

Non-Agricultural Source Material (NASM) Plan Development Certificate Core Competencies

Who needs a NASM PD certificate?

You need a Non-Agricultural Source Material (NASM) Plan Development certificate if you are preparing a NASM Plan for an agricultural operation. A NASM Plan is a nutrient management plan for the management of NASM and other nutrients that may be applied to agricultural land or stored in NASM storage facilities.

What laws apply to operating a business that applies prescribed materials?

The laws that relate to this activity are:

- The Nutrient Management Act, 2002 (NMA)
- Ontario Regulation 267/03 (O. Reg. 267/03)
- The associated Protocols

These laws outline the requirements dealing with developing NASM Plans.

What are Core Competencies?

Core Competencies are the skills and knowledge that you need for the NASM Plan Development certificate. The competencies are organized into four main categories:

1. General Information
2. NASM Plan Preparation
3. Soil Fertility and Management
4. Management of NASM

Getting Your Certificate

What do I need to do to be a NASM Plan Developer?

The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) offers training that will help you understand the provincial laws related NASM Plan development and meet the competencies in this document. The required training courses for this certificate are:

1. Introduction to Nutrient Management
2. How to Prepare a NASM Plan using NMAN
3. NASM Plan Developer's course

This training and these competencies focus on the rules that apply under O. Reg. 267/03.

If you are applying for this certificate, you should have the basic knowledge and skills needed to offer consulting services in agronomic practices. You may need to further develop your knowledge through additional education and training or practical experience. You can contact OMAFRA if you would like copies of their technical publications to help you learn more.

Is there an exam?

After you complete the courses, you will be tested on your knowledge of the provincial laws and the core competencies. Questions will also test your knowledge of the agronomic principles required to implement the nutrient management legislation. You will be given a copy of the *Nutrient Management Act, 2002*, O. Reg. 267/03, the associated Protocols, Nutrient Management Tables and the NASM Odour Guide as a reference when you write the exam.

Do I receive my NASM Plan Development certificate automatically when I pass the exam?

In addition to passing the exam (a mark of 75% or higher), you will need to successfully complete two fictitious scenario assignments before you are eligible to apply for certification.

Your certificate is valid for 5 years but it can be subject to conditions, amended, suspended or cancelled before it expires if you contravene the laws or if, in the opinion of the OMAFRA Director, you demonstrate incompetence or bad faith in preparing NASM Plans.

It is your responsibility to keep up-to-date with current provincial laws after you are certified and to conduct business in good faith and in a competent manner.

Terms and Definitions

Please carefully review all terms and definitions used in these core competencies. If you do not understand something, review the course material or refer to the *Nutrient Management Act, 2002*, O. Reg. 267/03 or the Nutrient Management Protocol.

Notice to Reader

The information contained in this document is derived from the *Nutrient Management Act, 2002* and O. Reg. 267/03. Every effort was made to make it as accurate as possible, but it is not authoritative. Please refer to www.e-laws.gov.on.ca for the authoritative text of the act and regulation. To stay current, please check the “News” page at: www.nutrientmanagement.ca.

For further details about nutrient management legislation, contact the Ministry of Agriculture, Food and Rural Affairs:

Toll Free: 1-877-424-1300

Email: nman.omafra@ontario.ca

Visit: ontario.ca/nma

Category 1: General Information

1. Identify the purpose and the goals of the Nutrient Management Act (NMA), 2002.
2. Describe the roles and responsibilities of the following people and identify when their services are required:
 - NASM Plan Development Certificate holder
 - NASM Generator
 - Farm Operator or Owner
 - Municipality
 - NASM Hauler
 - Prescribed Material Application Business Licence Holder
 - Nutrient Application Technician
 - Professional Engineer
 - Professional Geoscientist
 - Ministry of Environment and Climate Change (MOECC) Agricultural Environmental Officer
 - Agricultural Operation Strategy or Plan Development Certificate holder
3. Describe the roles of the OMAFRA Director and reviewer during the review of a NASM Plan.
4. Discuss the importance of communication between stakeholders such as NASM Generators, land applicators, haulers, land owners, farm operators and regulators (OMAFRA/MOECC), and NASM Plan Developers
5. Recognize the NASM Plan Developer's obligations to clearly communicate the details of the NASM Plan with his or her client (e.g. legal implications, content, timeline requirements, etc.).
6. Describe the importance of verifying that the NASM Plan is an accurate description of the NASM application area and associated storages, and identify how this can be done.
7. Determine which regulatory framework is appropriate for a given situation (e.g., Environmental Protection Act, Regulation 347, Ontario Water Resources Act, Nutrient Management Act, 2002, O. Reg. 267/03 and Protocols, municipal bylaws, etc.).
8. Describe and use key terms used in the Nutrient Management Act, 2002 and O. Reg. 267/03, including surface water, unsaturated soil, and wells.
9. Identify items that are defined as nutrients.
10. Identify items that are defined as agricultural source materials (ASM), commercial fertilizer and compost.
11. Identify items that are defined as non-agricultural source materials.
12. Define adverse effect and know its importance related to storage and land application of nutrients.
13. Describe the record keeping requirements for NASM identified in the regulation.
14. Explain the importance of record keeping for all NASM stakeholders (e.g. generators, farmers, MOECC, etc.)
15. List the requirements for a NASM Plan Development certificate and the renewal timeline.

16. Identify the types of actions that would jeopardize the status of a certificate (i.e. amendment, suspension or revocation).
17. Describe the various compliance tools available to enforcement personnel (with the Ministry of the Environment and Climate Change) under the NMA.

Category 2: NASM Plan Preparation

NASM Category Description

1. Determine the categorization of material using the NASM Category tables in the Regulation.
2. List the assigned quality criteria for the three NASM Categories.
3. Identify the analytical parameters that must be determined for a particular NASM.
4. Describe the implications of mixing NASM with other materials.
5. Describe the requirements for materials not categorized or listed in the Tables.

Requirements of a NASM Plan

6. Determine when a NASM plan is required.
7. Determine when a NASM plan requires approval.
8. Explain when the Regulation requires registration of an operation.
9. Identify the triggers of cessation or amendment of a NASM Plan.
10. Describe the review, update and summary requirements for a NASM plan.
11. Describe under what conditions a director may issue a notice requiring an approved NASM plan for Category 1 and Category 2 NASM.
12. List the components of a NASM plan.

Site Assessment and Mapping Skills for NASM Application Area

13. Identify proper methods of conducting and documenting a site assessment.
14. Identify the land that will be included in a NASM Application Area.
15. Determine soil series and soil texture by reading and interpreting soil map symbols.
16. Determine the Hydrologic Soil Group(s) of the land included in the NASM Application area.
17. Calculate slope; define maximum sustained slope.
18. Determine the top of bank to measure setback distances from watercourses.
19. Identify elements required on a field sketch.
20. Identify the components of a NASM Plan Area.

Contingency Planning

21. Recognize common situations that need to be addressed in a contingency plan.
22. Recognize how a contingency plan can affect a NASM Plan.
23. Identify who must be called in event of a spill.

24. Describe options for addressing unexpected odour issues.

Category 3: Soil Fertility and Management

Soil Physics

1. Describe the relationship between soil texture, slope, water infiltration and runoff.
2. Recognize the physical characteristics of soil and how they relate to potential soil productivity, crop suitability, soil texture, structure, drainage, and timing of processes.
3. Determine which soil series to use in a field where two or more soil series are found.
4. Use the Hydrologic Soil Group to determine the runoff potential, maximum application rate and other restrictions for application of NASM.

Soil Fertility

5. Identify accredited nutrient and metal analysis methodologies.
6. Select appropriate soil sampling methodologies for a given situation as per the Sampling and Analysis Protocol.
7. Interpret soil test results for a NASM application area.
8. Site the maximum permissible metal concentration in soil in a NASM application area.
9. Explain how the cropping system influences soil fertility levels and the method and timing of nutrient application.
10. Determine the Nitrogen credit from a previous crop and nutrient application.
11. Describe ways to deal with variations in topography within the field.
12. Describe ways to deal with variations in soil test results within the field.
13. Recognize how nutrient availability affects the crop response to the application of a given nutrient.

Nutrient Management

14. Recognize how material placement and application timing affect nutrient availability.
15. Interpret and use the guaranteed nutrient analysis of commercial fertilizer materials.
16. Determine nutrient application rates using materials with various nutrients content.
17. Describe the relationship between production inputs and crop yield.

Nutrient Balances

18. Define and calculate the agronomic balance.
19. Define and calculate the crop removal balance.
20. Identify the circumstances in which crop removal balance must be calculated, and the rationale for doing the calculation.

Category 4: Management of NASM

NASM Sampling and Analysis

1. Describe the appropriate sampling parameters and sampling frequency for each NASM category.
2. Select appropriate material sampling methodologies for a given situation as per the Sampling and Analysis Protocol.
3. Identify appropriate analytical methodologies for regulated parameters.
4. Describe the difference in calculating the arithmetic average and geometric mean.
5. Identify when to use the arithmetic average or geometric mean when interpreting NASM analytical results.
6. Interpret NASM analytical results.
7. Integrate the analytical results into the NASM plan.

NASM Quality Criteria

Metals

8. Identify the eleven regulated metals.
9. Identify the maximum permissible concentration for each regulated metal in CM1 and CM2.
10. Identify the maximum metal addition to soil receiving NASM per five year period for each regulated metal.
11. Identify which categories of NASM are required to test for metals.

Pathogens

12. List the pathogens must be considered/measured and the maximum permitted pathogen content of the materials to determine CP1 or CP2.
13. Use tables in Schedule 6 of the regulation and material analysis to determine pathogen category for a material.
14. Identify when pathogen testing is required.

Odour

15. Describe purpose of the Odour Guide and how it should be used to comply with the Regulation.
16. Determine the odour category of a listed NASM material as set out in the Nutrient Management Tables Document. (e.g. OC1, OC2)
17. Describe the procedure to assign a NASM odour category for an unlisted NASM as described in the Odour Guide.
18. Describe the procedures to reassess and assign a NASM to an odour category.
19. Describe how odour categorization can affect land application and storage of NASM.

Determination of the requirement of benefit

20. Cite the minimum requirement of benefit conditions that a material must meet in order to qualify as a NASM for agricultural land application.

21. Calculate the plant available nitrogen (PAN), plant available phosphate (PAP), and plant available potassium (PAK) contained in a NASM.

Storage

22. Determine if a storage facility is regulated under the NMA or EPA.
23. Describe the requirements for siting and construction of new permanent NASM storage facilities (design, size, setbacks, etc.).
24. Identify appropriate runoff management options for permanent NASM storage facilities.
25. Recognize the prohibition of on-farm storage under the NMA of OC3 NASM.
26. List the criteria for a temporary field NASM storage site.
27. Calculate the permitted number of days of storage in a temporary field NASM storage site.
28. Describe restrictions/prohibitions for temporary field storage for liquid and solid NASM.
29. Identify management practices to minimize odour and odour issues during storage of NASM.
30. Identify when a permanent NASM Storage must be designed to minimize odour emissions.

Land Application of NASM

31. Recognize how timing, rate and placement of NASM affect potential nutrient loss.
32. Identify the site prohibitions related to NASM land application.
33. Identify regulatory requirements for direct flow application systems and high trajectory guns.
34. Estimate the nutrient loss potential under different situations, such as number of days to incorporation, season of application (spring, fall etc.) bare soil, crop residue, standing crop, pre-tillage etc.
35. Determine depth of unsaturated soil and depth to bedrock.
36. Determine appropriate setback distances to regulated sensitive features.
37. Determine setbacks to dwellings, residential areas, commercial or community or institutional uses based on odour categorization.
38. Calculate useable area for prescribed materials application as they are affected by application setbacks and vegetated buffers.
39. Cite the winter spreading restrictions for application of NASM and explain why winter spreading is restricted.
40. Identify the restrictions for application of NASM based on depth of unsaturated soil and/or bedrock.
41. Identify the maximum application rate for NASM based on the following items:
 - Boron, FOG, metals, nutrients, sodium, run-off potential, risk of groundwater contamination, depth to bedrock, dry matter/liquid/solid loading
42. Identify pre-harvest and pre-grazing waiting periods when NASM is land applied.
43. Recognize situations requiring a vegetated buffer zone when applying NASM.

44. Describe odour management practices required by the regulation to address odour and odour issues during land application.
45. Describe the requirements for notification to the MOECC prior to land application.

For more information about nutrient management certification:

Toll Free: 1-855-648-1444

E-mail: mmcdonal@uoguelph.ca

www.nutrientmanagement.ca