

# Comprehensive Nutrient Management Plan (CNMP) (September 2017)

The Comprehensive Nutrient Management Plan (CNMP) is an important part of the conservation management system (CMS) for your Animal Feeding Operation (AFO). This CNMP documents the planning decisions and operation and maintenance information for the AFO.

**Farm/Facility:** Facility Address

**Owner/Operator:** Name

**Plan Period:** Beginning and ending dates from plan period

## **Certified Comprehensive Nutrient Management Plan (CNMP) Planner**

As a Certified Comprehensive Nutrient Management Plan (CNMP) Planner, I certify that I have reviewed the *Comprehensive Nutrient Management Plan* and that the elements of the documents are technically compatible, reasonable and can be implemented.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name:

Title: TSP Certification Credentials:

## **Conservation District (Optional)**

As a Conservation District employee, I have reviewed the *Comprehensive Nutrient Management Plan* and concur that the plan meets the District's conservation goals.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name:

Title:

## **Owner/Operator**

As the owner/operator of this CNMP, I, as the decision maker, have been involved in the planning process and agree that the items/practices listed in each element of the CNMP are needed. I understand that I am responsible for keeping all necessary records associated with implementation of this CNMP. It is my intention to implement/accomplish this CNMP in a timely manner as described in the plan.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name:

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## **Section 1. Farmstead (Production Area)**

### **1.1. Maps of Existing and Planned Farmstead Conservation Practices**

## 1.2. Farmstead Conservation Practices – Record of Decisions

(Include all conservation practices for farmstead agreed upon by landowner.)

Example:

### Conservation Practice Name/Practice Code (i.e. Waste Storage Facility/313)

Tract	Land Unit	Planned Amount	Planned Date	Applied Amount	Applied Date
(None)	Farmstead				

All NRCS conservation practices shall be installed, operated and maintained according to NRCS conservation practice standards and associated technical specifications.

### **1.3. Farmstead Conservation Practices – Implementation Requirements**

(Include any implementation requirements for practices on the Farmstead area that are required to complete assessments – i.e. Phosphorus Index, Soil Erosion Estimates. Implementation requirements for most practices applied on the farmstead will be completed at the time of the design and not included in the CNMP. Once the design and implementation requirements are completed, provide a copy to the landowner and place a copy in the case file.)

### 1.4. Animal Inventory

Animal Group	Type or Production Phase	Number of Animals*	Average Weight (lbs)	Confinement Period	Manure Collected (%)†	Storage Where Manure Will Be Stored

\*Average number of animals present in the production facility at any one time

† If manure collected is less than 100%, this indicates that the animals spend a portion of the day outside of the production facility or the production facility is unoccupied one or more times during the confinement period.

### 1.5. Manure Storage

Storage ID	Type of Storage	Pumpable or Spreadable Capacity	Annual Manure Collected	Maximum Days of Storage

**1.6. Planned Manure Exports off the Farm**

Month-Year	Manure Source	Amount	Receiving Operation	Location

**1.7. Planned Manure Imports onto the Farm**

Month-Year	Manure's Animal Type	Amount	Originating Operation	Location

**1.8. Planned Internal Transfers of Manure**

Month-Year	Manure Source	Amount	Manure Destination

**1.9 Brief Description of, or Additional Information about Animal Feeding Operation (Optional)**



## **Section 2. Crop and Pasture (Land Treatment)**

### **2.1. Maps of Fields, Soils, Application Setbacks, Existing and Planned Crop and Pasture Conservation Practices**

(If the same map is used for the farmstead area, it is not necessary to duplicate that map in this section.)

## 2.2. Crop and Pasture Conservation Practices – Record of Decisions

(Include all conservation practices for Crop and Pasture agreed upon by landowner.)

Example:

### Conservation Practice Name/Practice Code (i.e. Conservation Crop Rotation/328)

Tract	Land Unit	Planned Amount	Planned Date	Applied Amount	Applied Date

All NRCS conservation practices shall be installed, operated and maintained according to NRCS conservation practice standards and associated technical specifications.

### **2.3. Crop and Pasture Conservation Practices – Implementation Requirements**

(Include any implementation requirements for practices on the Crop and Pasture areas that are required to complete assessments – i.e. Phosphorus Index, Soil Erosion Estimates. Typical practices include: Conservation Cover (327), Conservation Crop Rotation (328), Cover Crop (340), and Residue and Tillage Management (329 or 345), Contour Farming (330), Stripcropping (585), Field Border (386) and Filter Strip (393). Additional implementation requirements will be completed at the time of the practice design and/or specification development and will not be included in this CNMP document. Once the engineering designs and implementation requirements are completed, provide a copy to the landowner and place a copy in the case file.) Attach implementation requirements, as needed.

## 2.4. Predicted Soil Erosion

### Average water, wind, irrigation, gully and ephemeral erosion estimates

Field	Predominant Soil Type	Slope (%)	Water (Sheet and Rill) (t/ac/yr)	Wind (t/ac/yr)	Irrigation Erosion Controlled (y/n)	Gully Erosion Controlled (y/n)	Ephemeral Erosion Controlled (y/n)	T Factor (t/ac/yr)

### Crop period sheet and rill erosion estimates

Field	Crop Year	Primary Crop	Starting Date (mm/dd/yyyy)	Ending Date (mm/dd/yyyy)	Crop Period Soil Loss (t/ac)

### Section 3. Nutrient Management Plan (590)

#### 3.1. Nitrogen and Phosphorus Risk Analyses Results

State Name Phosphorus Index

Field	Crop Year	Site Total	Management Total	P Index w/o P Apps	P Index w/ P Apps	P Loss Risk

### 3.2. Manure Application Setback Distances

Setback Requirements: (List setback source i.e. NRCS, State, etc.)

Feature	Setback Criteria	Setback Distance (Feet)

Source:

**3.3. Soil Test Result Data**

Field	Test Year	OM (%)	P Test Used	P	K	Mg	Ca	Units	Soil pH	Buffer pH	CEC (meq/100g)

### 3.4. Manure Nutrient Analyses

Manure Source	Dry Matter (%)	Total N	NH <sub>4</sub> -N	Total P <sub>2</sub> O <sub>5</sub>	Total K <sub>2</sub> O	Avail. P <sub>2</sub> O <sub>5</sub>	Avail. K <sub>2</sub> O	Units	Analysis Source and Date	Alum Treatment Rate (lbs/1000 sq.ft.)

- (1) Entered analysis may be the average of several individual analyses.
- (2) Other footnotes as necessary.



## Field Nutrient Status Details

(This table is generated in Manure Management Planner (MMP) and can serve as an alternative for sections 3.5, 3.6 and 3.7.)

### *Field Nutrient Status Details*

*Plan File:*  
*Operation:*

*State:*

*Last Saved:*  
*Init. File Rev:*

<i>Year</i>	<i>Field ID</i>	<i>Sub ID</i>	<i>Nutrient Needs</i>	<i>Crop</i>		<i>Yield Goal</i>	<i>Acres</i>	<i>N</i>	<i>P<sub>2</sub>O<sub>5</sub></i>	<i>K<sub>2</sub>O</i>
			Crop Fertilizer Recs	Crop						
			Crop Nutrient Removal	Crop						
<i>Date</i>	<i>Field ID</i>	<i>Sub ID</i>	<i>Nutrient Activity</i>	<i>Source</i>	<i>Equipment/Method</i>	<i>Rate</i>	<i>Acres</i>	<i>N</i>	<i>P<sub>2</sub>O<sub>5</sub></i>	<i>K<sub>2</sub>O</i>
			Fertilizer App	Type						
			Total Nutrients Applied	Non-manured Field						
			Balance After Recs	Non-manured Field						
			Balance After Removal	Non-manured Field						
<i>Year</i>	<i>Field ID</i>	<i>Sub ID</i>	<i>Nutrient Needs</i>	<i>Crop</i>		<i>Yield Goal</i>	<i>Acres</i>	<i>N</i>	<i>P<sub>2</sub>O<sub>5</sub></i>	<i>K<sub>2</sub>O</i>
			Crop Fertilizer Recs	Crop						
<i>Date</i>	<i>Field ID</i>	<i>Sub ID</i>	<i>Nutrient Activity</i>	<i>Source</i>	<i>Equipment/Method</i>	<i>Rate</i>	<i>Acres</i>	<i>N</i>	<i>P<sub>2</sub>O<sub>5</sub></i>	<i>K<sub>2</sub>O</i>
			Manure App							
			Fertilizer App							
			Total Nutrients Applied	Spreadable Area						
			Balance After Recs	Spreadable Area						
			Balance After Removal	Spreadable Area						
<i>Date</i>	<i>Field ID</i>	<i>Sub ID</i>	<i>Nutrient Activity</i>	<i>Source</i>	<i>Equipment/Method</i>	<i>Rate</i>	<i>Acres</i>	<i>N</i>	<i>P<sub>2</sub>O<sub>5</sub></i>	<i>K<sub>2</sub>O</i>
			Fertilizer App							
			Total Nutrients Applied	Non-spreadable Area						
			Balance After Recs	Non-spreadable Area						
			Balance After Removal	Non-spreadable Area						

#### Notes

- (1) If a field has a non-spreadable area, it is listed in a separate section following the field's spreadable area.
- (2) Yield Goal, Rate, N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O values are all per acre.

- (3) The crop's N fertilizer rec accounts for any N credit from a previous legume crop.
- (4) If a field has more than one manure application in the same crop year, or if the total area covered that year is less than or greater than the field's area, a field average is used in calculating balances. This field average is the sum of each manure application's area times its per-acre amount of nutrient applied, divided by the field's area.
- (5) Any positive P<sub>2</sub>O<sub>5</sub> or K<sub>2</sub>O balance is carried over to the next year. Available N not utilized in the current crop year is assumed lost.
- ▣ Indicates a custom fertilizer recommendation in the Crop Fertilizer Recs columns.
- <sup>a</sup> Indicates in the Balance After Recs N column that the legume crop is assumed to utilize some or all of the supplied N.

### 3.5. Planned Crops and Fertilizer Recommendations

Field	Crop Year	Planned Crop	Yield Goal (per ac)	N Rec (lbs/ac)	P <sub>2</sub> O <sub>5</sub> Rec (lbs/ac)	K <sub>2</sub> O Rec (lbs/ac)	N Removed (lbs/ac)	P <sub>2</sub> O <sub>5</sub> Removed (lbs/ac)	K <sub>2</sub> O Removed (lbs/ac)	Custom Fert. Rec. Source

\* Unharvested cover crop or first crop in double-crop system.

† Custom fertilizer recommendation.

### 3.6. Planned Nutrient Applications (Manure-spreadable Area)

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P <sub>2</sub> O <sub>5</sub> (lbs/ac)	Avail K <sub>2</sub> O (lbs/ac)

### Planned Nutrient Applications (Non-manure-spreadable Area)

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P <sub>2</sub> O <sub>5</sub> (lbs/ac)	Avail K <sub>2</sub> O (lbs/ac)

### 3.7. Field Nutrient Balance (Manure-spreadable Area)

Year	Field	Size Acres	Crop	Yield Goal /Acre	Fertilizer Recs <sup>1</sup>			Nutrients Applied <sup>2</sup>			Balance After Recs <sup>3</sup>			Balance After Removal <sup>4</sup>	
					N lbs/ac	P <sub>2</sub> O <sub>5</sub> lbs/ac	K <sub>2</sub> O lbs/ac	N lbs/ac	P <sub>2</sub> O <sub>5</sub> lbs/ac	K <sub>2</sub> O lbs/ac	N lbs/ac	P <sub>2</sub> O <sub>5</sub> lbs/ac	K <sub>2</sub> O lbs/ac	P <sub>2</sub> O <sub>5</sub> lbs/ac	K <sub>2</sub> O lbs/ac

### Field Nutrient Balance (Non-manure-spreadable Area)

Year	Field	Size Acres	Crop	Yield Goal /Acre	Fertilizer Recs <sup>1</sup>			Nutrients Applied <sup>2</sup>			Balance After Recs <sup>3</sup>			Balance After Removal <sup>4</sup>	
					N lbs/ac	P <sub>2</sub> O <sub>5</sub> lbs/ac	K <sub>2</sub> O lbs/ac	N lbs/ac	P <sub>2</sub> O <sub>5</sub> lbs/ac	K <sub>2</sub> O lbs/ac	N lbs/ac	P <sub>2</sub> O <sub>5</sub> lbs/ac	K <sub>2</sub> O lbs/ac	P <sub>2</sub> O <sub>5</sub> lbs/ac	K <sub>2</sub> O lbs/ac

<sup>1</sup> Fertilizer Recs are the crop fertilizer recommendations. The N rec accounts for any N credit from previous legume crop.

<sup>2</sup> Nutrients Applied are the nutrients expected to be available to the crop from that year's manure applications plus nutrients from that year's commercial fertilizer applications and nitrates from irrigation water. With a double-crop year, the total nutrients applied for both crops and the year's balances are listed on the second crop's line.

<sup>3</sup> For N, Nutrients Applied minus Fertilizer Recs for indicated crop year. Also includes amount of residual N expected to become available that year from prior years' manure applications. For P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O, Nutrients Applied minus Fertilizer Recs *through* the indicated crop year, with positive balances carried forward to subsequent years. Negative values indicate a potential need to apply additional nutrients.

<sup>4</sup> Nutrients Applied minus amount removed by harvested portion of crop through the indicated year. Positive balances are carried forward to subsequent years.

<sup>‡</sup> Indicates a custom fertilizer recommendation in the Fertilizer Recs column.

<sup>a</sup> Indicates in the Balance After Recs N column that the legume crop is assumed to utilize some or all of the supplied N.

<sup>†</sup> Indicates in the Balance After Recs N column that the value includes residual N expected to become available that year from prior years' manure applications.

### 3.8. Manure Inventory Annual Summary (Optional)

Manure Source	Plan Period	On Hand at Start of Period	Total Generated	Total Imported	Total Transferred In	Total Applied	Total Exported	Total Transferred Out	On Hand at End of Period	Units

**3.9. Fertilizer Material Annual Summary (Optional)**

Product Analysis	Plan Period	Product Needed Sep - Dec	Product Needed Jan - Aug	Total Product Needed	Units

### 3.10. Plan Nutrient Balance (Manure-spreadable Area)

	N (lbs)	P <sub>2</sub> O <sub>5</sub> (lbs)	K <sub>2</sub> O (lbs)
Total Manure Nutrients on Hand at Start of Plan <sup>1</sup>			
Total Manure Nutrients Collected <sup>2</sup>			
Total Manure Nutrients Imported <sup>3</sup>			
Total Manure Nutrients Exported <sup>4</sup>			
Total Manure Nutrients Gained/Lost in Transfer <sup>5</sup>			
Total Manure Nutrients on Hand at End of Plan <sup>6</sup>			
Total Manure Nutrients Applied <sup>7</sup>			
Available Manure Nutrients Applied (Utilized by plan's crops) <sup>8</sup>			
Available Manure Nutrients Applied (Not utilized by plan's crops)			
Commercial Fertilizer Nutrients Applied (Utilized by plan's crops) <sup>9</sup>			
Available Nutrients Applied (Manure and fertilizer; utilized by plan's crops) <sup>10</sup>			
Nutrient Utilization Potential <sup>11</sup>			
Nutrient Balance of Spreadable Acres <sup>12*</sup>			
Average Nutrient Balance per Spreadable Acre per Year <sup>13*</sup>			

1. Total manure nutrients present in storage(s) at the beginning of the plan.
2. Total manure nutrients collected on the farm.
3. Total manure nutrients imported onto the farm.
4. Total manure nutrients exported from the farm to an external operation.
5. Changes in total manure nutrients due to internal transfers between storage units with differing analyses.
6. Total manure nutrients present in storage(s) at the end of plan.
7. Total nutrients present in land-applied manure. *Losses due to rate, timing and method of application are not included in these values.*
8. Available manure nutrients applied on the farm based on rate, time and method of application. Based on total manure nutrients applied (row 7) after accounting for state-specific nutrient losses due to rate, time and method of application. Nutrients which will not be utilized by crops in the plan (row 9) are excluded from these values.
9. Nutrients applied as commercial fertilizers and nitrates contained in irrigation water. Nutrients that will not be utilized by crops in the plan (row 11) are excluded from these values.
10. Sum of available manure nutrients applied (row 8) and commercial fertilizer nutrients applied (row 10).
11. For N the value generally is based on crop N recommendation for non-legume crops and crop N uptake or other state-imposed limit for N application rates for legumes. P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O values generally are based on fertilizer recommendations or crop removal (whichever is greatest).
12. Available nutrients applied (row 12) minus crop nutrient utilization potential (row 13). Negative values indicate additional nutrient utilization potential and positive values indicate over-application.
13. Average per acre nutrient balance, calculated by dividing nutrient balance of spreadable acres (row 14) by the number of spreadable acres in plan and by the length of the plan in years. Negative values indicate additional average per acre nutrient utilization potential and positive values indicate average per acre over-application.

\* Non-trivial, positive values for N indicate that the plan was not properly developed. Negative values for N indicate additional nutrient utilization potential which may or may not be intentional. For example, plans that include legume crops often will not utilize the full N utilization potential for legume crops if manure can be applied to non-legume crops that require N for optimum yield. Positive values for P<sub>2</sub>O<sub>5</sub> and/or K<sub>2</sub>O do not necessarily indicate that the plan was not developed properly. For example, producers may be allowed to apply N-based application rates of manure to fields with low soil test P values or fields with a low potential P-loss risk based on the risk assessment tool used by the state. Negative values for P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O indicate that planned applications to some fields are less than crop removal rates.



### Plan Nutrient Balance (Non-manure-spreadable Area)

	N (lbs)	P <sub>2</sub> O <sub>5</sub> (lbs)	K <sub>2</sub> O (lbs)
Commercial Fertilizer Nutrients Applied <sup>1</sup>			
Nutrient Utilization Potential <sup>2</sup>			
Nutrient Balance of Non-spreadable Acres <sup>3*</sup>			
Average Nutrient Balance per Non-spreadable Acre per Year <sup>4*</sup>			

1. Nutrients applied as commercial fertilizers and nitrates contained in irrigation water.
2. Based on crop fertilizer recommendations.
3. Commercial fertilizer nutrients applied (row 1) minus crop nutrient utilization potential (row 2). Negative values indicate additional nutrient utilization potential and positive values indicate over-application.
4. Calculated by dividing nutrient balance of non-spreadable acres (row 3) by number of non-spreadable acres in plan. Negative values indicate additional average per acre nutrient utilization potential and positive values indicate average per acre over-application.

\* Non-trivial, positive values for N indicate that the plan was not properly developed. Negative values for N indicate additional nutrient utilization potential which may or may not be intentional. Positive values for P<sub>2</sub>O<sub>5</sub> and/or K<sub>2</sub>O do not necessarily indicate that the plan was not developed properly. For example, multiple year applications may have been planned during the final plan year(s) and these nutrients will not be utilized by crops in the current plan. Negative values for P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O indicate that applications to some fields may have been delayed to allow the producer to apply the nutrients in accordance with their fertilization schedule.