COMPREHENSIVE NUTRIENT MANAGEMENT PLAN
Guidance for Minimum Requirements

NOTE: All of the information listed below may be necessary for completing a successful Comprehensive Nutrient Management Plan (CNMP). In gathering all of this information, you will be completing an inventory of everything related to nutrient management in this operation. If the item does not apply to the operation you are working with, skip it and move on.

CNMP General Criteria

The information you will be gathering will help to document the six elements of the CNMP:

- Manure & waste water handling and storage
- Land treatment practices
- Nutrient management
- Record keeping
- Feed management
- Other utilization options

Inventory steps include gathering **background** information, **interviewing the operator** and others involved in the operation, and observing **features and conditions** on the site.

PREPARATION

Have the following in hand before beginning site visits:

- County or regional map showing the location of the operation
- Aerial photograph showing the farm boundaries and some surrounding area
- Topographic map, overlaid with farm boundaries
- Plat or tract map of the area, if available
- Soils map, overlaid with farm boundaries

  Note: farm boundaries should identify both owned and rented land in the control of the operation you are planning, as well as any land on which the operator has agreements to accept manure. You may not have all of these identified before going to the farm.

Have the following available for use during planning:

- Soils descriptions (Soil Survey)
- Rainfall data, frost dates, and snow cover dates for the operation location
- Manure production typical values
- Crop extraction typical values
- Nitrogen and phosphorus risk assessment tools

On the aerial photo and topo maps, note features of concern, including:

- Surface water: streams, rivers, lakes, ponds, wetlands, reservoirs
- Sinkholes or other evidence of karst topography
- Steep slopes
- Municipal water sources, either surface or wellhead
- Private water sources, if known
- Extent of 25 year and 100 year flood plains

(Expect to add additional notes to these maps during site visits)

WITH THE OPERATOR

First identify the decision maker for the operation; all legally responsible parties; and verify contact information for each. **Determine the operator's goals and objectives for the operation, their primary reasons for seeking your assistance, and whether they envision or desire any changes to the operation.** Then work with the operator to gather the following information:

Site information

- Verify the operation boundaries and status of lands used in the operation (owned, rented, etc.)
- Note location of all buildings and facilities; request a copy of the operator's farmstead map if one is available.
- Identify water sources for the farm and note location of any wellheads.
- Identify and note the location of the farmstead septic system or sanitary sewer for human and household waste. Is any human waste mixed into the manure stream?
- Obtain the dimensions of buildings, lagoons, pits, dry storage facilities, feedlots, etc. as well as their age and when they were modified or repaired. Record the area of roofs and impervious surfaces (concrete or asphalt). *(See details below).*
- What is the water source(s) for the farm? Where is drinking water (for both people and animals), wash water, flushing water, and dilution water drawn from?
- If the operator plans to construct any new facilities, where will they go? Is that the best place or the only place?

Livestock production information

- What type of operation is this? (Heifers for replacement; veal calves; milking herd; farrow-to finish pigs; layer flock; etc.)
- Animal numbers (breeding, finishing, nursery, etc.)
  - ✓ Maximum and minimum numbers for the year; numbers of animals born on farm, purchased to farm, and sold from farm; number of times flock/herd is replenished through the year, if it is; mortality numbers for year; average litter/lambing/calving rates.
  - ✓ Animal weights: average weight, weight-in & weight-out, weight at weaning, weight at breeding, or whatever applies to the operation.
- All locations where animals are housed or where they spend time during the year, including milking parlors, veterinary stalls, breeding stalls, dry cow housing, pasture, loafing lots, and so forth.
- Lengths of time animals spend at each location.

Feed management

- What are the feedstock and feed sources for this operation?
- Is any waste feed disposed of in the manure stream?
- Does the operator manipulate feed components to adjust the volume or content of the manure?
- Are any feed additives or special feed components used to reduce phosphorus or nitrogen in manure?
- Type and size of silage storage. Is silage leachate captured?

Manure and wastewater handling and storage

- *Manure handling*
  - ✓ How is manure transferred from pens/stalls/freestall to storage area? (Type of equipment, frequency, is water used, is manure separated or dewatered, are there interim holding areas, pits, or gutters; if water is used, how much & how often) Are transfer pumps, valves, and controls operating properly?
  - ✓ Is there temporary containment? What & how long?
  - ✓ When and how is manure agitated? Are solids completely removed when pits/lagoons are pumped out? If solids remain, estimate volume of storage displaced.
  - ✓ If bedding is used, what type and how much? How frequently is it replaced?
  - ✓ What volume of manure is sold or donated off the farm to others? What volume is spread on the operation's land?
  - ✓ Record location of any pipelines or channels containing manure or wastewater.

- *Waste water*
  - ✓ How is building or pen washdown water handled? Volume used? Frequency?
  - ✓ Is wastewater produced in other ways (milkhouse wastewater, egg washing, cooling water, etc) and how is it handled?
  - ✓ Is any wash water or transport water recycled? Are pumps, valves, and controls operating properly? Where is it stored in between uses?
  - ✓ Do wastewater systems have emergency shutoffs if needed?
- *Other animal wastes*
  - ✓ How does the operator dispose of spoiled feed and medical waste?
  - ✓ What is getting into the pits/lagoons/storage facilities besides manure? (Water: how much, where from; debris; bedding; detergents & disinfectants; additives)
- *Lagoons:*
  - ✓ Dimensions, surface area, and number of cells
  - ✓ Storage capacity under normal operation
  - ✓ Date built, and when repairs or modifications done. Are as-built drawings available?
  - ✓ How often is it pumped out? Who does it?
  - ✓ Are design and management documents available?
  - ✓ Is there a clay or other liner? Was the liner tested prior to filling the lagoon?
  - ✓ Is the operation and management plan being followed?
  - ✓ Has the production capacity of the farm changed while the lagoon was in use?
  - ✓ Does manure undergo any treatment, separation, or aeration prior to entering the lagoon?
  - ✓ Does the operator monitor the level in the lagoon? How much freeboard is available?
  - ✓ Is any dilution water used?
- *Pits:*
  - ✓ Dimensions and number
  - ✓ Storage capacity under normal operation
  - ✓ Date constructed.
  - ✓ How often pumped? By whom?
  - ✓ Are design and management documents available?
  - ✓ Has the production capacity or use of the building changed since the pit was constructed?
  - ✓ How much water is entering the pit?
- *Dry storage:*
  - ✓ Dimensions
  - ✓ Storage capacity
  - ✓ Roofed or open (& runoff control if open)
  - ✓ When built & date of any modifications. Are as-built drawings available?
  - ✓ How often is it cleaned out? Who does it?
  - ✓ Has production of the operation changed since it was built?
  - ✓ Are any materials other than manure going into the storage?

Land application

- *Manure application*
  - ✓ How much manure & wastewater is applied each year, according to the operator's figures? Does this vary from year to year?
  - ✓ Does the estimated livestock excretion amounts and planned application amounts match manure application records from previous years (i.e. discrepancies may indicate storage integrity issues)?
  - ✓ How often is manure applied (or storage emptied)?
  - ✓ Does the operator do it themselves or is it custom applied?
  - ✓ How often is manure analyzed? Obtain copies of analyses; at a minimum, within the last year.
  - ✓ Identify which fields are used for land application. How often, at what time of year, and on which fields is manure applied? Obtain copies of any records.
  - ✓ Determine if other waste products (milkhouse waste, washwater, flushing water, mortality, etc) are also land applied and if those are included in the records.

- ✓ What equipment is used to apply manure? If injected, what type of injectors and how deep? If surface applied, when and how is manure incorporated? Is application equipment calibrated? How often? By whom?
- ✓ Is manure transported over public roads during spreading? Identify which roads, how often. Is manure transported by anyone other than the operator or custom applicator?
- ✓ If irrigation is used to apply animal waste, what is the equipment, which fields is it used on, and what volumes are applied? Are pressure sensors and shut-off switches operational?
- ✓ Is irrigation and transfer equipment monitored during use?
- ✓ If manure is applied to any land not owned directly by the operation, are there manure application agreements with contact information for the landowners?

- *Crops & soils*
  - ✓ How often, at what time of year, and at what depth is soil tested? Obtain soil test records for as many years and fields as feasible. At a minimum, within the last four years.
  - ✓ Does the operator use soil tests and manure analysis when calculating manure applications?
  - ✓ Does the operator use both yield goals and yield records? Does the operator have yield monitors? Have any fields been grid-sampled, and is GPS in use?
  - ✓ Are manure applications actually tied to these calculations? Obtain copies of any available yield records.
  - ✓ What are the crop rotation, cropping history, planned crops, and yield targets for each field?
- *Fertilizer application:*
  - ✓ What fertilizer is used in addition to manure?
  - ✓ When and how is it applied? Who applies it?
  - ✓ Is the operator "crediting" manure contributions appropriately for both nitrogen and phosphorus?
  - ✓ Obtain copies of any available fertilizer application records.
- *Economics*
  - ✓ What does it currently cost the operator to collect and store manure?
  - ✓ What does pumping or emptying the storage facilities cost?
  - ✓ What does manure handling system maintenance cost?
  - ✓ What does application cost?
  - ✓ What is the value of the manure nutrients as fertilizer? *(You may have to do some work after the site visit to establish these values).*
  - ✓ How many hours per day, week, or year does the operator spend collecting, storing, and applying manure?
  - ✓ If the operator is not happy with his system, what is he considering changing and what does he estimate it will cost the operation?
- *Other considerations*
  - ✓ Does the operator have a written nutrient management plan? A manure management plan? Are they reflective of the current operation? Obtain copies.
  - ✓ Does the operator use N-serve or any other nitrogen-conserving additive? If so, under what conditions and circumstances?
  - ✓ Is manure ever applied to frozen or partly frozen ground? During rain? On top of snow?
  - ✓ What is the depth to water table for each soil type where manure is spread on this farm? Is the operator applying during times of year when the water table is likely to be high?

Other waste utilization

- Is any of the animal waste being used in any other way than land application?

Mortality disposal

- What volume of mortality needs to be managed each year (animal numbers & weights)?
- Does mortality occur evenly throughout the year, or is it seasonal or periodic?
- How is mortality disposed of? (Incineration, landfill, rendering, composting)
- Is disposal on the farm or elsewhere?
- Is composted mortality land applied? What is the volume, frequency, and location of applications? What bulking agent (usually sawdust) is used and how much? Is all of it land applied?

Permits and certifications

- Does the operation currently hold any state or federal permits or certifications? Are all confinement and manure storage structures included in the approval? Are the required setbacks in the approval met?
- Does the operator hold any certifications related to this plan?
- Are any additional permits or certifications needed for this operation?

Records *(Review or obtain copies as appropriate)*

- Manure analysis (annual from each containment)
- Soil tests. Most recent, at a minimum within the last 4 years.
- Application records (Field, crop, amount, time, date, weather, soil moisture, equipment & methods used)
- Application rate calculations
- Rainfall history on farm
- Equipment calibration & maintenance record
- Manure or wastewater discharges, releases, or spills, with location and level before & after
- Facility inspections. Does the operator have complete and updated monthly self-inspection reports, if required by IDEM? Have problems from the self-inspection reports been addressed?
- Employee training
- Dates when storage structures were emptied, with level before & after
- Manure transfer records (to third parties; nutrient content, volume, date, recipient)
- Emergency action plan

Operation and Maintenance

- Is there a maintenance schedule for equipment and facilities related to manure or fertilizer?
- Do liquid systems have emergency shutoffs as appropriate?
- Do all employees know how to implement the emergency spill response plan?

SITE OBSERVATIONS

Buildings, feedlot, and other activity areas

General site conditions

- Access roads and parking areas gravel or paved? Condition?
- Is production site free of ponded, spilled, or leaking manure?
- Is there a dead animal pick-up area?
- Does surface water pond on site or drain away freely? Where does it go? Is clean water adequately diverted? Are diversion berms properly vegetated and maintained?
- Are sinkholes and tile inlets protected?
- Are perimeter drains operating properly?
- Are livestock denied access to waste storage or staging areas?

Buildings

- Are holes, cracks, splays, seepage, or other defects visible in foundations or pits?
- Do floors and supports appear to be visibly in good condition? What is their lifespan?
- Animal pens and floors free of compacted manure accumulation?
- Floors and pens dry, or is water leaking?
- How is manure moved from pens/stalls/freestall area to storage area?
- Do washwater or transport water facilities have any leaks?
- Is there a dry, impermeable floored, secure location for fertilizer storage?
- Verify building dimensions and dimensions of impervious areas.
- Are buildings guttered? If so, is it diverted from buildings and storage structures? Where does it go?
- Are there any diversions or other practices to keep surface runoff from coming into contact with manure?
- Where are the manure collection points in the buildings? Are pump-out ports covered and intact?
- Is dust and particulate matter cleaned up around fans?

Feedlot

- Is stocking density appropriate?
- Where does water falling on the feedlot drain to? Is surface water collected or diverted?
- How is manure collected from the feedlot?

Earthen Liquid Waste Storage (Lagoons & Pits)

- Verify the lagoon or pit dimensions and apparent age.
- Is the liner intact and undamaged (i.e. damage by equipment or erosion)?
- Is the structure free of animal burrows, trees and woody shrubs, erosion, leaks, evidence of overtopping, or any other evidence of management problems?
- Is the embankment stable and solid, level, and not soggy? Is the embankment covered with vegetation that is well maintained? Is the base of the embankment soggy, damp or showing other signs of seepage?
- Are inlet pipes conveying manure from confinement houses submerged? Are all inlet and intake pipes adequately supported? Are all pipes secured to prohibit animal entry/damage?
- Are level or freeboard markers visible and properly mounted? Is the liquid level below the twenty-four (24) hour freeboard requirement?
- Is the spillway stable and not damaged or eroded?
- Does structure appear to be in good condition and free of leaks and cracks?

Dry storage

- Verify the facility's dimensions and apparent age.
- Is structure sound and properly designed for the type and volume of manure stored?

Mortality

- Are mortality handled within 24 hours? If incinerated, rendered, or ground, is there an adequate holding area for carcasses waiting to be processed or collected? Is the area protected from rain and surface runoff?
- If they are buried is it an appropriate site and method? Are they covered with at least 4 feet of cover?
- If mortality is composted, does the composting area have a roof and impermeable floor? Is there a way to collect any runoff? Is the facility constructed so compost can be turned and there are at least two pits or piles? Is adequate bulking/covering material being used? Is compost applied to the land appropriately?

Proximity

- Measure the distance from the production facility, and any storage structures, to the nearest:
    - Residential neighbor
    - Public building (school, church, recreation site)
    - Private water well (or other private water source)
    - Public water supply feature (wellhead, wellhead protection area boundary, surface water supply)
    - Surface water (stream, lake, reservoir, pond, ditch)
    - Drainage inlets, tile or underground drainage feature
    - Sinkhole
    - Public road

Livestock

- Determine if livestock is of the type, age, and number you expected from the operator's records. If not, further discussion with the operator is needed to clarify your information.
- Are livestock housed appropriately? Do they have access to areas that you had not already noted? Are they denied access to all water bodies?
- Are there any species on the farm which were not previously noted, such as 4-H animals, pets, or horses, in significant numbers?

Equipment and mechanical

- Verify the type and manufacturer of all equipment used to move, apply or handle animal waste or fertilizer.
- Determine if any equipment appears to be poorly maintained or inadequate to the task. Are there any noticeable leaks around pipes?
- Determine if equipment is the appropriate size/capacity for the type and volume of animal waste to be handled. Is the transport vehicle or conveyance free of leaks? Are measures taken to contain solid manure during transport?
- Is animal waste and fertilizer application equipment clean and properly housed?

Land application areas

- Determine the conservation practices currently being used on all fields where manure may be applied. Include both structural and management practices.
- If conservation tillage is used, is it consistently applied and do residue levels meet practice standards?
- Are structural practices well maintained and appropriate for the site?
- Are additional practices needed to reduce the risk of nutrients leaving the site, entering groundwater, or entering surface water?
- Are the fields tile drained? What is the depth of the tile? Is the tile system in good condition (free of blowholes, outlet appropriate and functional, and flowing freely)? Where does the tile outlet?
- Do any fields contain areas with steep slopes? Are appropriate measures taken to control runoff?
- If there is a growing crop in the field, is there any apparent fertility deficiency or excess? *(Since many things influence crop growth, this would not be a clear indicator of any problem by itself.)*

Staging of manure at application site

- Is the manure at the staging site for less than 72 hours? If staged for more than 72 hours, is it covered or otherwise protected? Is it applied within ninety (90) days?
- Does the staging area have adequate run-on and run-off controls? If staged within 300 feet of surface waters, drainage inlets or water wells, is an impermeable barrier or surface gradient present that contains or diverts contaminated run-off? If staged on a slope >6% is run-on and run-off controlled? Is it staged on any standing water or waterway? Is the barrier, diversion or waste water treatment strip free of any manure or standing water?

Sensitive or vulnerable areas on or off-site

- Observe any sensitive features of the landscape, such as sinkholes, ditches, or nearby residences, which were not previously recorded.
- Is there any apparent risk of manure inadvertently entering any of these areas?
- If manure is surface applied, is there any potential for spray drift into any of these areas?
- If discharge from subsurface perimeter tile drains is accessible is it clean (i.e. free of odor and visible discoloration)? Is it sampled and monitored?