

(o) An assessment of the location of the sewage treatment facilities relative to commercial establishments and to buildings which are occupied or intended for residential use, and from land which is being actively developed for commercial or residential use. The location of sewage treatment facilities shall comply with the provisions of s. NR 110.15 (3) (d).

(p) An assessment of the location of land disposal systems relative to public water supply wells. The location and horizontal separation from the proposed land disposal site and any public water supply well shall be shown. The assessment shall discuss the hydrogeologic conditions of the area, the direction of groundwater movement, the depth of the public well casing, and any other appropriate information. The department will determine whether the separation distance between the land disposal system and the public well is sufficient to protect the public health and quality of the public water supply.

(q) Soil boring logs if the selected treatment alternative includes lagoons or land disposal of effluent. The borings shall supply accurate information about the soil conditions, and groundwater and bedrock elevations at the proposed treatment facility site.

(r) Any facility plan which recommends the abandonment of a wastewater treatment, sludge or septage storage lagoon, or land disposal system shall include an abandonment plan. A plan outlining the proposed method of abandonment of the facility shall be submitted to the department for approval. This plan shall provide for the removal and proper disposal of any accumulated solid matter or liquid wastes and any re-landscaping necessary to prevent accumulation of standing water or runoff within 2 years of the date from which wastewater, sludge or septage was last disposed. The department shall require groundwater monitoring for a minimum of one year at a quarterly frequency after the abandonment of facilities which have an existing groundwater monitoring system. Groundwater monitoring may be required on a case-by-case basis for facilities which do not have existing groundwater monitoring systems. The monitoring data shall be reviewed after 1 year and the department shall determine whether groundwater monitoring should be continued or not. Any groundwater monitoring wells which are no longer necessary shall be abandoned in accordance with ch. NR 141 and documentation of well abandonment shall be provided to the department.

(3) CONTENT OF AN ENVIRONMENTAL ASSESSMENT. An adequate environmental assessment must be an integral, though indetifiable, part of any facilities plan submitted to the department under sub. (1). The information submitted in the environmental assessment will be used by the department for determining whether or not an environmental impact statement is necessary. The analyses that constitute an adequate environmental assessment shall include:

(a) *Description of the existing environment without the project.* This shall include for the delineated planning area a description of the present environmental conditions relevant to the analysis of alternatives or determinations of the environmental impacts of the proposed action. This description shall include, but not be limited to, discussions of the following topics where applicable to a particular study: surface and ground water quality; water supply and use; general hydrology; air quality; noise levels; energy production and consumption; land use trends; population projections, wetlands, floodplains, coastal zones and other environmen-

tally sensitive areas; historic and archaeological sites; other related federal or state projects in the area; and plant and animal communities which may be affected, especially those containing threatened or endangered species.

(b) *Description of the future environment without the project.* The future environmental conditions with the no project alternative shall be forecast, covering the same areas listed in par. (a).

(c) *Evaluation of alternatives.* This discussion shall include a comparative analysis of feasible options and a systematic development of wastewater treatment alternatives. The alternatives shall be screened with respect to capital and operating costs; significant primary and secondary environmental effects; physical, legal or institutional constraints; and whether or not they meet regulatory requirements. Special attention should be given to long term impacts, irreversible impacts and induced impacts such a development. The reasons for rejecting any alternatives shall be presented in addition to any significant environmental benefits precluded by rejection of an alternative. The analysis should consider, when relevant to the project:

1. Flow and waste reduction measures, including infiltration/inflow reduction;
2. Alternative locations, capacities, and construction phasing of facilities;
3. Alternative waste management techniques, including treatment and discharge, wastewater reuse and land application;
4. Alternative methods for disposal of sludge and other residual waste, including process options and final disposal options;
5. Improving effluent quality through more efficient operation and maintenance;

(d) *Environmental impacts of the proposed action.* Primary and secondary impacts of the proposed action shall be described, giving special attention to unavoidable impacts, steps to mitigate adverse impacts, any irreversible or irretrievable commitments of resources to the project and the relationship between local short term uses of the environment and the maintenance and enhancement of long term productivity. The significance of land use impacts shall be evaluated, based on current population of the planning area; design year population for the service area; percentage of the service area currently vacant; and plans for staging facilities. Special attention should be given to induced changes in population patterns and growth, particularly if a project involves some degree of regionalization.

(e) *Steps to minimize adverse effects.* This section shall describe structural and nonstructural measures, if any, in the facilities plan to mitigate or eliminate significant adverse effects on the human and natural environments. Structural provisions include but are not limited to changes in facility design, size, and location; nonstructural provisions include but are not limited to staging facilities as well as developing and enforcing land use regulations and environmentally protective regulations.

(f) *Documentation.* Sources of information used to describe the existing environment and to assess future environmental impacts should be documented. Register, November, 1990, No. 419

mented. In addition to the department, these sources should include regional, state and federal agencies with responsibility or interest in the types of impacts listed in par. (a). In particular, the following agencies should be consulted:

1. Local, and regional land use planning agencies and areawide waste treatment management planning agencies for assessments of land use trends and population projections, especially those affecting size, timing, and location of facilities;

2. The HUD Regional Office if a project involves a flood risk area identified under the Flood Disaster Protection Act of 1973 (Pub. L. 93-234);

3. The state coastal zone management agency, if a coastal zone is affected;

4. The secretary of the interior or secretary of agriculture, if a wild and scenic river is affected;

5. The secretary of the interior or secretary of commerce, if a threatened or endangered species is affected;

6. The fish and wildlife service (department of the interior), the department of commerce, and the U.S. army corps of engineers, if a wetland is affected.

(4) PUBLIC HEARING. Municipalities shall hold at least one public hearing before a facilities plan is adopted. A copy of the facilities plan should be available for public review before the hearing and at the hearing, since these hearings provide an opportunity for public comment on the issues associated with the facilities plan.

(5) CONTENT OF AN INFILTRATION/INFLOW ANALYSIS. (a) The infiltration/inflow analysis shall demonstrate whether or not excess infiltration/inflow exists in the sewer system. The analysis shall identify the presence, flow rate, and type of infiltration/inflow conditions, which exists in the sewer systems.

(b) For determination of the possible existence of excessive infiltration/inflow, the analysis shall include an estimate of the cost of eliminating the infiltration/inflow conditions. These costs shall be compared with estimated total costs for transportation and treatment of the infiltration/inflow. This determination shall be made at several levels of infiltration/inflow removal.

(c) If the infiltration/inflow analysis demonstrates the existence or possible existence of excessive infiltration/inflow and the specific sources of excessive infiltration/inflow have not been adequately identified, a sewer system evaluation survey shall be conducted in accordance with sub. (6). A detailed plan for the sewer system evaluation survey shall be included in the infiltration/inflow analysis. The plan shall outline the tasks to be performed in the survey and their estimated costs.

(d) The department may waive the requirements of pars. (a) through (c) if the owner can demonstrate to the department's satisfaction the obvious existence or nonexistence of excessive infiltration or inflow, or both. The information necessary for this demonstration may include infiltration and inflow estimates, per capita design flows, ratio of total flow to dry weather flow, cubic meters of infiltration per centimeter diameter per kilometer of pipe per day (gallons of infiltration per inch diameter per

mile per day), bypassing, and other hydrological and geological factors. The department may require the information be expanded to meet the requirements of pars. (a) through (c) if this demonstration is inconclusive.

(6) **CONTENT OF A SEWER SYSTEM EVALUATION SURVEY.** (a) The sewer system evaluation survey shall determine the location, estimated flow rate, method of rehabilitation and cost of rehabilitation versus cost of transportation and treatment for each defined source of infiltration/inflow.

(b) The report shall summarize the results of the sewer system evaluation survey. In addition, the report shall include:

1. A justification for each sewer section cleaned and internally inspected; and

2. A proposed rehabilitation program for the sewer system to eliminate all defined excessive infiltration/inflow.

(7) **CONSTRUCTION PLANS AND SPECIFICATIONS FOR SEWAGE TREATMENT PLANT PROJECTS.** In addition to the requirements of ch. NR 108 and ss. NR 110.06 and 110.07 above, the following requirements shall be adhered to for submission of plans for sewage treatment plants.

(a) *Overall plan.* A plan shall be submitted which shows the sewage treatment plant in relation to the remainder of the system. Sufficient topographic features shall be included to indicate its location with respect to streams and the point of discharge of treated effluent.

(b) *Layout.* A general layout plan shall be submitted which includes:

1. A contour map of the site;
2. The size and location of plant structures;
3. A schematic flow diagram indicating the various plant units;
4. Piping details including piping arrangements for bypassing individual units;
5. The materials handled and the direction of flow through each pipe;
6. The hydraulic profiles for sewage and sludge flows;
7. Soil conditions at the site.

(c) *Detailed plans.* Detailed construction plans shall be submitted which include:

1. The location, dimensions, elevations and details of all existing and proposed plant units;
2. The elevation of high and low water level in the receiving stream;
3. An adequate description of all features not covered in the specifications.

(8) **ADDITIONAL FACILITY PLANNING REQUIREMENTS FOR LAND DISPOSAL SYSTEM ALTERNATIVES.** (a) *General requirements.* In addition to the requirements of sub. (1), a report including a soil investigation and a hydrogeologic evaluation shall be submitted as part of the facilities plan

for a land disposal discharge alternative. The report shall detail the soil types, characteristics, variability and permeability, topography, groundwater conditions and quality, and other characteristics of the disposal site. Soil boring and test pit logs and soil analyses shall be provided. Wastewater characteristics which may influence the design of the disposal system shall also be discussed. Water supply quality, local groundwater use, and potential impacts of the facility on groundwater quality shall be included.

(b) *Hydrogeological investigation.* 1. A hydrogeological investigation shall be included as part of the facilities plan. The analysis of the hydrogeological information shall be done by a hydrogeologist, or other qualified person. The investigation shall include both regional and site-specific hydrogeological information.

Note: The skills and knowledge required of a hydrogeologist making submittals under this chapter include: the ability to apply hydrogeologic principles and practices to the siting, design and operation of land disposal systems; knowledge of contaminants associated with land disposal of wastewater, their transport mechanisms and fate in the environment; familiarity standards; and proficiency in the design of groundwater monitoring systems for defining the physical and chemical characteristics of groundwater flow. A soil scientist or other environmental scientist who can demonstrate the above skills and knowledge, as reflected in submittals made under this chapter, shall be deemed a "qualified person".

2. The following site-specific groundwater information shall be required as part of the facilities plan for land disposal facilities:

- a. Depth to highest anticipated groundwater elevation.
- b. Groundwater flow directions and rates of flow.
- c. Vertical and horizontal gradients.
- d. Groundwater quality.
- e. Presence of groundwater divides and barriers.
- f. Presence and extent of perched groundwater.
- g. Mounding calculations.

(c) *Soil investigation.* The soil evaluation may be performed in conjunction with the hydrogeological evaluation; however, each evaluation shall be performed by a person who is qualified to perform the evaluation. The following site-specific soil information shall be submitted as a part of the facilities plan for land disposal systems;

1. Soil borings and sampling performed in accordance with ss. NR 110.24 (3) (d) and 110.24 (4) (d), and test pit analyses performed in accordance with s. NR 113.09 (8). The one boring per acre minimum of s. NR 110.24 (3) (d) 4. does not apply to spray irrigation, ridge and furrow, or overland flow systems. A soil analysis may be required on a case-by-case basis for land disposal systems. The USDA soil classification system shall be used for spray irrigation systems, ridge and furrow, and overland flow systems.

2. Soil descriptions, including soil profile, stratification, slope, soil moisture content, continuity, structure, texture, relative density and depth to groundwater and bedrock.

3. Soil analyses shall be performed on the zone of soil which will provide treatment of the wastewater. The department may require that the

analyses include any or all of the following: grain size analyses, hydrometer analyses, field and laboratory horizontal and vertical permeabilities, Atterberg limits, soil pH, cation exchange capacity, bulk density and relative density, porosity, soil nutrient content, and organic matter content.

Note: The following methods are recommended for the analyses required in s. NR 110.09 (8) (c) 1.:

1. Grain size analyses (sieve and hydrometer) - ASTM D422 (1972).
2. Field and laboratory vertical permeabilities (constant and vertical head) - ASTM D2434 (1974).
3. Atterberg limits (liquid and plastic limits) - ASTM D4318 (1984).
4. Soil pH, nutrient and organic matter content - "Wisconsin Procedures for Soil Testing, Plant Analysis and Feed and Forage Analysis", soil fertility series No. 6 (1987), Department of Soil Sciences, University of Wisconsin - extension (Madison) or ASA-SSSA, "Methods of Soil Analysis; part 2, Chemical and Microbiological Properties" - agronomy monograph No. 9 - 2nd edition (1982).
5. Cation exchange capacity - ASA-SSSA, "Methods of Soil Analysis; part 2, "Chemical and Microbiological Properties" - agronomy monograph no. 9 - 22nd edition (1982).
6. Bulk density - ASA-SSSA, "Methods of Soil Analysis; part 2, Physical and Mineralogical Methods" - agronomy monograph no. 9 - 2nd edition (1982).
7. Porosity - volume calculation.
4. In-field infiltration rates (measured at the proposed elevation of application).
5. A description of the soil testing methods used.
6. Depth to bedrock.
7. Type and nature of bedrock.

History: Cr. Register, November, 1974, No. 227, eff. 12-1-74; r. and recr. Register December, 1978, No. 276, eff. 1-1-79; am. (1) (b) 4. and (2) (h), cr. (2) (n) to (q) and (5) (d), Register, February, 1983, No. 326, eff. 3-1-83, am. (2) (h) 5. and 6., cr. (2) (r) and (8), Register, November, 1990, No. 419, eff. 12-1-90.

NR 110.10 Sewage collection system projects. (1) **FACILITIES PLANS FOR SEWER PROJECTS.** For sewer projects the facilities plan shall include the following information:

- (a) *Description.* A brief description of the project; including its geographic location and any necessary reference maps or exhibits;
- (b) *Topography.* A brief description of the topography of the general area with specific reference to the area serviced by the proposed sewer;
- (c) *Soil investigations.* A description of the extent of soil investigations, including information on rock likely to be encountered. In addition, that portion of the proposed sewer which is below high ground water level shall be indicated;
- (d) *Flooding.* A designation of any portion of the proposed sewer which is located within the floodway or floodplain as defined in ch. NR 116. All projects shall conform to the requirements of ch. NR 116;
- (e) *Wetlands.* A statement indicating whether the proposed sewer will pass through a wetlands area, and the approximate acreage of the wetland;

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(f) *Population*. Population growth rate (annual) based on the most recent data for the municipality;

(g) *Sewer service area*. If the sewer project is tributary to a treatment plant for which a service area that has been delineated as a part of an approved areawide waste treatment management plan, indicate the location of the sewer on a map of the service area;

(h) *Downstream overflows*. A statement indicating the number and location of overflows and bypasses in the sewer system;

(i) *Description of treatment facilities*. A brief description of the type of treatment facility indicating the ability of the facility to handle the sewage of the proposed project during both wet and dry weather conditions;

(j) *Costs*. A discussion of the estimated capital costs and where an entire sewerage system is being installed, the estimated annual cost to the user of the system;

(k) *Basis of design*. The following data shall be provided for the proposed project:

1. Design period;

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