



BUREAU OF WATER QUALITY
Guidance Document

Wisconsin Department of Natural Resources
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Sludge Management Plans for Sewage Sludge (Biosolids):
How to Review and Approve

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This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

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1.0 Definitions

1. **Bedrock**: means the rocks that underlie soil material. Bedrock may be present at the earth's surface when the weathered in-place consolidated material, larger than 2mm in size, is greater than 50% by volume (referenced from ss. NR 113.03(7), NR 204.03(9), and NR 214.03(3), Wis. Adm. Codes).
2. **By-product solids**: means materials from animal product or food processing industry including, but not limited to remains of butchered animals, paunch manure, and vegetable waste materials such as leaves, cuttings, peelings, and actively fermenting sweet corn silage (referenced from s. NR 214.03(4), Wis. Adm. Code).
3. **Community well** or **community public water supply system**: means a public well which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. Any well servicing 7 or more homes, 10 or more mobile homes, 10 or more apartment units, or 10 or more condominium units shall be considered a community well unless information is available to indicate that 25 year-round residents will not be served (referenced from s. NR 204.03(12), Wis. Adm. Code).
4. **Department**: means the Wisconsin Department of Natural Resources (referenced from s. NR 204.03(15), Wis. Adm. Code).
5. **Detrimental effect**: means contamination of the lands or waters of the state, or making the same injurious to public health, harmful for commercial or agricultural use, or deleterious to animal or plant life (referenced from ss. NR 204.03(16) and NR 214.03(10), Wis. Adm. Code).
6. **Drainageway** or **dry run**: means a drainage pathway, either natural or artificial, with defined banks, which contains confined flow during periods of natural runoff (referenced from s. NR 204.03(18), Wis. Adm. Code).

Note: For the purposes of this guidance document, the terms "dry run" and "drainageway" are interchangeable.
7. **Grease interceptor** (aka grease trap): watertight receptacle designed to intercept and retain grease for fatty substances contained in kitchen and other food wastes (referenced from s. NR 113.03(21), Wis. Adm. Code). This term should not to be confused with a receptacle for grease collected from fryers (and similar cooking processes) retained in onsite containers for removal/reuse.
 - A) **Industrial/process grease interceptor** (aka food processing grease): means a watertight receptacle designed to intercept and retain grease connected through process piping (not sanitary plumbing).

Note: Industrial (process) grease is generated from large-scale food production. Numerous meat and poultry processors generate industrial/process grease. Grease generated by the industrial food production process enters a grease interceptor installed in or connected to process pipes, not sanitary plumbing

pipes. Non-domestic septage (including process grease) is regulated pursuant to ch. NR 214, Wis. Adm. Code. In addition, process piping is not regulated by the plumbing code; therefore, this waste is exempt from ch. NR 113, Wis. Adm. Code requirements. This waste is regulated as an industrial sludge pursuant to s. NR 214.18, Wis. Adm. Code.

B) Sanitary grease interceptor: means a watertight receptacle designed to intercept and retain grease connected through sanitary plumbing in and/or from kitchens and restaurants. Sanitary grease contains human pathogens. See ch. NR 113, Wis. Adm. Code.

8. Groundwater: means any of the waters of the state, as defined in ss. 281.01(18) and 283.01(20), Stats., occurring in a saturated subsurface geological formation of permeable rock or soil (referenced from s. NR 204.03(27), Wis. Adm. Code).

9. Holding tank: means an approved watertight receptacle for the collection and holding of sewage (referenced from s. NR 113.03(26), Wis. Adm. Code).

A) Domestic holding tank: a watertight receptacle for the collection and holding of domestic wastewater [See definition of wastewater-domestic below].

B) Nondomestic or mixed (domestic + nondomestic) holding tank: a watertight receptacle for the collection and holding of nondomestic wastewaters or a mix of domestic/nondomestic wastewaters [See definition of wastewater-nondomestic below].

10. Incorporation: means the mixing of sludge with topsoil to a minimum depth of 4 inches by such means as discing, mold-board plowing, chisel plowing, rototilling, or other tillage methods (referenced from s. NR 204.03(31), Wis. Adm. Code).

11. Industrial liquid waste or industrial wastewater: means process wastewater (non-agricultural process wastewater) and waste liquids, including silage leachate, whey, whey permeate, whey filtrate, contact cooling water, cooling or boiler water containing water additives, and wash water generated in industrial, commercial, and agricultural operations (referenced from s. NR 214.03(27), Wis. Adm. Code).

12. Injection: means the subsurface placement of liquid sludge to a depth of 4 to 12 inches (referenced from s. NR 204.03(32), Wis. Adm. Code).

13. Land application: means the spraying or spreading of sludge onto the land surface, the injection of sludge below the land surface, or the incorporation of sludge into the soil. Sludge can either condition or fertilize crops or vegetation grown in the soil (referenced from s. NR 204.03(33), Wis. Adm. Code).

14. Manure (animal waste): means a material that consists primarily of litter or excreta, (either treated or untreated), from livestock, poultry or other animals. Manure includes material mixed

with runoff, bedding contaminated with litter or excreta, or process wastewater (referenced from s. NR 243.03(36), Wis. Adm. Code).

15. Manure storage unit: any above or below ground unit designed (NRCS 313 standards) and approved to store manure. This storage unit may be approved by the county land and water conversation department or pursuant to ch. NR 243, Wis. Adm. Code requirements. For the purposes of this guidance document, manure digesters are considered a manure transfer structure that transfers waste into manure storage units.

16. Non-Permitted farm: a farm that does not have a Wisconsin Pollutant Discharge Elimination System (WPDES) permit (general or individual) that authorizes the application of liquid industrial waste or manure to cropland.

17. Permitted contract haulers: a business that has been issued a WPDES permit to haul, comingle, store, and land apply wastes.

18. Permitted farm: a livestock operation that has a WPDES permit (example: Concentrated Animal Feeding Operation or CAFO) that authorizes the application of liquid and/or solid manure to croplands or authorizes a discharge to surface waters.

19. Portable restroom: means fixtures, incorporating holding tank facilities, designed to directly receive human excrement. Portable restrooms are self-contained units, may be designed for one or more person's use at a given time and are readily transportable (referenced from s. NR 113.03(41), Wis. Adm. Code).

20. Private water supply well or private well: means a residential water supply or a livestock water supply. (referenced from s. NR 123.03(16), Wis. Adm. Code)

21. Privy: means a cavity in the ground or a portable above ground device constructed for toilet uses which receive human excrement either to be partially absorbed directly by the surrounding soil or stored for decomposition and periodic removal (referenced from s. NR 113.03(43), Wis. Adm. Code).

22. Septage: means the wastewater or contents of septic or holding tanks, dosing chambers, grease interceptors, seepage beds, seepage pits, seepage trenches, privies, or portable restrooms (referenced from s. NR 113.03(55), Wis. Adm. Code).

Note: this does not include non-domestic wastewater/septage (non-domestic examples include, but are not limited to process grease, car wash waste, catch basin waste, etc.).

23. Sewage sludge or biosolids: means the solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes scum or solids removed in primary, secondary or advanced wastewater treatment processes and material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works. (referenced from s. NR 204.03(55), Wis. Adm. Code)

24. Sludge (industrial sludge): means the accumulated solids generated during the biological, physical or chemical treatment, coagulation or sedimentation of water or wastewater (referenced from s. NR 214.03(34), Wis. Adm. Code).

25. Sludge management plan or land application management plan: a document that outlines how wastes are stored, transported, and land applied on department-approved fields.

Note: Sludge management plans may be required per s. NR 204.11, Wis. Adm. Code.

26. Storage structure: a lagoon, slurrystore, storage pad, etc. that has been reviewed and approved by the department to store industrial wastes, sewage sludges, septage wastes, and/or comingled wastes.

27. Total volume: cumulative volume of sludge hauled and/or disposed to other WPDES permitted locations.

28. Wastewater-Domestic: wastewater originating solely from human and domestic activities such as sanitary, bath, laundry, dishwashing, garbage disposal, and the cleaning of domestic areas or utensils. Wastewater from restaurants is considered to be domestic wastewater. [clarified pursuant to DSPS (DComm) and DNR Memo of Understanding dated December 16, 1999].

29. Wastewater-Non-Domestic: includes, but is not limited to, wastes collected from non-residential garages used for storage, maintenance, or washing of motor vehicles, commercial food processing, commercial laundromats, animal shelters or kennels, animal rendering, metal fabricating, electronic component manufacturing, chemical manufacturing, milkhouses and other industrial and commercial process water. [clarified pursuant to DSPS (DComm) and DNR Memo of Understanding dated December 16, 1999].

Note: Nondomestic wastewater may include a mix of nondomestic and domestic wastes.

30. Wetland: means those areas where water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation, and which have soils indicative of wet conditions (referenced from s. NR 204.03(72), Wis. Adm. Code).

2.0 Acronyms

1. CAFO: Concentrated Animal Feeding Operation
2. DNR: Department of Natural Resources (department)
3. DSPS: Department of Safety and Professional Services (formerly Department of Commerce)
4. MSDS: Material Safety Data Sheet (aka Safety Data Sheet or SDS)

5. NMP: Nutrient Management Plan
6. NRCS: Natural Resource Conservation Service (formerly known as the U.S. Soil Conservation Service (SCS))
7. SMP: Sludge Management Plan
8. SOP: Standard Operating Procedure
9. SWAMP: System for Wastewater Applications, Monitoring, and Permits
10. WPDES: Wisconsin Pollutant Discharge Elimination System
11. WWTF: Wastewater Treatment Facility

3.0 Applicability

This guidance document describes the sludge management plan (SMP) requirements for Wisconsin Pollutant Discharge Elimination System (WPDES) sewage sludge generators.

The following wastes and situations are excluded from the use of this document as well as other wastes and situations:

- Industrial wastes (industrial liquid wastes, by-product solids, and sludges including process grease, non-domestic wastes, etc.) landspread by the waste generator pursuant to ch. NR 214, Wis. Adm. Code;
- Septage wastes (septage, holding tank, sanitary grease, portable restroom, privy, etc.) landspread under a Wisconsin septage business license and pursuant to chs. NR 114 and NR 113, Wis. Adm. Code;
- WPDES permitted contract haulers that temporarily store and landspread various wastes;
- Septage haulers that have been issued a WPDES permit;
- Farm process wastewater regulated per ch. NR 243, Wis. Adm. Code;
- Farm process wastewater from non-permitted farms;
- Lime sludges generated by paper mills or water supply treatment facilities; and
- Hazardous wastes.

Note: Process wastewater (milkhouse waste, silage leachate, etc.) generated at an agricultural facility (permitted and non-permitted) and discharged into a manure storage unit is typically classified as an agricultural waste. Wastes from agricultural and industrial facilities may be characteristically similar but are regulated pursuant to the type and/or origin of waste generation.

4.0 Background

Sludge management plans outline how sewage sludge (biosolids) is stored, transported, and land applied on department-approved agricultural fields. The management plan typically serves as a standard operating procedure (SOP) for the permittee's employees and/or contractors to reference and implement. This document is also utilized by department staff to ensure that the permittee meets WPDES permit and code requirements when land applying sewage sludge.

SMPs include information such as a waste volume and characterization, storage locations, land application outfalls, type of transportation, land application vehicles/equipment, pathogen control requirements, vector attraction reduction control requirements, contingency plans for periods of adverse or inclement weather, spill response procedures, reporting requirements, and any other pertinent information.

The department recommends that a wastewater treatment facility (WWTF) develop an SMP if it stores, handles, disposes and/or land applies biosolids.

Pursuant to s. NR 204.11, Wis. Adm. Code, the department is authorized to require SMPs. Situations that may warrant the development of an SMP include, but are not limited to the following:

1. New WWTF operator that is unfamiliar with facility's land application practices;
2. New contractor(s) hired to transport, land apply, and/or dispose of sludge;
3. Any person who is responsible for importing bulk exceptional quality sludge into Wisconsin (per s. NR 204.11(2), Wis. Adm. Code);
4. Alternative uses for sludge pursuant to s. NR 204.09, Wis. Adm. Code;
5. Chronic and/or severe compliance issues; and
6. Any other relevant situations.

SMPs are tools for WWTFs to manage their land application programs pursuant to its WPDES permit and ch. NR 204, Wis. Adm. Code.

While it is common that the requirement to develop an SMP is included in the compliance schedule of a WPDES permit, an SMP may be requested at any time from department staff if warranted. For example, if a WPDES permit was recently issued, department staff may require the development of a SMP through a written request. This request typically occurs when chronic and/or severe land application compliance issues are identified. This request may be included in a Notice of Noncompliance or Notice of Violation. Once the SMP is approved by the department, the permittee is expected to operate in compliance with this SMP until the permittee submits and receives department approval for a new/revised SMP.

Because sludge is removed infrequently from lagoon systems (typically once per 15-20 years, depending on the rate of sludge buildup), the SMP also includes details for lagoon desludging projects (if applicable). The desludge plan details how the facility will continue to function during the lagoon drawdown, how surface water discharge limits will be met (if discharging), and precautions to prevent liner damage.

Given the increasing complexity of WWTF permits, as well as the growing number of compliance related issues regarding the land application of biosolids, the department developed this guidance document to create a standardized outline of items for WWTFs to address in their sludge management plans. When an SMP is required, the permittee must submit a plan that describes the facility's sludge management program, and how the permittee intends to operate in compliance with its WPDES permit and ch. NR 204, Wis. Adm. Code.

The department recommends that a copy of the final SMP be kept in all spreading vehicles and appropriate office locations.

Following approval by the department, the permittee must operate in compliance with the SMP. Again, if the permittee wishes to operate differently than specified in the approved management plan, a written request must be submitted to the department for approval to amend the management plan prior to implementing the operational changes.

Legal note: This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

5.0 Sludge Management Plan Requirements

Sludge management plans include the following sections:

1. Cover Page;
2. Sewage Sludge Information;
3. Sewage Sludge Storage Structures (Storage Outfalls);
4. Sludge Characterization;
5. Sludge Transport;
6. Land Application;
7. Disposal Options;
8. Lagoon Desludge Projects (if applicable), and
9. Record Keeping and Reporting.

5.1 Cover Page

The cover page includes the following information:

1. Permittee name,
2. WPDES permit number,
3. Mailing address of facility,
4. Authorized representative for permittee,
5. Contact information (phone, email address, etc.) of authorized representative,
6. Management plan developer,
7. Contact information (phone, email address, etc.) of SMP developer, and
8. Version number or draft number and date of the SMP.

5.2 Sewage Sludge Information

The waste information section includes the following information:

1. A description of the types of biosolids treatment processes prior to land application. These processes may include, but are not limited to:
 - a) Aerobic treatment,
 - b) Anaerobic treatment,
 - c) Sludge dewatering,
 - d) Sludge thickening, and/or
 - e) pH adjustment.
2. A listing of chemicals used in the sewage sludge treatment process is included. Also included is a listing of the material safety data sheets (MSDS or SDS) of chemicals used, if applicable.
3. Identification of any potential pollutants of concern in the sewage sludge is also provided. This may include, but is not limited to:
 - a) Metals (e.g. arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc),

- b) Radium, and/or
- c) Polychlorinated biphenyls (PCBs).

5.3 Sewage Sludge Storage Structures (Outfalls)

This section relates to storage structures with outfalls (not including manure storage structures used for disposal):

1. A list all DNR approved storage structures including the following information:
 - a) DNR designated sample point number,
 - b) Storage structure name,
 - c) Legal description of unit,
 - d) Construction description (type and materials),
 - e) Storage capacity (gallons, cubic yards, or tons) of structure,
 - f) Waste (liquid or cake) stored in structure, and
 - g) Approximate waste volume (gallons, cubic yards, or tons) stored annually in each structure.

Note: The SMP should detail leachate containment for storage units containing municipal cake sludge.

2. An aerial photograph with each storage structure location noted.
3. A flow diagram detailing how wastes are discharged into and removed from each storage structure.
4. The procedures for regularly inspecting and maintaining each storage unit. This procedure should also address spill management, leakage, and structural failure mitigation procedures.
5. A template inspection and maintenance/repair log. It is recommended that this log include the following information:
 - a) Date and time of inspection,
 - b) Storage structure(s) inspected,
 - c) Inspector(s),
 - d) Observations,
 - e) Recommended repairs/maintenance, and
 - f) Date of repairs/maintenance.
6. When a new or different storage structure is approved by the department (as part of a WPDES permit modification or reissuance), the specific information as outlined above should be provided as an amendment to the SMP.

5.4 Sludge Characterization

This section provides information related to the sludge characteristics, where and how samples are collected, and other related information. The following information is expected to be included in the sludge management plan:

1. A detailed description of how and where representative samples are collected from each sample location (outfall).
2. A list all sludge parameters and the monitoring frequency associated for each outfall.
3. A listing of all current state certified laboratories used to analyze the permittee's samples.
4. A template sampling log that includes the following information:
 - a) Date, exact place, method, and time of sampling or measurement;
 - b) The individuals who performed the sampling or measurements;
 - c) The laboratory that completed the analysis;
 - d) The analytical techniques or methods used; and
 - e) The results of the analysis.
5. A table summarizing the most recent characteristic data for each outfall. The department recommends calculating an average concentration (last 5 calendar years) for each pollutant. A range of data may be included as well to show expected range of data results.

The department recognizes that the permittee has the ability to send samples to any state certified laboratory. It is recommended that the permittee update the SMP if changes to the laboratory occurs.

5.5 Sludge Transport

The waste transport section of the sludge management plan includes the following:

1. A description of methods for transporting both solid and liquid sludge from the storage unit to the hauling vehicle, including the methods of loading.
2. A description of each vehicle used for hauling detailing the type (year, make, model) and capacity (gallons, cubic yards, tons).
3. Listing of all contractors or sub-contractors used for removing liquids/solids (if applicable).
4. Description for measuring the total volume hauled and the types of records that will be maintained. The department recommends that a transport log be kept. This log should record the following information:

A facility that generates sludge is ultimately responsible for its handling, transporting, storage and land application or disposal. A generator is responsible for compliance with its WPDES permit and all applicable provisions of ch. NR 204, Wis. Adm. Code.

If a sludge generator gives the sludge to another person to land apply, but that person does not alter the characteristics of the sludge, then that person is also responsible for complying with applicable provisions in this chapter, such as the land management practices specified in s. NR 204.07, Wis. Adm. Code.

- a) Permittee name,
 - b) Date/time waste is removed from storage structure,
 - c) Truck identification number,
 - d) Driver name,
 - e) Disposal location (land application field, WPDES permitted facility, landfill, etc.),
 - f) Date/time of disposal, and
 - g) Approximate volume (gallons, tons, cubic yards).
5. Explanation of how each application vehicle is unloaded at disposal location. If land applying with the same vehicle, provide further explanation on all types of equipment (including but not limited to high pressure spraying guns, spreader bars, splash plates, or other devices).
 6. A description of contingency plans developed for periods of adverse or inclement weather.
 7. A spill response plan for transportation and land application spills. This plan should include an SOP for clean-up of both minor (<50 gallons) and large spills (>50 gallons). This plan should include notification of the DNR 24-hour spill hotline (1-800-943-0003). The plan should also include local emergency response information, including but not limited to, contacts for the local police department, sheriff's department, and state patrol. Smaller WWTFs should consider a mutual assistance agreement with other local municipalities and/or septage businesses. The permittee may consider including emergency after-hours contacts for facility personnel.

5.6 Land Application Submittal Procedures for Requesting New Sites

The site submittal section of the sludge management plan includes the following information describing how to obtain new sites/fields for land applying:

1. A complete Land Application Site Request Form (Form 3400-053) is provided for each requested site. *Note: The 3400-053 form is subject to periodic review and updates.*
2. The location of each land application site/field on an aerial photograph.
3. A soil map for each site.
4. Proof of ownership is provided for each site. Proof of ownership can be obtained from a county's tax parcel website or office of land records.
5. All potential site restrictions are provided, including, but not limited to:
 - a) Bedrock,
 - b) Groundwater,
 - c) Permeability and available water holding capacity,
 - d) Slope and erodibility,

There are several free websites that can be used to generate aerial photographs. The department recommends use of the WDNR Surface Water Data Viewer or the NRCS Web Soil Survey.

- e) Residences,
 - f) Private and community wells,
 - g) Surface water (streams, rivers, ponds, lakes, etc.)
 - h) Wetlands,
 - i) Drainageways and dry runs,
 - j) Drainage tiles, and
 - k) Other site-specific information.
6. Proposed areas that are suitable for land application are shown on a site map (per ch. NR 204, Wis. Adm. Code),
 7. Potential crops to be grown and/or the dominant vegetation on the land application site along with the anticipated harvest and removal schedule.
 8. Description and map of the adjacent land use (commercial, residential, industrial, forest, etc.) as well as any other relevant land features associated with the site.
 9. Landowner permission completed on the “Land Application Site Request” form (3400-053) dated January 2020.
 10. A recent (within the last 4 calendar years) soil test report is provided per s. NR 204, Wis. Adm. Code. The locations of each composite soil test result are delineated on an aerial photograph.
 11. If other sources of nitrogen (commercial fertilizers, manure, etc.) will be applied to each field, an estimate of proposed additional fertilizer use is provided.

Note: Fields may have an approved nutrient management plan (NMP). A NMP assures that crops receive sufficient nutrients (nitrogen, phosphorus, and potassium) while reducing the potential for these nutrients to runoff into surface water and/or groundwater. Some fields have excessive soil phosphorus levels. In these cases, the WWTF may need to adjust ins application rate accordingly in order for the property owner to comply with their NMP.

The [Nutrient Application Guidelines for Field, Vegetable, and Fruit Crops in Wisconsin](#) (A2809) from the UW Extension can be used to determine the agronomic needs of a crop.

5.7 Land Application

This section details the actual practices used during land application activities and includes the following:

1. Detailed procedures for regularly obtaining and updating a list of department-approved land application sites/fields (“Approved Sites Report”).

2. Example field loadings that show nitrogen calculations for each outfall.
3. Example field loadings that show metal calculations for each outfall.
4. Detailed procedures for collecting soil composite samples, submitting the composites to a soil testing laboratory, and providing the final reports to the department.

Note: Soil test reports are required for actively used land application fields every four years per s. NR 204.06(6)(c), Wis. Adm. Code.

Sludge may not be land applied if the concentration of pollutants in the sludge exceed any of the ceiling concentration limits listed in Table 1 (s. NR 204.07(5), Wis. Adm. Code).

If sludge is applied to land and the sludge does not meet pollutant limits list in Table 3, then the cumulative metal loadings must be tracked and lifetime cumulative metal loading limits in Table 2 shall apply to all fields that received that sludge.

5. Estimates that show approximate acreage needed to land apply waste from all outfalls. Approximate acreage can be estimated by averaging the past five years of sludge characteristic data.
6. Spreading method descriptions for each outfall (examples include, but are not limited to: splash plate, manure spreader, incorporation, injector, etc.). *Note: All spreading methods must be including in the SMP in order to provide a complete description of the facility's sludge management program per s. NR 204.11, Wis. Adm. Code. The permittee should routinely verify with its field staff or contractors which spreading method(s) are being utilized. The SMP may need to be updated to include additional/new spreading methods.*
7. Procedures for meeting pathogen control and vector attraction reduction requirements per s, NR 204.07 (6) and (7), Wis. Adm. Code.
8. Identification of potential restrictions on cropping practices based on type of waste and/or spreading method.
9. Explanation of how setbacks and restricted areas are identified on each site/field (examples include: flagging, cones, rangefinder, GPS unit, etc.)
10. Templates or copies of the daily land application log. Generally, a land application log contains the following information:
 - a) Permittee name,
 - b) Date,
 - c) Sample point number (outfall),
 - d) DNR site number,
 - e) Site/field name,
 - f) Property owner,
 - g) Time of each application event,
 - h) Gallons/Tons/Cubic yards of each application event,

- i) Total daily volume land applied,
 - j) Application rate (gallons/acre, tons/acre, cubic yard/acre),
 - k) Application method (incorporation, injection, surface),
 - l) Total acres land applied,
 - m) Crop year and intended cover crop,
 - n) Applicator name, and
 - o) Other relevant information.
11. Examples of daily land application maps. These maps identify the locations where sewage sludge is land applied on each approved site/field per day.
 12. Detailed description explaining how sludge is uniformly spread across each site/field. Describe how the start and stop location is identified for each field (examples include but are not limited to: injection “tracks” for drag line system; cones or flags when using a splash plate).
 13. Detailed description for how hydraulic application rates are calculated for each type of spreading equipment. For tractors using an on-board flow meters, the SMP should detail the frequency of meter calibration.

The department recommends annual calibration of all flow meters.
 14. Description for how additional nitrogen sources are tracked for each site/field to ensure nitrogen loading rate limits are not exceeded. The department recommends that the permittee develop an SOP for communicating with each site owner and renter/farmer (if applicable).
 15. Description of procedures to minimize odors.
 16. Describe temporary and/or permanent staging areas for bulk sludge so as to minimize soil compaction, preventing surface runoff and to control objectionable odors pursuant to s. NR 204.07(3)(h), Wis. Adm. Code. Explain how these areas are selected and managed.

5.8 Lagoon Desludge Projects

For lagoon desludging projects, additional information is provided in the sludge management plan, including the following:

1. A list of all lagoon(s) that are included in the desludge project.
2. Detailed explanation describing how the WWTF will continue to function during the lagoon drawdown. The description should include how surface water and groundwater discharge limits will be met (if discharging).

3. Detailed description for whether liquids, solids, or both are land applied. Estimate total volume of each and provide calculations for estimated water depth and sludge thickness for each lagoon.
4. Estimates detailing the expected nitrogen and metal loading rates. These rates should be based on analysis of representative sludge samples (see the “Sludge Characterization” section above). Using this rate, show calculations detailing the total number of acres needed to meet the agronomic needs of the intended crop(s).
5. Estimates explaining the hydraulic loading rate proposed for land applying (total gallons, tons or cubic yards per day, and total volume per week). Estimate the total number of acres needed to land apply the contents of the lagoon(s) by using the hydraulic application rate).
6. Detail how fecal composite samples are collected from each lagoon. The permittee should verify that sample results meet WPDES permit and ch. NR 204, Wis. Adm. Code requirements.
7. A list of all approved sites/fields upon which sewage sludge will be land applied. New land application sites need to be submitted to the department for review (see the “Land Application Site Submittal Procedures for Requesting New Sites” section above).
8. A detailed explanation describing how the sludge will be removed and hauled to land application sites (equipment types and hauling vehicle capacity) is included. A description of precautions to prevent liner damage and spillage is provided.
9. A description of contingency plans developed for periods of adverse or inclement weather.
10. Notification details describing how the department will be notified prior to land application, including the amount of time for which the advanced notice will be given (in hours).

The sludge depth of a lagoon is typically taken using a sludge depth indicator, such as a “Sludge Judge,” a Gag-Simtech Tru-Core sludge sampler, or similar sampling device.

5.9 Additional Disposal Options

As part of the SMP, information relating to other disposal options is provided:

1. A list all the potential disposal options is included. Disposal locations may include, but are not limited to:
 - a) Incineration,
 - b) Landfill,
 - c) Hauling to another WWTF,
 - d) Hauling to an out of state facility, and/or
 - e) Hauling to an authorized WPDES permitted entity.

All additional storage options need to be itemized on the Other Methods of Disposal Report (form 3400-052).

2. A template or photocopy of the daily discharge log for using other disposal methods, including the location of the other disposal location(s). The disposal log may include, but is not limited to, the following information:
 - a) Permittee name,
 - b) Outfall number,
 - c) Date/Time waste is removed from storage structure,
 - d) Truck identification number,
 - e) Driver name,
 - f) Disposal location (WWTF, WPDES permitted contract hauler, etc.),
 - g) WPDES permit number,
 - h) Date/Time of disposal,
 - i) Approximate volume (gallons, tons, cubic yards), and
 - j) Other relevant information.

5.10 Record Keeping and Reporting

The record keeping and reporting section of the SMP includes the following information:

1. Identification of the person responsible for maintaining the daily log records and identifying the location where the records are kept.
2. Include a list of all required annual reports, the general due date for each report, and the name of the person who is responsible for submitting those reports to the department.
 - a) Wastewater Characteristic Reports (form 3400-049),
 - b) Other Methods of Disposal and Distribution Reports (form 3400-052), and
 - c) Annual Land Application Report (form 3400-055).

Laboratory reports may be required along with the submittal of the Wastewater Characteristic Reports (form 3400-049). Refer to the facility's WPDES permit requirements.
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6.0 Sludge Management Plan Review

Once received, a review of the SMP should be conducted by the department's facility regulator. Appendix A includes a checklist that can be used to review the draft SMP. Once the review has been completed, the facility regulator will send an approval or denial letter to the WWTF's authorized representative (see Appendix B). If the SMP is not complete, the sludge management plan should be denied and returned. Assistance may be necessary to help the applicant complete a satisfactory SMP.

7.0 SWAMP Documentation

For consistency efforts and to better query activities within the wastewater program, wastewater staff are required to update SWAMP after the SMP review is complete.

Event Tracker. Add the submittal and review date for the management plan into SWAMP’s Event Tracker tab under “Contact Events.”

Note in SWAMP’s Event Tracker the date of SMP receipt and review.

Permit Documents. Add the management plan summary letter into SWAMP’s Permit Documents tab. Title the document “Sludge Management Plan Approval Letter.” Add the final SMP into SWAMP’s Permit Documents tab. Title the document “SMP approved [*Enter Approval Date*].”

8.0 Sludge Management Plan Updates

Following approval by the department, the permittee must operate in compliance with the sludge management plan per s. NR 204.11, Wis. Adm. Code. If the permittee wishes to operate differently than specified in the approved plan, a written request should be submitted to the department for approval to amend the management plan. Deviating from the management plan without department approval may result in violations of the facility’s WPDES permit and/or code requirements. Further, the department may implement stepped enforcement on a case-by-case basis.

Appendices

9.1 Appendix A. Checklist for Reviewing Sewage Sludge Management Plans.

SLUDGE MANAGEMENT PLAN CHECKLIST			
Sewage Sludge (Biosolids)			
DNR REVIEWER:			
NAME OF FACILITY:		DATE SUBMITTED:	
FID:		PERMIT NUMBER:	
SUBMITTER:		WASTE(S) TYPES:	
<i>NOTE: FOR ADDITIONAL DETAILS REFER TO PROCEDURAL INSTRUCTIONS</i>			
1. SLUDGE MANAGEMENT PLAN REQUIREMENTS			
	Sufficient	Not Sufficient	Not Applicable
1. Cover page	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Sewage sludge information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Sewage sludge storage structures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Sludge characterization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Sludge transport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Land application submittal procedures for requesting new sites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Land application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Lagoon desludge projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Disposal options	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Record keeping and reporting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:			
2. COVER PAGE			
	Sufficient	Not Sufficient	Not Applicable
1. Permittee name	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. WPDES permit number	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Mailing address of facility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Authorized representative	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Contact information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Management plan developer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Version number/date of plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:			

3. SEWAGE SLUDGE INFORMATION			
	Sufficient	Not Sufficient	Not Applicable
1. Specify the types of biosolids treatment process(es) prior to land application.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Identify potential pollutants of concern in the sewage sludge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:			
4. SEWAGE SLUDGE STORAGE STRUCTURES (STORAGE OUTFALLS)			
	Sufficient	Not Sufficient	Not Applicable
1. List all DNR approved storage structures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Identification of each storage structure on aerial photograph	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Flow diagram	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Inspection and maintenance procedure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Note: Each time a storage structure is approved by the department, the above information should be provided as an amendment to the sludge management plan.</i>			
Comments:			
5. SLUDGE CHARACTERIZATION			
	Sufficient	Not Sufficient	Not Applicable
1. Detail where and how representative samples are collected from each outfall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. List all wastes parameters & monitoring frequencies associated with each outfall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Identify current state laboratory used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Sampling log	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Recent characteristic data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:			

6. SEWAGE SLUDGE TRANSPORT			
	Sufficient	Not Sufficient	Not Applicable
1. Describe method of pumping liquid waste from storage unit to hauling vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Detail type and capacity of hauling vehicle(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Identify contractor(s) for removing liquids / solids	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Detail how total volume hauled is measured and what kind of records will be kept	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Explain how each vehicle is unloaded at disposal location	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Contingency plan in case of inclement weather	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Outline spill response plan for transportation and land application spills. Plan should include DNR 24-hour spill hotline (1-800-943-0003)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:			
7. LAND APPLICATION - SITE REQUESTS (NEW SITES)			
	Sufficient	Not Sufficient	Not Applicable
1. Show each land application field on map	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Proof of ownership	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Map showing suitable conditions for land application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Crops / dominant vegetation & harvest schedule	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Describe adjacent land use, drainage, and land features	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Copy of land owner permission form	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Copy of soil test report	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Determination if other sources of nitrogen will be applied to each field	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Note: Fields may have an approved NMP. The facility may need to adjust land application rates accordingly to meet NMP requirements.</i>			
Comments:			

8. LAND APPLICATION - GENERAL			
	Sufficient	Not Sufficient	Not Applicable
1. Details of obtaining approved sites report	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Example of nitrogen calculations for each outfall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Example metal calculations for each outfall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Details for completing regular soil testing and obtaining results	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Estimate approximate acreage needed to land apply waste from all outfalls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Description of how waste is land applied from each outfall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Description for how pathogen control and vector attraction reduction requirements are met	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Outline how setbacks and restricted soils are identified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Complete daily land application log	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Example daily land application map	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Detail how waste is uniformly spread	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Hydraulic application rate calculation for each type of spreading equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Outline of additional nitrogen sources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Outline procedures to minimize odors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Description of temporary / permanent staging areas and how they are managed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:			

9. LAGOON DESLUDGE PROJECTS			
	Sufficient	Not Sufficient	Not Applicable
1. Identify lagoon(s) included in project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Detail how facility will continue to function during lagoon drawdown	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Detail whether solids, liquids, or both are land applied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Estimate expected nitrogen loading rates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Estimate hydraulic loading rate used during application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. List of all approved sites on which waste will be spread	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Detail how biosolids will be removed and hauled to spreading site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Inclement weather plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Describe how DNR will be notified prior to land application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:			
11. ADDITIONAL DISPOSAL OPTIONS			
	Sufficient	Not Sufficient	Not Applicable
1. List all potential disposal options (incineration, landfill, WWTF, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Provide blank copy of daily discharge log to the disposal location(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:			

9.2 Appendix B. Template Approval Letter for Sludge Management Plans.

[Enter Date]

[Enter WPDES Permittee Contact]

[Enter Facility Name]

[Enter Facility Address]

RE: Approval of sludge management plan for
[Enter WPDES Permit Name] (WPDES permit # [Enter WPDES Permit #])

Dear [Enter Name],

Thank you for submitting a draft copy of [Enter WPDES Permittee Name's] sludge management plan. The Department of Natural Resources (department) has reviewed and approved this draft document.

Effective immediately, the [Enter WPDES Permittee Name] must operate in conformance with this sludge management plan.

If [Enter WPDES Permittee Name] wishes to operate differently than specified in the approved sludge management plan, a written request should be submitted to the department for approval to amend the management plan. Deviating from the sludge management plan without department approval may result in violations of [Enter WPDES Permittee Name's] WPDES permit and/or ch. NR 204, Wis. Adm. Code requirements.

If you have any questions regarding this approval letter, please call me at [Enter Phone Number] or email me at [Enter Email Address].

Sincerely,

[Enter Signature Block]

cc. permit file
[enter Wastewater Supervisor name]
[enter other WDNR staff as appropriate]

10.0 Acknowledgements

This guidance document was developed by the WDNR Wastewater Program Landspreading Work Group. This group is composed of the following member: Michelle Balk, Alison Canniff, Richard Douglas, Ian Hansen, Kate Hanson, Fred Hegeman, Alexis Heim Peter, Leanne Hinke, Leila Jenkins, Danielle Luke, Trevor Moen, Steve Warrner, and Nate Willis. The Wastewater Program Landspreading Work Group would also like to thank the following staff for assistance drafting this guidance document: Mark Corbett, Ken Denow, Dan Heim, Lacey Hillman, Emily James, Kelley O'Connor, and Heidi Schmitt-Marquez. For any questions regarding this guidance document, please contact the group's co-coordinators: Fred Hegeman and Steve Warrner.