Nutrient Management Protocol for Ontario Regulation 267/03 Made under the Nutrient Management Act, 2002
Version: November 10, 2021

Part 1 – Introduction

This document is the Nutrient Management Protocol ("Protocol") which is incorporated by reference in Ontario Regulation 267/03 ("Regulation") made under the Nutrient Management Act 2002, S.O. 2002 ("Act"). It forms part of the Regulation and provides additional rules that must be complied with. Anyone reading this document should ensure that they have the most recent version of the Regulation and the Protocol. This Protocol references many defined terms from the Regulation. Where a term is defined in the Regulation or Act and is used in the Protocol, the term in the Protocol has the same meaning as in the Regulation or Act.

Part 2 – Revoked

Part 3 – Calculating Nutrient Units to Determine Regulatory Requirements

3.1 Using Nutrient Units to Determine the Obligations of Agricultural Operations Carried Out on a Farm Unit

The number of nutrient units (NUs) generated by a particular type of farm animal must be calculated by dividing the number of farm animals by the number given in the Nutrient Units Column shown on Table 1 Nutrient Unit Livestock Information, which can be found in the Nutrient Management Tables document. Please note that NUs are not the same as livestock units.

If more than one type of farm animal is relevant to this calculation, the calculation must be completed for each type of animal separately, then all the results totaled to give the total NU generated by farm animals.

Part 4 – Revoked

Part 5 – Nutrient Management Strategy for Agricultural Operations

5.1 Nutrient Management Strategy Contents in Addition to the Requirements of Section 17 of the Regulation

In addition to the contents of a Nutrient Management Strategy (NMS) required by section 17 of the Regulation, the following components must be included in the NMS:

- Certified preparer information, including:
    - Name of the Agricultural Operation Strategy or Plan Development certificate holder or the Agricultural Operation Planning certificate holder and that person's certification number;
- Owner of the farm unit and the owner or controller of the agricultural operation, if different, including:
    - List name and contact information;
- Farm unit information (see Part 5.2.1);
- Operation identifier;
- Storage system summary (see Part 5.2.2) that includes:
    - Livestock details;
    - Storage details;
    - Nutrient content and utilization; and
    - Transfer information;
- Overview of operation (see Part 5.2.3);
- Farmstead sketch (see Part 5.2.4); and
- Additional information required for regulated mixed anerobic digestion facilities (RMADFs) (see Part 5.2.5).

5.2 Identifier Numbers and Farm Unit Information

5.2.1 Farm Unit Information

The following information must be provided for the farm unit to which the NMS applies:

- Farm name;
- Any previous operation identifier issued to the agricultural operation or farm unit;
- Identification of nutrients as non-agricultural source material (NASM), agricultural source material (ASM), greenhouse nutrient feedwater or commercial fertilizer, where the nutrient is generated or received at the farm unit and is one of the listed types;
- Confirm status of the land to which the NMS applies as:
    - Owned; or
    - Rented or leased;
- Identify each farm location that makes up the farm unit by providing:
    - Upper and lower tier municipality name;
    - Geo township name;
    - Lot;
    - Concession; and
    - Municipal tax roll number.

5.2.2 Storage System Summary

All the calculations required to determine the volume of prescribed materials generated must be completed using the following information:

Livestock Details:

- Identify all livestock Types, Sub-Types, Sub-Sub-Types using Table 1, found in the Nutrient Management Tables document.
- If the NMS utilizes animal weights that are lower than the average weights provided by Table 1, which can be found in the Nutrient Management Tables document, a comprehensive, written explanation must be provided in the NMS to justify the use of lower weights.

Storage Details

- All permanent nutrient storage facilities on the farm unit must be listed in the NMS. For each permanent nutrient storage facility a written description is required that gives the capacity, dimensions and type of storage (for example: circular, rectangle, pile, covered, exposed to precipitation).
- For temporary field nutrient storage sites, the following information must be provided for each site:
    - Confirm/demonstrate that the storage has been sited in accordance with section 83 of the Regulation;
    - Confirm that the site will be managed in accordance with section 84 of the Regulation; and
    - Indicate the maximum number of days prescribed materials will be stored at this location determined in accordance with section 85 of the Regulation.
- For livestock operations, the NMS must provide all information, including calculations, necessary to demonstrate that the permanent nutrient storage facilities, temporary field nutrient storage sites or a combination of such facilities and sites is capable of containing at least all of the nutrients generated and received at the farm unit in the course of the operation in accordance with section 69 of the Regulation.

Determination of Manure Generated

To determine the amount of manure generated in the course of an operation and whether there is sufficient storage capacity, the following information shall be relied on:

- For new buildings or structures used to house farm animals ("livestock housing facilities)"or existing livestock housing facilities that are being expanded the number of farm animals must be equal to or greater than the number determined using the Livestock Housing Capacity value provided in Table 1, found in the Nutrient Management Tables document or documentation must be included indicating why the maximum housing capacity of the barn is different than the Livestock Housing Capacity value. Documentation must include barn schematics, a barn layout sketch or written description of the reason for this difference.
- For existing livestock housing facilities that are not being expanded, the number of farm animals must be based on the intended number of farm animals to be housed in the facility.
- To determine storage capacity, the amount of manure generated must be calculated using the appropriate column in Table 1 (Liquid Amt and/or Solid Amt)

found in the Nutrient Management Tables document. Alternatively, if the NMS utilizes values that are different than the values provided by Table 1, a comprehensive, written explanation must be included to justify the different values.

- Use Table 5.1 of the Protocol to determine the Solid Manure Density, if applicable.
- Use Table 5.2 of the Protocol to determine the allowances for freeboard and precipitation, if applicable.
- To determine if there is enough land to spread this material generated or received at the farm unit in accordance with the Regulation, use the actual amount generated and received at the farm unit rather than the above calculations.

Table 5.1 Solid Manure Density

Dry Matter (%)	Density[1] (kg/m^3)
15	961
18	913
20	881
25	833
30	801
35	753
40	721
43	673
45	641
48	593
50	561
53	513
55	481
58	400
60	320
65	320
70	320

Notes: [1] Density has been rounded to 3 significant digits.

Table 5.2 Allowances for Freeboard and Precipitation Freeboard[1]

Covered Storage (except covered barns with slatted floors): 0.15 m

Uncovered Storage: 0.30 m

Notes: 1. Freeboard dimensions have been rounded to 2 significant digits.

Table 5.3 Precipitation Effects[1]

Livestock Yard Runoff: 0.56 m/year

Solid Manure Storage Runoff: 0.56 m/year

Roof Runoff: 0.56 m/year

Direct Entry into Liquid Storage: 0.83 m/year

Notes: 1. Precipitation effects have been rounded to 2 significant digits.

Nutrient Content and Utilization

- Every NMS must provide details of all the prescribed materials and volumes of these materials generated or received by the operation. The NMS must identify whether each material is liquid or solid as defined by the Regulation.
- **Other Prescribed Materials:** Prescribed materials are defined by the Regulation as meaning both ASM and NASM. The type and quantity of prescribed materials generated and received at the farm unit, other than manure, must be documented and accounted for in the NMS. Examples of other prescribed materials are output from an RMADF that is ASM, milking centre washwater (an ASM) and treated sewage biosolids (a NASM).

Transfer Information

- A description of the destination of all prescribed materials is required. The description must include:
    - The quantity and type of prescribed materials;
    - Any applicable signed agreements; and
    - Where prescribed materials are intended to be used for something other than land application as a nutrient, the location and name of the destination of the materials must be provided along with the intended use of the prescribed materials.
- Where prescribed materials are intended to be land applied as a nutrient, the location and name of the destination of the materials must be provided including a statement as to whether the materials are to be:

    - Applied to land on the same farm unit;
    - Transferred under a Nutrient Transfer Agreement to another farm unit or operation with a NMP or NASM plan;
    - Transferred to another farm unit or operation which is not required to have a NMP or NASM plan under the Regulation;
    - Transferred to an intermediate operation; and
    - Transferred to a broker under a Broker Agreement.
- Any transfer or broker agreements required by the Regulation must be signed and copies attached to the NMS.

5.2.3 Overview of the Operation

The NMS must include an overview of the operation that includes at a minimum the following information, but do not repeat information provided in other sections of the NMS:

- Reason for submission (e.g. new or expanding agricultural operation, construction or expansion of a barn or storage facility, treating off-farm anaerobic digestion materials);
- Type and size of the agricultural operation;
- Overview of livestock housing facilities and practices that impact nutrient management;
- List of prescribed materials that are generated or received at the farm unit, including all NASM; and
- Overview of cropping and management practices.

5.2.4 Farmstead Sketch

The NMS must include a farmstead sketch. One or more sketches can be used to fulfill this requirement. A sketch must be hand drawn or computer generated, and it may incorporate photos (e.g. aerial photos), maps and satellite imagery. More than one sketch may be submitted if it is not possible to show all of the applicable details on one sketch or if there is too much information for one sketch. Every sketch must be neat and readable and include a north arrow.

The farmstead sketch must address the following items (either by including them or stating that an item does not exist):

- Location of livestock housing facilities and permanent nutrient storage facilities, temporary field nutrient storage sites, and storages for anaerobic digestion materials, as described below:
    - Existing and proposed livestock housing facilities;
    - Existing and proposed permanent nutrient storage facilities, temporary field nutrient storage sites, storages for anaerobic digestion materials;
    - For temporary field nutrient storage sites only, show the area where the temporary field nutrient storage site(s) may be located within the field; and
    - Dimensions of all livestock housing facilities and permanent nutrient storage facilities.
- Location, description and dimensions of any anaerobic digestion facility and other treatment system including a description of any facilities used for the storage of anaerobic digestion materials.
- Show how the temporary field nutrient storage site or permanent nutrient storage facility meets any applicable setbacks, flow paths and other distance requirements in the Regulation to all wells, surface water, tile inlets and tile drainage systems.
- For temporary field nutrient storage sites only, show how the temporary field nutrient storage site meets the required setbacks to any dwelling, residential area or commercial, community or institutional use as defined in the Regulation.
- Location and dimensions of any vegetated filter strip system (VFSS) including:
    - Location and dimensions of the extended vegetated filter strip area; and
    - Location and dimensions of any permanent vegetated area or flow path associated with a VFSS.

5.2.5 Additional Information Required for Regulated Mixed Anerobic Digestions Facilities

If the farm unit has a RMADF that exists or is proposed to be constructed, the NMS must describe the operation as set out in this part.

Anaerobic Digestion Output Volume and Material Type

The NMS must account for any prescribed materials generated by an anerobic digestion facility located at the farm unit. This applies regardless of whether the facility is a RMADF, is an anerobic digestion facility that treats only on-farm materials or is a mixed

anerobic digestion facility (MAD) operating under an Environmental Compliance Approval or Renewable Energy Approval (issued under the *Environmental Protection Act*).

Receipt of Off-farm Anaerobic Digestion Materials

The NMS must identify the Schedule of each off-farm anaerobic digestion material that is projected to be treated by the RMADF (Schedule 1, 2A and/or 2B). It must also project the maximum total quantity of Schedule 1 material as well as the combined total quantity of Schedule 2A/2B material that is proposed to be received and treated at the RMADF in any 12-month period using the best available information at the time.

If the off-farm anaerobic digestion materials proposed to be received are listed on either Schedule 2A or 2B, the NMS must include a description of the pre-treatment process for Schedule 2A and 2B materials, including the location of the pre-treatment and the minimum process temperature.

On-farm Anaerobic Digestion Materials Generated and Received

The NMS must confirm the approximate quantity and type of on-farm anaerobic digestion material that will be treated in the RMADF along with the off-farm anaerobic digestion materials. The NMS must describe both on-farm anaerobic digestion materials generated at the farm unit and on-farm anaerobic digestion materials that are/will be received from other farm units.

In the case of non-livestock operations, the NMS must demonstrate compliance with the quantity limits for on-farm anaerobic digestion materials established by section 98.8 of the Regulation.

The NMS must demonstrate that the section 98.9(1) paragraph 3 and 4 of the Regulation will be complied with.

Anaerobic Digestion Materials Management Systems

The NMS must provide information that addresses the receipt and management of various on-farm and off-farm anaerobic digestion materials. This may include, but is not limited to, information on the anaerobic digestion materials reception system, anaerobic digestion materials transfer system and the feedstock system. The information required must address the siting, construction and operations of systems that deal with:

- Off-farm anaerobic digestion materials;
- Any manure received from other farms; and
- Any on-farm anaerobic digestion materials that are fruit, vegetables or plant materials from the production and processing of fruit or vegetables.

RMADF Operation and Treatment

The NMS must include information that addresses the operation and treatment provided by the RMADF. This must include, but is not limited to, information that addresses elements of:

- The design of the RMADF;
- The time/temperature treatment to be provided;
- The operation of the RMADF; and
- Odour control systems (where required by the Regulation).

Management of Anaerobic Digestion Output

The NMS must provide information that addresses the management of anaerobic digestion output from the RMADF.

Part 6 – Revoked

Part 7 – Nutrient Management Plans

7.1 Nutrient Management Plan Contents in Addition to Requirements of Section 24 of the Regulation

In addition to the contents of a Nutrient Management Plan (NMP) required by section 24 of the Regulation, the following components must be in included in a NMP:

- Certified preparer information, including:
    - Name of the Agricultural Operation Strategy or Plan Development certificate holder or the Agricultural Operation Planning certificate holder and that person's certification number;
- Owner of the farm unit and the owner or controller of the agricultural operation, if different, including:
    - List name and contact information;
- Farm unit information (see Part 7.2);
- Description of ASM to be land applied (see Part 7.3);
- Field information (see Part 7.4);
- Field sketch (see Part 7.4);

- Cropping practices and application rate information (see Part 7.5); and
- Land base and storage information (see Part 7.6).

7.2 Farm Unit Information

The following information must be provided for the farm unit to which the NMP applies:

- Farm name;
- Operation identifier;
- Identification of materials containing nutrients as NASM, ASM, greenhouse nutrient feedwater or commercial fertilizer received at the farm;
- Confirm status of the land to which the NMP applies as:
    - Owned; or
    - Rented or leased;
- Identify each farm location that makes up the farm unit by providing:
    - Upper and lower tier municipality name;
    - Geo township name;
    - Lot;
    - Concession; and
    - Municipal tax roll number.

7.3 Description of Nutrients to be Land Applied

For each nutrient to be land applied at the farm unit, the NMP must set out the:

- Amount expected to be applied;
- Source of nutrient content information (must be a lab report or Table 2 from the Nutrient Management Tables);
    - If material test results are used, the material test laboratory reports must be kept as a record.
- Dry matter content (does not apply to commercial fertilizer);
- Nitrogen content;
- Phosphorus content; and

- Potassium content.

7.4 Field Information

Field Properties

The following information must be provided for each field that is included in the NMP:

- Field name;
- Field location;
- Tillable area within the field (in hectares or acres);
- Area available for land application of prescribed materials within the field (in hectares or acres);
- Maximum sustained slope within the field;
- The representative soil series, texture, and hydrologic soil group within the field; and
- Include soil test information and lab reports, where required, as per section 91 of the Regulation.

Field Sketch

A sketch is required for each field in the NMP. It must accurately reflect the required features identified in this part.

The sketch must include the field components as described below:

- Identify the individual fields and their boundaries including a field identifier that is consistently used through the NMP.
- Delineate the application area within the field.
- If applicable, identify and delineate sections within any field.
- Indicate on the sketch whether any field has any tile drainage. For any field that has any tile drainage features, include the following on the sketch:
    - Show or clearly describe the location of all known tile outlets that discharge to any type of drain, ditch or other surface water or that discharge to ground surface in any instance where the tile discharge occurs within the field boundary or at the edge of the field boundary.

    - Where no outlets are located within the scope of the sketch as described above, provide a statement or description that identifies where the tile drainage system daylights.
    - Show the location of all tile inlets located within the boundary of the field;
        - Where no tile inlets as describe above exist, a statement indicating this must be included.
    - Show the location of all known tile inlets located beyond the boundary of the field that may receive drainage from the field;
        - Where no tile inlets as describe above exist, a statement indicating this must be included.
- Indicate the location of wells on the sketch as follows:
    - Show the location of any well that is a municipal well where it is located within the field or within 100 metres of the field boundary;
        - Describe these wells as a "municipal well" on the sketch;
    - Show the location of all wells that are not a municipal well where they are located within the field or within 30 metres of the field boundary;
    - For each well that is not a municipal well, include a description of the well according to the following rules:
        - If the well is a drilled well that has a depth of at least 15 metres and a watertight casing to a depth of at least six metres below ground level, describe the well on the sketch as a "drilled well;" and
        - If the well is not a drilled well that has a depth of at least 15 metres and a watertight casing to a depth of at least six metres below ground level, describe the well on the sketch as an "other well."
    - In the event no wells meeting the criteria above exist, a statement indicating this must be included.
- Indicate the location of all surface water present in the field or within 150 metres of the field boundary. If no surface water meeting this criterion exists, a statement indicating this must be included. Where surface water is present within 150 metres of the application area, the following additional information is required:
    - Identify the maximum sustained slope of the field for the land that falls within 150 metres of the top of bank of surface water; and

- Show the separation distances from surface water that are required to meet regulatory requirements.

7.5 Cropping Practices and Application Rate Information

The following information must be used in order to determine whether the proposed application rate is compliant with the requirements of the Regulation and the Protocol:

- Planting and harvest dates (or growth and dormancy dates for perennial crops) for all crops and cropping years included in the NMP;
- A determination of crop yield;
- For each material containing nutrients to be land applied, the application rate, the application date, and method of application for all cropping years included in the NMP;
- The following information must be included to demonstrate the application rates do not result in any regulatory exceedances:
    - The nutrient balance for phosphate must be calculated; and
    - The NMP must demonstrate the application of nutrients does not result in a regulatory exceedance of phosphate application limits.

7.6 Land Base Information

A NMP must include a summary that demonstrates that at all times when the NMP is in force there will be sufficient storage for all prescribed materials and that the application rates will not exceed those permitted by the Regulation.

Part 8 – Non-Agricultural Source Material Plans

8.1 NASM Plan Contents in Addition to Requirements of Section 26.2 of the Regulation

In addition to the contents of a NASM plan required by section 26.2 of the Regulation, the following components must be included in a NASM plan:

- Certified preparer information, including
    - Name of the NASM Plan Development certificate holder and that person's certification number;

- Owner of the farm unit and the owner or controller of the agricultural operation, if different, including:
    - List name and contact information;
- Description of each NASM material (see Part 8.2);
- Farm unit information (see Part 8.3);
- NASM application area information (see Part 8.4);
- NASM storage information (see Part 8.5);
- Overview of operation (see Part 8.6);
- NASM application area field sketch (see Part 8.7);
- Material test results (see Part 8.8); and
- Application rate information (see Part 8.9).

8.2 Description of NASM Material

For each NASM received at the farm unit for land application on the NASM plan area, the NASM plan must set out:

- The generator name and contact information, and identification of the facility where the NASM was generated;
- Form of the NASM (liquid or solid);
- NASM Category (1, 2 or 3), item number and type of materials in accordance with the NASM Tables in Schedule 4 of the Regulation;
- The metal concentrations and the CM category as determined in accordance with the Regulation;
- The pathogen level and the CP category determined in accordance with the Regulation;
- The odour level (OC category) determined in accordance with Table 3 NASM Odour Category of the Nutrient Management Tables or as otherwise determined under the NASM Odour Guide; and
- Demonstration of beneficial use in accordance with section 98.0.6 of the Regulation. If beneficial use determination is based on plant available nitrogen, plant available phosphate and plant available potassium the concentration of each of these nutrients must be estimated using the calculations found in Part 8.11, below.

8.3 Farm Unit Information

The following information must be provided for the farm unit on which the NASM plan area is located:

- Farm name;
- Operation identifier (if previously assigned);
- Identification of materials containing nutrients as NASM, ASM, greenhouse nutrient feedwater or commercial fertilizer received at the NASM plan area;
- Confirm status of the land to which the NASM plan applies as:
    - Owned; or
    - Rented or leased;
        - If the land is not owned by the owner of the operation, you must provide the name of the landowner.
- Identify each farm location that makes up the farm unit by providing:
    - Upper and lower tier municipality name;
    - Geo township name;
    - Lot;
    - Concession; and
    - Municipal tax roll number.

8.4 NASM Application Area Information

The following information must be provided for each field to which NASM is to be applied under the NASM plan:

- Field name;
- Field location;
- Tillable area within the field (in hectares or acres);
- Area available for land application of prescribed materials within the field (in hectares or acres);
- Maximum sustained slope within the NASM Application Area of the field;

- The representative soil series, texture, and hydrologic soil group within the field; and
- Include soil test information and lab reports, where required, as per section 94 of the Regulation.

8.5 NASM Storage Information

A NASM storage facility can include either a permanent nutrient storage facility or temporary field nutrient storage site. The following information must be provided for each NASM storage facility included in the NASM plan:

- Location information;
- Construction date (for permanent nutrient storage facilities); and
- Identification of the type(s) of NASM to be kept in the NASM storage facility including the form of the NASM (liquid or solid).
- For permanent nutrient storage facilities, the following information must be provided for each NASM storage facility:
    - Shape;
    - Cover status (covered vs uncovered);
    - Construction materials;
    - Minimum freeboard to be maintained at all times;
    - Dimensions;
    - Description of runoff management system associated with the NASM storage; and
    - Confirmation that the requirements of Part VIII of the Regulation have been met (if required).
- For temporary NASM field nutrient storage sites, the following information must be provided for each site:
    - Confirm/demonstrate that the storage has been sited in accordance with section 83 of the Regulation;
    - Confirm that the site will be managed in accordance with section 84 of the Regulation; and
    - Identify the maximum number of days NASM will be stored at this location, which must be determined in accordance with section 85 of the Regulation.

- Provide a sketch of the NASM storage facility that shows the following:
    - The location of the permanent NASM storage facility on the farm unit;
    - For temporary field nutrient storage sites only, show the area where the temporary field nutrient storage site(s) may be located within the field;
    - Indicate on the sketch the location of any tile inlets located within 50 metres of the temporary field nutrient storage site or permanent NASM storage facility (if no inlets exist within 50 metres, a statement indicating this must be included);
    - Indicate on the sketch the location of any surface water located within 50 metres of the temporary field nutrient storage site or permanent NASM storage facility (if no surface water exists within 50 metres, a statement indicating this must be included);
    - Show how the temporary field nutrient storage site or permanent NASM storage facility meets any applicable setbacks, flow paths and other distance requirements in the Regulation to all wells, surface water, tile inlets and tile drainage systems; and
    - For temporary field nutrient storage sites only, show how the temporary field nutrient storage site meets the required setbacks to any dwelling, residential area or commercial, community or institutional use.

8.6 Overview of Operation

The NASM plan must include an overview of the operation that includes at a minimum:

- The reason for submission (e.g., seeking a new approval or amendment to an existing approval);
- Details of the agricultural operation, including any operation identifier(s) associated with the operation or farm unit plus any NMSs or NMPs associated with any of the land included as part of this farm unit;
- A description of any livestock facilities located on the farm unit (if applicable);
- If any unlisted NASM is included in the NASM plan, provide a description of the process by which the unlisted NASM is generated; and
- Describe the cropping and management practices for each NASM application area.

8.7 NASM Field Sketch

A sketch is required for each field containing all or part of a NASM application area. Sketch requirements for NASM storage facilities are addressed separately in Part 8.5. The field sketch must be prepared based on an on-site assessment. It must accurately reflect the required features identified in this part.

The sketch must include the date the on-site assessment was done and the name of the person conducting the assessment. The sketch must include the field components as described below:

- Identify the individual fields and their boundaries including a field identifier that is consistently used through the plan.
- Delineate the NASM application area within the field.
- If applicable, identify and delineate sections within any field.
- Indicate on the sketch whether any field has any tile drainage. For any field that has any tile drainage features, include the following on the sketch:
    - Show or clearly describe the location of all known tile outlets that discharge to any type of drain, ditch or other surface water or that discharge to ground surface in any instance where the tile discharge occurs within the field boundary or at the edge of the field boundary.
    - Where no outlets are located within the scope of the sketch as described above, provide a statement or description that identifies where the tile drainage system daylights.
    - Show the location of all tile inlets located within the boundary of the field;
        - Where no tile inlets as describe above exist, a statement indicating this must be included.
    - Show the location of all known tile inlets located beyond the boundary of the field that may receive drainage from the field;
        - Where no tile inlets as describe above exist, a statement indicating this must be included.
- For areas within the field that have soils less than 30 centimetre depth above bedrock and bedrock outcrops, provide a delineation of the area in question on the sketch and ensure that the NASM application area shown on the sketch does not include these areas (section 50 of the Regulation prohibits application of NASM on soils <30cm depth to bedrock). If these soil conditions do not exist within the field, a statement indicating this must be included.

- Provide information on the sketch that addresses the location of non-agricultural land uses described in section 47 of the Regulation (i.e. dwellings, residential areas and commercial, community or institutional use) as follows:
    - The sketch must show the location of any such non-agricultural land use that falls within an applicable minimum setback distance of the NASM land application area (refer to section 47 of the Regulation for minimum setback requirements); and
    - Where no land use meeting the criteria above exists, a statement indicating this must be included.
- Indicate the location of wells on the sketch as follows:
    - Show the location of any well that is a municipal well where it is located within the field or within 100 metres of the field boundary;
        - Describe these wells as a "municipal well" on the sketch;
    - Show the location of all wells that are not a municipal well where they are located within the field or within 90 metres of the field boundary;
    - For each well that is not a municipal well, include a description of the well according to the following rules:
        - If the well is a drilled well that has a depth of at least 15 metres and a watertight casing to a depth of at least six metres below ground level, describe the well on the sketch as a "drilled well;"
        - If the well is not a drilled well that has a depth of at least 15 metres and a watertight casing to a depth of at least six metres below ground level, describe the well on the sketch as an "other well."
    - In the event no wells meeting the criteria above exist, a statement indicating this must be included.
- Indicate the location of all surface water present in the NASM application area or within 150 metres from the boundary of the NASM application area. If no surface water meeting this criterion exists, a statement indicating this must be included. Where surface water is present in or within 150 metres from the boundary of the application area, the following additional information is required:
    - Identify the maximum sustained slope of the NASM application area for the land that falls within 150 metres of the top of bank of surface water; and
    - Show the separation distances from all surface water that are required to meet regulatory requirements.

8.8 Material Test Results

Prior to land application, all NASM sampling and analysis required by the Regulation must be completed. The analytical test results must ultimately be included in the NASM plan.

8.9 Application Rate Information

The following information must be used in order to determine whether the proposed application rate is compliant with the requirements of the Regulation and the Protocol:

- Planting and harvest dates (or growth and dormancy dates for perennial crops) for all crops and cropping years included in the NASM plan;
- A determination of crop yield;
- For each material containing nutrients to be applied to the NASM application area, the application rate, the application date, and method of application for all cropping years must be included in the NASM plan; and
- The following information must be included that demonstrates the application rates do not result in any regulatory exceedances:
    - Nutrient balances must be calculated.

8.10 Registration of Agricultural Operation where NASM Plan Approval Not Required

If a NASM plan does not require the approval of a Director, the person who owns or controls the agricultural operation must register the operation by filing with the Director a description of the operation that includes the following:

- Certified preparer information, including
    - Name of the NASM Plan Development certificate holder and that person's certification number;
- Owner of the farm unit and the owner or controller of the agricultural operation, if different, including:
    - List name and contact information;
- Description of each NASM material to be applied to land under the NASM plan (see Part 8.2);

    - In addition to the information described in Part 8.2 above, a registration submission must also include a projection of the amount of prescribed materials to be received at the NASM plan area each year;
- Farm unit information (see Part 8.3);
- NASM application area field property information (see Part 8.4);
- Overview of the operation (see Part 8.6);
- NASM application area field sketch (see Part 8.7); and
- A declaration in accordance with section 26.2(1)(d) of the Regulation.

8.11 Calculating Total Concentration of PAN, PAP and PAK

The calculation of the total concentration of plant available nitrogen (PAN), plant available phosphate (PAP) and plant available potassium (PAK) required by section 98.0.6 of the Regulation must be determined as follows:

Solid NASM

Total concentration of PAN in mg/kg + PAP in mg/kg + PAK in mg/kg must be greater than 13,000 mg per kilogram. All units for the analyses below shall be in mg/kg on a dry weight basis.

PAN (Plant Available Nitrogen) is calculated as follows:

- PAN = (Ammonia-N + ammonium-N) + (nitrite-N + nitrate-N) + (0.3*(Organic-N), where
- Organic-N = (Total Kjeldahl nitrogen – (ammonia + ammonium-N))

PAP (Plant Available Phosphate) is calculated as follows:

- PAP = (0.4*(Total Phosphorus * 2.29))

PAK (Plant Available Potassium) is calculated as follows:

- PAK = (0.9*(Total Potassium * 1.2))

Liquid NASM

Total concentration of PAN in mg/L + PAP in mg/L +PAK in mg/L must be greater than 140 mg/L. All units for the analyses below shall be in mg/L on a wet weight basis.

PAN (Plant Available Nitrogen) is calculated as follows:

- PAN = (Ammonia-N + ammonium-N) + (nitrite-N + nitrate-N) + (0.3*(Organic-N), where
- Organic-N = (Total Kjeldahl nitrogen – (ammonia + ammonium-N))

PAP (Plant Available Phosphate) is calculated as follows:

- PAP = (0.4*(Total Phosphorus * 2.29))

PAK (Plant Available Potassium) is calculated as follows:

- PAK = (0.9*(Total Potassium * 1.2))

Part 9 – Revoked

Part 10 – Methods for Making Determinations Required by the Regulation

10.1 Determination of Percentage of Crop Residue

In some circumstances, application of nutrients to the soil without incorporation is permitted by the Regulation where at least 30% of the soil surface is covered with crop residue at the time of application. This is provided for in Part VI of the Regulation.

The percentage of crop residue cover must be determined using the rope transect method or another method that can effectively determine the crop residue cover. The material required for the rope transect method is a light rope (about 8 m in length) with knots or other markings spaced along the rope at 15 cm intervals so that there is a total of 50 knots. This rope is laid out across the soil surface, preferably at an angle to the crop rows, and pulled slightly taut. The number of knots that are touching pieces of crop residue (minimum dimensions 2 mm by 2.5 cm) is counted. This number, when multiplied by two, is the per cent crop residue cover. This determination must be made a minimum of four times in different parts of the field, and the results averaged. If there is a conflict between the determination made using another method and the rope transect method, the determination made using the rope transect method prevails.

10.2 Determination of Unsaturated Soil Conditions

The Regulation requires the determination of the depth of "unsaturated" soil in certain circumstances. This is provided for in Part VI of the Regulation and in Part IX.2.

"Unsaturated," in relation to soil condition, refers to a soil water content that is less than 100 per cent of the total pore space, or is at a negative soil water pressure. Whether the soil is unsaturated for the purposes of the Regulation must be determined using the following procedure:

- Dig a hole or remove a soil core to the depth necessary to determine compliance with the rule in the Regulation that applies to your situation; and
- Observe whether water flows into the hole from the surrounding soil (this may take up to an hour in clay soils).

Water will only flow under saturated conditions, so if water is observed, the soil does not meet the applicable criteria for unsaturated soil.

10.3 Determination of Dry Matter Content of Manure

Subsection 81(5) of the Regulation requires the determination of the dry matter content of manure in accordance with the Protocol in order to comply with that provision The dry matter content of manure must be established through sampling or by referring to the Manure Databank for average values in Ontario. The Manure Databank can be found in Table 2 in the Nutrient Management Tables document.

Part 11 – Outdoor Confinement Areas

11.1 Snow that Contains Manure

Part VII of the Regulation allows a person to store or land apply snow which has been removed from an outdoor confinement area and that contains manure subject to certain conditions.

11.2 Parameters for Snow Containing Manure from Permanent Outdoor Confinement Areas

For the purposes of clause 61(2)(a) of the Regulation, snow containing manure that has been removed from a permanent outdoor confinement area cannot be applied to a field unless the snow meets the following parameters:

- It must have originated from a permanent outdoor confinement area;

- It must contain ice or snow crystals;
- It must not contain any foreign materials except livestock urine, feces, feed or bedding;
- It must have a dry matter content of no greater than 16%; and
- At the time of handling, it must be capable of being handled by, for example, a shovel or a front-end loader but not capable of being pumped through a hose.

Part 12 – Contingency Planning

12.1 General

Contingency plans are written documents that are a required component of NMSs, NMPs and NASM plans and must be tailored to the particular conditions of each operation. The contingency plan must be reviewed by all relevant parties, including the owners of the land where manure, anaerobic digestion output or NASM will be applied. Key people in every operation should be familiar with the contingency plan and know how to implement it.

Contingency plans must list in detail the contacts, equipment and other resources that are available should a contingency event occur, including without limitation:

- The owner/operator of the agricultural operation who can authorize expenditures;
- The number for the Spills Action Centre: (1-800-268-6060);
- The local municipality which can be contacted for drainage information and for assistance in spill response;
- People renting or willing to lend equipment who are close at hand; and
- Equipment such as loader tractors and emergency storage trailers.

12.2 Contents of Contingency Plan

The Regulation defines "contingency plan" as follows:

- "Contingency plan" means a proposal in a NMS or NMP for dealing with:
    a) An excess of prescribed materials or nutrients, if the amount of prescribed materials or nutrients generated or received at a farm unit is greater than that otherwise provided for by the strategy or plan;

b) An excess of prescribed materials or nutrients, if the amount of prescribed materials or nutrients requiring storage prior to use exceeds or is anticipated to exceed the storage capacity available for prescribed materials or nutrients otherwise provided for by the strategy or plan;

c) Unanticipated releases of prescribed materials or nutrients from storage or during transport or application;

d) Inability to store, apply or otherwise use prescribed materials or nutrients as otherwise provided for by the strategy or plan, as a result of weather conditions or unavailability of equipment; or

e) Any other contingency requiring the handling or storage of prescribed materials or nutrients in an emergency.

Each of the components in paragraphs (a) to (e) must be addressed when preparing the contingency plan for the NMS, or NASM plan.

12.3 Other Considerations

Managing Off-Farm Source Material

Where the agricultural operation has a RMADF on the farm unit, there may be off-farm anaerobic digestion materials stored on the farm unit. The contingency plan must have a plan for dealing with any material that may not be able to be used in the RMADF for any reason. The plan shall consider other disposal methods such as landfilling, composting or other processing methods that may be permitted.