# 06-096

# Department of Environmental Protection

# Maine Solid Waste Management Rules

# CHAPTER 419

# AGRONOMIC UTILIZATION OF RESIDUALS

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# Chapter 419: AGRONOMIC UTILIZATION OF RESIDUALS

SUMMARY: This Chapter establishes the rules of the Department for the agronomic utilization of residuals and the storage of residuals prior to utilization.

## 1. Applicability

### A. Facilities and ~~a~~Activities ~~s~~Subject to the ~~r~~Requirements of this Chapter

This Chapter applies to agronomic utilization activities and the storage of residuals prior to utilization. Agronomic utilization is the land application of residuals in a controlled manner in order to: increase the nutrient content of the soil at a rate commensurate with the nutritional needs of the crop to be grown and the assimilative capacity of the soil; otherwise improve agricultural soil conditions; or provide some other horticultural benefit. Agronomic utilization includes, but is not limited to:

(1) Land application of sewage sludge, biosolids, fish by-products, food waste, secondary papermill sludge or other residuals to supply nitrogen (N), phosphorus (P), potassium (K), or other nutrients to a crop;

(2) Land application of ash, lime-mud, cement kiln dust, or other residuals as an agricultural liming agent;

(3) Land application of primary papermill sludge, flume grit, wood wastes or other high carbon residuals to control erosion, as a topsoil replacement, as mulch, or to beneficially increase soil organic matter content;

(4) Utilization of composted residuals, decontaminated soil, or other processed residuals as a fertilizer, soil amendment, topsoil replacement or mulch.

**B. Facilities and ~~a~~Activities not ~~s~~Subject to the ~~r~~Requirements of this Chapter.** In addition to the facilities listed in Chapter 400, section 2.I, the following activities and materials are exempt from the siting, design, licensing and operating requirements of this Chapter:

Note: Manure and other agricultural wastes used as fertilizers are not residuals, and therefore are exempt from regulation under these rules. Utilization of agricultural waste is regulated by the Department of Agriculture under Chapter 565, Nutrient Management Rules (effective December 15, 1998).

(1) Utilization of chipped, shredded or composted wood and vegetative wastes as mulch when applied less than one foot thick.

(2) Utilization of chipped, shredded or composted wood and vegetative wastes for erosion control and filter berms.

(3) Wood ash from the burning of wood wastes is not subject to the requirements of this Chapter and is not considered a solid waste if the generator submits written documentation to the department stating that the wood ash is being used as an effective substitute for a commercially available agricultural product and identifying the use of the wood ash and the commercial product it is replacing. For the purposes of this Chapter, effective substitute includes utilization at an appropriate agronomic rate similar to the material it is replacing.

Note: "Wood wastes" is defined at 06-096 CMR 400(1)(LLll) as follows: "wood wastes" means brush, stumps, lumber, bark, wood chips, shavings, slabs, edgings, slash, sawdust and wood from production rejects, that are not mixed with other solid or liquid waste. For the purposes of this definition, "lumber" is entirely made of wood and is free from metal, plastics and coatings.

Any ash resulting from the burning of wood wastes is considered wood ash. No distinction is made between fly ash and bottom ash.

(4) The utilization as a topsoil of any of the following:

(a) 50 $yds^3$/yr or less of dredge materials in the area adjacent to and draining into the dredged water body;

(b) dredge materials from class AA, A and SA water bodies;

(c) dredge materials from agricultural or residential ponds, ditches and drainage ways when utilization occurs on the same property;

(d) dredge materials containing less than 15% fines (material passing the #200 sieve) from representative sampling of a minimum of four samples, or one sample per acre, whichever is more frequent; or

(e) dredge materials free from oil, grease, litter and other contaminants that is generated from normal maintenance of storm water and erosion control structures regulated under 38 MRSA. section 420-C and section 420-D.

Note: Dredging activities must still be licensed under 38 MRSA 480-A, et seq., the Natural Resources Protection Act.

(5) The agronomic utilization of any of the following residuals. The volume limit applies to the amount one generator may distribute for utilization in a calendar year. The volume limit also applies to the amount that may be received for utilization at any one site in a calendar year.

(a) 200 $yds^3$/yr or less of ~~type~~Type IA residuals, such as processed woodwaste, or leaves;

(b) 100 $yds^3$/yr or less of ~~type~~Type IB residuals, such as certain food processing wastes; or

(c) 50 $yds^3$/yr or less of ~~type~~Type IC residual, such as fish by-products, provided the ~~type~~Type IC residual is applied at a generally accepted agronomic rate between April 15 and July 1 and the waste is incorporated within 24 hours.

Note: See Chapter 400, section 1 for a complete definition of ~~type~~Type IA, IB, IC, II and III residuals.

(6) The storage on 1 acre or less for up to 24 months prior to agronomic utilization of any one of the following:

(a) wood wastes provided individual storage piles do not exceed 10,000 square feet, and there are 30 foot mineral strips between piles of chipped or shredded woodwastes;

(b) sewage sludge at a Publicly Owned Treatment Works; or

(c) composted residuals that meet the standards in section 8 of this Chapter.

(7) The storage on a licensed utilization site of residuals with a solids content of greater than 12% for 12 hours or less to facilitate spreading.

**C. Processing of Solid Waste**

(1) A site where a generator mixes or blends a residual prior to utilization, but does not otherwise process the residual, is not subject to Chapter 409, but is subject to this Chapter.

(2) Facilities that compost, aerobically or anaerobically digest, dry, heat treat, lime stabilize or otherwise alter the stability, physical properties, pathogen content, or chemical content of residuals to meet the standards of this rule must meet the applicable standards of Chapter 409 or Chapter 410. Utilization of the residual produced by the processing facility is subject to this Chapter.

**D. Beneficial Use of Solid Waste.** Agronomic utilization is a type of beneficial use. Generators proposing to beneficially use solid waste or waste derived products in a manner that does not constitute agronomic utilization must meet the applicable standards of Chapter 418. Agronomic utilization of a solid waste and another beneficial use of the same solid waste may be approved in one license. Except for agronomic utilization activities covered under this Chapter, beneficial use activities approved under the provisions of Chapter 567 are subject to the transition provisions of Chapter 418.

**2. Licenses for Residual Utilization and Storage**

**A. License ~~r~~Required for ~~r~~Residual ~~u~~Utilization and ~~s~~Storage**

(1) Utilization ~~l~~Licenses. The Department must conclude that the licensing standards in Chapter 400 and sections 2 through 7 of this Chapter are met prior to a generator distributing a residual for utilization, unless the activity is exempt under section 1.B. This conclusion may be made in a program license, or a combination of program license and site specific utilization license. A program license must be obtained before any site specific utilization licenses are obtained. The generators of the residual must obtain the utilization license. An application must be submitted under Chapter 400 and section 7 of this Chapter, or under the permit-by-rule provisions of sections 8 and 9. For purposes of this rule, processors of solid waste are the generators of the resultant residual.

(2) Residual ~~s~~Storage ~~l~~Licenses. Prior to establishing a new residual storage site, or altering an existing residual storage site, the Department must conclude that the licensing standards in Chapter 400 and section 10 through 12 of this Chapter are met, unless the activity is exempt under section 1.B. This conclusion may be made in a program license, a storage site license, or a combination of the two. Field stacking sites associated with a licensed utilization site may only be licensed to the residual generator. Other residual storage sites may be licensed to any person. The Department may approve of utilization and storage at the same location in one license, provided all of the applicable licensing criteria are met.

Note: Storage of a residual at composting or other processing facilities is subject to the standards in Chapter 409 or Chapter 410. Storage of residuals for purposes other than agronomic utilization is subject to Chapter 402 or in some beneficial use cases, Chapter 418.

(3) Inapplicability of ~~d~~Disposal ~~f~~Facility ~~s~~Standards. Residual storage sites and utilization activities, including program licenses issued under Chapter 567, constitute solid waste facilities, but do not constitute solid waste disposal facilities, as defined in Chapter 400. Therefore, agronomic utilization activities and residual storage sites are not subject to the provisions specific to solid waste disposal facilities in Chapter 400 or the Maine Solid Waste Laws.

**B. Program ~~l~~License.** A program license assesses the potential benefits and risks posed by the utilization activity and determines what management practices are necessary to mitigate those risks, including what type of site specific license, if any, is required at a residual storage site or the site of utilization.

**C. Site ~~l~~License.** The generator must obtain a site license for residual utilization or storage if the Department determines in the program license that a site license is necessary in order for the Department to find that all the applicable licensing standards of Chapter 400 and this Chapter will be met.

**D. Joint Utilization.** Prior to more than one generator licensing the same site, the DEP must approve a joint utilization agreement that specifies the responsibilities of each generator to assure compliance with these rules, their program license, and their site licenses. The agreement must specify one party who the Department may direct to correct a deficiency at the site.

**E. License ~~t~~Transfers**

(1) Site ~~l~~License ~~t~~Transfer. A generator may make application pursuant to Chapter 2, section 17 to transfer a utilization site license from another generator when both generators agree to the transfer, the receiving generator is in compliance with its program license, and the receiving generator has established title, right or interest in the site that is being transferred. When both parties generate the same kind of residual, such as sewage sludge treated to the same pathogen reduction standard, the transfer may be processed under the permit-by-rule procedures in section 9. Otherwise the license must be transferred pursuant to Chapter 2, section 17 and Chapter 400, section 3.B(3)

(2) Program ~~t~~Transfer. When a facility that generates the residual is transferred to a new owner, the new owner must obtain Department approval to transfer the utilization program and associated site and storage licenses pursuant to Chapter 2, section ~~17~~ 21 and Chapter 400, section 3.B(3).

**F. Municipal and Public Notice of Utilization Applications.** The public notice provisions of this subsection replace the public notice requirements of ~~chapter~~Chapter 2, section ~~9~~14, except as specified below.

(1) Program Licenses. Within 30 days prior to filing an application for a utilization or storage program license, including an application filed in accordance with section 8, an applicant shall give public Notice of Intent to File a new or amendment application, a resubmitted application that has been returned as incomplete pursuant to Chapter 2, section ~~7~~11.B, or a

license transfer. The notice must be published once in newspapers circulated in the area where the residual will be utilized and/or stored. In the case of state wide utilization and/or storage, the notice must be published once in a newspaper where the residual is generated and once in the Augusta daily paper on a Wednesday. The notice must include the information required by Chapter 2, section ~~9~~14.A, except that the notice for section 8 applications shall include the information required by Chapter 400, section 3.B(1)(c)(iii). The location where the application is locally filled is the municipal offices where the residual is generated. The applicant does not need to notify abutters.

(2) Site Licenses. Except as specified in 2.F(3) below and section 9 of this Chapter, an applicant for a utilization or storage site license, or site license transfer, shall give public notice in accordance with Chapter 2, section ~~9~~14. This provision also applies to applications filed in accordance with section ~~9~~10.

(3) One Time Use and Pilot Projects Lasting Less Than One Year. Within 30 days prior to filing an application for one time utilization or storage lasting less than one year, or a pilot project lasting less than one year, the applicant must give public Notice of Intent to File a new or amendment application, or a resubmitted application that has been returned as incomplete pursuant to Chapter 2, section ~~7~~11.B. A copy of the application and the notice must be provided to the municipality(ies) in which the site is located. The notice must also be published once in a newspaper circulated in the areas where the project is located, unless the application is for a pilot project located at a site previously licensed under this Chapter. The notice must include the information required by Chapter 2, section ~~9~~14.A. The applicant does not have to notify abutters.

Note: Pilot projects are to determine the feasibility of a common utilization practice. Innovative utilization activities of an experimental nature must be licensed under the provisions of 38 MRSA Section 362-A.

(4) Subsequent ~~i~~Information. After any utilization application has been filed, if the Department determines that the applicant submits significant new or additional information or substantially modifies its application at any time after acceptance of the application as complete, the applicant shall provide additional notice to interested persons who have commented on that application. The Department may require additional public notice in accordance with this subsection, if the modifications are significant.

**G. Public Notice Prior to Use of Certain Sites**

(1) At least 30 days prior to the first use of an approved individual utilization or storage site that is not the subject of a site-specific license, but is subject to a program license condition requiring prior notification to the Department of specific locations where a residual will be utilized or stored, the licensee shall provide notice of such use to the municipality in which the site is located. The notice must be mailed by certified mail or Certificate of Mailing to the municipal office. The notice must include the information required by section 2.G(3), below.

(2) At least 30 days prior to first use of an approved individual utilization or storage site that uses or stores sludge generated at industrial facilities employing kraft wood pulping processes, the licensee shall provide notice of such use to abutters and the municipality in which the site is located. The notice must be mailed by certified mail or Certificate of Mailing to the abutters and the municipal office. The notice must include the information required by section 2.G(3) below.

Note: These notification provisions are required by 38 MRSA section 1304(13) and (13-A).

(3) The public notice must include the following information:

(a) Name, address and telephone number of the program license holder;

(b) Citation of the statutes, rules, or license under which the site is being considered for utilization or storage;

(c) Location of the activity;

(d) Summary of the activity;

(e) Anticipated date for filing the notification with the Department; and

(f) A statement that public comments on the proposed project may be provided to the Department within 10 days of the filing of the notification, together with the mailing address of the Department.

**H. Surrender of Site Licenses.** Pursuant to 38 MRSA 1310-N(6-D), agronomic utilization site licenses may be voluntarily surrendered by the license holder, upon Department approval. Surrender will be approved when the Department determines that all residuals transported to the site have been utilized or removed from the site in compliance with Department rules and licenses. Petitions for surrender of site licenses may also be processed in accordance with Chapter 2, section 2~~0~~3, "Petition for Surrender of License".

**I. Transition and Relationship to Other Solid Waste Rules**

(1) Wood ash utilization program licenses held by wood ash generators that are now exempt from these rules in accordance with section 1(B)(3) of this Chapter will lapse provided that the licensee surrenders its utilization program license.

(2) These rules replace Chapter 567, which is repealed as of the effective date of these rules.

(3) Generators utilizing residuals under Chapter 567 with a site license, but without a program approval, must submit a complete application for a program license within one year of the effective date of this rule or cease their utilization program. For purposes of this subsection, a complete application means the submission requirements in section 7.A(3). Other submissions of section 7.A are only required if alterations to the utilization program have not been previously approved by the Department.

**3. Siting Standards for Agronomic Utilization**

**A. Siting Standards for ~~r~~Residuals ~~c~~Containing ~~n~~Nitrogen.** The provisions of this subsection apply to utilization of residuals that have a C:N of less than 25:1, unless the residual is a compost, or unless the Department determines in a program license that mineralization or other comparable studies demonstrate that excess nitrates will not contaminate groundwater. This section also applies to utilization of other residuals which the Department has determined in a Program license readily leach contaminants which may contaminate groundwater

(1) Setbacks. The boundaries of the spreading area at a utilization site must be located a minimum distance from certain features, as specified in Table 419.1, at the time the Department receives a complete site license application. The Department may require that the generator increase setbacks if necessary to meet the standards in section 4 and Chapter 400, sections 3 and 4.

Table 419.1
Minimum Setbacks for ~~l~~Leachable ~~r~~Residuals

| Type of Feature | Distance in Feet From Site Boundary to Feature |
|---|---|
| Public well | 500 |
| Private well | 300 |
| Property line | 25 |
| Bedrock outcrop | 25 |
| Off-site dwelling or occupied building | 300 |
| Surface water, and drainage features with mineral bottoms* | 35 |
| Down-slope soils derived from outwash or stratified drift parent materials without a minimum six inch soil cap of loamy fine sand or finer | 25 |

*Surface waters are waters of the state that are not groundwater. Drainage features include ditches, swales, ravines and gullies.

(2) Soil ~~c~~Cap. All soils derived from outwash or stratified drift parent materials must have a minimum six inch soil cap of loamy fine sand or finer.

(3) Minimum ~~d~~Depth to ~~b~~Bedrock. For established perennial crops such as hay, the bedrock must be a minimum of 10 inches below the ground surface. For other crops, including row crops, the depth to bedrock at the site must be a minimum of twenty (20) inches below the ground surface. The Department may increase bedrock separations if necessary to meet the standards in section 4 and Chapter 400, sections 3 and 4.

(4) Slope. The slope of the site may not exceed 15% for agricultural settings and 25% for forestry settings.

Note: If the utilization activity is proposed within the direct watershed of Marine waters, the site is also subject to the siting standards contained in section 3.B.

**B. Siting Standards for Certain Residuals**

(1) Applicability. The provisions of this section apply to any one of the following:

(a) Sewage sludge and residuals derived from sewage sludge that contain monthly average metal concentrations in excess of the applicable metal concentrations in ~~t~~Table 419.3, column A.

(b) Ash or other liming agents that contain monthly average metal concentrations in excess of the applicable metal concentrations in ~~t~~Table 419.4, columns A through C.

(c) Other residuals with monthly average metal concentrations in the residual that exceed the metal standards in Table 419.5, column A, unless the Department determines in a program license that the provisions of this section are not necessary in order to meet the licensing standards in section 4 and Chapter 400, sections 3 and 4.

(d) Mixtures of sewage sludge, liming agents and/or other residuals, when the ingredients in the mixture exceed their applicable metal concentrations as outlined above in section 3.B(1)(a) through (c) unless the Department determines in a program license that the provisions of this section are not necessary in order to meet the licensing standards in section 4 and Chapter 400, sections 3 and 4.

(e) Utilization of ~~type~~Type II residuals that have not been treated to a class A pathogen standards.

(f) Utilization of residuals that contain greater than 27 ppt 2,3,7,8 TCDD equivalents.

(g) Utilization in direct marine watersheds of residuals that have a C:N of less than 25:1, unless the residual is a compost, or unless the Department determines in a program license that mineralization or other comparable studies demonstrate that excess nitrates will not contaminate surface water.

(h) Utilization of residuals, in combination with other nutrient sources, supplying more than the crop uptake rate of phosphorus.

(2) Buffers and Setbacks. Boundaries of the utilization site must be located a minimum distance from some surface water, as specified in Table 419.2, unless otherwise approved in a site specific soil erosion control plan. The Department may increase setbacks if necessary to meet the standards in section 4 and Chapter 400, sections 3 and 4.

When the generator chooses to develop a site specific soil erosion control plan, the practices contained in the plan must prevent erosion and sedimentation into water bodies for the fields where the residuals will be utilized, and otherwise prevent surface water contamination. If the generator does develop a soil erosion control plan, the plan must be implemented as approved by the Department. The plan must consider the practices listed in the State of Maine Nonpoint Source Pollution Management Plan published by the Maine Department of Environmental Protection in November of 1989 and updated in 1992. The generator must ensure that erosion control plans are reviewed and, if necessary, modified each year prior to residuals application.

Table 419.2
Minimum Buffers to Protect Surface Water

| Buffer Characteristics* | Distance in Feet From Application area to marine waters, lakes, ponds, rivers, streams, brooks, and intermittent streams with mineral bottoms |
|---|---|
| 0-3% slopes, wooded | 35 |
| 3-8% slopes, wooded | 50 |
| 8-15% slopes, wooded | 100 |
| 15-25% slopes, wooded | 150 |
| 0-3% slopes, non-wooded | 50 |
| 3-8% slopes, non-wooded | 75 |
| 8-15% slopes, non-wooded | 150 |

* The slope and cover type refer to the buffer area, and not the adjacent utilization field. Non-wooded buffer for purposes of this table means vegetated fields, reverting fields or grassed areas, and forested areas in which more than 40 percent of the timber has been harvested in the past ten years.

(3) Setbacks. The utilization site may not be located within 300 feet of the high water mark of:

(a) surface water classified as GPA

(b) lakes, ponds and springs that are public drinking water supplies; and

(c) the shoreline within 1 mile upstream of the intake pipe on a stream or river that is a public drinking water supply.

(4) Slope. The slope of the site may not exceed 15% for agricultural settings and 25% for forestry settings.

(5) Flood ~~p~~Plain. The utilization site may not be located within the 100 year flood plain. This provision does not apply to sites that will receive ~~type~~Type II residuals treated to a class B pathogen treatment standard.

**C. Siting Standards for Utilization of Sludge**

(1) The Department may not issue a license for a site where sludge will be utilized within 75 feet of a river, perennial stream or great pond.

(2) The Department will condition a site license to restrict the land application of sludge to no less than 50 feet from abutting property boundaries, if so requested in writing by the abutting property owner during the processing of the site specific license.

Note: The above licensing requirements are required by 38 MRSA 1310-N, subsection 2-G

**4. General Operating Standards for Agronomic Utilization.** All agronomic utilization activities must be licensed and operated to meet the following standards.

**A. Residual ~~s~~Suitability.** The residual must be physically and chemically suitable for the intended utilization activity, must be non-hazardous, and must be of a known and consistent quality. Ash must be conditioned with water prior to utilization to prevent fires.

**B. Agronomic Benefit.** The residual must increase the nutrient content of the soil at a rate commensurate with the nutritional needs of the crop to be grown; otherwise improve agricultural soil conditions; or provide another horticultural benefit in which the residual meets or exceeds the generally accepted product specifications and standards for the product it is replacing. Each residual in a residual mixture must add to the agronomic benefit of the whole mixture.

**C. Sampling Plan.**

(1) The residual generator must develop and implement a waste characterization sampling and analytical work plan and, if required, a site monitoring plan in accordance with Chapter 405. The frequency of sampling must be adequate to represent the residual, soil or other media. The Department will require a site monitoring plan when it determines in a program or site license that a utilization program poses a potential threat to public health or safety or the environment because of the nature of the residuals utilized and/or the location, design and operation of a utilization site.

Note: Chapter 405 requires the applicant to sample a residual for compounds that may be in the residual. The frequency of sampling must be adequate to represent the residual. Analytical requirements depend upon the processes that generate the residual, inputs to that process and the intended use of the residual.

(2) Transition.~~:~~ Generators with utilization programs licensed pursuant to Chapter 567 must submit a waste characterization sampling and analytical work plan for review and approval by the Department by July 19, 2000.

(3) Hazardous and Special Waste Handling and Exclusion Plan ~~e~~Exemption. Utilization activities meeting the standards of this Chapter meet the intent of, and are therefore exempt from, the requirement in Chapter 400, section 9 to develop and implement a Hazardous and Special Waste Handling and Exclusion plan.

**D. Financial and Technical Ability.** The following general licensing standards from Chapter 400, section 4 must be met:

(1) Chapter 400, section 4.B - Financial Ability

(2) Chapter 400, section 4.C - Technical Ability

**E. Protection of Waters of the State**

(1) Utilization may not pollute any water of the State and residuals may not be placed where they will be washed into waters of the state.

(2) Unless otherwise approved in a license, residuals may not be applied when the soil is frozen, snow-covered or water-saturated.

(3) Residuals must be evenly applied at or less than the maximum allowable application rates. Application rates, including additions from other nutrient sources, may not exceed the following:

(a) agronomic rates for nitrogen;

(b) 3 tons calcium carbonate equivalents per acre per year; and

(c) plant uptake rates for phosphorus when the residual is applied in the direct watershed of Waterbodies Most at Risk from New Development.

(4) Sufficient vegetative ground cover for proper nutrient uptake and erosion control must be maintained at the site. Solids buildup must not impair underlying vegetative growth, unless the residual is being utilized as a mulch or topsoil replacement.

(5) Crops must be harvested and removed from the field prior to continued utilization, unless the next year's nutrient budget is adjusted to account for the nutrients returned by the crop.

(6) All buffer zones required by these rules between the area of utilization and a surface water, and all buffer zones required by these rules between the area of utilization and a drainage feature with a mineral bottom, must be vegetated during application and during the following growing season. The buffer zone must be inspected just prior to each spreading. All areas that show evidence of erosion or channeled flow must be repaired, re-contoured, seeded, mulched and otherwise modified to create sheet flow. Nutrients of concern may not be applied to buffer zones, except as necessary to support adequate plant growth to function as a buffer.

(7) Residuals may not be applied to hydric soils unless exempt or licensed pursuant to 38 MRSA section 480-A *et seq*. For purposes of this Chapter, hydric soil means a soil that is saturated long enough during the growing season to favor the growth of hydrophilic plants.

**F. Alternative Standards for Traffic Movement at Utilization ~~s~~Sites.** The standard for traffic in Chapter 400, section 4.D(1) must be met at all utilization sites . Unless demonstrated to the contrary, this standard is presumed to be met at utilization sites when either:

(1) the residual will be used as a topsoil replacement;

(2) the site is utilized one time or less every five years; or

(3) the utilization activity results in 16 or fewer additional vehicle trips per day.

**G. Alternative Standards for Fitting Harmoniously into the Natural Environment.** The standard for fitting harmoniously into the natural environment in Chapter 400, section 4.E(1) must be met at all utilization sites. Unless demonstrated to the contrary, this standard is presumed to be met at utilization sites when either:

(1) the residual replaces a virgin material, such as topsoil or fertilizer, in a construction project;

(2) the purpose of the utilization project is to reclaim a mined area, close a landfill, or remediate a state designated uncontrolled hazardous substance site; or

(3) the buffer requirements of Chapter 400, section 4.E(1)(b) and the applicable buffer requirements of this Chapter are met at the site of utilization and/or storage.

**H. Alternative Standards for Putrescible Residuals for Protection of Air Quality and from Nuisances.** The standard for no unreasonable adverse effect on air quality in Chapter 400, section 4.G must be met at all utilization sites. Unless demonstrated to the contrary, this standard is presumed to be met at utilization sites when the following standards are met:

(1) Putrescible residuals may not be land applied within 300 feet of occupied buildings other than the site owner's or operator's. The Department may require that the generator increase setbacks if necessary to prevent nuisance odors at adjacent occupied buildings;

(2) The generator must implement a site specific odor control plan to mitigate odor impacts at adjacent occupied buildings; and

(3) Notification. The generator must inform the Department each time residuals will be applied at the site at least 1 business day before spreading.

Note: This notification requirement can be satisfied with a telephone call, voice mail message, e-mail, letter or fax to the Residuals Utilization Program of the Solid Waste Division at any one of the Department's central or regional offices.

**I. Additional Operational Standards for Type II ~~r~~Residuals.** The generator must ensure that the following additional operational standards are met on sites where ~~type~~Type II residuals are utilized:

Note: "Type II ~~r~~Residuals" are residuals that may contain human pathogens, such as sewage sludge, or solids from dewatered septage. Pathogen containing residuals must be treated prior to utilization. Pathogens are microorganisms that cause diseases. The degree to which the residual is treated for pathogens and vector attraction determines its class. When residuals are treated to Class A standards, in which pathogens are reduced to ambient soil concentrations, no additional siting standards apply to utilization of that residual. When residuals are treated to Class B standards, in which pathogens are reduced by about 90%, additional siting and operational standards apply to utilization of that residual.

(1) The ~~type~~Type II residual must be treated to a Class A or Class B vector attraction reduction standard and Class A or Class B pathogen reduction standard prior to utilization and field stacking.

(a) To meet a Class A pathogen reduction standard, the residual must be processed to meet one of the alternatives in Appendix B.2, either prior to meeting, or at the same time that the Class A vector attraction reduction requirements are met. The residual must also meet the following analytical standard at the time the residual is utilized: The density of *Salmonella sp*. bacteria in the residual must be less than three Most Probable Number per four grams of total solids (dry weight basis). In the absence of analytical data on *Salmonella sp*. this standard is presumed to have been met when the density of fecal coliform in the residual is shown to be less than 1000 Most Probable Number per gram of total solids (dry weight basis).

(b) To meet a Class B pathogen reduction standard, the residual must be processed to meet one of the alternatives in Appendix B.3.

(c) To meet a Class A vector reduction standard, one of the standards in Appendix B.4 must be met.

(d) To meet a Class B vector reduction standard, one of the standards in Appendix B.5 must be met.

(2) At sites where residuals treated to ~~c~~Class B pathogen reduction standards are utilized, the generator must ensure that the following additional provisions are met:

(a) Residuals are applied a minimum of fifteen (15) inches above the groundwater surface at the time of application. If residuals are injected or incorporated, a minimum of fifteen (15) inches separation must be maintained between the water table surface and the limit of incorporation or injection. Residuals treated to class B pathogen standards and that are utilized in flood plains, must be applied prior to September 15th.

(b) The buffers and setbacks established in sections 3.B(2) and (3) must be met. Additionally, unless otherwise provided for in a site specific soil erosion control plan, the residual may not be spread within 25 feet of site waterways including gullies, ravines and swales.

(c) Food crops grown on the utilization site with harvested parts that touch a Class B with respect to pathogens residual/soil mixture and are totally above the land surface, are not harvested for at least fourteen (14) months after the last application of the residual that is treated to a Class B pathogen reduction standard.

(d) Food crops grown on the utilization site are not harvested for at least twenty (20) months after the last application of a residual that is treated to a ~~c~~Class B pathogen reduction standard when the crops have harvested parts below the surface of the land and the residual that is treated to a ~~c~~Class B pathogen reduction standard remains on the land surface for four months or longer prior to incorporation into the soil.

(e) Food crops grown on the utilization site are not harvested for at least thirty-eight (38) months after the last application of residual that is treated to a ~~c~~Class B pathogen reduction standard when the crops have harvested parts below the surface of the land and the residual that is treated to a class B pathogen reduction standard remains on the land surface for less than four months prior to incorporation into the soil.

(f) Food crops, feed crops, and fiber crops grown on the utilization site are not harvested from the land for at least thirty (30) days after the last application of the residual that is treated to a ~~c~~Class B pathogen reduction standard.

(g) Domestic animals are not allowed to graze on the land for at least thirty (30) days after the last application of the residual that is treated to a ~~c~~Class B pathogen reduction standard.

(h) Turf grown is not harvested for at least one year after the last application of a residual that is treated to a ~~c~~Class B pathogen reduction standard.

(i) Topsoil is not mined from a site for at least thirty-eight (38) months after the last application of a residual that is treated to a ~~c~~Class B pathogen reduction standard.

(j) Public access to land with a high potential for public contact is restricted at the time of application and for one year after the last application of the residual that is treated to a ~~c~~Class B pathogen reduction standard. At a minimum, signs must be placed at common entranceways, unfenced open areas, and other appropriate locations to provide notice of restricted access.

(k) Public access to land with a low potential for public exposure is restricted at the time of application and for 30 days after the last application of the residual that is treated to a ~~c~~Class B pathogen reduction standard. If necessary, the Department may require that signs be placed at appropriate locations to provide notice of restricted access, especially at common entranceways or unfenced open areas.

**J. Additional Operational Standards for ~~r~~Residuals ~~c~~Containing ~~h~~Heavy ~~m~~Metals**

(1) The residual generator must ensure that the following additional operational standards of this subsection are met on sites where residuals that have one or more of the following characteristics are utilized:

(a) Sewage sludge and residuals derived from sewage sludge that contain monthly average metal concentrations in excess of the applicable metal concentrations in table 419.3, column A.

(b) Ash or other liming agents that contain monthly average metal concentrations in excess of the applicable metal concentrations in table 419.4, columns A through C.

(c) Other residuals with monthly average metal concentrations in the residual that exceed the metal standards in Table 419.5, column A, unless the Department determines in a program license that the provisions of this section are not necessary in order to meet the licensing standards in section 4 and Chapter 400, sections 3 and 4.

(d) Mixtures of sewage sludge, liming agents and/or other residuals, when the ingredients in the mixture exceed their applicable metal concentrations as outlined above in section 4.J(1)(a) through (c) unless the Department determines in a program license that the provisions of this section are not necessary in order to meet the licensing standards in Chapter 400, sections 3 and 4.

(2) Prohibition. Sewage sludge or products derived from sewage sludge that have monthly average heavy metal concentrations in excess of the concentrations in Table 419.3, column B, must not be utilized.

(3) Buffer. The buffers and setbacks established in sections 3.B(2) and (3) must be met. Additionally, unless otherwise provided for in a site specific soil erosion control plan, the residual may not be spread within 25 feet of site waterways including gullies, ravines and swales.

(4) Annual ~~h~~Heavy ~~m~~Metal ~~l~~Loading ~~l~~Limits. The following annual heavy metal loading limits may not be exceeded at the site of utilization, using the calculations in Appendix A.2.

(a) when sewage sludge or a residual derived from sewage sludge is utilized, the annual heavy metal loading limit for any one heavy metal may not exceed the limit in Table 419.3, column C, during any 365 day period.

(b) when ash or other liming agents are utilized, the annual heavy metal loading limit for any one heavy metal may not exceed the limit in Table 419.4, column D, during any 365 day period, unless otherwise approved by the Department in a utilization program license. The Department may waive this requirement only if the standards are not necessary in order for the activity to meet the standards in section 4 and Chapter 400, sections 3 and 4.

(c) for residuals other than sewage sludge or liming agents that are utilized, the Department may establish annual pollutant loading limits in a utilization program license based on the procedures in Appendix .B, section 2, in order to meet the standards in Chapter 400, sections 3 and 4 and this Chapter.

(5) Heavy ~~m~~Metals in ~~s~~Soil. The concentration of parameters in soil at utilization sites may not exceed the following, as determined by background and on-going representative soil sample analysis, unless otherwise approved by the Department in a program license: The Department may only otherwise approve this in a program license if the Department determines that these standards are not necessary in order to meet the standards in section 4 and Chapter 400, section 3 and 4.

(a) for sewage sludge, the concentrations in Table 419.3, column E;

(b) for ash or other liming agents, the concentrations in Table 419.4, column F; and

(c) for residuals other than sewage sludge or ash, the concentrations in Table 419.5, column B.

Table 419.3
Heavy Metal Standards
for sewage sludge utilization
(dry weight)

| Heavy Metal | Screening Conc. in sewage sludge (mg/kg) | Ceiling conc. in sewage sludge (mg/kg) | Annual Pollutant Loading Rate at utilization site (kg/ha) | Cumulative Pollutant Loading Rate at utilization site (kg/ha) | Ceiling conc. in soil at utilization site (mg/kg) |
|---|---|---|---|---|---|
| | Column A | Column B | Column C | Column D | Column E |
| Aluminum | N/A | N/A | | | 100,000 |
| Arsenic | 34 | 41 | 1.7 | 34 | 73 |
| Barium | N/A | N/A | | | 1500 |
| Beryllium | N/A | N/A | | | 7 |
| Cadmium | 10 | 39 | 1.9 | 39 | 39 |
| Chromium | 1000 | 3000 | | | 3000 |
| Cobalt | N/A | N/A | | | 70 |
| Copper | 1000 | 1500 | 75 | 1500 | 1500 |
| Lead | 300 | 300 | 15 | 300 | 300 |
| Mercury | 6 | 10 | 0.3 | 6 | 6 |
| Molybdenum | 75 | 75 | | | 15 |
| Nickel | 200 | 420 | 20 | 420 | 420 |
| Selenium | 100 | 100 | 5 | 100 | 100 |
| Silver | N/A | N/A | | | 34 |
| Vanadium | N/A | N/A | | | 300 |
| Zinc | 2000 | 2800 | 140 | 2800 | 2800 |

Table 419.4
Heavy Metal Standards
for ash and other liming agents
(dry weight)

| Column: | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| | Screening Concentration of pollutants in ash based on the calcium carbonate equivalents of the ash (mg/kg) | | | | | |
| $CaCO_3$ equiv in ash | 25% | 50% | 75% | | | |
| Parameter | | | | Annual Metal Loading Rate (kg/ha) | Cumulative Loading Rate at Utilization site (kg/ha) | Ceiling conc in soil at utilization site (mg/kg) |
| Aluminum | 362,383 | 724,767 | N/A | 9,750 | 195,000 | 100,000 |
| Antimony | 19 | 37 | 56 | 0.5 | 10 | 5 |
| Arsenic | 20 | 40 | 60 | 0.54 | 11 | 73 |
| Barium | 7,434 | 14,867 | 22,301 | 200 | 4,000 | 2,000 |
| Beryllium | 7 | 14 | 21 | 0.19 | 4 | 7 |
| Cadmium | 30 | 59 | 89 | 0.8 | 16 | 8 |
| Chromium | 141 | 282 | 424 | 4 | 76 | 38 |
| Cobalt | 21,836 | 43,672 | 65,508 | 588 | 11,750 | 5,875 |
| Copper | 5,575 | 11,150 | 16,725 | 150 | 3,000 | 1,500 |
| Cyanide | 35 | 71 | 106 | 0.95 | 19 | 10 |
| Lead | 1,394 | 2,788 | 4,181 | 38 | 750 | 375 |
| Mercury | 2 | 5 | 7 | 0.06 | 1 | 1 |
| Molybdenum | 1,812 | 3,624 | 5,436 | 49 | 975 | 488 |
| Nickel | 483 | 966 | 1,450 | 13 | 260 | 130 |
| Selenium | 19 | 37 | 56 | 0.5 | 10 | 5 |
| Silver | 126 | 253 | 379 | 3 | 68 | 34 |
| Thallium | 3 | 5 | 8 | 0.07 | 1 | 1 |
| Vanadium | 2,555 | 5,111 | 7,666 | 69 | 1,375 | 688 |
| Zinc | 10,407 | 20,814 | 31,221 | 280 | 5,600 | 2,800 |

Table 419.5
Screening Concentrations for Other Residuals
and maximum allowable soil concentrations at utilization sites
mg/kg (dry weight)

| | Screening Concentration for other residuals | Ceiling Concentration in soil at Utilization sites |
|---|---|---|
| Inorganic Compound | Column A | Column B |
| Aluminum | 97,500 | 100,000 |
| Antimony | 5 | 5 |
| Arsenic | 5 | 73 |
| Barium | 2,000 | 2,000 |
| Beryllium | 2 | 7 |
| Cadmium | 8 | 8 |
| Chromium | 38 | 38 |
| Cobalt | 5,875 | 5,875 |
| Copper | 1,500 | 1,500 |
| Cyanide | 10 | 10 |
| Lead | 375 | 375 |
| Mercury | 1 | 1 |
| Molybdenum | 488 | 488 |
| Nickel | 130 | 130 |
| Selenium | 5 | 5 |
| Silver | 34 | 34 |
| Thallium | 1 | 1 |
| Vanadium | 688 | 688 |
| Zinc | 2,800 | 2,800 |

**K. Additional Operational Standards for Dioxin Containing Residuals.** The generator must ensure that the following additional operational standards are met when utilizing residuals with greater than 27 ppt total 2,3,7,8 TCDD equivalents (dry weight):

(1) Prohibition. Residuals containing PCDDs and PCDFs greater than 250 ppt total 2,3,7,8 TCDD equivalents (dry weight) may not be land applied or utilized and may not be blended with other materials to reduce the concentration of TCDD equivalents to meet utilization standards.

(2) Depth to ~~w~~Water ~~t~~Table~~:~~. Residuals must be applied a minimum of fifteen (15) inches above the groundwater surface at the time of application. If residuals are injected or incorporated, a minimum of fifteen (15) inches separation must be maintained between the water table surface and the limit of incorporation or injection.

(3) Buffer. The buffers and setbacks established in sections 3.B(2) and (3) must be met. Additionally, unless otherwise provided for in a site specific soil erosion control plan, the residual may not be spread within 25 feet of site waterways including gullies, ravines and swales.

(4) Soil ~~t~~Testing and ~~d~~Deed ~~r~~Restrictions~~:~~. For sites upon which dioxin-containing residuals are land applied, representative soil samples must be collected and analyzed for PCDD / PCDF within three (3) months after the last application of the residual in any year. If the soil

concentration is 27 ppt total 2,3,7,8-TCDD equivalents (dry weight) or greater, then the following restrictions apply:

(a) livestock and domestic fowl whose products are consumed by humans may not be pastured on sites;

(b) crops for human consumption may not be grown at sites; and

(c) the restrictions in section 4.K(4)(a) and (b) above apply to subsequent owners of the land utilization site. The licensee and/or landowner must prepare and record, in the Registry of Deeds, information and deed restrictions to provide notice to prospective purchasers and a pubic record of the location of the utilization site. The information must include that dioxin-containing residuals were land applied to that site; that soil concentrations met or exceeded 27 ppt total 2,3,7,8-TCDD equivalents (dry weight); and that subsequent owners are subject to use restrictions under this section. The generator must submit evidence to the Department that the above information, as well as site location, type of residual, date of utilization, and use restrictions have been recorded at the Registry of Deeds within sixty (60) days after obtaining soil sample analyses results.

**L. Additional Operational Standards for ~~r~~Residuals ~~c~~Containing ~~n~~Nitrogen.** The provisions of this subsection apply to utilization of residuals that have a C:N of less than 25:1, unless the residual is a compost, or unless the Department determines in a program license that mineralization or other comparable studies demonstrate that excess nitrates will not contaminate groundwater. This section also applies to utilization of other residuals that the Department has determined in a Program license readily leach contaminants that may contaminate groundwater.

(1) The setbacks in table 419.1 must be maintained.

(2) At the time of spreading, all soil derived from outwash or stratified drift parent material must have a minimum six inch soil cap of loamy fine sand or finer. Residuals may not be spread within 25 feet up-slope from soil derived from outwash or stratified drift parent material with a cap of six inches or less.

(3) On soil with a depth to bedrock less than 20 inches, and on soils derived from outwash or stratified drift parent material, residuals must be applied during the optimal growing time for the site crop to maximize nitrate uptake. For hay crops grown on these areas, the residual may not be spread after September 15 of any year. When spreading on these soils, available nitrogen must be monitored in the soil in the root zone, and at 18 inches or just above refusal, at the beginning and end of the growing season.

(4) Depth to ~~w~~Water ~~t~~Table~~:~~. Residuals must be applied a minimum of fifteen (15) inches above the groundwater surface at the time of application.

(5) Depth to ~~b~~Bedrock. Residuals must be applied a minimum of 10 inches above the bedrock surface, including the limits of incorporation.

(6) Buffer. If the utilization activity is proposed within the direct watershed of Marine waters, the buffers and setbacks established in sections 3.B(2) and (3) must be met. Additionally, unless otherwise provided for in a site specific soil erosion control plan, the residual may not be spread within 25 feet of site waterways including gullies, ravines and swales.

**M. Additional Operational Standards for Phosphorus ~~c~~Containing ~~r~~Residuals.** The following additional standards apply to utilization of residuals that will be applied, either alone or in combination with other nutrient sources, above the crop uptake rates for phosphorus.

(1) Seasonal ~~c~~Cut-~~o~~Off ~~d~~Dates. Residuals must be spread before September 15th of each year on somewhat poorly drained and poorly drained soils.

(2) Buffer. The buffers and setbacks established in sections 3.B(2) and (3) must be met. Additionally, unless otherwise provided for in a site specific soil erosion control plan, the residual may not be spread within 25 feet of site waterways including gullies, ravines and swales.

(3) Slopes. The residuals may not be spread on areas with slope gradients greater than 10% on row crops (such as corn), 15% on perennial crops (such as hay), and 25% in tree growth.

**N. Additional ~~o~~Operational ~~s~~Standards for ~~s~~Sludge ~~u~~Utilization.**

(1) An abutter to a sludge utilization site may request that sludge not be land applied within 50' of the abutter's property boundary. Requests must be filed with the Department in writing, and must include:

(a) the name and mailing address of the property owner requesting the setback;

(b) the name of the owner of the land upon which the residual is being spread;

(c) the physical location of the property upon which the sludge is being spread;

(d) a description of the sludge being spread; and

(e) if known, the name and mailing address of the facility generating the sludge.

(2) Pursuant to 38 MRSA 1310-N, subsection 2-G, sludge may not be land applied within 50' of an abutter's property boundary, upon notification that the Department has received a written request from the abutter to establish the setback.

**5. Suspension of ~~u~~Utilization ~~s~~Site ~~u~~Use**

**A. Suspension ~~a~~Action ~~l~~Levels~~:~~.** Application of residuals at a utilization site must be suspended when the generator, operator or Department determines that the residual supplies the parameter of concern and one or more of the following standards have been exceeded in the site soil:

(1) Soil pH is greater than 6.5 SU, and base saturation of the soil's cation exchange capacity is less than 2.5% potassium or 10% magnesium, or its equivalent;

Note: "or its equivalent" means that alternative analytical methods may be used to evaluate compliance with this standard. For example, by measuring the concentration of potassium or magnesium in site soil, and using a reasonably conservative assumption of what the CEC is in the site soil, the generator may demonstrate that this standard has been met.

(2) Base saturation of the soil's cation exchange capacity is greater than 15% sodium;

(3) pH of 7.5 SU;

(4) Organic matter content of 12% (dry weight basis);

(5) One or more of the following heavy metal concentrations:

(a) For sewage sludge, the concentrations in table 419.3, column E

(b) For residuals other than sewage sludge, the concentrations in table 419.5, column B;

(6) The concentration in Chapter 418 Appendix A of any parameter other than metals; or

Note: This standard does not mean that all site soils must be sampled for all the parameters in Chapter 418, Appendix A. The site soil will have to be tested for compounds that may be reasonably expected to be found. Analytical requirements depend upon the loading rate of a contaminant to the site's soil. The frequency of sampling must be adequate to represent the soil. Environmental monitoring plans are established under Chapter 419, Section 7.B(15), during the licensing process.

(7) A plant available phosphorus concentration in excess of 100 lbs/acre, as determined by a Morgan-type extract (sodium or ammonium acetate at pH 4.8), or its equivalent.

**B. Resumption.** Following suspension of use under section 5.A above, utilization activities may resume at the site when the generator submits written information to the Department and, based on that and other relevant information, the Department determines that continued utilization will meet the standards in Chapter 400, sections 3 and 4, and the standards in sections 3 and 4 of this Chapter.

**6. Record Keeping and Reporting**

**A. Record ~~k~~Keeping ~~r~~Requirements.** Unless otherwise provided for in the program license, the residual generator must make provisions to keep the following records and make them available for Department inspection and copying for the duration of the utilization activities, and for a minimum of three (3) years after the utilization program ceases:

(1) Volume of residual generated on a yearly basis;

(2) Volumes of residual utilized, processed, disposed and stored on a yearly basis;

(3) Analytical results and residual process monitoring records pertaining to the utilization program and residual, including a record of sample locations;

(4) A list of licensed utilization sites, loading rates at those site, analytical data, all license application submissions, a copy of licenses issued by the Department and all other site specific utilization information; and

(5) Other information as specified in the utilization program license.

**B. Periodic Reporting.** Licensees must submit reports containing analytical data and other information in accordance with the program license.

**C. Annual Report.** By February 28 of each year, the generator must forward to the Department an annual report for activities during the previous calendar year that summarizes the utilization program, and includes the applicable reporting fee. Unless otherwise approved in the program license, the report must include a summary of the information in section 6.A, above.

Note: A reporting fee schedule may be obtained from the Solid Waste Division of the Department.

**D. Certification Statement.** All information submitted to the Department demonstrating compliance with the standards of this Chapter must be accompanied by a statement that is signed by an authorized representative of the licensee which reads, "I certify under penalty of law that I have personally examined and am familiar with the information submitted herein. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

**7. Application Requirements for Residual Utilization.** Any generator seeking to undertake a utilization activity shall provide information sufficient to demonstrate that the standards of sections 3 and 4 of this Chapter have been met. The generator shall submit to the Department, on application forms developed by the Department, the following information:

**A. Submissions for ~~p~~Program ~~l~~Licenses**

(1) Program ~~d~~Description. A description how the residual will be handled for the utilization program including, if applicable, the benefit to crops or soil afforded by the utilization, the weekly and annual volume of residual produced, the volume proposed for utilization, the volumes proposed for disposal, a description of the blending, mixing, or processing of residuals and the purpose of this processing, proposed application rates in tons of residual per acre of land, methods of calculating the appropriate loading rate, and a description of how the residual will be stored and transported.

(2) Residual ~~s~~Suitability. A description of the processes that generate the residual(s) proposed for utilization and a physical and chemical description of the resultant residuals obtained in accordance with Chapter 405, section 6.

(3) Sampling. A sampling and analytical work plan meeting the standards in Chapter 405 to representatively monitor residual quality.

(4) Risk Management. A description of potential risks posed by the utilization program, and appropriate management strategies to mitigate those risks, including an identification of any

additional standards in sections 3 and 4 the utilization program is subject to, and one of the following:

(a) Screening ~~s~~Standards. A demonstration that the residual meets all of the applicable screening standards in Table 419.3 column A, Table 419.4, columns A through C, or Table 419.5, column A; and the screening standards for hazardous substances other than metals in Chapter 418, Appendix A;

Note: Not all compounds in appendix A must be analyzed for. See Chapter 405.

(b) Loading ~~r~~Rate. Loading rate calculations done in accordance with Appendix A.2.C which demonstrate that the following standards, as applicable, will not be exceeded: annual and cumulative loading rates in Table 419.3 columns C and D, Table 419.4 columns D and E, or Table 419.5 column A; and the screening standards for hazardous substances other than metals in Chapter 418, Appendix A;

(c) Comparison ~~s~~Studies. A comparison of characteristics of the residual to another residual for which a risk assessment has been done, demonstrating the applicability of that risk assessment; or

(d) Risk ~~a~~Assessment. An assessment of the human health and/or environmental risks posed by contaminants of concern, and a risk management strategy. The risk management must ensure that residual utilization activities, under present or future site uses, will not result in the aggregate risk to a highly exposed individual that exceeds an Incremental Lifetime Cancer Risk of $5X10^{-6}$ or that exceeds a Hazard Index of 1/2.

(5) Site ~~i~~Information

(a) Site ~~s~~Standards. The standards proposed for sites where the residual will be utilized including buffer zones and soil standards; a description of the site specific information that will be submitted to the Department for site licenses; and the proposed licensing processes for site specific utilization licenses; or

(b) Utilization ~~i~~Instructions. The information that will be provided to the person that uses the residual, that ensures compliance with the standards of section 3 and 4, and the notice, if any, that will be provided to the Department when site specific licenses will not be obtained.

Note: More than one strategy may be appropriate for a given residual, depending on the utilization circumstances.

(6) Traffic. A demonstration that the generator will meet the alternative traffic standards in section 4.F at all utilization sites or provisions to supply site specific information.

(7) Harmoniously ~~f~~Fitting into the ~~e~~Environment. A demonstration that the generator will meet the alternative standards in section 4.G for fitting harmoniously into the natural environment at all utilization sites, or provisions to supply site specific information.

(8) Financial and ~~t~~Technical ~~a~~Ability. The application submission requirements in Chapter 400, sections 4.B(2) and 4.C(2).

(9) Municipal and Public Notice. Proof that public notice of the application has been provided as required in section 2.F.

(10) Nuisance. A demonstration that the residual does not generate offensive odors, or provisions to meet the alternative odor control standards in section 4.H at all utilization sites or provisions to supply site specific information to meet the standard in Chapter 400, section 4.G.

**B. Submissions for ~~u~~Utilization ~~s~~Site ~~l~~Licenses.** Prior to utilizing a residual at a site, a generator must submit a complete application for a utilization site license, unless otherwise approved by the Department in a Program license. Unless otherwise approved in a program license, the utilization site application must include:

(1) Title, Right or Interest. Information demonstrating that the generator has sufficient title, right or interest in a property proposed for utilization by providing:

(a) the submissions enumerated in Chapter 2, section 7.D; or

(b) a copy of an agreement between a landowner(s) and a residual generator certifying that the owners own the land and agree to allow the utilization and, if applicable, storage of the residual on the property. The agreement must also include the signature, printed name, and address of the generator and all property owners, site location, description of the area authorized for use including acreage, and if available, the map and lot number from municipal tax maps.

(2) Project Summary. A summary of the types of crops to be grown, method of application, anticipated spreading schedule and any special management considerations for the site based on site characteristics.

(3) Site Maps

(a) Topographical Map: The most recent 7.5 minute US Geological Survey topographic or equivalent map marking the proposed utilization boundaries and site owner's property boundaries;

(b) Site Sketch. Site sketch(es) of the proposed utilization area(s) of sufficient quality and scale, and with sufficient features to ensure that the person spreading the residual can determine appropriate utilization boundaries. At a minimum the map must depict the area suitable for utilization, buffers and setbacks, features requiring buffers and setbacks, drainage features, and the map scale, orientation, and title.

(c) Tax Map. If available, the appropriate town tax map showing the site property boundaries, the area proposed for utilization, and the names and location of abutters.

(d) Soils Map and Report. A clear copy of the appropriate United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) County medium intensity soil survey map with the site clearly outlined and a copy of the key to the soil mapping units. If the Department questions the accuracy of the map, the Department may require a soils investigation report and site specific soils map. The report must describe the soil slope, permeability, flooding potential, drainage, depth to bedrock and/or sand or gravel deposits, along with appropriate operational standards to be employed to prevent surface or groundwater contamination.

(e) Sand and Gravel Aquifer ~~m~~Map. If the proposed site is within 500 feet of a sand and gravel aquifer, a copy of the most recent Hydrogeologic Data for Significant Sand and Gravel Aquifer map with the proposed utilization site clearly delineated.

(f) Flood Zone Map. If the proposed site is within 500 feet of a 100 year flood zone, the most recent Federal Emergency Management Agency (FEMA) flood zone map or its equivalent with the proposed utilization site clearly delineated.

(4) Sensitive ~~a~~Areas.~~:~~ A statement as to whether or not the site is located in, on, over or next to a protected natural resource, a sensitive receptor, and/or the direct watershed to Marine waters. If the site is located near one or more of these areas, provide the name of the feature and horizontal distance from nearest site boundary to the feature.

(5) Protected ~~l~~Location~~:~~. At the Department's discretion, letters from the Maine Department of Inland Fisheries and Wildlife, and from the Natural Areas Program of the Department of Conservation that the activity will not unreasonably adversely impact protected significant wildlife habitat, fragile mountain areas, or rare, threatened and endangered plant or animal species.

(6) Buffers, Erosion Control and Flooding:

(a) A description of buffer zones at the utilization sites established to meet the standards in sections 3 and 4. If the applicant is proposing a reduction in the buffers enumerated in table 419.2, a rationale for the reduction and a site specific soil erosion control plan meeting the standards in section 3.B(2).

(b) For utilization activities where the topography will be altered or structures built as part of the utilization activity, the application submissions in Chapter 400, section 4.J(2)(a) and Chapter 400, section 4.M(2). For utilization where the topography will not be altered, by meeting the standards of this Chapter, the standards in Chapter 400, section 4.J and Chapter 400, section 4.M are presumed to be met.

(7) Soil Nutrients. Representative soil nutrient analysis for the site.

(8) Traffic. A demonstration that the generator meets the alternative traffic standards in section 4.F or the traffic information required by Chapter 400, section 4.D(2).

(9) Natural ~~e~~Environment. A demonstration that the generator meets the alternative standards found in section 4.G, or the submissions enumerated in Chapter 400, sections 4.E(2) and 4.F(3).

(10) For residuals used to supply nitrogen, phosphorus, or other nutrients, a demonstration that the site has a need for the nutrient provided by the residual in addition to other on site nutrients.

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Note: Department of Agriculture Regulations, Chapter 565, effective December 15, 1998, requires farms utilizing residuals to have a licensed nutrient management specialist develop a whole farm nutrient management plan. While the plan itself need not be submitted to the Department, the information in any existing plan should form the basis for the above determination that additional nutrients are needed on a farm.

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(11) For repeat utilization of putrescible residuals, a site specific odor control plan to prevent nuisance odors at adjacent occupied buildings;

(12) For a residual that is treated to a class B pathogen reduction standard, a description of the class B pathogen reduction method, a description of any class B vector attraction reduction method proposed for the site; and a copy of a statement signed by the generator, landowner and the operator of the site that ensures that the applicable site restrictions in section 4.I will be met.

(13) For residuals subject to the additional dioxin standards in section 4.K a site specific sampling and analytical work plan to monitor soil dioxin concentrations. The applicant must also submit a copy of a statement signed by the generator, landowner and, if different, the operator of the site, that specifically acknowledges the presence and concentrations of PCDDs and PCDFs in the residual to be spread, and the ability and willingness of the landowner to comply with the standards in section 4.K(4):

(14) For residuals subject to the additional standards for heavy metals in section 4.J, a site specific sampling and analytical work plan to monitor soil metal concentrations; and loading rate calculations demonstrating that applicable annual and cumulative loading rates for metals in tables 419.3, 419.4 or 419.5 will not be exceeded.

(15) Environmental ~~m~~Monitoring ~~p~~Program. If determined appropriate under section 4.C, a site monitoring plan meeting the standards in Chapter 405.

(16) Public Notice. Proof that public notice of the application has been provided as required in section 2.F.

(17) Joint Utilization. When more than one generator are utilizing a residual that requires a site specific license at the same site, a joint utilization agreement, meeting the standards in section 2.D.

**8. Permit by ~~r~~Rule ~~p~~Program ~~l~~License for the ~~u~~Utilization of ~~c~~Composted ~~r~~Residuals**

**A. Applicability.** The permit-by-rule licensing provisions of this section shall apply to the distribution for utilization in Maine of residuals other than Type II residuals that meet all of the standards of this section. Failure to meet any of these standards will require formal application to the Department for a license to distribute composted residuals under sections 2 through 7. The Department assumes that the distribution of composted residuals in strict conformity with these permit-by-rule provisions will meet the standards of Chapter 400, section 4 and the standards in section 2~~-~~ through 6 of this Chapter. No variances to the requirements of this section may be granted.

Note: 38 M.R.S.A. § 1304(18) prohibits the Department from licensing the utilization and distribution of compost derived from Type II residuals under the permit-by-rule provisions of this section. See Chapter 400 for a full definition of residual types. Type IA residuals are leaf, vegetative and other residuals with a C:N ration of greater than 25:1. Type IB residuals are food and other residuals with a C:N ratio of between 25:1 to 15:1. Type IC residuals are fish and other residuals with a C:N ratio of less than 15:1. C:N refers to the ratio of available

carbon to nitrogen of the raw residual prior to composting. See appendix 410.B for a list of typical C:N ratios for various residuals. Type II residuals are sewage sludge, septage, and other residuals that may contain human pathogens. Type III residuals are petroleum contaminated soils and other residuals that may contain hazardous substances above the risk based standards in Chapter 418, Appendix A.

**B. Standards**

(1) Composting. The residual must be composted prior to distribution for utilization.

(2) Sampling. Sampling must be done in accordance with Chapter 405, section 6.D.

Note: ~~Pathogens,~~ Metals and other hazardous substances must only be measured if, based on the nature of the residuals processed and other appropriate factors, the Department determines that there is a potential for these constituents to be in the compost at levels that could pose a risk to human health or the environment.

~~(3) Process standard. For compost made from type II residuals or residuals that have a C:N ratio of less than 15:1, the residual must be maintained at 55 degrees Celsius or higher for three consecutive days. For windrow systems, this standard is met if the residual is generally maintained at 55 degrees Celsius or higher for 15 days or longer, and during the period when the compost is maintained at 55 degrees or higher, there is a minimum of five turnings of the compost pile.~~

~~(4) Confirmation sampling for pathogens. For composted type II residuals, the density of *Salmonella sp*. bacteria in the compost must be less than three Most Probable Number per four grams of total solids (dry weight basis). In the absence of analytical data on *Salmonella sp*. this standard is presumed to have been met when the density of fecal coliform in the compost is shown to be less than 1000 Most Probable Number per gram of total solids (dry weight basis). This analytical standard must be met at the time the compost is distributed.~~

(3~~5~~) Heavy ~~m~~Metal ~~s~~Standards

(a) Monthly concentrations of metals in the compost must be less than the concentrations in table 419.3, column A if the metals are derived from sewage sludge or dewatered septage.

(b) Monthly concentrations of metals in the compost must be less than the concentrations in table 419.5, column A, if the metals are derived from a ~~t~~Type III residual ~~other than sewage sludge~~.

Note: This does not necessarily mean that compost needs to be analyzed monthly for heavy metals. See Chapter 405, section 6 for determining frequencies.

(4~~6~~) Hazardous ~~s~~Substances. For compost made from ~~t~~Type III residuals, concentrations of hazardous substances other than heavy metals in the compost are less than the screening standards in Chapter 418, Appendix A.

(5~~7~~) Sharps and ~~s~~Synthetic ~~o~~Objects. The residual contains less than 0.05% by weight, of synthetic objects, and contains less than one sharp object, such as broken glass, nails or needles, per 10 tons of residual based on visual inspection.

(6~~8~~) Compost ~~s~~Stability. The stability class of the compost must be measured and the generator must distribute information to compost users on the appropriate uses of the compost, based in part on the compost's stability.

(7~~9~~) Salt ~~c~~Content. For compost with a salt content greater than 2 mmhos/cm, the generator must distribute information to compost users on the appropriate uses of the compost based in part on the salt content of the material.

(8~~10~~) Agronomic ~~u~~Utilization~~:~~. The compost must be distributed for agronomic utilization and each ingredient in the compost must add to the agronomic benefit of the mix as a whole.

(9~~11~~) Record ~~k~~Keeping and ~~r~~Reporting. The generator will keep records and file an annual report of the volume of compost distributed in Maine each year in accordance with section 6.

**C. Notification Requirements.** At least 15~~8~~ working days prior to the first shipment of any composted residual for utilization in Maine, the compost generator shall submit to the Department a permit-by-rule notification on a form developed by the Department. This notification must include:

(1) The generator's name, address, telephone number and contact person.

(2) The appropriate application fee.

(3) Public Notice. Proof that public notice of the application has been provided as required in section 2.F.

(4) Facility ~~d~~Description. For facilities other than those licensed under Chapter 410, a brief description of the compost facility including:

(a) the volume, type and characteristics of the residuals processed at the facility, any materials added to the compost prior to distribution for utilization, and the ratio of all materials in the final compost mix;

(b) the method of composting used at the facility; and

(c) a list of federal and state environmental permits held by the facility.

~~(5) Process Standard. For compost made from residuals that have a C:N ratio of less than 15:1, a detailed description of how the compost temperatures and other process parameters are monitored at the facility to ensure compliance with section 8.B(3) (above).~~

(5~~6~~) Sampling. A copy of the Sampling and Analytical Work Plan for the facility that is used to analyze the compost to ensure compliance with the compost quality standards in section 8.B ~~(~~above~~)~~. The plan must including a certification from a qualified chemist that the Sampling and Analytical Work Plan meets the applicable standards of Chapter 405.

(6~~7~~) Marketing. A brief description of how composted residuals will be distributed in Maine and instructions for appropriate use that will be provided to the users of the compost including:

(a) The name and address of the person who prepared the compost;

(b) A statement that the compost may not be applied when the soil is frozen, snow-covered or water-saturated; such that the compost will be washed into surface water; or placed directly into surface waters or below the groundwater table, without prior approval from the Maine Department of Environmental Protection; and

(c) Recommended blending and/or loading rates based upon annual heavy metals loading, nutrients, salt content, stability, and other factors as appropriate.

(7~~8~~) Certification. A statement signed by the applicant that the distribution of composted residuals will conform with the requirements of this section.

**9. Permit by Rule Site License for the Utilization of Digested Type IA, IB and IC Residuals**

**A. Applicability.** Only digested Type IA, IB and IC residuals that have received program approval from the Department, and which meet all the standards of this section, may qualify for a permit-by-rule under this section. For the purposes of this Chapter, the term "digested" means that the residual has undergone aerobic digestion or anaerobic digestion as defined in Appendix B(1) of this Chapter. Failure to meet any of these standards will require a complete license application pursuant to sections 2 through 7 of this Chapter. The Department assumes that the utilization of digested Type IA, IB and IC residuals in strict conformity with these permit by rule provisions will meet the standards in the *Solid Waste Management Rules: General Provisions*, 06-096 CMR 400(4) and sections 2 through 6 of this Chapter. No variances to the requirements of this section may be granted.

Note: See 06-096 CMR 400 for a full definition of Type IA, IB and IC residuals. Type IA residuals are leaf, vegetative and other residuals with a C:N ratio of greater than 25:1. Type IB residuals are food and other residuals with a C:N ratio of between 25:1 to 15:1. Type IC residuals are fish and other residuals with a C:N ratio of less than 15:1. C:N refers to the ratio of available carbon to nitrogen of the raw residual. See 06-096 CMR 410 Appendix B for a list of typical C:N ratios for various residuals.

**B. Standards.** To qualify for a permit-by-rule, all of the following standards must be met. Failure to meet any of these standards will require formal application to the Department for a utilization site license pursuant to sections 2 through 7 of this Chapter.

(1) Only digested Type IA, IB and IC residuals approved in the applicant's agronomic utilization program license shall be utilized at the site. The applicant must continue to adhere to all requirements in its agronomic utilization program license.

(2) Residuals proposed for utilization must meet the Class A vector attraction reduction standards of Appendix B(4)(A) of this Chapter.

(3) Only digested Type IA, IB and IC residuals meeting the screening concentration standards in Table 419.5 of this Chapter, or residual-specific ceiling concentrations established in the applicant's program license, may be utilized at the site.

(4) The loading rate of the digested Type IA, IB and IC residuals shall be commensurate with the nutritional needs of the crop to be grown.

Note: Department of Agriculture Regulations, *Nutrient Management Rules*, 01-001 CMR 565, requires farms utilizing residuals to have a licensed nutrient management specialist develop a whole farm nutrient management plan. While the plan itself need not be submitted to the Department (DEP), the information in any existing plan should form the basis for the above determination that additional nutrients are needed on a farm.

(5) The spreading area must meet the applicable minimum setbacks in section 3.A and 3.B of this Chapter.

(6) Digested Type IA, IB and IC residuals must be applied a minimum of 10 inches above the bedrock surface on established perennial crops such as hay and 20 inches above the bedrock surface for other/row crops, including the limits of incorporation.

(7) Digested Type IA, IB and IC residuals must be applied a minimum of 15 inches above the groundwater surface at the time of application.

(8) Digested Type IA, IB and IC residuals shall not be spread on areas with slope gradients greater than 15%.

(9) Digested Type IA, IB and IC residuals may not be applied when the site is frozen, snow covered or water saturated; such that the digested Type IA, IB and IC residuals will be washed into surface water; or placed directly into surface waters or below the groundwater table.

(10) Digested Type IA, IB and IC residuals may not be stockpiled at the utilization site.

(11) The generator must inform the Department each time the digested Type IA, IB and IC residuals will be applied at the site at least one working day before the anticipated date of spreading. This notification requirement can be satisfied in person, with a telephone call, voice mail message, e-mail, letter, or fax to the Residuals Utilization Unit of the Division of Solid Waste Management at the Department's central office or appropriate regional office.

(12) Record Keeping and Reporting. The generator shall keep records and file an annual report of the volume of digested Type IA, IB and IC residuals utilized in Maine each year in accordance with section 6 of this Chapter.

(13) Certification. A statement signed by the applicant that the utilization of the digested Type IA, IB and IC residuals will conform to the requirements of this section.

**C. Notification Requirements.** The applicant shall submit to the Department, a permit-by-rule notification in sufficient time for Department receipt at least 15 working days prior to the anticipated first date of agronomic utilization of the digested Type IA, IB and IC residuals at a site. The permit-by-rule notification shall be on a form provided by the Department. Within 15 working days of receipt of the permit-by-rule notification, the Department shall mail notice to the applicant indicating whether the notification meets the permit-by-rule notification provisions of this section. If the notice to the applicant is not mailed within 15 working days of receipt, the permit-by-rule notification is deemed accepted.

The notification must include:

(1) The applicant's name, address, telephone number, e-mail address, and contact person.

(2) Public Notice. Proof that public notice of the application has been provided as required in 06-096 CMR 400(3)(B)(1)(c).

(3) Title, Right, or Interest. Information demonstrating that the generator has sufficient title, right, or interest in a property proposed for utilization by providing:

(a) The submissions enumerated in 06-096 CMR 2(11)(D); or

(b) A copy of an agreement between a landowner(s) and a residual generator certifying that the owners own the land and agree to allow the utilization of the residual on the property. The agreement must also include the signature, printed name, and address of the generator and all property owners, site location, description of the area authorized for use including acreage, and if available, the map and lot number from municipal tax maps.

(4) The applicant's digested Type IA, IB and IC residual agronomic utilization program license number.

(5) Site Maps.

(a) Topographical Map. A clear, legible copy of the most recent 7.5 minute US Geological Survey topographic or equivalent map marked with the proposed utilization boundaries and site owner's property boundaries.

(b) Site Sketch. Clear legible site sketch(es) of the proposed utilization area(s) of sufficient quality and scale, and with sufficient features to ensure that the person spreading the residual can determine appropriate utilization boundaries. At a minimum the map must depict the area suitable for utilization, buffers and setbacks, features requiring buffers and setbacks, drainage features, and the map scale, orientation, and title.

(c) Soils Map. A clear, legible copy of the appropriate United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) County medium intensity soil survey map with the site clearly outlined and a copy of the key to the soil mapping units.

(d) Sand and Gravel Aquifer Map. If the proposed site is within 500 feet of a sand and gravel aquifer, a clear, legible copy of the most recent Hydrogeologic Data for Significant Sand and Gravel Aquifer map with the proposed utilization site clearly delineated.

(6) Soil Nutrients. Representative soil nutrient analysis for the site.

(7) Travel directions from the site of generation to the utilization site, anticipated spreading schedule, estimated volume or tonnage, and acreage involved.

(8) A statement by the applicant that the utilization of the digested Type IA, IB and IC residuals will conform to the requirements of this section.

(9) The appropriate application fee.

**~~9~~10. Permit by Rule Transfer of Site License**

**A. Applicability.** The permit-by-rule licensing provisions of this section shall apply to the transfer of utilization site licenses that meet all of the standards of this section. Failure to meet any of these standards will require formal application to the Department for a utilization site license transfer under section 2.E. Sites transferred under this section are subject to the applicable operating standards in section 4, the operational standards contained in the site license(s), and the receiving generator's program license. No variances to the requirements of this section may be granted.

**B. Standards**

(1) Both generators generate the same kind of residual, such as sewage sludge treated to a class B pathogen reduction standard;

(2) Both generators agree to the transfer;

(3) The receiving generator must be in substantial compliance with its program license;

(4) Both program licenses must require the same siting standards;

(5) The entire site is being transferred; and

(6) All residuals from the current license holder must have been properly utilized or removed from the site prior to filing the transfer notification.

**C. Notification Requirements.** At least 15~~8~~ working days prior to transferring the license, the generator who is obtaining the site shall submit to the Department a permit-by-rule notification on a form developed by the Department. This notification must include:

(1) The generators' name, address, telephone number and contact person;

(2) The appropriate application fee;

(3) Both generators' program license numbers;

(4) Public Notice. Proof that public notice of the application has been provided as required in section 2.F.

(5) The site license number;

(6) Title, Right or Interest. Information demonstrating that the generator has sufficient title, right or interest in a property proposed for utilization by providing one of the following:

(a) submissions enumerated in Chapter 2, section 7.D; or

(b) a copy of an agreement between a landowner and a residual generator certifying that the owners own the land and allowing utilization and if applicable storage of the residual on the landowner's property. The agreement must also include the signature, name and address of the generator and all property owners, and site location;

(7) Fee. The appropriate application fee; and

(8) Certification. A statement signed by the applicant stating that all the standards in this section have been met, and all applicable requirements of these rules and the transferred license will be met.

**11~~0~~. Storage of Residuals Prior to Utilization.** This section applies to storage of residuals prior to agronomic utilization. For purposes of this Chapter, "a field stacking facility" means a facility for the storage of residuals on a permeable surface and not under a permanent roof. For purposes of this Chapter, "contained storage facilities" means storage facilities where residuals are stored on impervious surfaces or under a roof. All residual storage sites must be sited, designed and operated to meet the standards in Chapter 400, sections 3 and 4 and the following standards:

**A. General ~~s~~Siting ~~s~~Standards for ~~r~~Residual ~~s~~Storage**

(1) The residual handling area must meet the setbacks in table 419.1 and 419.2, and be located greater than:

(a) 500 feet to the nearest occupied building other than those owned by the site owner or operator;

(b) 100 feet from public roads and abutting property boundaries; and

(c) 300 feet from a great pond that is a public drinking water supply.

(2) The facility may not be located on a 100 year floodplain. This prohibition does not apply to sites where residuals are field-stacked if the following standards are met:

(a) residuals are stacked for less than 30 days to facilitate a spreading;

(b) residuals are stacked only at times when the depth to the water table is 24 inches or greater; and

(c) residuals are stacked only prior to September 15th of each year.

**B. General ~~d~~Design ~~s~~Standards for ~~r~~Residual ~~s~~Storage.** The facility must be designed to, in conjunction with the siting standards, meet the following:

(1) The facility may not contaminate waters of the state.

(2) Except for field stacking sites, or storage facilities for ~~type~~Type IA residuals, residual storage areas must have impervious floors and side walls, such as asphalt or concrete, sufficient to prevent untreated leachate from discharging into groundwater.

(3) The residual must be contained within the facility. The residual may not be discharged to a protected natural resource, without a license issued pursuant to 38 MRSA section 480-A *et seq.*

(4) Run-~~o~~On. Runoff from land areas surrounding a storage site must be controlled or diverted away from the stored residual with berms or diversion ditches as necessary to prevent contact with the stored residual.

(5) Leachate ~~c~~Control. The site design must have provisions to contain, collect, and, if applicable, treat leachate and run-off mixed with leachate. The design may include: roofing or

covering the storage area to prevent excessive leachate generation; providing a filter strip to discharge leachate to an approved area during the growing season; on-site filtering systems, and/or a plan developed for ultimate disposal of leachate. Disposal of any wastewater, leachate and wash down waters must be in accordance with 38 MRSA section 413 et seq.

(6) The stored residual must not cause an odor or dust nuisance at an occupied building or protected location, or spontaneously combust.

(7) Access Control. For facilities storing ~~type~~Type III residuals, and/or ~~type~~Type II residuals that have not been treated to class A pathogen reduction standards, public access to the site must be restricted by, at a minimum, placing a sign at the access to the storage site that restricts access to authorized personnel. The Department may require that a locking gate be placed at the access to the storage site and/or fencing be installed around the facility, if necessary to meet the criteria in Chapter 400, sections 3 and 4.

(8) Traffic. The site design, in conjunction with siting and operations, must make provisions to ensure that the facility is accessible during inclement weather and meets the traffic standards in Chapter 400 section 6.D, or the alternative traffic standards in section 4.F of this Chapter.

(9) Separate Storage. If more than one residual is stored at the site, separate, labeled, storage areas must be provided for each different residual.

(10) Pursuant to 38 MRSA section 1304(13-A), for storage of sludge generated at industrial facilities utilizing kraft wood pulping processes, sludge storage sites may not be located within 300 feet of a year-round river, stream, brook or pond nor within 75 feet of any intermittent stream or brook or any natural drainage way, including gullies, swales and ravines.

**C. Additional Siting and Design Standards for Field Stacking Sites.** In addition to the standards in section 10.A above, the following siting and design standards apply to field stacking of residuals that have a C:N of less than 25:1, unless the residual is a compost or unless the Department determines in a program license that mineralization or other comparable studies demonstrate that excess nitrates will not contaminate groundwater. This section also applies to utilization of other residuals that the Department has determined in a Program license readily leach contaminants that may contaminate waters of the state.

(1) Unless otherwise provided for by the Department, field stacking facilities must be located on the site where the residual will be utilized.

(2) Storage ~~v~~Volumes. The volume of residual to be stored at the field stacking site may not exceed that required to meet the utilization requirements for one spreading season at that site.

(3) Footprint. The residuals at the field stacking site may not cover an area greater than 1/2 acre.

Note: the waste handling area may be greater than 1/2 acre

(4) Soil ~~t~~Type~~:~~. The waste handling area must have a maximum permeability in the C horizon of 2.0 inches per hour. Effective October 30, 2002, stockpile sites to be used in excess of 30 days per growing season must be on insitu soils with a C horizon that is a marine sediment, lacustrine sediment or basal till that is at least 40 inches thick.

Note: The Department intends to facilitate studies into the actual impacts to groundwater from field stacking nitrogenous materials. The information from these studies, along with site monitoring data, will be used to modify requirements for field stacking, if necessary.

(5) The waste handling area may not be located on slopes in excess of three (3) percent.

(6) The minimum depth to bedrock in the waste handling area must be 40 inches when the residual is to be stored for over 30 days. The minimum depth to bedrock in the waste handling area must be 30 inches when the residual will be stored for 30 days or less.

(7) The minimum depth to the seasonal high water table in the waste handling area must be 24 inches when the residual is stored for over 30 days. The minimum depth to the water table in the waste handling area throughout the time period that the waste will be stored must be 24 inches when the residual is stored for 30 days or less.

(8) The waste handling area may be modified to meet the standards in section 10.C(5) through (7) above, except that in no case may the waste handling area be located where the native soil is less than 30 inches to bedrock, or on hydric soils.

(9) Leachate ~~c~~Control. Residual field stacking facilities must be sited and designed so that any leachate, or runoff mixed with leachate, is not carried beyond an approved utilization area. Applicants must develop and implement a leachate control plan, as approved by the Department, which may include filter strips during the growing season, placing residuals on a layer of sawdust, papermill fiber or similar material to absorb free liquids and inorganic nitrogen; placing hay bales and silt fences around stockpiles; forming piles to shed water; covering piles such that precipitation does not penetrate the pile; or making provisions to collect and treat leachate. The leachate control plan must have specific provisions to control leachate when the ground is not covered with vegetation, frozen, snow covered or water saturated.

Note: NRCS Practice Standard 393 may be used to design filter strips.

**D. Additional Siting Standard for Storage of Sludge.** The Department may not issue a license for a sludge storage site or storage facility off the site of generation that is within 250 feet of a river, perennial stream or great pond.

Note: the above licensing standard is required by 38 MRSA Section 1310-N, subsection 2-G,

**12~~1~~. Application ~~r~~Requirements for ~~r~~Residual ~~s~~Storage.** Any person seeking to store residuals prior to utilization shall provide information sufficient to demonstrate that the standards of sections 10 and 12 of this Chapter are met. The applicant shall submit to the Department, on application forms developed by the Department, the following information:

**A. Submissions for Program Licenses for Storage.** The following submissions are required for applications for a program license to store residuals.

(1) Summary. A brief summary of the proposed utilization program for which the storage is required.

(2) Residual Characteristics. The physical and chemical characteristics of the residual that will be stored obtained in accordance with Chapter 405, including an assessment of the environmental and human risk posed by storage of the material, including risk to groundwater and surface water, and proposed management to mitigate those risks.

(3) Siting Standards. When appropriate, the standards proposed for sites where the residual will be utilized, including:

(a) Buffer ~~z~~Zones. A description of appropriate buffer zones at utilization sites that will be employed to meet the standards in Chapter 400, section 4, subsections E through H and the applicable standards in section 10 and 12 of this Chapter;

(b) Soils. A description of appropriate soil drainage class, depth to bedrock or other permeable layers, and slope, that will be appropriate to meet the standards in section 10.C and Chapter 400, sections 4.J and 4.K; and

(c) Other. A description of other siting standards, if any, that will ensure that the licensing standards of these rules are met.

(4) Site Licensing Procedures. Propose the situations when a site specific license will be obtained, the information that will be provided to individuals storing the residual to meet the standards in sections 10 and 12 when storage sites are not individually licensed, and the notice, if any, that will be provided to the Department when site specific storage licenses will not be obtained.

Note: More than one strategy may be appropriate for a given storage program

(5) Traffic. A demonstration that the applicant meet the alternative traffic standards in section 4.F for sites that will not be individually licensed.

(6) Public Notice. Proof that public notice of the application has been provided as required in section 2.F.

**B. Submissions for Storage Site Licenses.** An applicant must submit a complete application for a storage site license, unless otherwise approved by the Department in a Program license. Unless otherwise approved in a program license, the storage site application must include:

(1) Description. A brief description of the storage site, and reason for storage.

(2) Residual Characteristics. The physical and chemical characteristics of the residual that will be stored obtained in accordance with Chapter 405, including an assessment of the environmental and human risk posed by storage of the material and proposed management to mitigate those risks.

(3) Topographic Map. The most recent 7.5 minute US. Geological Survey topographic or equivalent map showing the location of the proposed site, the property boundary, and if storing putrescible residuals, airports within 10,000 feet of the site. The map must include all surrounding area within one mile of the proposed site.

(4) Chapter 400 ~~s~~Submissions. The submission requirements of Chapter 400, section 4, subsections B, C, F, G, H, I, J, and L.

(5) Storm Water Control. A certification that the siting and/or design of the proposed site will not result in post-construction runoff that is greater than pre-construction runoff or the submission requirements of Chapter 400, section 4.M(2)

(6) Traffic Movement. A demonstration that the site meets the alternative traffic standards in section 12.A(5) or the traffic information required by Chapter 400, section 4.D(2).

(7) Fitting Harmoniously into the Natural Environment. A demonstration that the site meets the alternative standards for fitting harmoniously into the natural environment in section 12.A(9) or the information required by Chapter 400, section 4.E.

(8) Sand and Gravel Aquifer ~~m~~Map. If the proposed site is within 500 feet of a sand and gravel aquifer, a clear copy of the most recent Hydrogeologic Data for Significant Sand and Gravel Aquifer map with the proposed storage site clearly delineated.

(9) Flood Zone Map. If the proposed site is within 500 feet of a 100 year flood zone, the most recent Federal Emergency Management Agency (FEMA) flood zone map, or equivalent map, with the proposed storage site clearly delineated.

(10) Operations ~~m~~Manual. An operations manual meeting the standards in section 12.A(1).

(11) Environmental ~~m~~Monitoring ~~p~~Program. If the Department determines that it is necessary to confirm that the site will meet the standards in Chapter 400, section 4 due to the nature of the wastes stored and/or the location, design and operation of the site, a monitoring program for ground water, surface water or waste characteristics, as applicable, designed in accordance with the provisions of Chapter 405.

(12) Hazardous and ~~s~~Special ~~w~~Waste ~~e~~Exclusion ~~p~~Plan. Except for sites that only accept specific residuals from specific generators specified by Department license, a hazardous and special waste handling and exclusion plan meeting the standards in Chapter 400, section 9.

Note: A template for a hazardous and special waste handling and exclusion plan is attached as Appendix 400.A to Chapter 400.

(13) Public Notice. Proof that public notice of the application has been provided as required in section 2.F.

**C. Additional ~~a~~Application ~~r~~Requirements for ~~f~~Field ~~s~~Stacking ~~s~~Sites.** Unless otherwise approved by the Department in a Program license, in addition to the application requirements in section 11.B above, the following application requirements apply to field stacking sites:

(1) Title, ~~r~~Right or ~~i~~Interest. The information in section 7.B(1) demonstrating Title, Right, or Interest in the project.

(2) Soils ~~m~~Map. A clear copy of the appropriate United States Department of Agriculture (USDA.) Natural Resources Conservation Service (NRCS) County soil medium intensity soil survey map indicating the proposed spreading area, the proposed field stacking area, and the leachate treatment areas. If the Department questions the accuracy of the map, the Department may require a soils investigation report and site specific soils map demonstrating that the applicable sitting and design standards in section 10.C are met. Soils investigations

must be conducted in a manner that avoids disturbing the ability of the insitu soils to prevent groundwater contamination.

(3) Narrative and ~~s~~Site ~~s~~Sketch. A narrative and site sketch of the storage site features and proposed structures, of sufficient detail to demonstrate compliance with the standards in section 10. The sketch must include the scale and orientation, buffers, slopes, run-on and run-off control features, and leachate management features.

(4) Odor and ~~d~~Dust ~~c~~Control ~~p~~Plan. For putrescible residuals, a site specific odor control plan to treat the residual or locate, design, and operate the site to avoid nuisance odors at off site occupied buildings. For dusty residuals, a site specific dust control plan to treat the residual or locate, design, and operate the site to avoid dust at off site locations.

**D. Additional ~~a~~Application ~~r~~Requirements for ~~c~~Contained ~~s~~Storage ~~s~~Sites.** Unless otherwise approved by the Department in a Program license, in addition to the application requirements in section 11.B, the following application requirements apply to residual storage sites other than field stacking sites:

(1) Title, ~~r~~Right or ~~i~~Interest. The application submissions in Chapter 400, section 4.A demonstrating Title, Right, or Interest in the project.

(2) Site ~~p~~Plans and ~~d~~Drawings. A bid ready site design and construction package showing all structures and demonstrating that the applicable standards in section 10 and 12 will be met, including the system to contain, control and treat leachate and run-off mixed with leachate.

(3) Odor ~~c~~Control ~~s~~System. For the storage of putrescible residuals, either

(a) a demonstration that the site will not cause an off-site nuisance odor, including one or more of the following:

(i) a demonstration that the materials handled at the site do not generate objectionable odors;

(ii) comparative studies with similar existing sites taking into account similarities and differences in site design, throughput, proximity to neighbors, meteorological conditions and topography; or

(iii) odor dispersion modeling studies demonstrating that the site will not cause more than a one hour average odor impact of 2 dilutions to threshold (2D/T), in any calendar year at any protected location and any occupied buildings;

Note: D/T is defined by ASTM Method 679-9A. The generator may wish to demonstrate that they will meet this standard at the storage site's property boundary, in order to meet the operational requirements to not cause a nuisance when areas near the site are subsequently developed. For information on this air model, see Serjak, Tamsin, Nicholas Marchese and Robert Gaudes, 1995, "ALCOSAN and Odor Regression Analysis: The Application of a New Analytical Approach", (Prepared for Air & Waste Management Association 88th Annual Meeting and Exhibition, June 18-23, by Camp Dresser & McKee, Cambridge, MA).

(b) or a site specific odor control plan to avoid nuisance odors at off site occupied buildings including a description of how the residual will be treated prior to storage, or a detailed description and design of the system to contain, control and treat odors at the storage site.

(4) Utilities. The application submissions of Chapter 400, section 4.L(2).

**13~~2~~. Operational ~~s~~Standards for ~~r~~Residual ~~s~~Storage ~~s~~Sites.** All new and existing sites storing residuals prior to agronomic utilization shall comply with the operating requirements of this section. Existing residual storage sites are required to comply with these requirements no later than July 19, 2000.

**A. General Storage Standards.** The following operational standards apply to the operation of all residuals storage sites:

(1) Operations ~~m~~Manual.

(a) For storage sites with a site specific license for residuals storage, the licensee shall prepare, maintain, and implement an operations manual to enable facility personnel to determine the procedures that must be followed to operate the storage facility in compliance with the standards in sections 10 and 12 and the site license. A current copy of the operations manual must be available for inspection at the storage site, or in the case of a field storage site, the residual generation facility.

(b) Transition~~:~~. For residual storage sites licensed under Chapter 567, and that are in effect on July 19, 1999, an operations manual must be submitted to the Department for review and approval by July 19, 2000.

(2) Odor and ~~d~~Dust ~~c~~Control. The stored residual must not cause an odor or dust nuisance at an occupied building or protected location.

(3) Permitted ~~r~~Residuals ~~o~~Only. Only those residuals specifically permitted by the Department may be accepted at the storage site. The licensee must implement the approved hazardous and special waste handling and exclusion plan, if applicable.

(4) Separate ~~s~~Storage. Unless otherwise approved by the Department, different kinds of residuals must be stored in separate areas of the facility. Separate areas must be clearly marked with signs.

(5) Alternative Traffic Standard. The standard for traffic in Chapter 400, section 4.D(1) must be met at all utilization storage sites. This standard is presumed to be met at storage sites when either:

(a) the residual is being stored at a consecution or remediation site for a construction project, to reclaim a mined area, close a landfill, or remediate a state designated uncontrolled hazardous substance site; or

(b) the storage activity results in 16 or fewer additional vehicle trips per day.

(6) Site Access. Access gates to storage sites that have been required in a Department license must be closed and locked except when an authorized person is on duty. Access roads at the site must be maintained in good repair. Livestock must be excluded with fences from

facilities that store a residual that is treated to a class B pathogen reduction standard, including leachate treatment areas, while the residual is stored at the site and for at least 30 days after the removal of the residual.

(7) Fire ~~c~~Control. The licensee shall prevent and control fires at the solid waste site by arranging for a nearby fire department to provide emergency service, and providing sufficient on-site equipment for minor fires. The licensee must also develop and implement a plan to prevent spontaneous combustion in woodwaste, residual, and compost piles, as applicable. All ash must be conditioned with water to prevent combustion at the storage site.

Note: Facilities should develop a fire and rescue plan in conjunction with the local fire department.

(8) Erosion and Sedimentation Control. For storage sites where the topography will be altered or site soils will be disturbed, the applicant must meet the standards in Chapter 400, section 4.J(1)(b).

(9) Alternative Standards for Fitting Harmoniously into the Natural Environment. The standard for fitting harmoniously into the natural environment in Chapter 400, section 4.E(1) must be met at all utilization sites. This standard is met at utilization sites when either:

(a) the residual is being stored on a construction or remediation site for a construction project, to reclaim a mined area, close a landfill, or remediate a state designated uncontrolled hazardous substance site; or

(b) the buffer requirements of Chapter 400, section 4.E(1)(b) and the applicable buffer requirements of this Chapter are met at the site of storage.

(10) Final Construction Certification. Within 30 days following construction completion, the licensee must submit a certification to the Department that the site has been constructed in accordance with the approved drawings and specifications.

(11) Inspection. The storage site licensee must make provisions for an inspection at least annually. The licensee must record the condition of the facility, repairs required, and repairs performed.

(12) Monitoring Program

(a) The licensee shall implement any waste characterization and environmental monitoring program as approved or conditioned in the site license.

(b) Transition~~:~~. For residual storage sites licensed under Chapter 567, and that are in effect on July 19, 1999, a monitoring and/or waste characterization sampling and analytical work plan meeting the standards in Chapter 405 must be submitted to the Department for review and approval by July 19, 2000.

(13) Record-Keeping. The licensee must keep records for a minimum of five (5) years which include the annual volume of residuals placed in and removed from the site, the dates that residuals were stored at the site during the year, problems encountered during operations and their remedies, and other information as established by license condition.

(14) Reporting. On or before February 28 of each year an annual report detailing the activities for the previous year must be submitted to the Department by the licensee. The report must include a summary of the information outlined in sections 12.A(9) through (11) (above) and any other details as specified in the program and site licenses.

**B. Additional ~~o~~Operational ~~s~~Standards for ~~l~~Licensed ~~f~~Field ~~s~~Stacking ~~s~~Sites.** In addition to the operational standards in section 12.A, the following operational standards apply to field stacking sites:

(1) Solids ~~c~~Content. The residual must have a sufficient solids content to stack and maintain a side slope such that for every 3 feet of run, the pile must rise at least one foot.

(2) Shape. Operators must form and maintain a conical shaped pile that sheds water.

(3) Pathogen ~~t~~Treatment. Type II residuals must be treated to class A or B pathogen and vector attraction reduction standards prior to field stacking.

(4) Groundwater ~~p~~Protection. The provisions of this subsection apply to storage of residuals that have a C:N of less than 25:1, unless the residual is a compost, or unless the Department determines in a program license that mineralization or other comparable studies demonstrate that excess nitrates will not contaminate groundwater. This section also applies to storage of residuals which the Department has determined in a Program license contain pollutants which may contaminate waters of the state.

(a) Any leachate, or runoff mixed with leachate, generated from field stacking of a residual must be managed such that pollutants are not carried beyond an approved utilization area. Applicants must develop and implement a leachate control plan, as approved by the Department, which may include filter strips, placing residuals on a layer of sawdust, papermill fiber or similar material to absorb free liquids and inorganic nitrogen; placing hay bales and silt fences around stockpiles; forming piles to shed water; covering piles such that precipitation does not penetrate the pile; or making provisions to collect and treat leachate.

(b) The residual may only be stockpiled on soils with a maximum permeability in the soil C horizon of 2.0 inches per hour;

(c) On soils with a permeability in the C horizon of between 0.6 and 2.0 inches per hour, the residual must be stockpiled on a geomembrane, stockpiled on an absorbent material with a minimum C:N ratio of 100:1, or covered with a tarp, such that contaminated water does not pass through the C soil horizon.

(d) After October 30, 2002, the residual may not be stockpiled in excess of 30 days per growing season, except on insitu soils that have a C horizon that is a marine sediment, lacustrine sediment, or basal till that is at least 40 inches thick.

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Note: The Department intends to facilitate studies into the actual impacts to groundwater from field stacking nitrogenous materials. This will include studies done with the University of Maine, and data from monitoring field stockpile sites. The information from these studies will be used to modify this requirement, and the standards for field stacking residuals for 30-days or less, if necessary.

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(e) The depth to bedrock in the waste handling area must be at least 40 inches when the residual is to be stored for over 30 days, and at least 30 inches when the residual will be stored for 30 days or less.

(f) The depth to the water table in the waste handling area must be at least 24 inches throughout the time period that the waste is stored.

(g) Mitigation. The licensee must, if necessary to scavenge excess soil nitrogen, take any necessary steps, including harrowing and reseeding, to sustain healthy ground cover when residuals are not stored at the site.

(h) Storage ~~t~~Time. The residual must not be field stacked for longer than eight (8) months.

(5) Kraft ~~s~~Sludge. Storage of sludge generated at industrial facilities utilizing kraft wood pulping processes, the maximum storage period at storage sites without impervious liners and leachate collection and treatment is 6 months. The Department may waive this requirement on a case-by-case basis for a maximum of 2 additional months when the applicant has demonstrated that the storage site is inaccessible or that utilization of the stored material would be in violation of any prohibition of land spreading on frozen, snow-covered or saturated ground. For storage of sludge generated at industrial facilities utilizing kraft wood pulping processes, storage sites without impervious liners and leachate collection systems may be used only once in any 10-year period.

Note: This standard is required by 38 MRSA section 1304(13-A).

**C. Additional Siting and Operational Standards for Sludge Storage Facilities**

(1) An abutter to a sludge storage site may request that sludge not be stored within 50' of the abutter's property boundary. Requests must be filed with the Department in writing, and must include:

(a) the name and mailing address of the property owner

(b) the physical location of the property upon which the sludge is being stored;

(c) the type of sludge being stored; and

(d) the name and mailing address of the facility generating the sludge.

(2) Pursuant to 38 MRSA 1310-N, subsection 2-G, sludge may not be stored within 50' of an abutter's property, upon notification that the Department has received a written request from the abutter to establish the set-back.

**D. Closure of ~~r~~Residual ~~s~~Storage ~~s~~Sites**

(1) Notification: The licensee of a residual storage site shall notify the Department within 10 days after the permanent closure of a licensed storage site.

(2) Closure Performance Standard. The licensed storage site must be closed in a manner that minimizes the need for further maintenance; and so that the closed site will not pollute any waters of the state, contaminate the ambient air, constitute a hazard to health or welfare, or

create a nuisance. At a minimum, the licensee must remove all wastes and residuals from the site; broom clean the site structures and equipment; and in the case of field stacking sites, harrow, reseed and take any other necessary steps to sustain healthy ground cover at the site.

**14~~3~~. Municipal Oversight of Residuals Utilization Activities**

**A. Municipal Ordinances.** Pursuant to 38 MRSA section 1310-U, under the municipal home rule authority granted by the Constitution of Maine, Article VIII, Part Second and Title 30-A, section 3001, municipalities may enact ordinances with respect to residual utilization and storage that contain standards the municipality finds reasonable, provided the following standards are met:

(1) The standards contained in the ordinance may not be more strict than those contained in 38 MRSA section 1301 *et seq*. and these rules.

(2) The municipality must file a copy of the ordinance with the Commissioner within 30 days of its adoption.

(3) Municipal ordinances must use definitions consistent with those in Chapter 400, section 1, and this Chapter.

**B. Municipal Licensing and Enforcement of Sludge Licenses.** For purposes of this subsection, the term "sludge" includes municipal, commercial or industrial wastewater treatment plant sludge.

(1) Municipal Enforcement. Pursuant to Title 30-A, section 4452, section 6, a municipality, after notifying the Department, may enforce the terms and conditions of a sludge utilization or storage site permit issued by the Department under this Chapter and Chapter 400.

(2) Coordination between municipality and the Department on sludge licenses.

(a) Notification. The Department shall notify municipalities (municipal officers or their designees) in which sludge utilization sites or sludge storage sites are being proposed. Notification will be made within 14 working days of Department receipt of a complete license application. The notification will include, at a minimum, the name and address of the applicant, and analytical results of the sludge proposed to be spread in the municipality.

(b) Municipal ~~c~~Conditions in Department Licenses. Prior to approving an application for a sludge land application site or storage facility, the Department will consult with the municipal officers or their designees in the municipality in which the site or facility is proposed, and provide them with an opportunity to suggest conditions, including additional setbacks, to be included in the license. The Department will impose those conditions that are necessary for the project to meet the licensing standards in this Chapter. If the Department does not impose conditions on a license that has been suggested in writing by the municipality, the Department will provide a written explanation to the municipality.

(c) The Department shall consult with a municipality within 10 days of receipt of a request by a sludge generator to change the terms or conditions of a sludge land application or storage facility license concerning a facility located in the municipality.

(3) Petitions ~~c~~Concerning ~~s~~Sludge ~~t~~Testing ~~p~~Protocols. A municipality may petition the Commissioner to review a generating facility's testing protocol for sludge. The Commissioner will respond to the municipality, in writing, within 10 days of receipt of a written petition. The Commissioner may order the generator to conduct an additional waste characterization test on their sludge at the generator's expense. The generator must provide a copy of the additional test results to the municipality within 30 days of receipt.

## Appendix A. Loading Rate Calculations

### 1. Nitrogen ~~l~~Loading ~~r~~Rate ~~c~~Calculations

**A**. The Percent of Organic Nitrogen Mineralized from Sewage Sludge must be assumed as in table 419.6, unless residual specific information obtained in accordance with Chapter 405 is available. For other residuals, the generator must determine residual mineralization rates through sampling, in accordance with Chapter 405:

Table 419.6
Percentages of Organic Nitrogen Mineralized after
Sewage sludge of various types are land applied

| Years after sludge application | Type of Sewage Sludge | | | |
|---|---|---|---|---|
| | Primary and waste activated | Aerobically Digested | Anaerobically Digested | Composted |
| 0 -1 | 40 | 30 | 20 | 10 |
| 1 - 2 | 20 | 15 | 10 | 5 |
| 2-3 | 10 | 8 | 5 | 3 |
| 3-4 | 5 | 4 | 3 | 3 |

**B**. When detailed information regarding organic sources of nitrogen from past utilization of residuals or manure and cropping practices is not available, soil organic matter must be assumed to provide 10 pounds of available nitrogen per acre per 1% organic matter over 5%. (i.e. if organic matter in soil is 6.5% the soil provides 10 lbs. x (6.5-5) = 10 lbs. x 1.5 = 15 lbs. per acre)

**C.** Unless otherwise approved by the Department, crop nitrogen needs must be determined based on the recommendations in the *"Soil Testing Handbook for Professionals in Agriculture, Horticulture, Nutrient and Residuals Management*, (3rd edition, 1997). Other crop needs will be determined by the Department on a case by case basis, based on recommendations from the Maine Cooperative Extension's Maine Soil Testing Service and Analytical Laboratory at the University of Maine in Orono, and other agricultural or silvicultural sources.

**D.** Loading rates of residuals based on Nitrogen need must be calculated as follows, based on representative residual analysis:[1]

[1]Modified from Boub, et. al. 1995.

| Line | Parameter | value | Unit |
|---|---|---|---|
| 1. | Available Nitrate-N = %$NO_3$-N[2] x 2000 lbs/ton | | lbs $NO_3$-N / ton residual |
| 2. | Available Ammonium-N= Recovery fraction[3] x %$NH_4$-N[4] x 2000 lbs/ton | | lbs $NH_4$-N/ ton residual |
| 3. | Available Inorganic N/ton residual = Available $NH_4$ [line 2] + $NO_3$-N [line 1] | | lbs Inorganic N / ton residual |
| 4. | Organic N = [Total N - Inorganic N [line 3]] x 2000 lbs/ton | | lbs Organic N / ton residual |
| 5. | Available Organic N = Organic N [Line 4] x mineralization rate[5] | | lbs Available Organic N / ton residual |
| 6. | Available N from the residual that was applied in previous years[6] | | lbs Available Organic N / ton residual |
| 7. | Total Plant Available N = Inorganic N [line 3] + Avail Org N [line 5] | | lbs Available N / ton residual |
| 8. | Total Available N required from residual = N needs of crop[7] - Credits from Crop History[8] - Mineralized N from previous years application [line 6] | | lbs Available N/ acre-yr |
| 9. | Residual Application (dry) Rate = N required from residual / Avail N from residual [line 8 / line 7] | | dry tons residual / acre-yr |
| 10. | Residual Application (wet) Rate = Dry Residuals Rate [line 9] / % Solids | | wet tons residual / acre-yr |
| 11. | If Applicable: Residual Application (wet) Rate per cut of hay = [line 10] / 2 cuttings | | wet tons residual / acre-cutting |

Note: References Cited and Other guidance on agronomic rate calculations:

Boub, Tom, George O. Estes, James R. Mitchell and David Seavey, June 1995, "Best Management Practices: Biosolids" (University of New Hampshire Cooperative Extension, UNH, Durham, NH).

EPA, December 1994, Land Applications of Sewage Sludge: A Guide for Land Appliers on the Requirements of the Federal Standards for the Use or Disposal of Sewage Sludge, 40 CFR Part 503 (EPA/831-B-93-002b, USEPA, OECA, Washington, DC).

[2]From Residual Analysis

[3] When surface applied, approximately 50% of the Ammonium $NH_4$-N Nitrogen will be lost to volatilization. Recovery fraction is the portion of Ammonium that does not volatilize.

[4]From Residual Analysis

[5]Mineralization rates are specified in appendix A, section 1.A above. A weighted average of these percentages may be used for combined sludges.

[6]See Appendix A, section 1.A or Section 1.B above

[7]See Hoskins, Bruce R., 1997, "Soil Testing Handbook for Professionals in Agriculture, Horticulture, Nutrient and Residuals Management, 3rd edition (Formerly Soil Testing Handbook for Professional Agriculturists), (Maine Soil Testing Service, 5722 Deering Hall, University of Maine, Orono, ME).

[8]This includes the pounds of nitrogen per acre available to the crops from corn silage, animal manure, and / or cover crops.

EPA, October 1983, Process Design Manual: Land Application of Municipal Sludge (USEPA, Environmental Research Laboratory, Cincinnati OH, EPA-625/1-83-016).

Hoskins, Bruce R., 1997, "Soil Testing Handbook for Professionals in Agriculture, Horticulture, Nutrient and Residuals Management, 3rd edition (Formerly Soil Testing Handbook for Professional Agriculturists), (Maine Soil Testing Service, 5722 Deering Hall, University of Maine, Orono, ME).

Huddleston, J.H. and M.P. Ronayne, September 1995, Manual 8: Guide to Soil Suitability and Site Selection for Beneficial Use of Domestic Wastewater Biosolids (Cooperative Extension Service, Agricultural Communications, Oregon State University, Administrative Services A422, Corvallis, OR 97331-2119).

**2. Pollutant Loading Calculations**

**A. Annual Pollutant Loading Rate Calculation.** To determine the annual loading rate of heavy metals or other pollutants at a utilization site, use equation 419.1 as follows

(equation 419.1)

$$APLR = LR * RP_C * .001$$

where:
APLR - Annual Pollutant Loading Rate in kg-pollutant/ha
LR - Residual loading rate in mt-residual/ha (amount of residual applied in a year)
$RP_C$ - Pollutant concentration in the residual in mg-pollutant/kg-residual
.001 - Conversion factor = 1,000 kg/mt * 0.000001 kg/mg

**B. Cumulative Pollutant Loading Rate Calculation.** To determine the cumulative pollutant loading rate of heavy metals or other pollutants at a utilization site, sum the annual pollutant loading rates for the site, as shown in equation 419.2.

(Equation 419.2)

$$CPLR = APLR_1 + APLR_2 + ... APLR_n$$

(equation 419.4)

where:
CPLR - Cumulative Pollutant Loading Rate in kg-pollutant/ha at the site
$APLR_1$ - Annual Pollutant Loading Rate during the first year in kg-pollutant/ha
$APLR_2$ - Annual Pollutant Loading Rate during the second year in kg-pollutant/ha
$APLR_n$ - Annual Pollutant Loading Rate during the nth, or most recent, year in kg-pollutant/ha

**C. Estimation of ~~s~~Soil ~~p~~Pollutant ~~c~~Concentration ~~i~~Increase ~~b~~Based on ~~r~~Residual ~~p~~Pollutant ~~c~~Concentration.** To estimate the pollutant concentration in soil that will result from the cumulative loading of a pollutant in a residual at a site, use equation 419.3:

(equation 419.3)

$SI = (RPc * LR * SL) / (2000)$

Where:

SI - Cumulative soil concentration increase in mg-pollutant/kg-soil

$RP_C$ - Pollutant concentration in the residual in mg-pollutant/kg-residual

LR - Residual loading rate in mt-residual/ha/yr (amount of residual applied in a year)

SL - Site Life, or the number of times the residual will be applied at the site in 100 years, in years.

2000 - is the assumed dry mass of soil in mt/ha (dry weight) in a plow layer 15 cm thick (based on a bulk density of 1.33 g/cm$^3$)

**D. Common Conversions**

(1) Dry tons / acre ∗ 2.24 = Dry metric tons / hectare

(2) Wet tons ∗ (% solids ∗ 0.01) = Dry Tons

(3) Approximation based on weight of water: wet tons/acre ∗ 239.7 gallons/ton = gallons/acre

(4) Approximation based on weight of water: 1 yd$^3$ sludge = 27ft$^3$/yd$^3$ ∗ 63.0 lb/ft$^3$ = 1700 lbs

(5) Approx. based on weight of water: 1 yd$^3$ sludge = 1700 lbs/yd$^3$ ÷ 2000 lb/ton = 0.85 tons

(6) Approx. based on weight of soil: lb/acre ÷ 2 = ppm

(7) lb/acre * 1.121 = kg/ha

(8) 1 acre = 43,560 ft$^2$

(9) 1 acre of soil six inches deep = approx. 2,000,000 lbs

(10) 1 lb = 0.453 kg

(11) 1 lb P = 2.29 lb $P_2O_5$ (phosphoric acid)

(12) 1 lb K = 1.2 lb $K_2O$ (potash)

(13) 1 ppm (in water) = 1 mg/l

(14) 1 ppm (in soil) = 1 mg/kg

(15) soil metal concentration in soil (ppm) = loading rate (lbs/acre) / 2

## Appendix B. Pathogen and Vector Attraction Reduction Standards

**1. Special Definitions.** For the purposes of this Chapter, the following terms have the following meanings:

**A.** Aerobic digestion is the biochemical decomposition of organic matter in sewage sludge into carbon dioxide and water by microorganisms in the presence of air.

**B.** Anaerobic digestion is the biochemical decomposition of organic matter in sewage sludge into methane gas and carbon dioxide by microorganisms in the absence of air.

**C.** Density of microorganisms is the number of microorganisms per unit mass of total solids (dry weight) in the sewage sludge.

**D.** Land with a high potential for public exposure is land that the public uses frequently. This includes, but is not limited to, playgrounds, public parks, athletic fields, cemeteries, plant nurseries, construction sites in urban areas, and turf farms.

**E.** Land with a low potential for public exposure is land that the public uses infrequently. This includes, but is not limited to, agricultural land, forests, and/or reclamation sites located in an unpopulated or rural area; remote lands; or securely fenced land.

**F.** Pathogenic organisms are disease-causing organisms. These include, but are not limited to, certain bacteria, protozoa, viruses, and viable helminth ova.

**G.** pH means the logarithm of the reciprocal of the hydrogen ion concentration, corrected to a standard temperature of 25 degrees Celsius.

**H.** Specific oxygen uptake rate (SOUR) is the mass of oxygen consumed per unit time per unit mass of total solids (dry weight basis) in the sewage sludge.

**I.** Total solids are the materials in sewage sludge that remain as residue when the sewage sludge is dried at 103 to 105 degrees Celsius.

**J.** Unstabilized solids are organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

**K.** Vector attraction is the characteristic of sewage sludge that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

**L.** Volatile solids is the amount of the total solids in sewage sludge lost when the sewage sludge is combusted at 550 degrees Celsius in the presence of excess air.

**2. Class A ~~p~~Pathogen ~~r~~Reduction ~~p~~Process ~~s~~Standards.** Class A pathogen reduction standards must be met through one of the following processes:

**A. Composting.** ~~-~~ Through the process of composting, the temperature of the residual is maintained at 55 degrees Celsius or higher for three consecutive days. For windrow systems, this standard is presumed to be met if the residual is generally maintained at 55 degrees or higher for 15 days or longer, and during the period when the compost is maintained at 55 degrees or higher, there is a minimum of five turnings of the compost pile.

**B. Thermophilic ~~a~~Aerobic ~~d~~Digestion.** Liquid residual is agitated with air or oxygen to maintain aerobic conditions and the mean cell residence time of the residual is 10 days at 55 to 60 degrees Celsius.

**C. Beta ~~r~~Ray ~~i~~Irradiation.** Residual is irradiated with beta rays from an accelerator at dosages of at least 1.0 megarad at room temperature (ca 20 degrees Celsius).

**D. Gamma ~~r~~Ray ~~i~~Irradiation.** Residual is irradiated with gamma rays from certain isotopes, such as $^{60}$Cobalt and $^{137}$Cesium, at dosages of at least 1.0 megarad at room temperature (ca 20 degrees Celsius).

**E. Pasteurization.** The temperature of the residual is maintained at 70 degrees Celsius or higher for 30 minutes or longer.

**F. Heat Drying.** Residual is dried by direct or indirect contact with hot gases to reduce the moisture content of the residual to 10 percent or lower. Either the temperature of the residual particles exceeds 80 degrees Celsius or the wet bulb temperature of the gas in contact with the residual as the residual leaves the dryer exceeds 80 degrees Celsius.

**G. Heat Treatment.** Liquid residual is heated to a temperature of 180 degrees Celsius or higher for 30 minutes.

**H. Time and ~~t~~Temperature**. The temperature of the residual must be maintained at a specific value for a period of time as specified in one of the following:

(1) When the percent solids of the residual is seven percent or higher, the temperature of the residual must be 50 degrees Celsius or higher; the time period must be 20 minutes or longer; and the temperature and time period must be determined the following equation (419.4), except when small particles of residual are heated by either warmed gases or an immiscible liquid:

EQUATION (419.4):

$$D = (131{,}700{,}000) \div 10^{0.1400t}$$

Where: D=time in days
t=temperature in degrees Celsius.

(2) When the percent solids of the residual is seven percent or higher and small particles of residual are heated by either warmed gases or an immiscible liquid, the temperature of the residual must be 50 degrees Celsius or higher; the time period must be 15 seconds or longer; and the temperature and time period must be determined using equation (419.4).

(3) When the percent solids of the residual is less than seven percent and the time period is at least 15 seconds, but less than 30 minutes, the temperature and time period must be determined using equation (419.4).

(4) When the percent solids of the residual is less than seven percent; the temperature of the residual is 50 degrees Celsius or higher; and the time period is 30 minutes or longer, the temperature and time period must be determined by using equation (419.5).

EQUATION (419.5)

$$D=50{,}070{,}000 \div 10^{0.1400t}$$

Where: D=time in days
t=temperature in degrees Celsius.

**I. Alkaline Stabilization.** The pH of the residual must be raised to above 12 and must remain above 12 for 72 hours. The temperature of the residual must be above 52 degrees Celsius for 12 hours or longer during the period that the pH of the residual is above 12. At the end of the 72 hour period during which the pH of the residual is above 12, the residual must be air dried to achieve a percent solids in the residual greater than 50 percent.

**J. Other.** Other methods for the treatment of residuals will be approved on a case by case basis, when the generator demonstrates, at a minimum, that the proposed process can meet the following standards, and under what operating conditions the following standards are met. Once approved, the process must be operated under the conditions that are established by the Department as meeting, at a minimum, the following Class A pathogen reduction standards.

(1) The density of *Salmonella sp*. bacteria in the residual must be less than three Most Probable Number per four grams of total solids (dry weight basis).

(2) The density of fecal coliform in the residual is shown to be less than 1000 Most Probable Number per gram of total solids (dry weight basis).

(3) The density of enteric viruses in the residual after pathogen treatment is less than one Plaque-forming Unit per four grams of total solids (dry weight basis).

(4) The density of viable helminth ova in the residual after pathogen treatment is less than one per four grams of total solids (dry weight basis)

**3. Class B ~~p~~Pathogen ~~r~~Reduction ~~p~~Process ~~s~~Standards.** Class B pathogen reduction standards must be met through one of the following processes:

**A. Alkaline ~~s~~Stabilization.** Sufficient alkali material, such as lime, is added to the residual to raise the pH of the residual to 12 after two hours of contact.

**B. Aerobic ~~d~~Digestion.** Residual is agitated with air or oxygen to maintain aerobic conditions for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature must be between 40 days at 20 degrees Celsius and 60 days at 15 degrees Celsius.

**C. Air ~~d~~Drying.** Residual is dried on sand beds or on paved or unpaved basins. The residual dries for a minimum of three months. During two of the three months, the ambient average daily temperature is above zero degrees Celsius.

**D. Anaerobic ~~d~~Digestion.** Residual is treated in the absence of air for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature must be between 15 days at 35 to 55 degrees Celsius and 60 days at 20 degrees Celsius.

**E. Composting.** In a compost system the minimum temperature of all the residual is 40 degrees Celsius or higher for five days. For four hours during the five days, the temperature in the compost pile exceeds 55 degrees Celsius.

**F. Test Out.** Seven samples of the residual must be less than either 2,000,000 Most Probable Number per gram of total solids (dry weight basis) or 2,000,000 Colony Forming Units per gram of total solids (dry weight basis).

**G. Other.** Other methods for the treatment of residuals will be approved on a case by case basis, when the generator demonstrates that the proposed process meets the standards in section 4 and Chapter 400, sections 3 and 4.

**4. Class A ~~v~~Vector ~~a~~Attraction ~~r~~Reduction ~~s~~Standards.** Class A vector attraction reduction standard must be met through one of the following process:

A. In an aerobic or anaerobic digestion process, the mass of volatile solids in the residual must be reduced by a minimum of 38 percent (see calculation procedures in "Environmental Regulations and Technology - Control of Pathogens and Vector Attraction in Sewage sludge," EPA-625/R-92/013, 1992, US. Environmental Protection Agency, Cincinnati, Ohio 45268). This standard does not apply to a composting process.

B. When the 38 percent volatile solids reduction requirement in Appendix B.4.A (above) cannot be met for an anaerobically digested sewage sludge, vector attraction reduction can be demonstrated by digesting a portion of the previously digested sewage sludge anaerobically in the laboratory in a bench-scale unit for 40 additional days at a temperature between 30 and 37 degrees Celsius. When at the end of the 40 days the volatile solids in the sewage sludge at the beginning of that period is reduced by less than 17 percent, vector attraction reduction is achieved.

C. When the 38 percent volatile solids reduction requirement in Appendix B.4.A (above) cannot be met for an aerobically digested sewage sludge, vector attraction reduction can be demonstrated by digesting a portion of the previously digested sewage sludge that has a percent solids of two percent or less aerobically in the laboratory in a bench-scale unit for 30 additional days at 20 degrees Celsius. When at the end of the 30 days, the volatile solids in the sewage sludge at the beginning of that period is reduced by less than 15 percent, vector attraction reduction is achieved.

D. The specific oxygen uptake rate (SOUR) for residual treated in an aerobic digestion process must be equal to or less than 1.5 milligrams of oxygen per hour per gram of total solid (dry weight basis) at a temperature of 20 degrees Celsius. This standard does not apply to a composting process.

E. Residual must be treated by composting or in an other aerobic process for 14 days or longer. During that time, the temperature of the residual must be higher than 40 degrees Celsius and the average temperature of the residual must be higher than 45 degrees Celsius.

F. The pH of residual must be raised to 12 or higher by alkali addition and, without the addition of more alkali, must remain at 12 or higher for two hours and then at 11.5 or higher for an additional 22 hours.

Note: The pH does not have to be 11.5 at the time of application.

G. The percent solids of residual that does not contain unstabilized solids generated in primary wastewater treatment process must be equal to or greater than 75 percent based on the moisture content and total solids prior to mixing with other materials.

H. The percent solids of residual that contains unstabilized solid generated in a primary wastewater treatment process must be equal to or greater than 90 percent based on the moisture content and total solids prior to mixing with other materials.

I. Other methods for the treatment of residuals will be approved on a case by case basis, when the generator demonstrates that the proposed process meets the standards in section 4 and Chapter 400, sections 3 and 4.

**5. Class B ~~v~~Vector ~~a~~Attraction ~~r~~Reduction ~~s~~Standards.** Class B vector attraction reduction standards must be met through one of the following residual handling practices:

A. Residual must be injected below the surface of the land. No significant amount of the residual must be present on the land surface within one hour after the residual is injected. When the residual that is injected below the surface of the land is Class A with respect to pathogens, the residual must be injected below the land surface within eight hours after being discharged from the pathogen treatment process.

B. Residual applied to the land surface must be incorporated into the soil within six hours after application. When the residual that is incorporated into the soil is Class A with respect to pathogens, the residual must be applied to or placed on the land within eight hours after being discharged from the pathogen treatment process.

C. The pH of residual must be raised to 12 or higher by alkali addition and, without the addition of more alkali, must remain at 12 or higher for two hours and then at 11.5 or higher for an additional 22 hours.

D. Other methods for the treatment of residuals will be approved on a case by case basis, when the generator demonstrates that the proposed process meets the standards in section 4 and Chapter 400, sections 3 and 4.

STATUTORY AUTHORITY: 38 MRSA section 1304(1), (13) and (13-A).

EFFECTIVE DATE:
April 21, 1985 (as Chapter 567, Rules for Land Application of Sludge and Residuals)

AMENDED:
October 8, 1986 (Part D added)
October 17, 1988 - Sections D-1 and E
December 5, 1989 - Section D
December 23, 1989 - Section C and A-3
December 23, 1989 - Section B-4
September 23, 1990 - Part D
July 27, 1991 - Part D
January 4, 1994 - Part D

EFFECTIVE DATE (ELECTRONIC CONVERSION):
May 4, 1996

NON-SUBSTANTIVE CORRECTIONS:
February 16, 1997 - Duplicate paragraphs from Part D removed; Part D and E appendices renamed; Part E referenced in Table of Contents, Part C Table of Contents referencers corrected, page numbers in Table of Contents corrected.

REPEALED AND REPLACED:
July 19, 1999 - Chapter 567 replaced by Chapter 419, Agronomic Utilization of Residuals

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December 19, 1999

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January 13, 2000 - renumbered 11(C), 12(B)(4); corrected font problem in Appendix B(2)(D).

AMENDED:
February 8, 2012 - filing 2012-14