

Chapter NR 206

LAND DISPOSAL OF MUNICIPAL AND DOMESTIC  
WASTEWATERS

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**NR 206.01 Purpose.** The purpose of this chapter is to establish effluent limitations and monitoring requirements to be used in permits for discharges of wastewaters from publicly owned treatment works and privately owned domestic wastewater treatment works to land disposal systems. Section 147.02, Stats., requires a permit for the lawful discharge of any pollutant into the waters of the state. Section 147.015(13), Stats., defines "waters of the state" as including groundwater. Consequently, permits are required for the type of discharges to which this chapter applies. It is the intent of the department through this chapter to restore and maintain the physical, chemical and biological integrity of the groundwater of the state and to encourage the protection of this resource, and to achieve compliance with ch. NR 140.

History: Cr. Register, March, 1985, No. 351, eff. 4-1-85; am. Register, November, 1990, No. 419, eff. 12-1-90.

**NR 206.02 Applicability.** (1) The provisions of this chapter are applicable to discharges to land disposal systems of liquid wastewaters from publicly owned wastewater treatment works and from privately owned domestic wastewater treatment works;

(2) The provisions of this chapter are not applicable to land disposal of:

(a) Industrial wastes and by-products approved and permitted under ch. NR 214;

(b) Sludge from publicly owned wastewater treatment works and privately owned domestic wastewater treatment works regulated under ch. NR 204;

(c) Domestic wastewater by "private pumpers" as defined and regulated under ch. NR 113;

(d) Septage disposal regulated under ch. NR 113; and

(e) Solid, liquid, and hazardous wastes at a disposal site licensed pursuant to ch. NR 181 or chs. NR 500 to 520.

History: Cr. Register, March, 1985, No. 351, eff. 4-1-85; am. (1), r. (2) (d), renum. (2) (e) and (f) to be (2) (d) and (e), and am. (e), Register, 1990, November, No. 419, eff. 12-1-90.

**NR 206.03 Definitions.** The following definitions are applicable to terms used in this chapter. Definitions of other terms and the meanings of abbreviations are set forth in ch. NR 205.

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(1) "Average daily flow" means the average daily wastewater volume discharging to the wastewater treatment system determined for the previous 24 months.

(2) "Average design flow" means the anticipated average daily wastewater discharge to a sewage treatment facility.

(3) "Bedrock" means the rocks that underlie soil material. Bedrock may be present at the earth's surface when the weathered in place consolidated material, larger than 2 mm in size, is greater than 50% by volume.

(4) "Biological treatment" means a level of wastewater treatment accomplished through:

- (a) An activated sludge process,
- (b) Trickling filters,
- (c) An aerated lagoon,
- (d) Rotating biological contactors,
- (e) A stabilization pond, or
- (f) Other equivalent systems approved on a case-by-case basis.

(5) "Cation exchange capacity" means the sum total of exchangeable cations absorbed by a soil, expressed in milliequivalents per 100 grams of oven dry soil.

(7) "Domestic wastewater" means the type of wastewater normally discharged from plumbing facilities in private dwellings or commercial domestic establishments and includes, but is not limited to, sanitary, bath, laundry, dishwashing, garbage disposal and cleaning wastes.

(8) "Groundwater" means any of the waters of the state as defined in s. 144.01(19), Stats., occurring in a saturated subsurface geological formation of rock or soil.

(9) "Groundwater monitoring" means measuring the groundwater level and/or analyzing samples of water taken from one or more wells.

(10) "Hazardous waste" means a waste identified by the department as hazardous under s. 144.62 (2), Stats.

(11) "Highest anticipated groundwater elevation" means the sum of the calculated mounding effects of the disposal discharge and the seasonal high groundwater level.

(12) "High groundwater level" means the higher of either the elevation to which the soil is saturated as observed as a free water surface in an unlined hole, or the elevation to which the soil has been seasonally or periodically saturated as indicated by soil color pattern throughout the soil profile.

(13) "Hydraulic application rate" means the average daily volume of effluent discharged to a designated acreage of land of the land application system during a calendar month or other period of time specified in a WPDES permit. The rate is calculated by dividing the total discharge volume for the month or period of time by the acreage of land and by the number of days in the month or period of time (usually expressed in units

of gpad). For overland flow systems, the hydraulic application rate is expressed as flow rate per unit width of slope.

(14) "Hydraulic loading rate" means the average daily volume of effluent discharged to a land disposal system during a calendar month or other period of time specified in a WPDES permit for the discharge. The average is calculated by dividing the total discharge volume for the month or period of time by the number of days in the month or period of time.

(15) "Injection" means the subsurface emplacement of a fluid or waste.

(16) "Land disposal system" means a facility for disposing of liquid wastes consisting of:

- (a) An absorption or seepage pond system,
- (b) A ridge and furrow system,
- (c) A spray irrigation system,
- (d) A subsurface soil absorption system or mound system,
- (e) An overland flow system, or
- (f) Any other land area receiving liquid waste discharges.

(17) "Large scale soil absorption system" means a subsurface soil absorption system with a design capacity of 8,000 or more gallons per day which uses septic tanks with drainfield or mound systems, and which meets the following criteria:

(a) A single system with a design capacity of 8,000 gallons or more of wastewater per day; or

(b) Multiple systems which:

1. Are controlled by the same owner or have ownership interest vested in the same person; and

2. Where the distance between any 2 of the systems is 1,500 feet or less; and

3. Have a cumulative design treatment capacity of 8,000 or more gallons of wastewater per day.

(c) The addition of an individual system which in conjunction with one or more existing systems falls within the conditions listed in par. (b).

(18) "Privately owned domestic wastewater treatment work" means facilities which treat domestic wastewater and which are owned and operated by non-municipal entities or enterprises such as mobile home parks, restaurants, hotels, motels, country clubs, etc., which are permitted under ch. 147, Stats.

(19) "Publicly owned treatment work" has the meaning specified under s. NR 211.03 (8).

(20) "Soil" means the unconsolidated material which overlies the bedrock.

(21) "Total Kjeldahl nitrogen" or "TKN" means the sum of ammonia nitrogen and organic nitrogen.

(22) "Total nitrogen" means the sum of nitrate plus nitrite nitrogen, ammonia nitrogen, and organic nitrogen.

(23) "Toxic pollutants" has the meaning specified under s. NR 205.03 (7).

(24) "Water table observation well" means any groundwater monitoring well whose screen intersects the water table, installed for the specific purpose of determining either the elevation of the water table or the physical, chemical, biological or radiological properties of groundwater at the water table or both.

(25) "WPDES permit" means a permit issued under the Wisconsin pollutant discharge elimination system.

(26) "Well" means any borehole or other excavation or opening in the ground deeper than it is wide constructed for the purpose of obtaining or monitoring groundwater.

History: Cr. Register, March, 1985, No. 351, eff. 4-1-85; r. (7), (12) and (17), renum. (1) to (6), (8) to (11) and (13) to (16) to be (3), (4), (7) to (10), (14) to (16), (18) to (20), (23) and (25) and am. (16), cr. (1), (2), (5), (6), (11) to (13), (17), (21), (22), (24) and (26), Register, November, 1990, No. 419, eff. 12-1-90.

**NR 206.05 Compliance with effluent limitations and monitoring requirements.** (1) All new or modified land disposal systems approved on or after December 1, 1990 shall comply with the applicable effluent limits and monitoring requirements of this chapter and groundwater quality standards in ch. NR 140.

(2) All land disposal systems, except large scale soil absorption systems, approved or modified prior to December 1, 1990 shall comply with the effluent limits as shown in Table 1, and with the groundwater quality standards in ch. NR 140.

(3) All land disposal systems, except large scale soil absorption systems, approved prior to December 1, 1990 shall comply with the monitoring requirements described in s. NR 206.09 by January 1, 1994.

(4) Large scale soil absorption systems shall comply with the effluent monitoring requirements of this chapter and with the groundwater quality standards in ch. NR 140. Influent monitoring may be required on a case-by-case basis.

(5) All systems, except large scale soil absorption systems, approved prior to December 1, 1990 shall comply with the effluent limits for BOD<sub>5</sub> and load/rest requirements described in ss. NR 206.08 (1) (b) 1, (2) (b) 3, (3) (b) 3, and 110.25 (4) (f).

(6) All systems for which groundwater monitoring is required under s. NR 206.10 shall comply with the groundwater monitoring construction requirements of s. NR 110.25 and ch. NR 141.

Table 1. Effluent Limits  
Based on System Type and Date of System Approval

System Type	Date of Approval		
	Pre - 1/1/85	Post 1/1/85 and Pre 1/1/90	Post 1/1/90
Absorption Pond	BOD <sub>5</sub> : 50 mg/l Load/Rest: as per permit	BOD <sub>5</sub> : 50 mg/l Load/Rest: as per permit Total Nitrogen: 20 mg/l	BOD <sub>5</sub> : 50 mg/l Load/Rest: as per permit Total Nitrogen: 10 mg/l TDS: 500 mg/l Cl: 250 mg/l Hydraulic Application Rate: case by case
Spray Irrigation	All parameters case by case	All parameters case by case	BOD <sub>5</sub> : 50 mg/l Load/Rest: as per permit Total Nitrogen: case by case Hydraulic Application Rate: case by case Fecal coliform: case by case
Ridge and Furrow	All parameters case by case	All parameters case by case	BOD <sub>5</sub> : 50 mg/l Load/Rest: case by case Total Nitrogen: case by case Hydraulic Application Rate: case by case
Overland Flow	All parameters case by case	All parameters case by case	All parameters case by case
Other	All parameters case by case	All parameters case by case	All parameters case by case

History: Cr. Register, March, 1985, No. 351, eff. 4-1-85; r. and recr. Register, November, 1990, No. 419, eff. 12-1-90.

**NR 206.06 Alternative requirements.** (1) If the owner of a proposed land disposal system feels that compliance with the monitoring requirements, discharge prohibitions and effluent limits of this chapter are impracticable, the reasons therefore shall be fully communicated in writing to the department. This communication shall set forth alternative requirements for which department approval is sought and all pertinent facts, data, reports, and studies supporting the imposition of such alternative requirements, along with supporting documentation on the ability of the system to meet ch. NR 140 standards or standards pursuant to the appropriate variances.

(2) If the department determines that compliance with the monitoring requirements, discharge prohibitions and effluent limits of this chapter would be impracticable in specific cases, it may approve alternative requirements which, in its opinion, are in substantial compliance with the requirements of this chapter and ch. NR 140.

History: Cr. Register, March, 1985, No. 351, eff. 4-1-85; am. Register, November, 1990, No. 419, eff. 12-1-90.

**NR 206.07 General conditions required for all land disposal systems.** (1) DESIGN LIMITATIONS. (a) A land disposal system shall be constructed in

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accordance with the design criteria in ch. NR 110, or the appropriate rules promulgated by the department of industry, labor and human relations for large scale subsurface soil absorption systems.

(b) Background groundwater monitoring data described in ss. NR 140.20 (1) and 206.10 (4) shall be collected prior to the design of a land disposal system, and submitted to the department as part of the facility plan required on s. NR 110.09.

(c) Land disposal systems shall be designed and operated to maintain compliance with the groundwater quality standards contained in ch. NR 140, as required by s. NR 140.22 (1).

(2) OPERATIONAL REQUIREMENTS. (a) No discharge to a land disposal system may exceed the loadings specified in the WPDES permit for the system.

(b) No discharge to the system may have physical or chemical characteristics which prevent the proper operation of the land disposal system.

(c) The discharge of toxic or hazardous pollutants to land disposal systems is prohibited unless the applicant can demonstrate and the department determines that the discharge of such pollutants will be in such small quantities that no detrimental effect on groundwater or surface water will result. The criteria used shall include but not be limited to the toxicity of the pollutant, capacity of the soil to remove the pollutant, degradability, usual or potential presence of the pollutant in the existing environment, method of application and all other relevant factors.

(d) The underground injection of municipal and domestic wastewaters through a well is prohibited.

(e) All municipal and domestic wastewater land disposal systems shall be preceded by a biological, chemical or physical treatment or a combination of treatments approved by the department. Industrial waste discharges tributary to the municipal treatment works shall be in compliance with applicable pretreatment standards under s. NR 211.30.

(f) For a land disposal system located on a site where soil, geologic or other conditions may result in an increased possibility of groundwater contamination, the department may require additional treatment prior to discharge to such land disposal systems.

(g) Discharge to a land disposal system shall be limited so that the discharge and any precipitation which falls within the boundary of the disposal system during such discharge does not overflow the boundary of the system unless the WPDES permit authorizes collection and discharge of runoff to a surface water.

(h) 1. All land disposal facilities shall be operated in accordance with an approved management plan. The management plan shall conform to the requirements of s. NR 110.25 (3m).

2. For all land disposal facilities approved after December 1, 1990, an acceptable management plan shall be submitted with the construction plans and specifications.

3. For land disposal facilities constructed prior to December 1, 1990, an acceptable management plan shall be submitted in accordance with a schedule established by the department.

4. If operational changes are needed the management plan shall be revised.

5. All management plans and revisions to management plans shall be submitted to the department for review to determine adequacy and compliance with code requirements.

History: Cr. Register, March, 1985, No. 351, eff. 4-1-85; r. (2) (i) and (j), Register, September, 1987, No. 381, eff. 10-1-87; am. (1) and (2) (e), r. (2) (f), renum. (2) (g) and (h) to be (2) (f) and (g), cr. (2) (h), Register, November, 1990, No. 419, eff. 12-1-90.

NR 206.08 Effluent limitations for specific types of land disposal systems. (1) ABSORPTION POND SYSTEMS. (a) *Design limitations*. Absorption pond systems shall conform to the design requirements in s. NR 110.255 (1).

(b) *Effluent limitations*. 1. The discharge to an absorption pond system may not exceed a monthly average BOD<sub>5</sub> concentration of 50 mg/l.

2. The maximum hydraulic application rate to an absorption pond system shall be determined on a case-by-case basis in accordance with s. NR 110.255 (1) (a) 2.

3. The discharge to an absorption pond system which is subject to the groundwater quality standards in ss. NR 140.10 and 140.12 shall comply with the following limitations:

a. The monthly average total nitrogen concentration may not exceed 10 mg/l.

b. The total dissolved solids concentration may not exceed 500 mg/l.

c. The chloride concentration may not exceed 250 mg/l.

4. If an absorption pond system has been granted an exemption to groundwater quality standards under s. NR 140.28, the discharge requirements for nitrogen, total dissolved solids and chloride will be determined by the department on a case-by-case basis. Information to be considered in approving alternate limitations shall include:

a. Alternate concentration limits under ch. NR 140;

b. Qualifications on the exemption, if any exist;

c. Level of treatment of the wastewater for the particular contaminant;

d. Removal capability prior to discharge to the treatment system;

e. Expected increase in the concentration of a pollutant in groundwater downgradient at the point of standards application.

5. The department may approve alternative effluent limitations in accordance with s. NR 206.06 for total nitrogen, BOD<sub>5</sub>, hydraulic application rate, total dissolved solids and chlorides; and may require effluent limitations for additional substances on a case-by-case basis in order to protect and maintain groundwater quality as required in ch. NR. 140.

Note: The effluent limitations in par. (b) 3. have been established to provide compliance with the groundwater enforcement standards for nitrate, total dissolved solids and chloride. The department has determined that it is not technically and economically feasible for absorption pond systems to comply with the preventive action limits for these substances. These effluent limitations, in combination with groundwater monitoring requirements, will assist the department in minimizing the levels of nitrate, total dissolved solids and chloride in the

groundwater, to the extent technically and economically feasible. Groundwater enforcement standards and preventive action limits are specified in ss. NR 140.10 and 140.12.

(2) **SPRAY IRRIGATION SYSTEMS.** (a) *Design limitations.* Spray irrigation systems shall conform to the design requirements in s. NR 110.255 (2).

(b) *Effluent limitations.* 1. Discharge shall be limited to prevent any runoff of effluent from the site. Wastewater may not be sprayed during any rainfall event that causes runoff from the site. Uncontaminated storm water may be allowed to drain from a spray irrigation field.

2. The volume of discharge shall be limited to prevent ponding, except for temporary conditions following rainfall events.

3. The monthly average BOD<sub>5</sub> concentration may not exceed 50 mg/l.

4. The department may limit the fecal coliform bacteria in the discharge to the spray irrigation system based on the potential impact to public health.

5. The hydraulic application rate for each system shall be based on hydrogeologic conditions, soil texture, permeability, cation exchange capacity, topography, cover crop and wastewater characteristics. The average hydraulic application rate may not exceed 10,000 gallons per acre per day.

Note: Based upon the department's experience, the recommended range for the average hydraulic application rate is 2,000 to 7,000 gallons per acre per day, based on a monthly average.

6. The annual nitrogen application rate shall be limited to the nitrogen needs of the cover crop plus demonstrable denitrification occurring in the treatment system. Determination of the annual nitrogen application rate shall include the nitrogen supplied by the wastewater and any supplemental fertilizers used.

7. The soil at each individual spray irrigation field shall be tested annually for nitrogen, available phosphorus, available potassium and pH. The results of these analyses shall be submitted to the department and used to manage the spray irrigation system.

8. The department may limit additional parameters as necessary to protect and maintain groundwater quality as required in ch. NR 140.

(3) **RIDGE AND FURROW SYSTEMS.** (a) *Design limitations.* Ridge and furrow systems shall conform to the design requirements in s. NR 110.255 (3).

(b) *Effluent limitations.* 1. Discharge to a ridge and furrow system shall be limited so that the discharge and precipitation from a 10-year frequency, 24-hour duration rainfall event does not overflow the boundary of the system.

2. The discharge shall be alternately distributed to individual sections of the disposal system to allow sufficient resting periods to maintain the treatment capability of the soil.

3. The monthly average BOD<sub>5</sub> concentration may not exceed 50 mg/l.

4. The volume of discharge shall be limited to prevent inundation of the ridges except for temporary conditions following precipitation events.



5. The average hydraulic application rate may not exceed 10,000 gallons per acre per day for the system.

Note: Based upon the department's experience, the recommended range for the average hydraulic application rate is 2,000 to 5,000 gallons per acre per day based on a monthly average.

6. The annual total nitrogen in the wastewater applied to the system shall be limited to the annual nitrogen need of the cover crop plus demonstrable denitrification occurring in the treatment system.

7. The department may limit additional parameters as necessary to protect and maintain groundwater quality as required in ch. NR 140.

(4) OVERLAND FLOW SYSTEMS. (a) *Design limitations.* Overland flow systems shall conform to the design requirements in s. NR 110.255 (4).

(b) *Effluent limitations.* 1. The discharge to the overland flow system shall be alternately distributed to individual sections of the system in a regular load/rest cycle that allows sufficient resting to dry accumulated solids and maintain a complete grass cover.

2. The hydraulic application rate shall be as defined in the management plan, developed according to s. NR 206.07 (2) (h). The hydraulic application rate is expressed as a flow rate per unit width of slope.

3. Hydraulic application rates shall be reduced substantially when the vegetative cover has not developed sufficiently to anchor the soil and create the filter mat necessary for effective wastewater treatment. This condition may occur during original or springtime system startup.

4. The discharge of wastewater to an overland flow system shall be in accordance with a WPDES permit.

5. The department may limit parameters to an overland flow system in order to protect and maintain groundwater quality as required in ch. NR 140.

(5) All other land disposal systems shall be evaluated by the department on a case-by-case basis.

History: Cr. Register, March, 1985, No. 351, eff. 4-1-85; r. and recr. Register, November, 1990, No. 419, eff. 12-1-90.

NR 206.09 Wastewater monitoring requirements. (1) Discharges to land disposal systems, except for large scale soil absorption systems, shall be monitored for total daily flow and at least monthly for total dissolved solids, chlorides, BOD<sub>5</sub>, organic nitrogen, ammonia-nitrogen and nitrate plus nitrite nitrogen. For spray irrigation systems, fecal coliform bacteria monitoring may be included on a case-by-case basis. For large scale soil absorption systems, effluent shall be monitored for total daily flow, and at least quarterly for BOD<sub>5</sub>, organic nitrogen, ammonia nitrogen, total dissolved solids and chlorides. The frequency of flow monitoring and sampling and the type of samples shall be as specified in the WPDES permit.

(2) Influent to all treatment facilities subject to the monitoring provisions of sub. (1) shall be monitored for total daily flow, and at least monthly for BOD<sub>5</sub> and organic nitrogen and ammonia-nitrogen. The frequency of flow monitoring and sampling and the type of samples shall be as specified in the WPDES permit. Any flow bypassing the treatment

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facility to the land disposal system shall be monitored at a minimum of once per bypass event for the parameters for which effluent monitoring is required or as determined by the department. Influent monitoring may be required on a case-by-case basis for large scale soil absorption systems.

(3) Monitoring for other pollutants parameters may be required on a case-by-case basis dependent on waste characteristics and their potential for groundwater contamination.

(4) Unless otherwise specified in the WPDES permit for a land disposal system:

(a) The procedures for measuring flow and taking samples of discharges shall be those set forth in ch. NR 218.

(b) The methods of analysis for substances contained in discharges shall be those set forth in ch. NR 219.

(c) Sample analysis used for permit reporting shall be performed by a laboratory certified under ch. NR 149.

History: Cr. Register, March, 1985, No. 351, eff. 4-1-85; r. and recr. (1) and (2), cr. (4) (c), Register, November, 1990, No. 419, eff. 12-1-90.

**NR 206.10 Groundwater monitoring, (1) DESIGN CRITERIA.** The design criteria and construction standards for a groundwater monitoring well shall conform to s. NR 110.25(5) and ch. NR 141.

**(2) CONSTRUCTION REQUIREMENTS.** (a) Approval of plans and specifications for groundwater monitoring wells installed after the treatment facility has been constructed is required for any well which is to be used as a permanent groundwater monitoring well.

(b) If wells were installed prior to treatment facility construction, department approval for use of these wells as permanent groundwater monitoring wells is required and is conditional, based on documentation that the wells were constructed in conformance with ch. NR 141.

**(3) MONITORING REQUIREMENTS.** (a) For systems approved on or before December 1, 1990, monitoring requirements shall be based on average daily flow.

(b) For systems modified or approved after December 1, 1990, monitoring requirements shall be based on average daily flow.

(c) If the system has a design or average daily flow less than 0.015 MGD, the department may require groundwater monitoring if there is reason to believe contamination of groundwater is occurring.

(d) If the system has a design or average daily flow equal to or greater than 0.015 MGD, groundwater shall be monitored at a minimum of one level, at locations specified in the permit, and may include monitoring at more than one level. The department may waive this requirement on a case-by-case basis. Criteria which will be evaluated to waive this requirement include degree of treatment of the effluent, depth to groundwater and bedrock, nature of the bedrock, soil permeability, directions and rate of groundwater flow, vertical and horizontal flow gradients, existing groundwater quality, downgradient uses of the groundwater and compliance with ch. NR 140 standards.

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(e) Groundwater elevation within the land disposal system shall be monitored through the use of a water table observation well for all land disposal systems that have a depth to groundwater from cell bottom of less than 5 feet.

(4) SAMPLING FREQUENCY. (a) For systems where background water quality has been established, the groundwater sampling frequency shall be quarterly.

(b) For systems where background water quality has not been established, the groundwater sampling frequency shall be every 6 to 7 weeks until 8 representative samples have been obtained, and shall be quarterly thereafter.

(c) The department may modify the sampling frequency on a case-by-case basis.

(5) PARAMETER LIST. (a) The department may require groundwater monitoring for any or all of the following parameters in filtered or unfiltered samples: elevation, BOD<sub>5</sub>, field specific conductance, COD, organic nitrogen, ammonia nitrogen, nitrate plus nitrite nitrogen, chlorides, sulfates, total dissolved solids, alkalinity, hardness, temperature and pH.

(b) Monitoring for other parameters may be required on a case-by-case basis if there is reason to believe contamination is occurring or if these contaminants are present in the wastewater, to determine compliance with the groundwater quality standards in ch. NR 140.

(6) SAMPLING PROCEDURES. Groundwater sampling procedures shall comply with the methods contained in s. NR 140.16.

(7) ANALYTICAL PROCEDURES. (a) The methods of analysis for substances contained in groundwater samples shall be those in ch. NR 219.

(b) Sample analysis used for permit reporting shall be performed by a laboratory certified or registered under ch. NR 149.

History: Cr. Register, March, 1985, No. 351, eff. 4-1-85; r. and recr. Register, November, 1990, No. 419, eff. 12-1-90.