2. Soil borings extending to bedrock, unless depth to bedrock is 100 feet or more below the ground surface, or 30 feet below the anticipated facility base grade, whichever is greater. The borings shall be distributed in a grid pattern throughout the area. At least one boring per 5 acres with a minimum of 5 borings is required.

3. Soil borings shall be converted to water table observation wells and well nests in accordance with the following schedule:

a. Three wells nests consisting of a water table observation well and a piezometer in the unconsolidated material.

b. One piezometer within the competent bedrock at one of the well nest locations.

4. Analyze each significant soil layer encountered during boring investigations for grain-size distribution and classify according to the unified soil classification system.

5. At least one laboratory permeability test shall be conducted for each significant soil layer above and below the water table. Single well response tests shall be performed on all on-site wells.

6. A summary of the groundwater monitoring data obtained under ss. NR 635.12 and 635.16, where applicable.

(cg) *Subsurface investigation results.* Summarize the results of the subsurface investigations utilizing a series of geologic sections which connect the soil borings performed. In each section show present topography, soil borings, soil classification and other properties, interpreted soil stratigraphy, bedrock, well construction permeability results and stabilized water level readings for each well.

(cm) *Water table contour map.* Prepare a water table contour map based on stabilized water level readings. The topographic map shall be used as a base for this map.

(ct) *Monitoring summary.* A summary of all groundwater, gas, surface water and physical features monitoring previously performed for the facility, including all monitoring required under chs. NR 600 to 685.

(cw) *Plume.* A description of any plume of contamination that has entered the groundwater from any treatment, storage or disposal unit at the time the initial site report is submitted that:

1. Delineates the extent of the plume on the map required under par. (c) 1; and

2. Identifies the concentration of each hazardous constituent in ch. NR 635 - Appendix I throughout the plume or identifies the maximum concentrations of each ch. NR 635 - Appendix I hazardous constituent in the plume.

(d) *Data analysis.* From the results of the field investigations, regional geotechnical information and land use information, analyze and make preliminary conclusions and recommendations on site development. Include a discussion of the potential for the site to meet the locational requirements in s. NR 660.06 and potential limitations on site development.

(e) *Preliminary liner assessment.* One or more potential alternatives for a primary liner meeting the requirements of s. NR 660.13 (10) (a) shall be identified.

(em) *Proposed testing, primary liner.* A description of the proposed testing program for the primary liner shall be submitted which outlines the proposed procedures for performing the tests required in s. NR 660.09 (7) and the number of samples necessary to obtain representative results. All proposed testing shall meet or exceed the requirements of the national sanitation foundation standard 54 for flexible membrane liners. The definitions of terms or words in section 2 of the national sanitation foundation standard 54 for flexible membrane liners shall apply to terms or words used in this subdivision where a dictionary definition does not exist or is not applicable. The description of the proposed testing program shall include:

1. Liner compatibility including:

a. The effect of soil pH.

b. The effect of chemical contaminants within the soil.

c. Short-term testing to evaluate the ability of the liners to contain the waste and waste leachate.

d. Long-term testing including samples of the delivered liner and actual field constructed seams.

2. Susceptibility to attack by bacteria and fungi.

3. Physical suitability including:

a. Tear resistance.

b. Puncture resistance.

c. Creep resistance.

d. Elongation potential.

e. Membrane thickness.

Note: The publication containing standard 54 may be obtained from:

National Sanitation Foundation
P.O. Box 1468
Ann Arbor, Michigan 48106

This publication is available for inspection at the offices of the department, the secretary of state and revisor of statutes.

(er) *Proposed testing, secondary liner.* A description of the proposed testing program for the secondary liner shall be submitted which outlines the proposed procedures for performing the tests required in s. NR 660.09 (8) and describes the number of samples necessary to obtain representative results. The description of the proposed testing program shall include:

1. For short and long-term permeability testing, the:

a. Types of permeant;

b. Proposed pressure gradients;

c. Number of pore volumes to be passed through the samples;

d. Chemical analysis of the influent through time; and

e. Chemical analysis and volume measurements of effluent being discharged through time.

2. A description of the physical testing program of the samples before and after permeability testing to meet the requirements of s. NR 660.09 (8) (b).

(f) *Appendix.* Show the site boundaries on all maps included in the appendix. In the appendix include:

1. All new data such as boring logs, soil tests, well construction data, water level measurements and test data and results.

2. A plat map of the area.

3. A USGS quadrangle of the area, updated with locations of applicable wells installed after preparation of the quadrangle.

4. A soil conservation service soil map and interpretation, if available.

5. References.

History: Cr. Register, February, 1991, No. 422, eff. 3-1-91; corrections in (2) (c) 5. b. and (e) made under s. 13.93 (2m) (b) 1 and 7, Stats., Register, May, 1992, No. 437; correction in (2) made under s. 13.93 (2m) (b) 1 and 7, Stats., Register, August, 1992, No. 440; correction in (2) made under s. 13.93 (2m) (b) 7, Stats., Register, March, 1993, No. 447.

NR 660.09 Feasibility report. Unless specifically exempted in s. NR 660.04, no person may establish or construct a hazardous waste landfill or surface impoundment, expand an existing facility or be issued an initial operating license under s. NR 680.32 without first obtaining approval of a feasibility report describing the physical conditions of the proposed facility and subsequently obtaining approval of a plan of operation from the department. The purpose of the feasibility report is to determine whether the facility has potential for use as a hazardous waste landfill or surface impoundment and to identify any conditions which the applicant is required to include in the plan of operation. The feasibility report shall be submitted in accordance with s. 144.44, Stats., and ss. NR 680.05 and 680.06.

(1) All information specified in s. NR 660.08 (2) shall be submitted.

(a) If an initial site report has been submitted, the applicant shall include all pertinent information contained in the feasibility report.

(b) If an initial site report has been reviewed by the department, additional information addressing all department review comments shall be included.

(2) The applicant shall prepare an existing site condition topographic plan which shall contain a detailed topographic survey of the facility area and all area within a distance of 1500 feet of the facility. The minimum scale of this plan shall be one inch = 200 feet with a maximum 2-foot contour interval. The contour interval shall be sufficient to clearly show the pattern of surface water flow in the vicinity of and from each operating unit of the facility. All elevations shall be related to USGS data. More than one plan sheet shall be prepared to show the required

information if one sheet is too detailed to be clear. The plan or plans shall clearly show:

(a) 100-year floodplain area.

(b) Surface waters, including intermittent streams.

(c) Homes, buildings, man-made features and utility lines.

(d) Surrounding land uses, such as residential, commercial, agricultural and recreational.

(e) Property boundaries, facility or waste management boundaries and fill areas, including any previous fill area.

(f) Access control, such as fences and gates.

(g) Water supply wells and any other wells, such as irrigation wells.

(h) Well boring locations and observation well locations.

(i) A wind rose, which show prevailing wind speed and direction.

(j) Buildings, treatment, storage or disposal operations; or other structures such as recreation areas, runoff control systems, access and internal roads, storm, sanitary and process sewerage systems, loading and unloading areas and fire control facilities.

(k) Barriers for drainage or flood control.

(l) Location of operational units within the facility where hazardous waste is or will be treated, stored or disposed of, including equipment cleanup areas.

(3) Field and laboratory investigations shall be performed to further define site physical characteristics including soils, bedrock and groundwater. These investigations shall include:

(a) Sufficient soil borings to adequately define the soil and bedrock conditions at the site. At a minimum, 5 soil borings for the first 5 acres and 3 borings for each additional 5 acres or portion thereof shall be performed. The borings shall be located in a grid pattern to provide at least one boring in each major geomorphic feature, such as ridges, lowlands and drainage swales. All borings shall extend at least 30 feet below the anticipated facility base grade or to bedrock, unless the depth to bedrock is 100 feet or more below the facility base grade.

(b) Soil samples shall be collected utilizing standard undisturbed soil sampling techniques. Samples may not be composited for testing purposes. Soil samples shall be collected on a continuous basis from the ground surface to at least 30 feet below the anticipated base of the facility. After that point, soil samples shall be collected from each soil layer encountered and at maximum 5-foot intervals. All soil and bedrock samples shall be described and retained until the department issues a feasibility determination. Representative samples of all major soil units and bedrock formations shall be retained until the department issues an operating license for the facility.

(c) Boring logs accurately recording soil and bedrock conditions encountered at the site shall be submitted for all borings. Each log shall include soil and rock descriptions, method of sampling, sample depth, date of boring, water level measurements and dates, and soil test data. All elevations shall be corrected to USGS data.

2. The tests utilized in the quality control and quality assurance program shall be detailed. The number and location of the tests shall be indicated.

Note: The publication containing standard 54 may be obtained from:

National Sanitation Foundation
P.O. Box 1468
Ann Arbor, MI 48106

This publication is available for inspection at the offices of the department, the secretary of state and the revisor of statutes.

(8) The following tests shall be performed in accordance with procedures approved in writing by the department, to document that the secondary liner is compatible with the expected or actual leachate:

(a) Short and long term tests to determine:

1. The saturated variable head permeability of the clay samples with both distilled water and leachate.

2. Chemical analysis of the permeants over the duration of the test.

3. Chemical analysis and volume measurements of the effluent being discharged over the duration of the test.

(b) Physical testing of the clay samples before and after permeability testing including:

1. Particle size, as specified in ASTM standard D-422-63 (1972).

2. Particle size for material finer than number 200 sieve, as specified in ASTM standard D-1140-54 (1971).

3. Liquid limit, as specified in ASTM standard D-423-66 (1972).

4. Plasticity index, as specified in ASTM standard D-424-59 (1971).

Note: The publications containing these standards may be obtained from:

American Society for Testing and Materials
1916 Race Street
Philadelphia, PA 19103

The publications containing these standards are available for inspection at the offices of the department, the secretary of state and the revisor of statutes.

(9) The topographic map required under sub. (2) shall include a delineation of the waste boundary, the property boundary, the proposed "point of standards application" as specified in ch. NR 635, the proposed location of groundwater monitoring wells as required under ch. NR 635, and, to the extent possible, the information required in s. NR 660.08 (2) (b) 4.

(10) If the presence of hazardous constituents has not been detected in the groundwater at the time of the feasibility report is submitted, the owner or operator shall submit sufficient information, supporting data, and analysis to establish a detection monitoring program which meets the requirements of ss. NR 635.05 to 635.15 This submission shall address the following items specified under ss. NR 635.05 to 635.15:

(a) A proposed list of indicator parameters, waste constituents or reaction products that can provide a reliable indication of the presence of hazardous constituents in the groundwater;

(b) A proposed groundwater monitoring system;

(c) Background values for each proposed monitoring parameter or constituent, or procedures to calculate the values; and

(d) A description of proposed sampling, analysis and statistical comparison procedures to be utilized in evaluating groundwater monitoring data.

(11) If the presence of hazardous constituents has been detected in the groundwater at the point of standards application at the time feasibility report is submitted the owner or operator shall submit sufficient information, supporting data, and analyses to establish a compliance monitoring program which meets the requirements of ss. NR 635.05 to 635.15. Except as provided in s. NR 635.13 (9), the owner or operator shall also submit an engineering feasibility plan for a corrective action program necessary to meet the requirements of s. NR 635.15, unless the owner or operator obtains written authorization in advance from the department to submit a proposed license schedule for submittal of the plan. To demonstrate compliance with s. NR 635.13, the owner or operator shall include the following information:

(a) A description of the wastes previously handled at the facility;

(b) A characterization of the contaminated groundwater, including concentrations of hazardous constituents;

(c) A list of hazardous constituents for which compliance monitoring shall be undertaken in accordance with ss. NR 635.09 and 635.12;

(d) Proposed concentration limits for each hazardous constituent, based on the criteria in s. NR 635.06, including a justification for establishing any alternate concentration limits;

(e) Detailed plans and an engineering report describing the proposed groundwater monitoring system in accordance with the requirements of s. NR 635.09; and

(f) A description of proposed sampling, analysis and statistical comparison procedure to be utilized in evaluating groundwater monitoring data.

(12) If hazardous constituents have been measured in the groundwater which exceed the concentration limits established under table I in s. NR 635.09, or if groundwater monitoring conducted at the time of feasibility report submittal under s. NR 635.14 at the waste boundary indicates the presence of hazardous constituents from the facility in groundwater over background concentrations, the owner or operator shall submit sufficient information, supporting data and analyses to establish a corrective action program which meets the requirements of s. NR 635.12. An owner or operator is not required to submit information to establish a corrective action program if the owner or operator demonstrates to the department that alternate concentration limits will protect human health and the environment after considering the criteria listed in s. NR 635.08 (2). Instead, the owner or operator shall submit sufficient information to establish a compliance monitoring program which meets the requirements of s. NR 635.12. To demonstrate compliance with s. NR 635.12, the owner or operator shall address the following items:

(a) A characterization of the contaminated groundwater, including concentrations of hazardous constituents;

(b) The concentration limit for each hazardous constituent found in the groundwater as in s. NR 635.09;

(c) Detailed plans and an engineering report describing the corrective action to be taken; and

(d) A description of how the groundwater monitoring program will demonstrate the adequacy of the corrective action.

(e) The feasibility determination may contain a schedule for submittal of the information required in pars. (c) and (d), if the owner or operator obtains written authorization from the department prior to a final decision on the feasibility of the project.

(13) Recommendations on design constraints for development of the site, shall be made and reasons given for the recommendations. This shall include a discussion of the potential for the site to meet locational requirements in s. NR 660.06. Particular attention shall be given to assessing the results of the compatibility testing on the primary and secondary liners. For expansion of existing facilities, the report shall include sufficient information to assess the effectiveness of the existing facility design and operation in protecting air, surface water and groundwater quality.

(14) Based on the conclusions resulting from site analysis, a proposed site design shall be prepared. This shall consist of preliminary engineering plans and a general discussion of proposed operating procedures. This section of the report shall include the following information:

(a) A plan sheet showing proposed access, lateral extent of filling, and phases of site development. The existing site conditions map shall be utilized as a base for this sheet.

(b) A series of north-south and east-west cross-sections showing present topography, proposed base grades and final grades. This information shall be displayed on the geological sections.

(c) Preliminary cover balance calculations.

(d) Proposed methods for leachate and gas control including collection, containment and treatment. Preliminary agreements with wastewater treatment plants shall be included when applicable.

(e) Proposed operating procedures including method of site development, method of access control, control of surface water, screening, covering frequency as applicable and other special design features.

(f) Evaluation of proposed facility location and operation in terms of environmental soundness, safety and potential for accidental spills and other failures of environmental concern.

(g) Detailed plans and an engineering report describing the proposed groundwater monitoring program to be implemented to meet the requirements of ch. NR 635.

(h) Proposed groundwater, leachate, surface water, gas, air, unsaturated zone and other monitoring.

(i) Proposed contingency plan and method of correcting accidents or potential failures of the proposed facility that may affect air, surface water and groundwater quality.

(j) Proposed closure sequence.

(k) Proposed final use.

(l) Proposed method of demonstrating financial responsibility and long-term care requirements.

(15) To aid in completing an environmental assessment and in determining the need for an environmental impact report or environmental impact statement, the feasibility report shall include a brief discussion of the following:

(a) The purpose and need for the proposed project and for the recommended site.

(b) The probable adverse and beneficial physical, biological, social, economic and other impacts of proposed site development.

(c) The probable adverse impacts of site development that cannot be avoided.

(d) The irreversible or irretrievable commitments of resources if the site is developed as proposed.

(e) The alternatives to the proposed site development and alternate methods of waste disposal or recycling.

(f) The direct, indirect and cumulative effects of the proposed site development.

(g) Estimated construction, operation and long-term care costs for the entire project.

(16) An environmental impact statement is required under s. 1.11 (2), Stats., for a new hazardous waste disposal facility if any of the following conditions exist:

(a) The total area committed to solid and hazardous waste disposal exceeds 80 acres.

(b) The total volume of solid and hazardous waste intended for disposal under the plan of operation exceeds one million cubic yards.

History: Cr. Register, February, 1991, No. 422, eff. 3-1-91; renum. under s. 13.93 (2m) (b) 1, Stats., Register, August, 1992, No. 440; correction in (9) made under s. 13.93 (2m) (b) 7, Stats., Register, March, 1993, No. 447.

NR 660.093 Feasibility report, department review. Within 60 days after a feasibility report is submitted, the department shall either determine that the report is complete or notify the applicant in writing that the report is not complete, specifying the information which the applicant shall submit before the report is deemed complete. The department shall determine whether or not the feasibility report is complete by determining whether or not the minimum requirements of this section have been met. Additional feasibility information may be required of the applicant after a determination that the feasibility report is complete only if the department establishes that a detailed review of the feasibility report

(2) Within 90 days after ceasing to accept waste, seeding, fertilizing and mulching of the finished surface shall be accomplished in accordance with sub. (1) (b) and the final site use. Seed type and amount of fertilizer shall be selected depending on the type and quality of topsoil and compatibility with native vegetation.

(3) Following final or partial closure, the facility shall be inspected and maintained by the owner or operator until it becomes stabilized or until the responsibility of the owner or operator terminates. The department may require installation of groundwater and leachate monitoring wells or other devices, groundwater and leachate quality sampling and analysis programs, gas monitoring and sampling provisions for the protection against detrimental effects of leachate and gas migration from any landfill and surface impoundment in accordance with s. NR 660.14 and ch. NR 635.

(4) Upon final or any partial closure, all hazardous waste and hazardous waste residues including standing liquids, the liner, underlying and surrounding contaminated soil and structures and equipment contaminated with waste and leachate shall be removed from surface impoundments not approved for final disposition of the wastes and shall be disposed of in accordance with chs. NR 600 to 685. Requests for department approval to allow any of the materials to be disposed of in place shall be submitted to the department prior to completion of closure, as a request for modification of the closure plan approval, in accordance with s. NR 685.05. Closure of these facilities shall be accomplished in accordance with the provisions of the approved plan of operation and with all applicable requirements of this section. If necessary to support the final cover specified in the approved closure plan, the owner or operator shall treat remaining liquids, residues and soils by removal of liquids, drying or other means.

(5) The owner or operator of a facility that treats hazardous waste shall, at completion of closure, remove all hazardous waste and hazardous waste residues, including, but not limited to, ash and sludges, from the treatment process or equipment, discharge control equipment and discharge confinement structures. The department may require monitoring of ground or surface waters, if the operation or design of the facility in relation to the hazard of wastes handled at the facility warrants monitoring.

History: Cr. Register, February, 1991, No. 422, eff. 3-1-91.

NR 660.17 Long-term care. (1) The department may grant a written exemption from any of the requirements of this section and s. NR 685.06 as part of a closure plan or plan of operation approval or modification thereof for surface impoundments, if no hazardous waste residues including standing liquids, the liner, underlying and surrounding contaminated soil and structures and equipment contaminated with waste and leachate are left in place at final closure.

(2) After final closure, the owner or operator shall comply with all long-term care requirements contained in s. NR 685.06 and any plan of operation approval, including maintenance and monitoring throughout the long-term care period. The owner or operator shall:

(a) Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion or other events.

(b) Maintain and monitor the back-up leachate collection system in accordance with the approved plan of operation.

(c) Continue to operate the leachate collection and removal system.

(d) Maintain and monitor the groundwater monitoring system and comply with all other applicable requirements of ch. NR 635.

(e) Prevent run-on and run-off from eroding or otherwise damaging the final cover.

(f) Protect and maintain all surveyed benchmarks, including benchmarks used in complying with s. NR 660.13 (11) for the entire period of long-term care.

(g) Implement measures needed to correct contamination caused by leachate or gases generated within the landfill.

History: Cr. Register, February, 1991, No. 422, eff. 3-1-91.

NR 660.18 Waste management fund. The owners and operators of landfills and surface impoundments utilized for disposal shall contribute to the waste management fund as specified in s. NR 685.09, unless specifically exempted in s. NR 660.04.

History: Cr. Register, February, 1991, No. 422, eff. 3-1-91.

NR 660.19 Surface impoundments with discharges regulated under ch. 147, stats. (1) GENERAL. Except as otherwise provided in sub. (2), no person may operate or maintain a surface impoundment unless the person has obtained an interim license, operating license or waiver from the department in accordance with the requirements of ss. NR 600.09, 680.20 to 680.24 or 680.30 to 680.32.

(2) EXEMPTIONS. Unless otherwise provided, this section does not apply to:

(a) The owner or operator of a facility used for the disposal of metallic mining wastes resulting from a mining operation as defined in s. 144.81 (5), Stats.

Note: Metallic mining wastes are regulated under ch. NR 182.

(b) The owner or operator of a facility operating under an interim license, except as provided in ss. NR 680.21 (4) and (5) and 680.22.

(3) REGULATORY INTEGRATION. Wherever practicable, the department shall integrate the regulation of surface impoundments under this section with the plan approval process under s. 144.04, Stats., and the permitting process under ch. 147, Stats., to avoid duplicate or contradictory actions or requirements.

(4) GENERAL FACILITY STANDARDS. Unless specifically exempt under sub. (2), the owner or operator of a surface impoundment with discharges regulated under ch. 147, Stats., shall comply with ss. NR 630.10 to 630.18, 630.21, 630.22, 630.30, 630.31, 630.40, 660.06, 680.06 and 685.05 to 685.08.

(5) INITIAL SITE INSPECTION. Unless specifically exempted under sub. (2), any person proposing to establish a hazardous waste surface impoundment with discharges regulated under ch. 147, Stats., or expand an existing facility shall contact the department to arrange for an initial site inspection.

(6) INITIAL SITE REPORT. Unless specifically exempted under sub. (2), any person wishing to establish a hazardous waste surface impoundment with discharges regulated under ch. 147, Stats., or expand an existing facility, shall comply with s. NR 660.08 if the person wishes to submit an initial site report.

(7) FEASIBILITY REPORT. Unless specifically exempted under sub. (2), any person wishing to establish a hazardous waste surface impoundment with discharges regulated under ch. 147, Stats., or expand an existing facility shall comply with s. NR 660.09 to 660.095.

(8) PLAN OF OPERATION. Unless specifically exempted under sub. (2), any person wishing to establish a hazardous waste surface impoundment with discharges regulated under ch. 147, Stats., or expand an existing facility shall comply with s. NR 660.10 to 660.107, except as follows:

(a) In lieu of compliance with s. NR 660.103 (1) (g), (j), (k) and (l) and (2), except (2) (b) 9., 10. and 11., the following may be submitted:

1. Detailed plans and engineering report describing how the surface impoundment shall be constructed to meet the requirements of sub. (11), including:

a. The construction of the liner system;

b. Prevention of overtopping; and

c. Structural integrity of the dikes.

2. Description of how each surface impoundment, including the liner and cover systems and appurtenances for control of overtopping, shall be inspected in order to meet the requirements of s. NR 660.13 (28). This information may be included in the inspection plan submitted under s. NR 680.06 (3) (e).

3. A description of the procedure to be used in removing a surface impoundment from service, as required under s. NR 660.13 (30), (31), (32), (33) and (34). This information shall be included in the contingency plan submitted under s. NR 660.103 (4).

4. If ignitable or reactive wastes are to be placed in a surface impoundment, an explanation of how sub. (11) (a) shall be complied with.

5. If incompatible wastes, or incompatible wastes and materials shall be placed in a surface impoundment, an explanation of how s. NR 660.13 (4) shall be complied with.

(9) SUBSTANTIAL COMPLIANCE WITH THE PLAN OF OPERATION. Unless specifically exempt under sub. (2), the construction of all surface impoundments with discharges regulated under ch. 147, Stats., shall be certified by a qualified engineer as follows:

(a) For existing units, the certification which attests to the structural integrity of each dike, as required under s. NR 660.13 (27), shall be submitted with the plan of operation under sub. (8).

(b) For new units the engineer shall provide the certification required under par. (a) upon completion of construction in accordance with the plans and specifications and with the plan of operation under sub. (8).

(10) RECORDING OF NOTICE. Unless specifically exempt under sub. (2), the owner or operator of a surface impoundment with discharges regulated under ch. 147, Stats., shall comply with s. NR 660.12.

(11) MINIMUM DESIGN AND OPERATIONAL REQUIREMENTS. Unless specifically exempt under sub. (2), the owner or operator of a surface impoundment with discharges regulated under ch. 147, Stats., shall comply with s. NR 660.13, except as follows:

(a) In lieu of compliance with s. NR 660.13 (3), the owner or operator may comply with the following:

1. Ignitable or reactive waste may not be placed in a surface impoundment, unless the waste is placed in a surface impoundment that is used solely for emergencies or unless the waste is treated, rendered, or mixed before or immediately after placement in the surface impoundment so that:

a. The resulting waste, mixture or dissolution of material no longer meets the criteria of ignitable or reactive waste under s. NR 605.08 (2) or (4); and

b. Section NR 630.17 (2) is complied with.

(b) In lieu of compliance with s. NR 660.13 (6), (8), (10) to (18) and (25) to (27), the owner or operator may comply with the following:

1. A surface impoundment shall have a double liner system that is designed, constructed and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil or groundwater or surface water at any time during the active life, including the closure period of the impoundment. The primary and secondary liners shall be:

a. Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients, including static head and external hydrogeologic forces, physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation and the stress of daily operations;

b. Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression or uplift; and

c. Installed to cover all surrounding earth likely to be in contact with the waste or leachate.

2. The owner or operator may be exempted from the requirements of subd. 1. if the department finds, based on a demonstration by the owner or operator, that alternate design and operating practices, together with location characteristics, shall prevent the migration of any hazardous constituents into the groundwater or surface water at any future time. Exemption requests shall be made by the owner or operator, in accordance with s. NR 680.04, in the feasibility report. In deciding whether to grant an exemption, the department shall consider:

a. The nature and quantity of the wastes;

b. The proposed alternate design and operation;

c. The hydrogeologic setting of the facility, including the attenuative capacity and thickness of the liners and soils present between the impoundment and groundwater or surface water, and

d. All other factors which would influence the quality and mobility of the leachate produced and the potential for it to migrate to groundwater or surface water.

3. A surface impoundment shall be designed, constructed, maintained and operated to prevent overtopping resulting from normal or abnormal operations; overfilling; wind and wave action; rainfall; run-on; malfunctions of level controllers, alarms and other equipment; and human error.

4. A surface impoundment shall have dikes that are designed, constructed and maintained with sufficient structural integrity to prevent massive failure of the dikes. In ensuring structural integrity it may not be presumed that the liner system shall function without leakage during the active life of the unit.

5. The department shall specify in the plan of operation approval all design and operating practices that are necessary to ensure that the requirements of this paragraph are satisfied.

6. During construction and installation, liners and cover systems, such as membranes, sheets or coatings, shall be inspected for uniformity, damage and imperfections, such as holes, cracks, thin spots or foreign materials. Immediately after construction or installation:

a. Synthetic liners and covers shall be inspected to ensure tight seams and joints and the absence of tears, punctures or blisters; and

b. Soil-based and admixed liners and covers shall be inspected for imperfections including lenses, cracks, channels, root holes or other structural non-uniformities that may cause an increase in the permeability of the linear or cover.

(12) GROUNDWATER AND LEACHATE MONITORING. The owner or operator of a surface impoundment with discharges regulated under ch. 147, Stats., shall comply with ch. NR 635, unless specifically exempt under s. NR 635.04.

(13) SPECIAL MONITORING. Unless specifically exempt under sub. (2), the owner or operator of a surface impoundment with discharges regulated under ch. 147, Stats., shall comply with s. NR 660.14, when required by the department.

(14) CLOSURE. Unless specifically exempt under sub. (2), the owner or operator of a surface impoundment with discharges regulated under ch. 147, Stats., shall comply with s. NR 660.15 or 660.16, whichever is applicable.

(15) LONG-TERM CARE. Unless specifically exempt under sub. (2), the owner or operator of a surface impoundment with discharges regulated under ch. 147, Stats., shall comply with s. NR 660.17.

(16) WASTE MANAGEMENT FUND. Unless specifically exempt under sub. (2), the owner or operator of a surface impoundment with discharges regulated under ch. 147, Stats., shall, if the surface impoundment is utilized

for disposal of hazardous waste, contribute to the waste management fund as specified in s. NR 685.09.

History: Cr. Register, February, 1991, No. 422, eff. 3-1-91; correction in (1) and (7) made under s. 13.93 (2m) (b) 7, Stats., Register, March, 1993, No. 447.

NR 660.20 Special requirements for hazardous wastes F020, F021, F022, F023, F026 and F027. (1) Hazardous wastes F020, F021, F022, F023, F026 and F027 may not be placed in a landfill or surface impoundment unless the owner or operator operates the landfill or surface impoundment in accordance with a management plan for these wastes that is approved by the department pursuant to the standards set out in this section and in accord with all other applicable requirements in chs. NR 600 to 685. The factors to be considered are:

(a) The volume and physical and chemical characteristics of the wastes, including their potential to migrate through soil or to volatilize or escape into the atmosphere;

(b) The attenuative properties of underlying and surrounding soils or other materials;

(c) The mobilizing properties of other materials co-disposed with these wastes; and

(d) The effectiveness of additional treatment, design or monitoring requirements or techniques.

(2) The department may determine that additional design, operating and monitoring requirements are necessary for landfills and surface impoundments managing hazardous wastes F020, F021, F022, F023, F026 and F027 in order to reduce the possibility of migration of these wastes to groundwater, surface water or air so as to protect human health and the environment.

History: Cr. Register, February, 1991, No. 422, eff. 3-1-91.