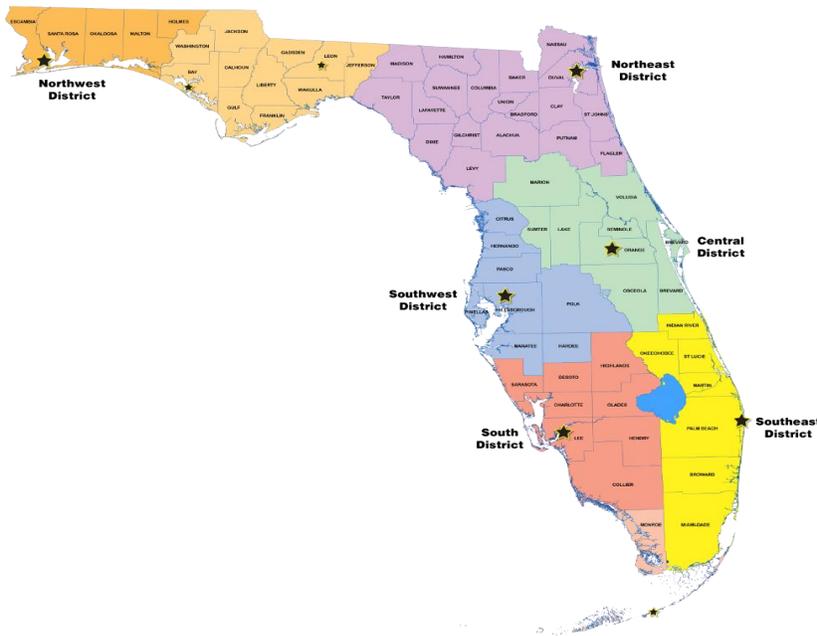
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<sup>8</sup> NRCS, Code 359, by contrast, states that “[t]he lagoon shall have a bottom elevation that is a minimum of 2 feet above the seasonal high water table unless special design features are incorporated that address buoyant forces, lagoon seepage rates, and non-encroachment of the water table by contaminants.” Florida, however, allows a bottom elevation much closer to groundwater, inasmuch as it allows these facilities to operate in areas that are as little as 18 inches above groundwater.

potential for groundwater contamination. While storage in lagoons is required, the design of these lagoons is suspect, because even the EPA considers liners for lagoons to be [voluntary](#).<sup>9</sup> Consequently, there is more than ample opportunity for groundwater contamination.

With the above in mind, we reviewed the CAFO permits issued by the FDEP in the South Florida region, and the results of that review follow.

### C. The CAFO Permits Issued by the FDEP



The FDEP issues CAFO permits pursuant to its delegated authority to administer the federal National Pollutant Discharge Program (NPDES). These permits are typically considered to be industrial wastewater permits, and the

[facility information](#) can be found on the FDEP’s website. From that website we located those facilities that the FDEP has designated as CAFO facilities. There are 31 such permits that the FDEP has issued in a geographical area that is roughly south of Orlando.<sup>10</sup> For the reader’s benefit, the above image of Florida, showing the counties involved, is on the [FDEP website](#). The permits have been issued out of the South, Southeast and Southwest Districts. Once identified,

<sup>9</sup> Page 2-25, EPA’s *Managing Manure Nutrients at Concentrated Animal Feeding Operations*, December 2004.

<sup>10</sup> Exhibit B includes a list of the facilities, together with their permit numbers, acreage, size of herd and

we reviewed the permits and nutrient management plans (NMPs) associated with each facility. The results of that review are summarized below.

What we found was that the majority (19 out of 31) of these facilities are operating in the geographical area for which the Southeast District is responsible. This is a district that, according to our [latest report on FDEP enforcement](#), is among the worst in the state when it comes to enforcing Florida’s environmental laws.

So far as the south Florida counties are concerned, the number of facilities permitted by the FDEP are shown in the table below:

FDEP Office	County	Number of CAFO Facilities Under Permit
Southwest	Hardee	6
Southwest	Manatee	3
South	Desoto	2
South	Glades	1
Southeast	Highlands	4
Southeast	Okeechobee	14
Southeast	St. Lucie	1

As shown above, 14 of the 19 permits issued by the Southeast District pertain to facilities in Okeechobee County alone. *Thus, they are directly north and adjacent to Lake Okeechobee.*

Okeechobee County has a population of 39,997, according to its [website](#). Ironically, according to the permits issued by the FDEP, its human population is smaller than the number of dairy cows permitted by the FDEP in that county.

The permits also provide us with information about the number of acreage and cattle in each of these counties.

County	Acreage Under Permit	Acreage Directly Receiving Waste	Total Number of Cattle
Hardee	8,525.00	2,081.85	14,667.00
Manatee	1,994.00	1,135.00	6,900.00
Desoto	2,140.00	470.00	2,650.00
Glades	300.00	295.00	3,050.00
Highlands	7,138.10	1,284.60	14,306.00
Okeechobee	24,997.00	3,726.40	45,685.00
St. Lucie	690.00	175.00	2,005.00

Based upon the permits issued by the FDEP, we know that, in total, there are now at least 89,263.00 dairy cows being used in Florida’s southern CAFOs, and most of them are in Okeechobee County directly to the north of Lake Okeechobee.

Given the number of dairy cattle in this region, each farm produces copious amounts of manure each day. The CAFO permits do not directly indicate the amount produced by each farm,

however, most of the NMPs provided by the farms include this information. Further, the NMPs often disclose the extent to which the manure is retained onsite or sold to third parties. Further, not all the manure that is retained onsite is makes its way into storage ponds. This is clearly not an exact science, however, based upon reviews of the NMPs provided, it appears that roughly 70% of the manure that is retained onsite ends up in treatment lagoons and/or spray irrigation. The remaining solids are sometimes used for land application by the producing farm. With that in mind, the following table shows the rough amounts of manure produced each year (for each county) by those farms that reported this information (9 did not), the net pounds of manure that are retained onsite, and the net pounds of manure that are transferred to treatment lagoons.

County	Total Number of Cattle	Lbs. of Manure Produced Each Year	Net Lbs. Manure/Yr. Remaining On Site	Net Lbs. Manure/Yr. Going to Treatment
Hardee	14,667.00	341,076,575.00	76,115,056.00	53,280,539.20
Manatee	6,900.00	Not Reported	Not Reported	Not Reported
Desoto	2,650.00	49,275,000.00	49,275,000.00	34,492,500.00
Glades	3,050.00	Not Reported	Not Reported	Not Reported
Highlands	14,306.00	486,526,096.00	178,596,584.90	125,017,609.43
Okeechobee	45,685.00	1,019,411,779.65 <sup>11</sup>	384,578,914.72	269,205,240.30
St. Lucie	2,005.00	55,890,807.50	55,890,807.50	39,123,565.25

<sup>11</sup> 4 farms in Okeechobee County did not provide data on the amount of manure production. Consequently, the cumulative totals for this county are significantly lower than what is realistically being produced.

<b>Cumulative Totals</b>	<b>89,263.00</b>	<b>1,952,180,258.15</b>	<b>744,456,363.12</b>	<b>521,119,454.18</b>
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In considering the above data, we would caution that it contains no data from the 30% of the farms that did not provide any information on this subject to the FDEP. Those farms have a cumulative total of 18,049.00 cattle, or 20% of all the cattle being used in this region. If we assume that the manure production on the non-reporting farms is equal to that of those that did report, we would estimate that it would add an additional 390,436,051.63 pounds of manure produced each year in the region.

In addition to manure, it is a fair question to ask to what extent these farms are producing wastewater that must be disposed of by them. The FDEP permits also give us some insight into this aspect of CAFO operations. Each of these operations produces effluent that is often referred to as “barn wash,” which is comprised of water used to hose down each cow, the equipment being used, and the waste produced by each cow. Each CAFO permit provides detailed estimates of the amount of such wastewater that is produced each day. Accordingly, we assimilated this data and reached the following results for each of the counties identified above.

<b>County</b>	<b>Total Number of Cattle</b>	<b>Total Gallons of Wastewater Produced Each Day</b>
<b>Hardee</b>	14,667.00	4,357,884.00
<b>Manatee</b>	6,900.00	397,006.05

Desoto	2,650.00	62,000.00
Glades	3,050.00	180,000.00
Highlands	14,306.00	968,426.00
Okeechobee	45,685.00	4,083,364.00
St. Lucie	2,005.00	52,000.00

Based on information provided in the permits, all of these CAFOs combined are producing at least **10,100,680.05** gallons of nutrient-laden wastewater each day, and this wastewater must be treated before its release back into the environment. On that point, the next consideration is the extent to which the wastewater is contaminated with nutrients such as nitrogen and phosphorus.

While the permits do not directly specify the amount of nutrients allowed to be produced by each farm, we did find that the NMPs provided by the facilities to the FDEP do categorize the wastewater produced. The NMPs typically advise the FDEP about the number of pounds of nutrients (nitrogen or phosphorus) produced each day by each animal.<sup>12</sup> Knowing this information, together with the size of the herd, allows for a calculation of the nutrient production for each farm. Consequently, based upon those NMPs (except for 6 that did not report this

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<sup>12</sup> It should be noted that the number of pounds varies somewhat, depending upon whether the cows are milk cows, dry cows, calves etc. The percentage of non-milk cows on each farm is typically miniscule when compared with the number of milk cows in production. Milk cows typically produce the highest volume of nutrients in each herd.

information in their NMPs) we were able to calculate the rough number of pounds of nutrients that are being produced by each farm on an annual basis.

On average, we found that each dairy cow on these CAFOs produces .62 pounds of nitrogen each day. Likewise, an average of .22 pounds of phosphorus is produced. However, these amounts can vary by farm, based upon the types of feed consumed by each cow.

Cumulatively, this means that, on average, 750,521.01 pounds of nitrogen is produced each year by each CAFO in this region. Likewise, an average of 274,484.10 pounds of phosphorus is produced. County-by-county production is as follows:

County	Total Number of Cattle	Total Gallons of Wastewater Produced Each Day	Lbs. of Nitrogen Production/Yr.	Lbs. of Phosphorus Production/Yr.
Hardee	14,667.00	4,357,884.00	3,365,672.30	907,079.75
Manatee	6,900.00	397,006.05	Not Reported	Not Reported
Desoto	2,650.00	62,000.00	394,200.00	241,447.50
Glades	3,050.00	180,000.00	Not Reported	Not Reported
Highlands	14,306.00	968,426.00	907,079.75	879,156.52
Okeechobee	45,685.00	4,083,364.00	17,216,371.10	6,386,186.00
St. Lucie	2,005.00	52,000.00	365,912.50	95,137.25
<b>Combined Nutrient Production</b>			<b>23,266,151.20</b>	<b>8,509,007.02</b>

Once again we see that the disproportionate amount of nutrient production is in Okeechobee County, just north of Lake Okeechobee.

The fact that so many nutrients are produced does not mean that they are all being discharged into the environment without being used for beneficial purposes. Modern CAFOs typically engage in a process of planting specific types of crops on pastures that will assist in using the nutrients contained within animal waste. These crops are capable of a certain amount of “uptake” which means that they essentially recycle the nutrients into feed that can be consumed by the herd. Bermuda grass is a typical crop that is planted. Today’s NMPs typically discuss the uptake rates of their crops in an effort to show that the amount of nutrients available to be discharged into the environment is less than what is actually produced by the herds. All but two of the documents available from the FDEP for CAFO facilities discussed these uptake rates, and those documents revealed a total expected annual rate of uptake to be 3,106,179.35 pounds of nitrogen and 870,799.63 pounds of phosphorus. This leads to a **net** amount of nitrogen potentially available for discharge into the environment of **20,162,935.85** pounds each year, and **7,639,936.39** pounds of phosphorus. In other words, a considerable amount of nutrients remains even after being utilized for crop production. The uptake rates per county are shown below:

County	Total Gallons of Wastewater Produced Each Day	Lbs. of Nitrogen Uptake/Yr.	Lbs. of Phosphorus Uptake/Yr.
Hardee	4,357,884.00	692,916.65	242,912.95
Manatee	397,006.05	Not Reported	Not Reported
Desoto	62,000.00	69,195.00	16,224.00

<b>Glades</b>	180,000.00	Not Reported	Not Reported
<b>Highlands</b>	968,426.00	517,087.50	206,033.70
<b>Okeechobee</b>	4,083,364.00	1,210,785.20	356,947.70
<b>St. Lucie</b>	52,000.00	69,125.00	8,225.00
<b>Combined Nutrient Production</b>		<b>3,106,179.35</b>	<b>870,799.63</b>

The net nitrogen and phosphorus available for discharge in each county thus becomes:

<b>County</b>	<b>Total Gallons of Wastewater Produced Each Day</b>	<b>Lbs. of Nitrogen Discharge /Yr.</b>	<b>Lbs. of Phosphorus Discharge/Yr.</b>
<b>Hardee</b>	4,357,884.00	2,672,755.65	226,952.50
<b>Manatee</b>	397,006.05	Not Reported	Not Reported
<b>Desoto</b>	62,000.00	327,969.00	226,952.50
<b>Glades</b>	180,000.00	Not Reported	Not Reported
<b>Highlands</b>	968,426.00	1,406,907.80	673,122.82
<b>Okeechobee</b>	4,083,364.00	16,005,585.90	6,029,238.30
<b>St. Lucie</b>	52,000.00	296,787.50	86,912.25

<b>Combined Nutrient Production</b>		<b>20,162,935.85</b>	<b>7,639,936.39</b>
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The above numbers do not mean that these volumes of nitrogen and phosphorus are being directly discharged by CAFOs into Florida’s surface and groundwaters. Indeed, they are not. In the first place, it must be understood that they are merely estimates that are provided by facility engineers to the FDEP to show the FDEP that they are able to recoup some of the nutrients that are produced. Further, some of these nutrients are clearly captured by the facilities and used for other purposes or trucked away so that their ability to harm the environment is minimized. However, the numbers do show that significant volumes of waste still remain available for discharge into the environment, even after accounting for uptake by new crops.

**D. What the CAFO Permits Do Not Tell Us**

Consider for a moment that as part of the NPDES program the FDEP routinely issues domestic wastewater permits authorizing the discharge of treated wastewater from the multiple sewage treatment plants in Florida. These permits set forth in detail the exact limits that these plants are allowed to discharge in the form of various chemicals, nutrients, solids etc. on a monthly basis. And from the above CAFO data outlined in this report one might think that CAFO permits would also tell the public a significant amount about exactly how many nutrients are being discharged (and allowed to be discharged) into the environment by these facilities. But that is not the case. Unlike municipal treatment plants that are treating human waste, the wastes produced by CAFOs do not contain human pathogens. Consequently, environmental regulatory

agencies do not require reporting with the same specificity as is required from with other NPDES facilities.

What we found in our review of FDEP's CAFO permits is that they are all rather standard, cookie-cutter documents that ultimately impose only general requirements upon the facilities and that ultimately do not tell the FDEP, or the public, exactly how much in the way of contaminates each facility is discharging each month. Since CAFOs do not allow the direct discharge of waste into surface waters except in the event of a 25-year, 24-hour rainfall event, the permits require reporting of various parameters such as flow, nitrogen levels and phosphorus levels only when such discharges occur. Yet, even when such discharges happen, the permits only require the facility to report the amount of the various pollutants that were discharged. In other words, they do not limit the amount of these pollutants that can be discharged into the environment. **Consequently, if a facility discharges nutrient-laden animal waste, treated or untreated, directly into a surface water it can do so and not violate its permit, provided the discharge occurs during a 25-year, 24-hour rainfall event.**

So far as land application is concerned, these facilities are only obligated to report the amount of effluent that is applied, and those reports are typically only submitted on a semi-annual or quarterly basis. This means that there are effectively no limits on the amount of nitrogen and/or phosphorus that can actually be applied by the facilities during operation. So long as they tell the FDEP a few times a year how much nitrogen and/or phosphorus was found in a sample taken for reporting purposes, the FDEP will consider that they have complied with their permits.

The facilities are also required to monitor the state of the groundwater under their property. For this purpose, they are required to install monitoring wells, typically at the

perimeters of sprayfields and/or storage ponds from which to conduct the sampling. However, the facilities are also given a zone of discharge that typically extends to their property boundary, meaning that their primary obligation is to ensure that any discharges are within groundwater limits at the time that they leave the edge of the property.

As with land application, groundwater is required to be tested twice a year, although on some occasions discharge monitoring reports with test data are submitted quarterly. **We found that none of the permits set specific limits on the amount of fecal coliform, nitrogen, phosphorus, ortho phosphate, or turbidity that is allowed in the groundwater.** The only limits that were set were for pH (6.5-8.5 s.u.) and nitrite plus total nitrate (as N) which has a limit of 10 mg/L. Otherwise, no groundwater limits apply.

We have frequently mentioned NMPs in this report. The facilities are required to submit NMPs to the FDEP prior to issuance of the CAFO permit. However, we found that NMPs were frequently not updated with each new permit cycle. Further, while the permits themselves state that the facility must abide by the NMP, the NMPs themselves were all written by engineering firms hired by the permittee. Consequently, best management practices are often “suggested” rather than being mandatory. Words such as “should” are not infrequently used. Simply stated, the practices and the NMPs that they discuss are essentially aspirational and are typically unenforceable unless the FDEP were able to show a wholesale abdication on the part of a facility in its duty to comply with the NMP. Such was the case in the few enforcement cases that we found for these permits. This is perhaps best encapsulated by a comment in one NMP that we found for a current permit. It stated that, “. . . even under the best of management conditions it is

understood that the pastures and forage fields will still have significant amounts of nutrients lost in storm runoff.”<sup>13</sup>

#### E. CAFO Permit Enforcement

Our review of enforcement filings against these CAFOs found that of the 31 permits there have been 5 enforcement actions, 3 of which were against the same dairy in the Southeast District. That dairy, the *J.M. Larson Dairy* has entered into 3 separate consent orders in 2004, 2005, and 2007. Those consent orders were for:

- 2007—OGC No. 07-1456—failure to file an updated NMP--\$500 penalty assessment
- 2005—OGC No. 05-2379—Unauthorized discharge--\$8,500 penalty assessment
- 2005—OGC No. 05-034—Unauthorized discharge--\$2,500 penalty assessment

The remaining 2 enforcement cases were against other dairies for failure to maintain the facility (*Farren Daiken Dairy*) and for failure to submit a required sampling report (*Cameron Daiken Dairy*). Otherwise, the FDEP has reported no enforcement on Oculus against any of the 31 dairies reviewed for this report.

#### F. Conclusion

After reviewing the permits for CAFOs in the region that ultimately discharges into Lake Okeechobee it is clear that, while the FDEP has put the facilities under permit, the agency did so

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<sup>13</sup> This comment was noted in Addendum A of the NMP submitted on behalf of H W Rucks Dairy, Barns 1 & 3, Permit FLA139173

only after being forced to do so by a circuit court judge. Yet, the monitoring of these facilities continues to be woefully inadequate. This is a system that essentially allows engineers hired by the facilities to write the terms of the permits that are eventually issued. This is because the permits largely require only that the facilities report the level of discharges on a quarterly basis and then leave it up to the nutrient management plans to fill-in the gaps with more specificity concerning how the facilities will be operated. Often the nutrient management plans contain verbiage that makes the detailed operation plans merely aspirational, rather than mandatory. Consequently, we are left with data that shows that each year almost 3.5 billion gallons of mixed water and feces, itself comprised of at least a half a million pounds of manure, is being deposited onto land that is north of Lake Okeechobee. The problem is compounded by the addition of hundreds of tons of additional manure that are directly applied to pastures and other areas in the vicinity. Most of this material is nutrient-rich and ultimately finds its way to Lake Okeechobee. The disturbing fact is that it appears that the FDEP itself has no idea just how many tons of these pollutants are entering the lake. Why? Because the FDEP doesn't have the fortitude to require specific reporting that would give them the answer. To do so would require crossing politically powerful interests and the politicians that they support. Meanwhile, the algae blooms continue; and rather than cleaning up Lake Okeechobee, the conversation invariably centers around what can be done to divert the highly polluted lake-water to other parts of the state.