

Section II – Comprehensive Nutrient Management Planning

Development of Comprehensive Nutrient Management Plans

The purpose of this document is to provide technical guidance for the development of a Comprehensive Nutrient Management Plan (CNMP), whether they are developed for USDA's voluntary programs or as a means to help satisfy the Nebraska Department of Environmental Quality (NDEQ) or the United States Environmental Protection Agency's (USEPA) National Pollutant Discharge Elimination System (NPDES) permit requirements.

The information in and attached to this document should be used by field office staff and Technical Service Providers (TSPs) when developing CNMPs. This technical guidance is not intended as a sole-source reference for developing CNMPs. Rather, it is to be used as a tool in support of the conservation planning process, as contained in the National Planning Procedures Handbook (NPPH).

A CNMP is a conservation system that is unique to Animal Feeding Operations (AFOs). A CNMP is a grouping of conservation practices and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved.

The conservation practices and management activities planned and implemented as part of a CNMP must meet NRCS technical standards. In accordance with General Manual Title 180 – Conservation Planning & Application, Part 409 – Conservation Planning Policy, 409.10 Comprehensive Nutrient Management Plans must contain the following element:

1. Background & Site Information,
2. Manure and Waste Water Handling and Storage,
3. Farmstead Safety & Security,
4. Land Treatment Practices,
5. Soil & Risk Assessment Analyses,
6. Nutrient Management according to the criteria in the Nutrient Management (Code 590),
7. Record-keeping (Land Application and Facility Management Records),
8. References,
9. *Feed Management (Optional),
10. *Other Utilization Options (Optional),
 ** Air Quality.

*Feed Management and *Other Utilization Options are not required elements of a CNMP, unless utilized to reduce manure nutrient values when land application sites are limited and/or there is a high potential for nutrient runoff/leaching from the sites. These two elements require specific technical expertise (i.e. animal nutritionists or university professionals) and are not a required part of the CNMP, unless the client decides to implement one of them. Technical Assistance notes should document that these elements were discussed with the client.

**Where air quality has been identified as a resource concern because of management operations, air quality may be an added element to the CNMP. Specific resource quality criteria are located in Section III of FOTG.

In working with AFO owners and/or operators, practical and technically feasible CNMP alternatives must be developed and meet their needs. Alternatives may include a mixture of structural and/or management practices. The AFO owner and/or operator, as the decision-maker, selects from these alternatives to create a CNMP that best meets their management objectives and address environmental concerns.

CNMP implementation may require additional design, analysis or evaluations. Operational changes may cause partial or complete revisions to the planned alternatives. It is important for the planner to maintain a relationship with the client during CNMP implementation to address changes or new challenges.

Follow-up site visits are necessary to evaluate whether the implemented alternatives are meeting the client's needs and addressing environmental concerns. Adjustments may be needed if an alternative is not meeting the clients' objectives or addressing environmental concerns.

Comprehensive Nutrient Management Plan Checklist/Guidance

I. Collect Resource Inventory.

When a client expresses an interest in any aspect of a CNMP (e.g. incentive payment, to address NDEQ requirements, etc.), start the CNMP planning process by collecting the client's resource inventory information by setting up an interview the client and completing the Inventory Job Sheet for Comprehensive Nutrient Management Plans (NE-CPA-73).

The NE-CPA-73 must be completed fully and thoroughly to develop a sound CNMP. Sections within the NE-CPA-73 that are not applicable to the operation shall be filled with NA or struck-out so it is acknowledged that it was discussed with the client. For example, for livestock operation without existing manure storage structures, place an "NA" in existing storage structure sections. If additional information or maps are attached to the NE-CPA-73, please indicate "refer to" or "see the attached" in the corresponding section.

The NE-CPA-73 has been developed to maintain consistency in the collection of inventory information and land application maps for developing a CNMP. The NE-CPA-73 has been divided into sections as listed below:

Section 1 – Background & Site Information, Client Objectives and Resource Concerns

- Name, address, and contact telephone number (include the name of the NDEQ permit holder),
- Number and type of livestock (see Section 2),
- Location (legal description) of livestock operation and mailing address,
- Latitude & longitude of the operation entrance,
- Sketch of operation or use an aerial photo of livestock operation & indicate locations of production area, manure storage facility and components,
- Client's objectives,
- Resources concerns, including those that may arise from the implementation of the CNMP (including air quality).

Section 2 - Manure & Waste Water Handling and Storage Facility Information

- Animal Inventory
 - Livestock type,
 - Livestock numbers with start (beginning), stop (ending) & average weight,
 - Confinement period, production cycle or days on feed,
 - Bedding description and quantity (as applicable),
 - Flush water quantities (as applicable)
 - Corresponding manure storage identification (ID),
 - Future plans (expansion, reduction, or changes in animal type).
- Normal Mortality Plan.
- Operation Size (acres of runoff)
 - Production Area,
 - Feed Mixing and/or Storage Area,
 - Open Lot and Contributing Drainage Areas (as applicable).
- Existing Manure Storage Facility
 - Manure storage type.
 - Presence of a depth gauge marker or system to measure liquid depth.
 - Livestock type & numbers specific to a storage system.
 - Estimate Wastewater or Runoff Water:
 - (i) Amount of flush water or wash water used in each building,
 - (ii) Amount of lot and contributing drainage area runoff,
 - (iii) Amount of water used for cooling system or overflow waters (also include dates systems are used, i.e. overflows used from November 15 to March 15).
 - Management of manure and wastewater:
 - (i) Percent manure collected,
 - (ii) Number of times a barn is scraped,
 - (iii) Number of times manure pack is removed from buildings/hoop structures,

- (iv) Number of times manure is removed or cleaned out of storage facility (debris basin, ponds, pits, etc.).
- Liner type and condition (if existing).
- Existing &/or Planned Storage Structure Dimensions / Capacities.
- Stockpiling &/or Composting Characteristics (i.e. location, size, runoff, removal).
- Feed Storage and Mixing Area Characteristics (i.e. location, size, and runoff).
- Type, size, quantity, average application rate of equipment:
 - Transfer equipment (i.e. pit pumps, transfer stations, loaders),
 - Manure application equipment (i.e. honey wagons, spreaders, trucks, tankers),
 - Irrigation equipment (i.e. pivots, gravity irrigation).
- Current Manure Exports (obtain copies of records):
 - Name, address & phone number of recipient,
 - Month/year and amount of transfer,
 - If the producer has ongoing sales records (for a minimum of 2-3 years) obtain copies.
- Current Manure Imports (obtain copies of records):
 - Source of import (i.e. name of originating operation), address and contact number,
 - Month/year and amount of transfer,
 - Manure type,
 - Manure analysis.
- Current Manure Internal Transfers:
 - Manure source,
 - Month/year and amount of transfer,
 - Manure destination.
- Operation and Maintenance (O&M) Plan in place.
- Closure Plan.

Section 3 – Farmstead Safety & Security (Determine existing plans)

- Emergency Plan - Response to leaks or spills of manure, chemical, fuel or other substance that may pose a threat to the environment, and appropriate contact information.
- Biosecurity - Procedures and/or protocols for farm visitors, livestock, sanitation and disposal of animal veterinary waste.
- Catastrophic Animal Mortality (CAM).
- Chemical Handling & Storage Locations (NPDES Permitted Operations only),
- Petroleum / Oil Storage, Transfer, Uses or Consumption.

Section 4 - Land Treatment Practices (Discuss Application Site Characteristics)

- Utilize existing maps (aerial photos, soils maps, USGS maps) to document field boundaries and show the following:
 - Existing setbacks, buffers, waterways, & tile inlets/outlets, etc.,
 - Existing conservation practices (necessary for P-Index),
 - Sensitive areas:
 - (i) Sandy soils,
 - (ii) Streams, lakes, frequently flooded sites, wetlands, drainage courses, etc.,
 - (iii) Ephemeral & classic gully erosion areas.
 - Other site information features of significance (property boundaries, occupied dwellings);
- Document planned land treatment conservation practices

Section 5 - Nutrient Management & Soil and Risk Assessment Analysis (Collect current cropping and tillage information relevant to develop a NMP.)

- Client crop insurance records for yield verification. If not available use National Agricultural Statistics Service (NASS) for county averages. See

<http://www.nass.usda.gov/>. At a minimum, use a 5-year average. Do not use yields when a significant crop loss occurred: hail, drought, wind or other natural disasters.

- Land Application Site Information:
 - Legal description and maps of land available for manure application.
 - Land ownership (owned, rented or manure application agreements):
 - (i) Obtain copies of existing land agreements.
 - (ii) If no agreements available complete agreements using blank forms or forms developed by client (be sure to include legal site description on agreement).
 - Farmable or spreadable acres.
 - Land use (dryland cropland, irrigated cropland, pasture, hayland).
 - (i) Note any water restrictions for irrigation.
 - Cropping history (2-3 years based on crop rotation) for crop type, crop rotation, yields, planting & harvest dates.
 - Historical average N&P application rates for all commercial fertilizer, manure and/or sludge. Provide average rate, total applied, timing, method, form and placement for:
 - (i) Individualized for each land application site or
 - (ii) Summarized based on crop type & rotation (i.e. irrigated corn following beans; dryland corn following corn, etc.).
- Tillage inventory (necessary for RUSLE2 and/or P-Index Risk Assessment with Erosion Estimator calculations for land application sites).
- Other land application site & nutrient management information (Obtain copies):
 - Soil test reports (most current & no older than 5 years) – label them according to field number or name if not listed on report,
 - Manure analysis for each manure type and storage containment – if applicable, label them based on waste storage structure,
 - Equipment calibrations reports or dates,
 - Chem valve or safety valve,
 - Crop consultants reports,
 - Irrigation water analysis.
- Description of current nutrient management record-keeping system.

Section 6 – Other Information (as applicable)

- Feed management information
 - Obtain copy of feed ration for use in Land Estimator (optional).
- Other waste treatment or utilization options (composting, methane collection, other).
- Other pertinent information.

II. Evaluation of Nutrient Management, Manure Storage Facility Capacity, Manure Transfer & Land Treatment Using the Appropriate Tools.

- ❖ *This Section is devoted to reviewing, evaluating and processing the resource inventory into information to answer the following questions:*
 - 1) *What is the estimated annual manure & wastewater produced at the site?*
 - 2) *What is the estimated amount of available nutrients (N&P) in the manure being produced annually?*
 - 3) *What is the estimated amount of available nutrients (N&P) in the manure after storage, transfer & application losses?*
 - 4) *Does the operation have adequate storage based on availability of the land application sites and cropping practices?*
 - 5) *Does the operation have adequate equipment (size and numbers) to transport the manure and/or wastewater to land application sites during suitable application periods?*
 - 6) *Does the operation have adequate land application sites for N-based and P-based plan?*
 - 7) *Does the operation need to implement P-based application rate plan due to runoff considerations?*

- 8) *Does the operation need to implement additional land treatment practices due to the risk for nutrient runoff?*
- 9) *Does the operation need to adjust management practices based on risk for nutrient runoff or leaching?*

A. Nutrient Management & Land Treatment – Utilize Appropriate Risk Tools

- 1) Develop conservation plan maps for each of the land application sites. Use aerial photo maps, soils maps, or USGS maps. All maps should be labeled with Site ID, Legal Description, FSA Track & Field Numbers (do not provide FSA info to DEQ) and include a map scale.

Delineate maps with field borders; label each map with site ID, legal description, spreadable or farmable acres, land use, irrigation practices and per field; and provide a scale.

- The following information must be included on one map or multiple maps:
 - Soil type with soils legend:
 - (i) Develop a non-technical soil description summary for each soil type listed on all of the land application sites.
 - USGS topography maps.
 - Existing or planned conservation practices.
 - Sensitive areas on maps:
 - (i) Sandy soils,
 - (ii) Streams, lakes, frequently flooded sites, wetlands, drainage courses, etc.,
 - (iii) Ephemeral & classic gully erosion areas.
 - Manure setbacks (NDEQ, Title 130 had applicable setbacks for manure application).
- 2) Complete a Nutrient Analysis – Compare Total Manure Produced verses Storage Containment Capacity verses Application Method/Rate/Placement verses Nutrient Utilization (Utilize UNL Land Estimator, UNL Nutrient Inventory Spreadsheet, MMP or other pre-approved software or worksheets)
 - Calculate total manure being produced and estimate total nutrient (for N & P) content (provide calculations).
 - Estimate nutrients (N & P) available after losses from storage and application methods (provide calculations).
 - Estimate acres needed for available N & P based on crop uptake (using certified or proven yields or NASS county average).
 - Determine if manure can be applied to land application sites in reasonable time at agronomic rates based on Production info/volume and type of manure to be applied quantified to compare to the available equipment and manpower.
 - 3) Determine N-Leaching Risk Potential for each land application site (Refer to instructions on the NE-CPA-38 and Specifications for Nutrient Management (S-590)).
 - Summarize Nitrate Leaching Potential in a table for on all the land application sites.
 - The summary table should include: Field ID or Management Unit; Legal Description; Spreadable Acres; Land Use; Soil Type and Percent Slope; Soil Texture; Leaching Potential (or rating) for Fall Application, Spring Application – Preplant, and Sidedress/Split Application.
 - Fields or Management Units can be combined if predominant soils, nutrient application and cropping practices (crops, yields, and land use) are the same.
 - For Medium & Low Leaching Ratings:
 - Fall applications of commercial nitrogen fertilizer or manure that is high in inorganic nitrogen, such as chicken litter or swine slurry, shall only occur when soil temperatures are 50 degrees or less when spring planted crops are grown unless a nitrification inhibitor is utilized.
 - For sites with HIGH Leaching Ratings:
 - Commercial nitrogen fertilizer or manure that is high in inorganic nitrogen, such as chicken litter or swine slurry, shall not be ball applied when growing spring planted crops.
 - Commercial nitrogen fertilizer or manure that is high in inorganic nitrogen, such as chicken litter or swine slurry, shall be split applied when growing fall planted

- Evaluate if additional land application sites are needed. In cases where existing site are required to be P-based or excluded due to very high ratings, the operator may need to obtain additional land application sites or written easements.
- Expect rises in soil test levels shall be accounted for when applying manure beyond P-removal basis. Generally this occurs when manure is applied annually to the same site and/or when manure is applied at high rates along with commercial P.

B. Manure Storage (Utilize the AW-Forms, AWM software or equivalent):

- 1) Evaluate adequacy of existing and proposed manure storage structure based on manure and waste water (or runoff water) being produced; the solids accumulation volume, treatment volume, total storage capacity, seepage potential, structural soundness, ability to empty facility with existing or planned equipment on a timely basis and other pertinent factors.
- 2) Determine total volume of manure and/or wastewater being produced and stored at the operation.
- 3) Determine if the existing and proposed manure storage / treatment structure is compatible with application equipment and available landbase, critical pumping levels, and timeline / schedule managing pumping levels.
- 4) If needed, develop system for measuring depth levels in manure storage structure including required pump down levels.
- 5) As needed, develop alternatives for manure storage structure volume deficiencies.

C. Manure Transfer & Application (Utilize the NE-ENG-82 and 81):

- 1) Determine/evaluate the timeline needed to apply manure or waste water with existing/planned application equipment.
- 2) Evaluate the adequacy of the type and size of irrigation equipment, pumps, application equipment to apply the volume and type of manure / runoff water, distance of travel to the application site, man-power available for application or use of commercial application equipment in order to apply the manure in a timely basis.
- 3) As needed, develop alternatives for manure transfer based on timeliness of application sites and cropping practices.

D. Other Utilization Alternatives:

- 1) Evaluate other utilization alternatives if applicable such as waste treatment strips, composting, methane, marketing manure, etc.

III. Present Preliminary NMP, Land Treatment, Manure Storage/Transfer or other Utilization Option Alternatives to Client for final decision.

At the livestock operation:

- 1) Review the completed NE-CPA-73 with the client and discuss the livestock operation, manure storage/transfer, land treatment, and preliminary nutrient management analysis (refer to items A-D above for specific items).
- 2) Present and discuss initial alternatives with the client. Alternatives shall take the client's objectives into account.

A. NMP Alternatives:

- 1) Review and present preliminary NMP to client that summarizes the following information obtained in Steps I & II
 - Animal types, numbers, start/stop & average weights.
 - Existing and/or planned livestock waste control facilities (type, capacity, management).
 - Total (annual) manure production quantities & calculations.
 - Manure handling and storage loss calculations.
 - Total Acres needed for nutrient utilization of nutrients in manure (N and P),

- Total acres available to utilize manure (include agreement acres, if applicable),
 - Application sites (fields) summary table(s) with
 - Site ID or management area and legal description,
 - Land owner, address & phone number and operator,
 - Spreadable or farmable acres,
 - Crop type & crop yield,
 - Dominant soil type and percent slope,
 - Erosion estimate or RUSLE2 value,
 - Initial P-Index risk assessment values and rating,
 - N- or P-based application requirements,
 - Erosion practices or management alternatives,
 - Soil Texture,
 - Nitrogen Leaching Risk for application timing during fall, pre-plant and summer side-dress.
 - Individual application site maps properly labeled.
 - Type of application equipment available with capacities, and if owned, needed or rented,
 - Annual anticipated loads to be hauled or hours of pumping time. New or planned systems may have different O&M than existing systems,
 - *Planned* manure application rates and timing by manure type (i.e. 15 tons/ac. solids every fall and 0.77 ac.-in./acre liquids during the growing season),
 - Soil, manure, and equipment calibration procedures.
 - Record keeping procedures.
- 2) If additional application land must be obtained, ensure the client understands this. If associated with a NDEQ permit, agreement forms should be provided.

B. Land Treatment Alternatives:

- 1) Visit the land application sites and discuss the land treatment or other measures needed to reduce erosion and P-Index Risk Assessment values; including buffers, erosion control practices, nutrient management measures, and manure transfer alternatives.

C. Manure Storage/Transfer Alternatives

- 1) Gather information needed to complete a rough engineering design/estimate to ensure that manure storage/transfer and land treatment practices/alternatives are practical.
- Complete an on-site review of the production area and review the site information from the NE-CPA-73 to determine accuracy. (Check foreign drainage and drainage patterns, especially for open lot operations).
 - Complete Preliminary Estimated Capacity& Cost Estimate for the Storage Facility and Land Treatment Practices:
 - Re-evaluate existing storage and manure transfer components/facilities, if applicable, to determine the need for additional storage.
 - Re-evaluate/determine storage requirements using appropriate design tools (AW-FORMS spreadsheet, AWM, etc.).
 - Complete a rough layout of planned facilities using GIS software or Terramodel or hand drawn on aerial photos.
 - Estimate quantities of earthwork, pipe concrete, clay liner, etc. (If a design has already been completed by a TSP, ask client to get estimated quantities from TSP.)
 - Conduct additional site visit(s) to complete engineering alternatives if necessary (initial geology/soil investigations may be necessary, and/or open lot operations may require additional site visits due to the land slope, drainage patterns, foreign drainage, etc.).

D. Other Utilization Alternatives

- 1) As appropriate, present options on waste utilization alternatives, including but not limited to composting, methane digesting, etc.

E. Document client's final decision for Nutrient Management, Land Treatment and Manure Storage/Transfer, other Utilization Options and assemble NMP and Conservation plan according to Section IV below.

III. Assemble Conservation Plan, Nutrient Management Plan and Associated Contents (Refer to NPPH State Supplements Section 1 for guidance on assembling conservation plans).

A. Conservation Plan and Associated Contents – Provide the following information:

1) Land Application Sites (land treatment and nutrient management practices):

- Plan map of individual fields that identifies all structural measures, manure setbacks (spreadable acres), buffers, waterways & environmentally sensitive areas (streams, wetlands etc.) identified.
- Soils maps and descriptions, USGS maps of land application areas.
- Document existing and planned land treatment and nutrient management measures, location, amount and schedule of application in customer service toolkit.
 - Practices are consistent with P-Index Risk Assessment.
 - Includes all runoff and erosion control practices such as waterways, terraces, grade stabilization structures, underground outlets, filter strips, other buffers, etc.
 - Nutrient management measures (i.e. setbacks; N- or P-based rates; timing, form, & method of application, etc.) according to Practice Standards 590 & 633 on all application sites (consistent with NMP).

2) Manure Transfer / Storage :

- Documentation on Existing and Planned Manure Transfer / Storage (clean water diversions, basins, storage facilities, treatment lagoons, pumps & other handling measures etc.) in customer service toolkit.
 - Cost estimate and components identified (i.e. earthwork, liner, pipe, pumps, etc.),
 - Location and size of manure storage facility are compatible with the planned practices, geological investigation and site conditions.
- Discuss manure quantities for each system.
 - O&M practices may also differ between existing and planned systems. Ensure client has understanding of storage and O&M practices.

3) Other Utilization Options:

- Document practices for other utilization options / practices such as waste treatment strips, methane digester, composting facility, and feed management in customer service toolkit if appropriate.

B. Nutrient Management Plan Contents:

1) Final NMP that meets all requirements in NPPH; Practice Standards 590 & 633; and includes the following:

- Sketch of livestock feeding area identifying all components.
- Animal types, numbers, start/stop and average weights, confinement period.
- Annual (total) manure production.
- Existing and /or planned livestock waste control facilities (size, capacity, days of storage, and management).
- Nutrient loss calculations based on storage and handling.
- Total acres needed for manure based on nutrient content (N and P).
- Total acres available to utilize manure (include agreement acres, if applicable).
- Application site summary as discussed above including maps of each site.
- Application equipment summary (type, capacities, and if owned, needed or rented).
- Anticipated loads to be hauled or hours of operating time to pump;
- Planned manure application rates and timing by manure type (i.e. 15 tons/ac. solids every fall and 0.77 ac-in./acre liquids during the growing season).

2) Summary of P-Index Risk Assessments and N Leaching Potential,

3) Summary/examples of nutrient management and record keeping.

4) Summary/table listing timing, form, method, rate (N- or P-based plan, rotation or combination), setbacks & other management measures to be utilized on each application site.

5) Summary / table listing existing and planned equipment / components to be used in manure transfer and application, application site, and amount and schedule of application:

- Include manure transfer equipment, pumps, application equipment and manure handling measures to be used in applying manure / waste water.

C. Optional Contents:

- 1) Provide client copies of inventory and analysis information as appropriate for background information (i.e. engineering estimates, NE-ENG-82 etc.).

IV. Design Land Treatment, Manure Storage, Manure Transfer Practices and Complete State Permit Application.

A. Design Practices per Standards and Specifications, Practice Documentation Requirements and Statement of Work for appropriate practices per Section IV of FOTG.

B. Ensure that Federal, State, County, and Local permits, rules and regulations are addressed and appropriate information is submitted to NDEQ along with design (examples of these are listed below):

- 1) Nutrient Management Plan
- 2) Manure Application Agreements,
- 3) O&M Plan,
- 4) Sludge & Sediment Plan,
- 5) Emergency Response Plan,
- 6) Chemical Storage Plan,
- 7) Mortality Plan,
- 8) Closure Plan,
- 9) Odor Management Plan (as applicable),
- 10) Notice of Intent (NOI) for NPDES permit (if applicable),
- 11) Ground Water Monitoring Plan (if applicable),
- 12) County Zoning Requirements,
- 13) NRD Requirements, or
- 14) Other Requirements.

V. Layout, Installation and Checkout of Land Treatment, Manure Storage, & Manure Transfer Practices.

A. Layout Practices per Standards and Specifications, Practice Documentation Requirements and Statement of Work for appropriate practices per Section IV of FOTG.

B. Install practices per Standards and Specifications, Practice Documentation Requirements and Statement of Work for appropriate practices per Section IV of FOTG

- 1) Follow-up with the client by conducting occasional site visits during the installation of practices to ensure that practices are being installed correctly or if adjustments are needed.
- 2) Complete adjustments and revisions to planned practices as necessary to fit site conditions and other elements of the CNMP.
- 3) Review/provide client with practice operation and maintenance requirements, record keeping requirements, nutrient management plan requirements, and all other elements of a CNMP during the final installation stage.

C. Checkout and Document Practices per Standards and Specifications, Practice Documentation Requirements and Statement of Work for appropriate practices per Section IV of FOTG:

VII. Follow-up with Client to Review Operation and Maintenance of Practices Installed, Nutrient Management Plan Implementation and Record-Keeping, and Reporting CNMP.

NRCS follow-up visits are important to evaluate the effectiveness of conservation practices and review CNMP records kept by the operation. Annual reviews are highly recommended. The "CNMP Follow-Up Inspection" Sheet can be used for guidance/documentation during a site review.

The first visit should take place within two months of completion of the manure storage facility.
Review the following items during follow-up visits to verify CNMP implementation and adjustments needed:

A. Land Treatment Practices (includes site visit of applicable fields):

- 1) Determine if practices have been implemented and match the P-Index Risk Assessment (adjust as necessary).
- 2) Determine if existing practices have been maintained or if there is a need for new practices.
- 3) Determine if additional erosion control measures are needed.

B. Nutrient Management :

- 1) Review nutrient management plan including soil testing, manure analysis, nutrient budget, nutrient timing, form and rate and other measures identified in NMP and determine if practice is implemented according to 590 Nutrient Management Standard requirements.
 - Determine if any adjustments to NMP are needed based on manure analysis, soil test results or other factors.
 - Determine if any changes made to NMP and Land Treatment Practices portion of the CNMP are needed (based on the P-Index, and N Leaching Index assessments).
- 2) Review and discuss the records with the client.
 - Provide the client feedback on current record keeping (refer to record-keeping) and documentation practices. Discuss with the client what benefits he has received from the current record keeping system.
 - Discuss with the client the weak areas and/or inadequate documentation found in the current record keeping system. Provide direction on how to improve record keeping.

C. Manure Transfer / Storage Facility.

- 1) Evaluate the manure transfer / storage facility and determine if it is working as designed and meeting the objectives of the client.
- 2) Discuss overall operation of the system with the client, including the pros and cons.
- 3) Discuss record-keeping requirements for facilities and manure transfer. Insure a depth gauge or system to measure liquid depth is in place or the need to add one.
- 4) Determine if adjustments are needed, and obtain any applicable permits prior to adjusting the system.

D. Other Utilization Options

- 1) Evaluate alternative manure practices and determine if practice is meeting objective of client.
- 2) Discuss conclusions with client and determine if additional adjustments are appropriate.

E. Record-Keeping

- 1) Accurate records provide a foundation for decisions related to CNMP implementation, documentation of events, facility maintenance, nutrient management plan implementation, and legal evidence in the event of litigation.
- 2) Records should be retained for a period of five years.
- 3) Evaluate the following records and determine if appropriate records are being kept and client objectives are being met. Note:
 - Small CAFOs = operations 300 AU and smaller;
 - Medium CAFOs = 301 – 999 AUs;
 - Large CAFOs = 1000 AUs and greater.

- Production Area
 - Inspections of storm water diversions and structures
 - (i) Small & Medium CAFOs– Record Monthly,
 - (ii) Large CAFOs – Record Weekly.
 - Inspections of water lines, including drinking and cooling water
 - (i) Small & Medium CAFOs – Record Monthly,
 - (ii) Large CAFOs – Record Daily.
 - Deficiencies found, corrections actions & dates completed, and repairs completed.
 - Daily livestock capacity records.
 - Mortality dates and numbers, disposal method.
 - Dates and amount of precipitation.
- Manure Storage Facility (s), Transfer/Handling & Application Equipment
 - Records of liquid / slurry depths of the manure storage structure
 - (i) Small & Medium CAFOs – Monthly documentation,
 - (ii) Large CAFOs – Weekly documentation.
 - Sludge & Sediment inspections once per year to determine depth (Large CAFOs).
 - Dates of emptying, level before emptying, and level after emptying.
 - Discharge of overflow events, including level before and after event.
 - Records of maintenance & dates performed with O&M plans.
 - Activities associated with emergency spill response plan.
 - Irrigation equipment used for wastewater / slurry application
 - (i) Annual Chem / Safety valve inspections by NRD,
 - (ii) Inspection prior and during application, record dates (Large CAFOs),
 - (iii) Inspection during application, record dates (Small & Medium CAFOs).
 - Manure transfer/handling and application equipment
 - (i) Routine Inspections & Repairs, dates,
 - (ii) Date & method of application equipment calibration.
- Farm Safety & Security
 - Emergency plan (posted names, phone numbers and operation address)
 - Biosecurity
 - (i) Visitor protocol,
 - (ii) Sharps disposal method & date - If buried on property, record location.
 - Catastrophic Animal Mortality dates, numbers & disposal method - If buried on property, record location.
 - As applicable, chemical handling & storage records.
- Nutrient Management (in accordance with 590)
 - Annual manure test for nutrient contents for each type of manure storage containment.
 - Current soil test results in accordance with University of Nebraska requirements outlined in NebGuide “Guidelines for Soil Sampling” (G1740).
 - Applicable irrigation water testing.
 - Cropping information
 - (i) Crop planted and planting and/or harvesting dates by field,
 - (ii) Crop yields.
 - Application records for each manure type or commercial fertilizer application event, including calculations that show actual application amount for N & P for each field:
 - (i) Source, type and form of manure and/or commercial fertilizer,
 - (ii) Field(s) where manure and/or fertilizer are applied,
 - (iii) Application method & equipment used,
 - (iv) Application rate applied per acre or amount applied to each field,
 - (v) Time and date of application,
 - (vi) Weather and soil conditions during application; 24 hours prior to and 24 hours after the event (Large CAFOs).

- (vii) Calibration records for manure application equipment.
 - Whole farm nutrient balance – show calculations for the following:
 - (i) Total Available Nutrients (from manure & commercial fertilizers) for N & P,
 - (ii) Total Nutrients Taken up by Crops,
 - (iii) Nutrient Balance.
 - Manure Exports (going off-site) to neighbors, etc.
 - (i) Amount and date,
 - (ii) Recipient name & address,
 - (iii) Nature of transfer (sold or given),
 - (iv) Copy of manure analysis provided to third party.
 - Manure Imports (coming from off-site) by another operation (from neighbors, trading, etc.)
 - (i) Manure type, amount & date,
 - (ii) Name of supplying operation,
 - (iii) Copy of manure analysis received.
 - Internal transfer of manure
 - (i) Amount and date,
 - (ii) Manure structure ID.
 - Land Treatment Practices to Application Sites
 - Inspection of existing practices,
 - Complete maintenance and repairs ,
 - Evaluate effectiveness of practice.
 - Changes to CNMP
 - Livestock production,
 - Manure storage structures and clean water diversions,
 - Manure handling and application equipment,
 - Nutrient Management & cropping practices,
 - Land application sites.
- 4) Determine if adjustments to existing record keeping system are appropriate.
- Review all adjustments to existing record-keeping system with client.
 - Verify all records that need to be kept with client.

F. Report CNMP as Applied

- 1) After verifying implementation of all elements of a CNMP including; Manure Transfer / Storage Facility, Nutrient Management, Recording Keeping Land Treatment, and if applicable Other Utilization Options report CNMP as Applied.

VIII. Additional Follow-Up

Operations that take part in Nutrient Management (590) or Waste Management (633) incentive programs will need additional guidance in contract requirements. Meet with the client (and their crop consultant, farm manager, etc.) to discuss 590 and 633 documentation requirements. Provide the client with nutrient management specifications, jobsheets, planning sheets and Nebguides.

One meeting may not be adequate, two or possible more meetings may be necessary to ensure the client understands what requirements need to meet to be payment eligibility. Timing of the meeting can serve as reminders of 590 requirements. For example, early fall meetings can serve as event reminders, such as soil sampling and manure analysis. Letters or post cards serve as helpful reminders for events: soil testing, manure analysis, irrigation water sampling; equipment calibration, nutrient budgets; actual nutrient application records and cropping.

We cannot stress the importance of providing upfront nutrient management planning with the client. Field staff can request assistance from State Ecological Sciences Staff and Water Quality Team as necessary to help with planning and compliance reviews.