

Complying with New CAFO Annual Report Requirements

Michigan Department of Environmental Quality



Webinar Setup

- All lines will be muted
- Questions can be sent to us via the question/chat box
- We will record webinar and post online

Complying with New CAFO Annual Report Requirements

Jerrod Sanders, MDEQ

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February 19, 2013



Program Announcements.....

- *2012 Annual Reports due April 1, 2013*
- *Spill Prevention, Control, & Countermeasure (SPCC) requirements webinar – March 26, 10-11:30*
...Google: “[DEQ Webinars](#)”

Why was the Annual Report Changed?

- *Reduce submittals*
- *Good progress on daily records*
- *Improve correlation with “big picture” compliance*
- *Calendar Year vs. Crop Year*
- *Staff workload challenges*

What Changed?

Removed:

- *Most record keeping is not submitted*

New Submittal*:

- *Agronomic synopsis by crop year*

**No “new” requirements...*

Terms & Resources

[MDEQ CAFO Webpage](#)

[MAEAP – Michigan Agriculture Environmental Assurance Program](#)

[GAAMPs – Generally Accepted Agricultural & Management Practices](#)

[Fertilizer Recommendations for Field Crops in Michigan \(Extension Bulletin E2904, 2004\)](#)

[MSUE Bulletin MM-2 “Utilization of Animal Manure for Crop Production”](#)

[MMP Software](#)

[Michigan MMP CNMP DLL template](#)

Getting started.....

Download Annual Report Form from
DEQ Webpage (internet search for
[“Michigan CAFO”](#))

General Instructions:

- CAFO Annual Report is a Required Form
- Complete a separate annual report for each CAFO
- Page 1 of the report form must be completed in it's entirety, and then signed by an authorized representative of the farm.
- Additional information required for a complete annual report

Section 1: General Info

- 1.a. is the reporting period (ie. “2012” for reports coming in on April 1, 2013)
- Complete the rest of this section using the most current information available.

| Section 1: General Facility Information | |
|---|---|
| a. Reporting Period | January 1 Through December 31, <u>2012</u> |
| b. Facility Name: | <u>Sanders Farm-CAFO (Certificate of Coverage Letter or District Staff)</u> |
| c. Permit/COC Number: | <u>MIG010139 (Certificate of Coverage Letter or District Staff)</u> |
| d. Facility Address | <u>7953 Adobe Road, Kalamazoo, MI 49009</u> |
| e. Mailing Address (if different) | <u>Same</u> |
| f. Facility Contact | <u>Jerrod Sanders</u> |
| g. Contact Phone Number | <u>269/567-3579</u> |
| h. Email Address (if available) | <u>sandersj3@michigan.gov</u> |

Section 2: Operational Info

- Information reported for the “reporting period” (ie. Calendar year 2012)
- “Estimates” should be based on farm record keeping

| Section 2: Operational Information (Represent only the Reporting Period Identified Above) | |
|--|---|
| a. Average and (maximum) type of animals confined { <i>ie. Swine ≥ 55 lbs: 5,100 (5,600); Swine < 55 lbs: 11,000 (13,500)</i> } | Mature Dairy Cows: 1000 (1,150); Dairy Calves: 100(125) *(From Farm Inventories) *(Dry Cows are Mature Dairy Cows) |
| b. Estimated total CAFO waste generated (identify tons and/or gallons): | 7,800,000 Gallons *(calculated OR based on storage and hauling) |
| c. Estimated total waste transferred/manifested (identify tons and/or gallons): | 15,500 gal *(estimated from records - MMP output) |
| d. Total number of acres in the CNMP available for land application | 2,250 Acres *(at the end of the calendar year - MMP/DLL output) |
| e. Total number of acres used for land application | 1,230 *(calculated from spreading records - MMP/DLL output) |

Categories of Animals

- *broilers*
- *layers*
- *swine < 55 lbs*
- *swine > 55 lbs*
- *beef cattle*
- *dairy calves*
- *dairy heifers*
- *mature dairy cows*
- *veal calves*
- *sheep and lambs,*
- *horses,*
- *ducks,*
- *turkeys*
- *other*

Section 3: Additional Submittals

- Complete by checking the appropriate boxes. All boxes in 3.a. and 3.c. Only one box in 3.b.
- 3.a. requires an agronomic synopsis for all fields harvested during the reporting period (ie. 2012) that used 1st year applied manure nutrients (summer/fall 2011 & spring/summer 2012).

Section 3: Additional Information to be Submitted/Attached

- a. The following land application records (i. through viii.) for the reporting period for each field harvested during the reported period which utilized nutrients from previously-applied CAFO waste (this section will often require agronomic information from previous reporting periods):

| | |
|--|---|
| i. <input checked="" type="checkbox"/> Actual crops planted | v. <input checked="" type="checkbox"/> Actual N and P content of land-applied CAFO waste |
| ii. <input checked="" type="checkbox"/> Crop yield goals | vi. <input checked="" type="checkbox"/> Calculations and data used in accordance with Part I.A.4.b.7.c. of the permit (see instructions for details). |
| iii. <input checked="" type="checkbox"/> Actual crop yields | vii. <input checked="" type="checkbox"/> Quantity of CAFO waste land applied |
| iv. <input checked="" type="checkbox"/> Soil testing results | viii. <input checked="" type="checkbox"/> Amount of any supplemental fertilizer applied |

- b. A summary of all CAFO waste discharges from the production area that have occurred during the reporting period, include date, time, and approximate volume...OR... No discharges occurred
- c. A field-specific spreading plan for the upcoming reporting period.

Section 3.a.

a. The following land application records (i. through viii.) for the reporting period for each field harvested during the reported period which utilized nutrients from previously-applied CAFO waste (this section will often require agronomic information from previous reporting periods):

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Fields that would be included in 2012 Annual Report (due 4/1/2013):

- Manure Spring 2012 – 2012 Corn
- Manure Fall 2011 – 2012 Corn
- Manure Summer 2011 (wheat stubble) – 2012 Corn

Field that would not be included in 2012 Annual Report:

- Manure Fall 2012 – 2013 Corn (Planned)*

*This field would be included in the 2013 Annual Report (due 4/1/2014)

Section 3.a.

a. The following land application records (i. through viii.) for the reporting period for each field harvested during the reported period which utilized nutrients from previously-applied CAFO waste (this section will often require agronomic information from previous reporting periods):

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Example table on Page 3 of form.....

Example Annual Summary of Crop and Nutrient Balance for 20__

| Field Name | Soil P (ppm) | Year | Crop Planted | Yield Goal (unit) | Actual Yield | Amount of Manure Applied (ton or gal) | Manure N (lb) | Manure N 1st Year Available (lb) | Manure P (lb) | Credits N (lb) | Fertilizer N (lb) | Fertilizer P (lb) | Total N Crop Year (lb) | Total P (lb) | Basis for Rate Calculation |
|---------------|--------------|------|--------------|-------------------|--------------|---------------------------------------|---------------|----------------------------------|---------------|----------------|-------------------|-------------------|------------------------|--------------|----------------------------|
| Example Field | 85 | 2010 | Corn Grain | 130 (bu) | 135 | 5,000 (gal) | 100 | 65 | 20 | 30 | 55 | 0 | 150 | 20 | 1 year P |

*units are in elemental P; (P = P2O5 / 2.29)
 *all values are for a per acre basis

Consistent with CNMP and Records

Generally Match Prev. Spreading Plan

Retain Supporting Records

Manure P + Fertilizer P

Most recent soil test.
No App. >150

Field-by-Field Averages

Application records / manure analysis

From soil test: 0-75 or 75-150 ppm

Phosphorus Compliance*

*Based on crop removal rates (Pgs. 11 & 12 – Permit)

Soil P = 0-74 ppm:

- Total P up to 4 year P crop removal (crops?)

Soil P = 75-149 ppm:

- Total P up to 1 year P crop removal OR
- Total P up to 2 year P crop removal (if justified)

Soil P = 150+ ppm:

- No manure application

Section 3.a.

a. The following land application records (i. through viii.) for the reporting period for each field harvested during the reported period which utilized nutrients from previously-applied CAFO waste (this section will often require agronomic information from previous reporting periods):

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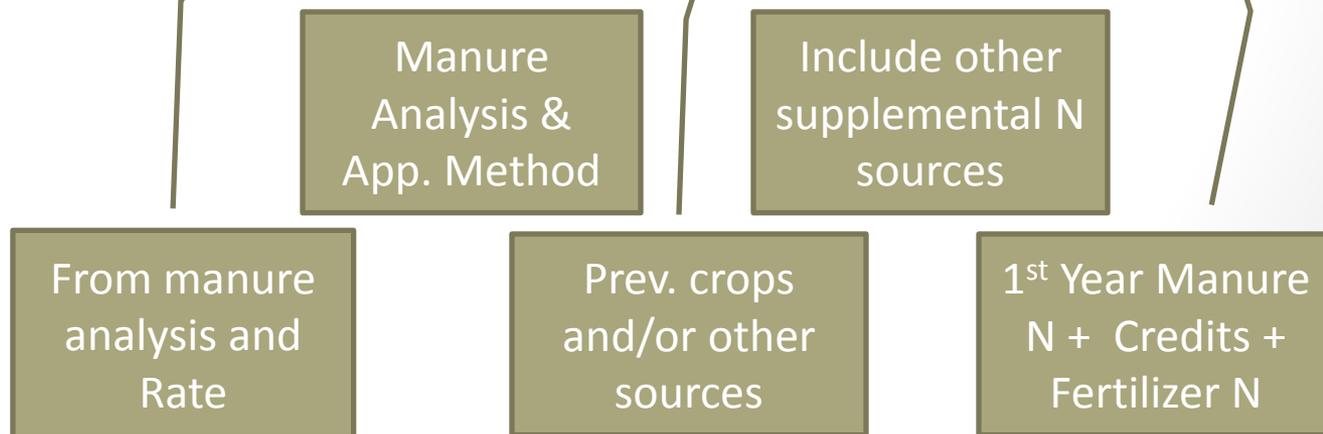
Example table on Page 3 of form.....

Example Annual Summary of Crop and Nutrient Balance for 20

| Field Name | Soil P (ppm) | Year | Crop Planted | Yield Goal (unit) | Actual Yield | Amount of Manure Applied (ton or gal) | Manure N (lb) | Manure N 1st Year Available (lb) | Manure P (lb) | Credits N (lb) | Fertilizer N (lb) | Fertilizer P (lb) | Total N Crop Year (lb) | Total P (lb) | Basis for Rate Calculation |
|----------------------|--------------|------|-------------------|-------------------|--------------|---------------------------------------|---------------|----------------------------------|---------------|----------------|-------------------|-------------------|------------------------|--------------|----------------------------|
| <i>Example Field</i> | 85 | 2010 | <i>Corn Grain</i> | 130 (bu) | 135 | 5,000 (gal) | 100 | 65 | 20 | 30 | 55 | 0 | 150 | 20 | 1 year P |

*units are in elemental P; (P = P2O5 / 2.29)

*all values are for a per acre basis



Nitrogen Compliance*

*Based on N fertilizer recommendations (or legume removal rate) from MSU E2904 Document

Soil P = 0-149 ppm:

- Crop year N up to N fertilizer recommendation OR
- Crop year N up to 1 year N removal rate (legumes)

Soil P = 150+ ppm:

- No manure application

Section 3.b. Discharge Summary

b. A summary of all CAFO waste discharges from the production area that have occurred during the reporting period, include date, time, and approximate volume...OR... No discharges occurred

| 2012 Annual Report Waste Discharge Summary | | | | |
|--|------|------------|------|--------------------------|
| Sanders Farm-CAFO | | | | |
| Date Started | Time | Date Ended | Time | Approximate Volume (gal) |
| 1/22/2012 | 11am | 1/22/2012 | 1pm | 5,000 |
| 7/25/2012 | 1pm | 7/26/2012 | 10am | 20,000 |
| 12/21/2012 | 5pm | 12/21/2012 | 7PM | 1,000 |

Annual Report: Date(s), Time(s), and Approximate Volume

*Permit requirements for discharge reporting during event:

- Report to DEQ as soon as practicable (< 6 hours from discovery) – District Office or PEAS Line (800/292-4706)
- Monitoring (I.A.2. – Pg. 5)
- Written Report within 5 days (II.C.6. – Pg. 27)

Section 3.c. - Spreading Plan

c. A field-specific spreading plan for the upcoming reporting period.

12 month spreading plan:

- Calendar year (2013 plan for 2012 Reporting Period)
- Where (field), How Much, Planned Crops, Crop Yield Goals
- Could include applications that already happened
- Account for all CAFO waste (indicate manifesting volume)

Spreading Plans for 2012

| Crop Yr | App Yr | Mon | Field | Acres | For Crop | Storage Id | Equipment | P Test | Unit s | MARI | Rate/A | Unit | Amt Applied | Avail. N | P205 | K2O |
|---------|--------|-----|-------|------------|------------|------------|-----------|--------|--------|------|--------|------|-------------|----------|------|-----|
| 2012 | 2012 | Apr | 44A | 16/18.34 | Corn grain | Bam 1 | Balzer | 51 | lbs/a | | 5500 | Gal | 87,750 | 170 | 86 | 133 |
| 2012 | 2012 | Apr | 44B | 16.2/18.59 | Corn grain | Bam 1 | Balzer | 69 | lbs/a | | 5500 | Gal | 89,100 | 170 | 86 | 133 |
| 2012 | 2012 | Apr | 44C | 18.7/19.82 | Corn grain | Bam 2 | Balzer | 65 | lbs/a | | 5500 | Gal | 102,600 | 170 | 86 | 133 |
| 2012 | 2012 | Apr | 44D | 18.8/19.9 | Corn grain | Bam 2 | Balzer | 59 | lbs/a | | 5500 | Gal | 103,275 | 170 | 86 | 133 |
| 2012 | 2012 | Apr | | 10.1/11.45 | Corn grain | Bam 2 | Balzer | 133 | lbs/a | | 5000 | Gal | 50,625 | 155 | 79 | 121 |
| 2012 | 2012 | Apr | | 9.1/10.27 | Corn grain | Bam 3 | Balzer | 84 | lbs/a | | 5500 | Gal | 49,950 | 127 | 86 | 133 |
| 2012 | 2012 | Apr | | 17.4/21.45 | Corn grain | Bam 3 | Balzer | 116 | lbs/a | | 5000 | Gal | 87,075 | 116 | 79 | 121 |
| 2012 | 2012 | May | | 18.2/18.16 | Corn grain | Bam 3 | Balzer | 50 | lbs/a | | 5500 | Gal | 99,900 | 127 | 86 | 133 |
| 2012 | 2012 | May | | 15.2/15.14 | Corn grain | Bam 2 | Balzer | 48 | lbs/a | | 5500 | Gal | 83,700 | 170 | 86 | 133 |
| 2012 | 2012 | May | | 12.5/14.97 | Corn grain | Bam 1 | Balzer | 105 | lbs/a | | 5500 | Gal | 68,850 | 170 | 86 | 133 |

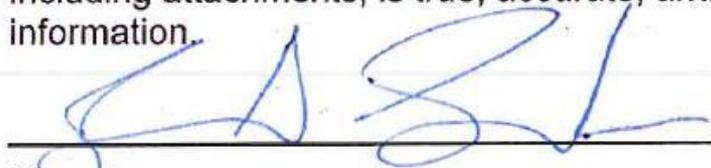
Need Yield Goals!

Section 4: Certification Block

- Must be signed by an authorized representative from the farm (Not Consultant).

Section 4: Certification by Authorized Facility Representative

I certify that all of the following are true: (1) All retained self-monitoring requirements have been complied with, and the year-to-date log has been maintained; (2) the application on which the facility's permit coverage is based still accurately describes the animal feeding operation; and (3) the information contained in this submission, including attachments, is true, accurate, and complete. I am aware there are legal penalties for submitting false information.



Signature

2/15/13

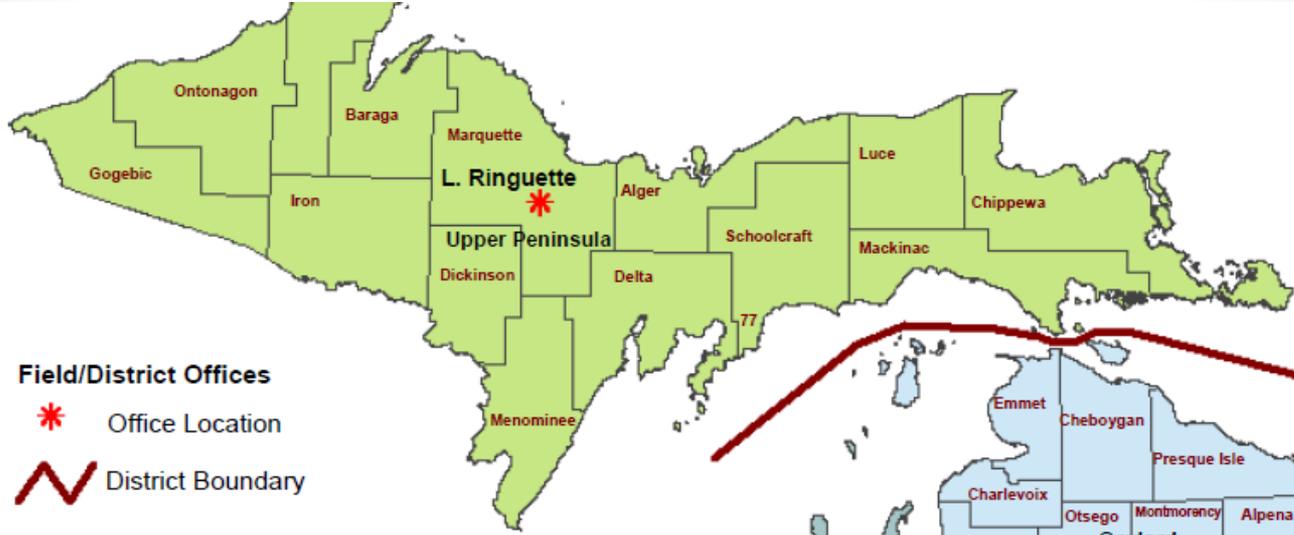
Date

Jerrod Sanders

Printed Name

Submitting the Annual Report

- Must be received April 1st each year
- Fax, email, mail, CD all OK
- Digital submission preferred
- Send to the appropriate District Office



Statewide CAFO Permitting Contact: [Mike Bitondo](#): 517-335-3303

Upper Peninsula: 420 5th Street Gwinn 49841
[Lindsey Ringuette](#) 906-346-8518

Gaylord: 2100 West M-32, Gaylord 49735
[Tim Hall](#) 616-356-0210 (based in Grand Rapids)

Cadillac: 120 W. Chapin St, Cadillac 49601
[Tim Hall](#) 616-356-0210 (based in Grand Rapids)

Saginaw Bay: 401 Ketchum Street, Suite B, Bay City 48708
[Gene Suuppi](#) 989-894-6276

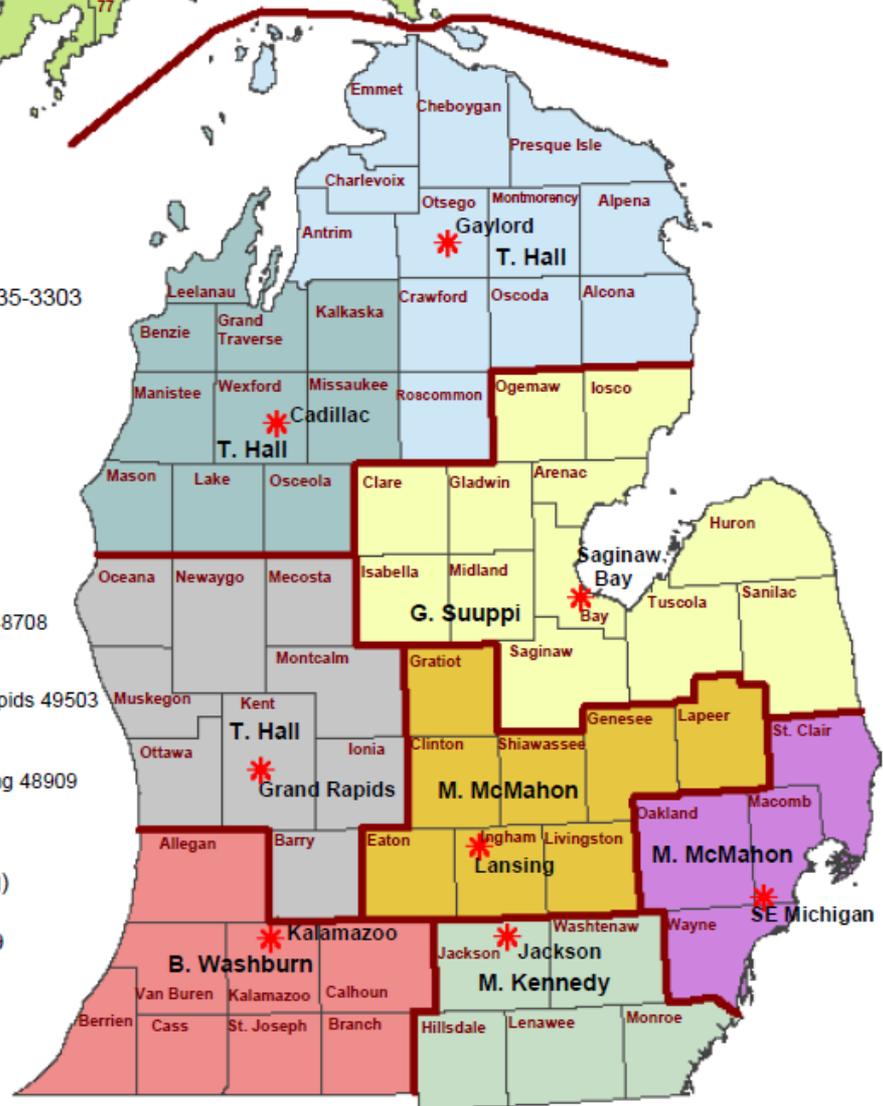
Grand Rapids: 5th Fl. 350 Ottawa Ave NW, Grand Rapids 49503
[Tim Hall](#) 616-356-0210

Lansing: 525 W. Allegan (Constitution Hall, 4N), Lansing 48909
[Megan McMahon](#) 517-335-6107

SE Michigan: 27700 Donald Court, Warren 48092
[Megan McMahon](#) 517-335-6107 (based in Lansing)

Kalamazoo: 7953 Adobe Road, Kalamazoo 49009
[Bruce Washburn](#) 269-567-3576

Jackson: 301 E. Louis Glick Hwy, Jackson 49201
[Michael Kennedy](#) 517-780-7917



Other Comments

- Get going early
- Pay attention to units:
 - Soil tests results: ppm or lbs per acre?
 - Manure/Fertilizer: P or P₂O₅?
- Report what really happened
- Keep all self-retained records for 5 years
- Work with district staff

Questions?

Phosphorus Compliance

Total Phosphorus (report in elemental P) should not exceed the permit limits which are based on crop removal:

Soil P = 85 ppm (1 or 2 year P removal)

130 (bu. corn) x .16 = 20.8 lbs of P (1 year)

41.6 lbs of P (2 years) with justification

*example for 2 years of 130 bushel corn

Soil P = 55 ppm (N recommendation appl. = max 4 year P rem.)

2 Yr. Corn (130 bu.) + *2 Yr. Soybean (50 bu.) = 42 + 35 = 77 lbs of P

*2 yr. Soybean = 50 bu. X .35 X 2 years = 35

P Removal -Pages 11 & 12 of Permit

P₂O₅ values are included for reference purposes.

| Crop | Harvest Form | Unit of Realistic Yield Goal per Acre | P | P ₂ O ₅ |
|----------------------|--------------|---------------------------------------|--------------------------|-------------------------------|
| | | | - - lb/unit of yield - - | |
| Alfalfa | Hay | ton | 5.72 | 13.1 |
| Alfalfa | Haylage | ton | 1.41 | 3.2 |
| Apple | Fruit | ton | 0.19 | 0.44 |
| Asparagus | Shoots | ton | 1.1 | 2.51 |
| Barley | Grain | bushel | 0.17 | 0.38 |
| Barley | Straw | ton | 1.41 | 3.2 |
| Beans (dry edible) | Grain | cwt | 0.53 | 1.2 |
| Beans (green, fresh) | Pods | ton | 1.22 | 2.8 |
| Blueberry | Fruit | ton | 0.20 | 0.46 |
| Bromegrass | Hay | ton | 5.72 | 13 |
| Buckwheat | Grain | bushel | 0.11 | 0.25 |
| Canola | Grain | bushel | 0.40 | 0.91 |
| Carrots | Root | ton | 0.79 | 1.81 |
| Cherries (sour) | Fruit | ton | 0.3 | 0.69 |
| Cherries (sweet) | Fruit | ton | 0.37 | 0.85 |

| | | | | |
|--------------------|---------|--------|------|------|
| Clover | Hay | ton | 4.4 | 10 |
| Clover-grass | Hay | ton | 5.72 | 13 |
| Corn | Grain | bushel | 0.16 | 0.37 |
| Corn | Stover | ton | 3.61 | 8.2 |
| Corn | Silage | ton | 1.45 | 3.3 |
| Cucumbers | Fruit | ton | 0.47 | 1.1 |
| Grapes | Fruit | ton | 0.26 | 0.6 |
| Millet | Grain | bushel | 0.11 | 0.25 |
| Oats | Grain | bushel | 0.11 | 0.25 |
| Oats | Straw | ton | 1.23 | 2.8 |
| Orchardgrass | Hay | ton | 7.48 | 17 |
| Peaches | Fruit | ton | 0.24 | 0.55 |
| Pears | Fruit | ton | 0.23 | 0.53 |
| Plums | Fruit | ton | 0.2 | 0.46 |
| Potato | Tubers | cwt | 0.06 | 0.13 |
| Rye | Grain | bushel | 0.18 | 0.41 |
| Rye | Straw | ton | 1.63 | 3.7 |
| Rye | Silage | ton | 0.66 | 1.5 |
| Sorghum | Grain | bushel | 0.17 | 0.39 |
| Sorghum-Sudangrass | Hay | ton | 6.6 | 15 |
| Sorghum-Sudangrass | Haylage | ton | 2.02 | 4.6 |
| Soybean | Grain | bushel | 0.35 | 0.8 |
| Spelts | Grain | bushel | 0.17 | 0.38 |
| Squash | Fruit | ton | 0.76 | 1.74 |
| Sugar beets | Roots | ton | 0.57 | 1.3 |
| Sunflower | Grain | bushel | 0.53 | 1.2 |
| Timothy | Hay | ton | 7.48 | 17 |
| Tomatoes | Fruit | ton | 0.57 | 1.3 |
| Trefoil | Hay | ton | 5.28 | 12 |
| Wheat | Grain | bushel | 0.28 | 0.63 |
| Wheat | Straw | ton | 1.45 | 3.3 |

Nitrogen Compliance:

Total Nitrogen cannot exceed the N Fertilizer recommendation (E2904 – Pg. 9) or N Removal for legumes (Pg. 8):

| Corn | Mineral soil | Organic soil |
|---|--------------|--------------|
| $\text{Corn grain} = (1.36 \times \text{YG}) - 27 - \text{NC} = (1.36 \times \text{YG}) - 67 - \text{NC}$ | | |

Corn grain (mineral soil):

$$(1.36 \times 130 \text{ bu.}) - 27 - 0 \text{ (no N credits)} = \underline{150 \text{ lbs N}}$$

Legume example - Soybean

$$50 \text{ bu.} \times 3.8 = \underline{190 \text{ lbs N}}$$

Legume N Removal Rates (Page 8 of E2904)

Table 3. Nutrient removal in harvest portion of several Michigan field crops.

| Crop | Unit | N | | | P ₂ O ₅ | | | K ₂ O | | |
|------------------------------|------|-----------|--|--|-------------------------------|--|--|------------------|--|--|
| | | - - - - - | | | lb/unit of yield - - - - - | | | - - - - - | | |
| Alfalfa (Hay) | ton | 45 | | | 13.0 | | | 50.0 | | |
| (Haylage) | ton | 14 | | | 3.2 | | | 12.0 | | |
| Barley (Grain) | bu | 0.88 | | | 0.38 | | | 0.25 | | |
| (Straw) | ton | 13 | | | 3.2 | | | 52 | | |
| Beans (dry edible) (Grain) | cwt | 3.6 | | | 1.2 | | | 1.6 | | |
| Bromegrass (Hay) | ton | 33 | | | 13 | | | 51 | | |
| Buckwheat (Grain) | bu | 1.7 | | | 0.25 | | | 0.25 | | |
| Canola (Grain) | bu | 1.9 | | | 0.91 | | | 0.46 | | |
| Clover (Hay) | ton | 40 | | | 10 | | | 40 | | |
| Clover-grass (Hay) | ton | 41 | | | 13 | | | 39 | | |
| Corn (Grain) | bu | 0.90 | | | 0.37 | | | 0.27 | | |
| (Stover) | ton | 22.0 | | | 8.2 | | | 32.0 | | |
| (Silage) | ton | 9.4 | | | 3.30 | | | 8.00 | | |
| Millet (Grain) | bu | 1.1 | | | 0.25 | | | 0.25 | | |
| Oats (Grain) | bu | 0.62 | | | 0.25 | | | 0.19 | | |
| (Straw) | ton | 13 | | | 2.8 | | | 57 | | |
| Orchardgrass (Hay) | ton | 50 | | | 17 | | | 62 | | |
| Potato (Tubers) | cwt | 0.33 | | | 0.13 | | | 0.63 | | |
| Rye (Grain) | bu | 1.1 | | | 0.41 | | | 0.31 | | |
| (Straw) | ton | 8.6 | | | 3.7 | | | 21 | | |
| (Silage) | ton | 3.5 | | | 1.5 | | | 5.2 | | |
| Sorghum (Grain) | bu | 1.1 | | | 0.39 | | | 0.39 | | |
| Sorghum-Sudangrass (Hay) | ton | 40 | | | 15 | | | 58 | | |
| Sorghum-Sudangrass (Haylage) | ton | 12 | | | 4.6 | | | 18 | | |
| Soybean (Grain) | bu | 3.8 | | | 0.80 | | | 1.40 | | |

N Credit Calculation (Page 9 – E2904)

Table 5. Nitrogen credit for N-responsive crops grown in rotation with these crops.

| Previous crop | N credit |
|----------------------|---------------------|
| | - - - lb N /A - - - |
| Alfalfa, established | 40 + (% stand) |
| Alfalfa, seeding | 40 + 0.5 (% stand) |
| Clover, established | 40 + 0.5 (% stand) |
| Clover, seeding | 20 + 0.5 (% stand) |
| Trefoil, established | 40 + 0.5 (% stand) |
| Barley + legume | 30 + 0.5 (% stand) |
| Oats + legume | 30 + 0.5 (% stand) |
| Wheat + legume | 30 + 0.5 (% stand) |
| Dry edible beans | 20 |
| Soybeans | 30 |
| Grass hay | 40 |

MSUE Bulletin MM-2 "Utilization of Animal Manure for Crop Production" – Injection (No NH4 Loss)

Table 1. Average values for characteristics of different manure types (MWPS, 1985).

| Animal Species | Manure Type | % Dry Matter | Total N | NH ₄ -N | Total P ₂ O ₅ | Total K ₂ O | Manure Density* | Mineralization Factor** |
|----------------|-------------------|--------------|--|--------------------|-------------------------------------|------------------------|-----------------|-------------------------|
| | | | -- lb/ton for solids; lb/1000 gal for liquids -- | | | | - lb/cu ft - | |
| Dairy | Solid w/o bedding | 18 | 9 | 4 | 4 | 10 | 62 | 0.35 |
| | Solid w/ bedding | 21 | 9 | 5 | 4 | 10 | 62 | 0.25 |
| | Anaerobic liquid | 8 | 24 | 12 | 18 | 29 | 62 | 0.30 |
| | Flushed liquid | 1 | 4 | 2.5 | 4 | 5 | 62 | 0.30 |
| Beef | Solid w/o bedding | 15 | 11 | 4 | 7 | 10 | 60 | 0.35 |
| | Solid w/ bedding | 50 | 21 | 8 | 18 | 26 | 60 | 0.25 |
| | Anaerobic liquid | 11 | 40 | 24 | 27 | 34 | 62 | 0.30 |
| | Flushed liquid | 1 | 4 | 2 | 9 | 5 | 62 | 0.30 |
| Swine | Fresh w/o bedding | 18 | 10 | 6 | 9 | 8 | 60 | 0.50 |
| | Anaerobic liquid | 4 | 36 | 26 | 27 | 22 | 62 | 0.35 |
| | Flushed liquid | 1 | 4 | 3 | 2 | 4 | 62 | 0.35 |
| Poultry | Deep pit (solid) | 76 | 68 | 44 | 64 | 45 | 60 | 0.45 |
| | Solid w/o litter | 45 | 33 | 26 | 48 | 34 | 60 | 0.35 |
| | Solid w/ litter | 75 | 56 | 36 | 45 | 34 | 60 | 0.30 |
| Turkey | Solid w/o litter | 22 | 27 | 17 | 20 | 17 | 60 | 0.35 |
| | Solid w/ litter | 29 | 20 | 13 | 16 | 13 | 60 | 0.30 |
| Sheep | Solid | 28 | 14 | 5 | 9 | 25 | 65 | 0.25 |
| Horses | Solid w/ bedding | 46 | 14 | 4 | 4 | 14 | 60 | 0.20 |

1st Year Available N per 1000 gallons
 =
 26 (NH₄-N)
 +
 10 (Total N – NH₄-N) x 0.35 (Mineralization)
 26 + 3.5 = 29.5 lbs
5000 gallons per acre
 =
147 lbs N

Future N Credits = 3.5 (1st yr org.) X 5 (1000 gal) X %

| | | |
|----------------------------|----------------------------|----------------------------|
| <u>2nd year</u> | <u>3rd year</u> | <u>4th year</u> |
| 9 | 4 | 2 |

N additions to the soil-plant system. At the present time, organic N released (mineralized) during the second, third and fourth cropping years is estimated to be 50%, 25% and 12.5% respectively, of the amount released the first year. Further discussion of decomposition and



Water

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Surface Water

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Concentrated Animal Feeding Operation (CAFO)

Agency: Environmental Quality

Provided below are links to Concentrated Animal Feeding Operation permit related information. The downloadable documents are available in PDF format.

CAFO General Permit

- [General Permit](#)
- [General Permit Responsiveness Summary](#)
- [CAFO General Permit - merge & compare to the public noticed version of the permit](#)
- [CAFO General Permit - merge & compare to the 2005 permit](#)

General Information

- [EPA Revised CAFO Rule: Frequently Asked Questions](#)
- [No Potential to Discharge Information/Application](#)
- [MDEQ CNMP Guidance \(2010\)](#)
- [Completion of NPDES Permit Applications for CAFOs \(Revised March 2012\)](#)
- [How to Apply for an NPDES Permit and Downloadable Application Forms](#)
- [CAFO Declaratory Ruling \(June 15, 2005\)](#)
- [CAFO Declaratory Ruling Fact Sheet \(updated July 26, 2005\)](#)
- [CAFO Questions and Answers \(updated December 2, 2005\)](#)
- [CAFO Rules](#)
- [CAFO Technical Standards](#)
- [CAFO Waste Storage Facility Guide](#)
- [Instructions for Determining Precipitation Forecasts](#)
- [Final Determination and Notice Regarding Surface Water Discharges from New Large CAFOs](#)
- [ECOS Final Report Coverletter](#)
- [ECOS Final Report](#)

CAFO Guidance Documents

- [Guidance #1: Depth Gauge, 2-2008](#)
- [Guidance #2: Manifesting, 3-2008](#)

Related Content

- [Selenium Projects at Empire and Tilden Mines](#)
- [Concentrated Animal Feeding Operation \(CAFO\) Staff Map](#)
- [NPDES \(Surface Water\) Discharge Staff Map](#)
- [Pesticide Control](#)
- [Various Studies and Reports](#)
- [Original MOU Delegating NPDES to Michigan DEQ](#)
- [Ballast Water Control 316\(b\) \(Thermal Intake Structure\) Guidance Document](#)
- [NPDES Fees](#)
- [Permits Section Staff](#)
- [How to Apply for an NPDES permit](#)
- [Watershed basins and permit reissuance](#)
- [Water Quality Parameters](#)
- [Who needs an NPDES permit?](#)

Existing Storage Structure Evaluation Guidance

- [Synthetic Structure Evaluation Guidance\(WORD\) \(PDF\)](#)
- [Natural Clay Structure Evaluation Guidance \(WORD\) \(PDF\)](#)
- [Compacted Earth Structure Evaluation Guidance \(WORD\) \(PDF\)](#)
- [Concrete Lined Structure Evaluation Guidance \(WORD\) \(PDF\)](#)
- [Synthetic-Concrete Structure Evaluation Guidance \(WORD\) \(PDF\)](#)
- [Reinforced Concrete Structure Evaluation Guidance \(WORD\) \(PDF\)](#)
- [Steel Storage Structure Evaluation Guidance \(WORD\) \(PDF\)](#)
- [Solid-Dry Stack Structure Evaluation Guidance \(WORD\) \(PDF\)](#)

CAFO Staff

- [CAFO Staff Map](#)

Complying as a CAFO, Part II Guidebook

- [Complying as a CAFO, Part II Guidebook](#)

Forms

- [Record Keeping Forms for MIG019000](#)
- [Daily Land Application Record for MIG019000](#)
- [Manifest for Large CAFO Waste](#)
- [Annual Report](#)
- [Discharge Reporting Form](#)

Permitted/Pending CAFO Facilities

- [List of Permitted/Pending CAFO Facilities](#)

Helpful Links

- [Air Emission Reporting Information](#)
- [EPA CAFO website](#)
- [Michigan Agricultural Environmental Assurance Program](#)
- [MSU Animal Agriculture Information](#)

If you have an questions or concerns relating to the CAFO program, please contact:

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