ILLINOIS POLLUTION CONTROL BOARD
March 14, 1991

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| IN THE MATTER OF: | ) | |
| | ) | |
| UTILITY INDUSTRY AMENDMENTS | ) | R90-25 |
| TO THE LANDFILL REGULATIONS | ) | (Rulemaking) |
| (PARTS 810-815) | ) | |

PROPOSED RULE. FIRST NOTICE.

OPINION AND ORDER OF THE BOARD (by J. Anderson):

On November 29, 1990, the Board received a Regulatory Proposal from the Illinois Utility Group ("Utility Group"). In its filing the Utility Group proposed amendments to the development, operating, and reporting requirements for non-hazardous waste landfills that were developed in R88-7 and that are found at 35 Ill. Adm. Code 811. On December 20, 1990, the Board issued an Order directing the Utility Group to amend its proposal to comply with certain filing requirements set forth in 35 Ill. Adm. Code 102.121. Specifically, the Board directed the Utility Group to provide it with information on the economic impact of the proposed rule and an explanation of which material in the R88-7 Economic Impact Study is applicable to the proposed rule, and to complete an Analysis of Economic and Budgetary Effects questionnaire. On February 4, 1991, the Utility Group filed its Response to the Board's December 20, 1990 Order. On March 13, 1991, the Utility Group filed an amended proposal.

The Board today acts to send this regulatory proposal to First Notice without ruling on the merits of the proposal. The Board directs the Clerk of the Board to cause the publication of the proposal in the Illinois Register. This action does not constitute the Board's adoption of a substantive position concerning the proposal. Notwithstanding the above, the Board has made minor changes in the proposal to correct minor deficiencies. For example, the Board has corrected punctuation.

In addition to the foregoing, the Board directs the Hearing Officer to set a hearing date for this proposal and, as appropriate, to establish deadlines for the pre-filing of testimony, exhibits, questions, and responses thereto. Those who do not pre-file such materials will be able to present their evidence only as time permits. The Board believes that such procedures will make efficient use of the Board's limited hearing money, avoid undue delay, and provide an opportunity for public participation.

The Board also notes the following: First, pursuant to Section 27 of the Environmental Protection Act (Act), the Board

has 60 days from the date of first acceptance for hearing to determine whether or not an Economic Impact Study (EcIS) is necessary for this proposal. Accordingly, the calculation of time during which the Board must make this determination for this proposal begins to run as of this date. Those wishing to comment on this aspect of the proceeding must do so within 21 days of this date (see Section 27 of the Act). Second, we note that the Utility Group has proposed amendments to 35 Ill. Adm. Code 814, which covers existing landfills. We remind the proponent that the Board, in R88-7, granted a one year stay from the September 18, 1990 effective date of 35 Ill. Adm. Code 811 for new landfills that dispose of wastes generated by electric utilities only. We have, however, included the amendments to 35 Ill. Adm. Code 814 in this First Notice for the purpose of administrative ease and economy. We emphasize that our action is not to be construed as staying the September 18, 1990 applicability date of the landfill regulations for existing landfills.

ORDER

The Board hereby proposes for First Notice the following amendments to 35 Ill. Adm. Code 811 and 814, as well as 35 Ill. Adm. Code 816. The Clerk of the Board is directed to file these proposed amendments with the Secretary of State.

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE G: WASTE DISPOSAL
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER i: SOLID WASTE AND SPECIAL WASTE HAULING

PART 811
STANDARDS FOR NEW SOLID WASTE LANDFILLS

SUBPART A: GENERAL STANDARDS FOR ALL LANDFILLS

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811.102 Location Standards
811.103 Surface Water Drainage
811.104 Survey Controls
811.105 Compaction
811.106 Daily Cover
811.107 Operating Standards
811.108 Salvaging
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SUBPART B: INERT WASTE LANDFILLS

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SUBPART C: PUTRESCIBLE AND CHEMICAL WASTE LANDFILLS

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AUTHORITY: Implementing Sections 5, 21, 21.1, 22, 22.17 and 28.1 and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1989, ch. 111 1/2, pars. 1005, 1021, 1021.1, 1022, 1022.17, 1028.1 and 1027.).

SOURCE: Adopted in R88-7 at 14 Ill. Reg. 15861, effective September 18, 1990; amended in R90-25 at 15 Ill. Reg. effective

NOTE: Capitalization indicates statutory language.

SUBPART A: GENERAL STANDARDS FOR ALL LANDFILLS

Section 811.101 Scope and Applicability

a) The standards of this Part apply to all new landfills, except those regulated pursuant to 35 Ill. Adm. Code 7( through 749. Subpart A contains general standards applicable to all new landfills. Subpart B contains additional standards for new landfills which dispose of only inert wastes. Subpart C contains additional standards for new landfills which dispose of chemical and putrescible wastes, except for electric fossil fuel combustion waste landfills, which are regulated under 3 Ill. Adm. Code 816. 35 Ill. Adm. Code 816 contains standards for new landfills which dispose of electric utility fossil fuel combustion wastes.

b) This Part shall not apply until one year after the effective date of this Part to new landfills solely receiving the following wastes generated by the following industries, provided that proposed regulations of general applicability to that industry category are filed with the Board no later than December 1, 1990: wastes generated by foundries and primary steel production facilities and coal combustion wastes generated by electric utilities. The requirements of 35 Ill. Adm. Code 807 shall apply to such landfills during the interim period of one year after the effective date of this Part. This Part shall become effective immediately after December 1, 1990 if no proposal has been filed by that date.

c) All general provisions of 35 Ill. Adm. Code 810 apply to this Part.

(Source: Amended at 15 Ill. Reg. , effective ).

SUBPART C: PUTRESCIBLE AND CHEMICAL WASTE LANDFILLS

Section 811.301 Scope and Applicability

In addition to the requirements of Subpart A, the standards f this Subpart apply to all landfills in which chemical and putrescible wastes are to be placed, except for electric fossil fuel combustion waste landfills, which are regulated under 35 Ill. Adm. Code 816.

(Source: Amended at 15 Ill. Reg. , effective ).

SUBPART D: MANAGEMENT OF SPECIAL WASTES AT LANDFILLS

Section 811.401 Scope and Applicability

a) This Subpart applies to all landfills permitted by the Agency pursuant to Section 21 of the Act, including landfills operated onsite, with or without a permit, that accept special wastes, except for electric fossil fuel combustion waste landfills, which are regulated under 35 Ill. Adm. Code 816.

b) The standards of this Subpart apply in addition to the standards of 35 Ill. Adm. Code 809.

c) Inspection, testing or acceptance of waste by a solid waste management facility shall not relieve the generator or transporter of responsibility for compliance with the requirements of 35 Ill. Adm. Code: Subtitle G.

(Source: Amended at 15 Ill. Reg. , effective )

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE G: WASTE DISPOSAL
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER i: SOLID WASTE AND SPECIAL WASTE HAULING

PART 814
STANDARDS FOR EXISTING LANDFILLS AND UNITS

SUBPART A: GENERAL REQUIREMENTS

Section
814.101 Scope and Applicability
814.102 Compliance Date
814.103 Notification to Agency
814.104 Applications for Significant Modification of Permits
814.105 Effect of Timely Filing of Notification and Application for Significant Modification
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SUBPART B: STANDARDS FOR UNITS ACCEPTING INERT WASTE

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SUBPART C: STANDARDS FOR EXISTING UNITS ACCEPTING CHEMICAL AND PUTRESCIBLE WASTES THAT MAY REMAIN OPEN FOR MORE THAN SEVEN YEARS

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814.301 Scope and Applicability
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SUBPART D: STANDARDS FOR EXISTING UNITS ACCEPTING CHEMICAL AND PUTRESCIBLE WASTES THAT MUST INITIATE CLOSURE WITHIN SEVEN YEARS

Section
814.401 Scope and Applicability
814.402 Applicable Standards

SUBPART E: STANDARDS FOR EXISTING UNITS ACCEPTING INERT WASTE ONLY, OR ACCEPTING CHEMICAL AND PUTRESCIBLE WASTES THAT MUST INITIATE CLOSURE WITHIN TWO YEARS

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814.501 Scope and Applicability
814.502 Standards for Operation and Closure

SUBPART I: STANDARDS FOR EXISTING ELECTRIC UTILITY FOSSIL FUEL COMBUSTION WASTE LANDFILLS WHICH REMAIN OPEN FOR MORE THAN SEVEN YEARS AFTER THE EFFECTIVE DATE OF THESE REGULATIONS, AND FOR THE CLOSURE AND POST-CLOSURE MONITORING OF EXISTING ASH POND SURFACE IMPOUNDMENTS WHICH WERE OPERATED UNDER THE NPDES PERMIT PROGRAM AND WHICH INITIATE CLOSURE MORE THAN SEVEN YEARS AFTER THE EFFECTIVE DATE OF THESE REGULATIONS

Section 814.901 Scope and Applicability
Section 814.902 Applicable Standards

SUBPART J: STANDARDS FOR EXISTING ELECTRIC UTILITY FOSSIL FUEL COMBUSTION WASTE LANDFILLS WHICH INITIATE CLOSURE WITHIN SEVEN YEARS AFTER THE EFFECTIVE DATE OF THESE REGULATIONS, AND FOR THE CLOSURE AND POST-CLOSURE MONITORING OF EXISTING ASH POND SURFACE IMPOUNDMENTS WHICH WERE OPERATED UNDER THE NPDES PERMIT PROGRAM AND WHICH INITIATE CLOSURE WITHIN SEVEN YEARS AFTER THE EFFECTIVE DATE OF THESE REGULATIONS

Section 814.920 Scope and Applicability
Section 814.921 Applicable Standards

SUBPART K: STANDARDS FOR EXISTING ELECTRIC UTILITY FOSSIL FUEL COMBUSTION WASTE LANDFILLS WHICH INITIATE CLOSURE WITHIN TWO YEARS AFTER THE EFFECTIVE DATE OF THESE REGULATIONS, AND FOR THE CLOSURE AND POST-CLOSURE MONITORING OF EXISTING ASH POND SURFACEIMPOUNDMENTS WHICH WERE OPERATED UNDER THE NPDES PERMIT

PROGRAM AND WHICH INITIATE CLOSURE WITHIN TWO YEARS AFTER THE EFFECTIVE DATE OF THESE REGULATIONS

Section 814.930 Scope and Applicability
Section 814.931 Applicable Standards

AUTHORITY: Implementing Sections 5, 21, 21.1, 22, 22.17 and 28.1, and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1989, ch. 111 1/2, pars. 1005, 1021, 1021.1, 1022, 1022.17, 1028.1 and 1027).

SOURCE: Adopted in R88-7 at 14 Ill. Reg. 15861, effective September 18, 1990; amended in R90-25 at 15 Ill. Reg. , effective

NOTE: Capitalization indicates statutory language.

SUBPART A: GENERAL REQUIREMENTS

Section 814.104 Applications for Significant Modification of Permits

a) All operators of landfills permitted pursuant to Section 21(d) of the Environmental Protection Act (Act) (Ill. Rev. Stat. 1989, ch. 111 1/2, par. 1021(d)) shall file an application for a significant modification to their permits for existing units, unless the units will be closed pursuant to Subpart E or Subpart K within 2 years of the effective date of this Part.

b) The operator of an existing unit shall submit information required by 35 Ill. Adm. Code 812 to demonstrate compliance with Subpart B, Subpart C, ~~or~~ Subpart D, Subpart I, or Subpart J, whichever is applicable.

(Source: Amended at 15 Ill. Reg. , effective ).

SUBPART I: STANDARDS FOR EXISTING ELECTRIC UTILITY FOSSIL FUEL COMBUSTION WASTE LANDFILLS WHICH REMAIN OPEN FOR MORE THAN SEVEN YEARS AFTER THE EFFECTIVE DATE OF THESE REGULATIONS, AND FOR THE CLOSURE AND POST-CLOSURE MONITORING OF EXISTING ASH POND SURFACE IMPOUNDMENTS WHICH WERE OPERATED UNDER THE NPDES PERMIT PROGRAM AND WHICH INITIATE CLOSURE MORE THAN SEVEN YEARS AFTER THE EFFECTIVE DATE OF THESE REGULATIONS

Section 814.901 Scope and Applicability

a) The standards of this Subpart are applicable to all existing units of landfills, including those exempt from

permit requirements in accordance with Section 21(d) of the Act, that have accepted or accept only fossil fuel combustion wastes from electric utility boilers. Based upon the information submitted pursuant to Subpart A, and any Agency site inspection, units that meet the requirements of this Subpart may remain open for an indefinite period of time beyond seven years after the effective date of this Subpart.

b) Based upon an evaluation of the information submitted pursuant to Subpart A and any Agency site inspection, units which are unable to meet the requirements of this Subpart are subject to the requirements of Subparts J or K.

c) The closure and post-closure monitoring of ash pond units which are constructed, operated and regulated under the NPDES permit program, and which subsequently initiate closure more than seven years following the effective date of these regulations, shall upon closure be regulated under this Subpart.

(Source: Added at 15 Ill. Reg. , effective ).

Section 814.902 Applicable Standards

a) All of the requirements for new units described in 35 Ill. Adm. Code 816 shall apply to units regulated under this Subpart except the following:

1) The general location standards in 35 Ill. Adm. Code 816.102;

2) The technical facility location requirements in 35 Ill. Adm. Code 816.110;

3) The foundation and mass stability analysis standards in 35 Ill. Adm. Code 816.112;

4) The foundation construction standards in 35 Ill. Adm. Code 816.113;

5) The liner system requirements in 35 Ill. Adm. Code 816.114;

6) The final cover requirements of 35 Ill. Adm Code 816.116 shall not apply to units or parts of units closed, covered and vegetated prior to the effective date of this Part; and

7) The hydrogeologic site investigation requirements in 35 Ill. Adm. Code 816.117, except that

information shall be collected to implement a groundwater monitoring program in accordance with 35 Ill. Adm. Code 816.120, 816.121 and 816.122.

b) Units regulated under this Subpart shall be subject to the following standards:

1) The operator shall provide a long-term static safety factor of at least 1.5 to protect a completed unit against slope failure;

2) Calculation of the Design Period

For the purpose of calculating financial assurance, the design period shall be calculated as follows:

A) The design period shall be no less than the operating life of the unit plus 15 years of post-closure care; and

B) The post-closure care period shall be extended by three years for each year the unit is expected to be in operation, up to the applicable design period required by 35 Ill. Adm. Code 816.

(Source: Added at 15 Ill. Reg. , effective ).

SUBPART J: STANDARDS FOR EXISTING ELECTRIC UTILITY FOSSIL FUEL COMBUSTION WASTE LANDFILLS WHICH INITIATE CLOSURE WITHIN SEVEN YEARS AFTER THE EFFECTIVE DATE OF THESE REGULATIONS, AND FOR THE CLOSURE AND POST-CLOSURE MONITORING OF EXISTING ASH POND SURFACE IMPOUNDMENTS WHICH WERE OPERATED UNDER THE NPDES PERMIT PROGRAM AND WHICH INITIATE CLOSURE WITHIN SEVEN YEARS AFTER THE EFFECTIVE DATE OF THESE REGULATIONS

Section 814.920 Scope and Applicability

a) The standards of this Subpart are applicable to all existing units of landfills, including those exempt from permit requirements in accordance with Section 21(d) of the Act, that have accepted or accept only fossil fuel combustion wastes from electric utility boilers, and which initiate closure within seven years of the effective date of these regulations.

b) Based upon an evaluation of the information submitted pursuant to Subpart A, and any Agency site inspection, units which are unable to comply with the requirements of this Section are subject to the requirements of Subpart K.

c) The closure and post-closure monitoring of ash pond units which are constructed, operated and regulated under the NPDES permit program, and which subsequently initiate closure within seven years following the effective date of these regulations, shall upon closure be regulated under this Subpart.

(Source: Added at 15 Ill. Reg. , effective ).

Section 814.921 Applicable Standards

a) All of the requirements for new units described in 35 Ill. Adm. Code 816 shall apply to units regulated under this Subpart except the following:

1) The general location standards in 35 Ill. Adm. Code 816.102;

2) The technical facility location requirements in 35 Ill. Adm. Code 816.110;

3) The foundation and mass stability analysis standards in 35 Ill. Adm. Code 816.112;

4) The foundation construction standards in 35 Ill. Adm. Code 816.113;

5) The liner system requirements in 35 Ill. Adm. Code 816.114;

6) The final cover requirements of 35 Ill. Adm Code 816.116 shall not apply to units or parts of units closed, covered and vegetated prior to the effective date of this Part:

7) The hydrogeologic site investigation requirements in 35 Ill. Adm. Code 816.117;

8) The groundwater impact assessment standards of 35 Ill. Adm. Code 816.119;

9) The groundwater monitoring requirements of 35 Ill. Adm. Code 816.121; and

10) The groundwater quality standards of 35 Ill. Adm. Code 811.122.

b) The following standards shall apply to units regulated under this Subpart:

1) No new units shall be opened and an existing unit may not expand beyond the area included in a permit

issued prior to the effective date of this Part, or, in the case of permit-exempt facilities, beyond the area needed for landfilling to continue until closure is initiated;

2) Groundwater Standards

A unit shall not contaminate a source of drinking water at the compliance boundary, defined as any point on the edge of the unit at or below the ground surface. At any point on the compliance boundary, the concentration of constituents shall not exceed the water quality standards specified in 35 Ill. Adm. Code 302.301, 302.303, 302.304, and 302.305. The Board may approve for a zone of attenuation and adjust the compliance boundary in accordance with Section 28.1 of the Act, and the procedures of 35 Ill. Adm. Code 106.Subpart G, upon petition demonstration by the operator that the alternative compliance boundary will not result in contamination of groundwater which may be needed or used for human consumption. In reviewing such petitions, the Board shall consider the following factors:

A) The hydrogeologic characteristics of the unit and surrounding land, including any natural attenuation and dilution characteristics of the aquifer;

B) The volume and physical and chemical characteristics of the leachate;

C) The quantity, quality and direction of flow of groundwater underlying the facility;

D) The proximity and withdrawal rates of groundwater users;

E) The availability of alternative drinking water supplies;

F) The existing quality of the groundwater, including other sources of contamination and their cumulative impacts on the groundwater;

G) Public health, safety and welfare effects; and

H) In no case shall the zone of compliance extend beyond the facility property line or beyond the annual high water mark of any navigable surface water.

3) Calculation of the Design Period

For the purpose of calculating financial assurance, the design period shall be calculated as follows:

A) The design period shall be no less than five years; and

B) The post-closure care period shall be extended by three years for each year the unit is expected to be in operation, up to the applicable design period required by 35 Ill. Adm. Code 816.

(Source: Added at 15 Ill. Reg. , effective ).

SUBPART K: STANDARDS FOR EXISTING ELECTRIC UTILITY FOSSIL FUEL COMBUSTION WASTE LANDFILLS WHICH INITIATE CLOSURE WITHIN TWO YEARS AFTER THE EFFECTIVE DATE OF THESE REGULATIONS, AND FOR THE CLOSURE AND POST-CLOSURE MONITORING OF EXISTING ASH POND SURFACE IMPOUNDMENTS WHICH WERE OPERATED UNDER THE NPDES PERMIT PROGRAM AND WHICH INITIATE CLOSURE WITHIN TWO YEARS AFTER THE EFFECTIVE DATE OF THESE REGULATIONS

Section 814.930 Scope and Applicability

a) The standards in this Subpart are applicable to all existing units of landfills, including those exempt from permit requirements in accordance with Section 21(d) of the Act, that accept or have accepted only fossil fuel combustion wastes from electric utility boilers and which will initiate closure within two years after the effective date of these regulations.

b) All units which cannot demonstrate compliance with the requirements of Subparts I or J of this Part, or which are scheduled to initiate closure within two years after the effective date of this Part must begin closure within two years of the effective date of this Part.

c) The closure and post-closure monitoring of ash pond units which are constructed, operated and regulated under the NPDES permit program, and which subsequently initiate closure within two years following the effective date of these regulations, shall be regulated under this Subpart.

d) A new permit shall not be required for any facility at which all units will close within two years of the effective date of this Part.

(Source: Added at 15 Ill. Reg. , effective ).

Section 814.931 Applicable Standards

a) All units regulated by this Subpart are subject to all applicable requirements of 35 Ill. Adm. Code 807; and

b) All units regulated by this Subpart are subject to all conditions of the existing permit.

(Source: Added at 15 Ill. Reg. , effective ).

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE G: WASTE DISPOSAL
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER i: SOLID WASTE AND SPECIAL WASTE HAULING

PART 816
STANDARDS FOR NEW ELECTRIC UTILITY FOSSIL FUEL COMBUSTION WASTE LANDFILLS

Section
816.101 Scope and Applicability
816.102 Location Standards
816.103 Surface Water Drainage
816.104 Survey Controls
816.105 Operating Standards
816.106 Combustion Waste Sale or Re-Use
816.107 Boundary Control
816.108 Closure and Written Closure Plan
816.109 Post-Closure Maintenance
816.110 Facility Location--Technical Requirements
816.111 Design Period
816.112 Foundation and Mass Stability Analysis
816.113 Foundation Construction
816.114 Liner Systems
816.115 Intermediate Cover
816.116 Final Cover System
816.117 Hydrogeologic Site Investigations
816.118 Plugging and Sealing of Drill Holes
816.119 Groundwater Impact Assessment
816.120 Design, Construction and Operation of Groundwater Monitoring Systems
816.121 Groundwater Monitoring Programs
816.122 Groundwater Quality Standards
816.123 Final Slope and Stabilization
816.124 Waste Checking Program

AUTHORITY: Implementing Sections 5, 21, 21.1, 22, 22.17 and 28.1 and authorized by Section 27 of the Environmental Protection

Act (Ill. Rev. Stat. 1989, ch. 111 1/2, pars. 1005, 1021, 1021.1, 1022, 1022.17, 1028.1 and 1027.).

SOURCE: Adopted in R90-25 at 15 Ill. Reg. , effective

NOTE: Capitalization indicates statutory language.

Section 816.101 Scope and Applicability

a) The standards of this Part apply to all new electric utility fossil fuel combustion waste landfills.

b) Utility NPDES-permitted surface impoundments, upon closure, shall comply with Sections 816.109 and 816.116 (closure), and 816.121 (groundwater monitoring).

c) All general provisions and definitions of 35 Ill. Adm. Code 810 apply to this Part.

d) New waste management units, located at existing facilities, should not be required to comply with:

1) The location standards in Sections 816.102 (a), (b), (c), (d), and (g); and

2) The foundation and mass stability analysis standards in Section 816.112.

e) For the purpose of this Part, electric utility fossil fuel combustion wastes shall include all fly ash, bottom ash, miscellaneous ashes, air pollution control wastes, scrubber sludges and other combustion wastes produced by the combustion of fossil fuels for the production of electricity in utility boilers. Further, for the purposes of this Part, disposal shall not include the sale or re-use of electric utility fossil fuel combustion wastes for beneficial purposes, including, but not limited to, use as fill or for coal mine reclamation purposes.

Section 816.102 Location Standards

a) The facility shall not invade or diminish the scenic, recreational and fish and wildlife values for any river designated for protection under the Wild and Scenic Rivers Act (16 U.S.C. 1271 et seq.).

b) The facility shall not restrict the flow of a 100-year flood, result in washout of solid waste from the 100-year flood, or reduce the temporary water storage

capacity of the 100-year floodplain, unless measures are undertaken to provide alternative storage capacity.

c) The facility shall not be located in areas where it may pose a threat of harm or destruction to the features for which an irreplaceable historic or archaeological site was listed pursuant to the National Historic Preservation Act (16 U.S.C. 470 et seq.) or the Illinois Historic Preservation Act (Ill. Rev. Stat. 1989, ch. 127, pars. 133d1 et seq.) for which a Natural Landmark was designated by the National Park Service or the Illinois State Historic Preservation Officer, or for which a natural area was designated as a Dedicated Illinois Nature Preserve pursuant to the Illinois Natural Areas Preservation Act (Ill. Rev. Stat. 1989, ch. 105, pars. 701 et seq.).

d) The facility shall not be located in areas where it may jeopardize the continued existence of any designated endangered species, result in the destruction or adverse modification of the critical habitat listed for such species, or cause or contribute to the taking of any endangered or threatened species of plant, fish or wildlife listed pursuant to the Endangered Species Act (16 U.S.C. 1531 et seq.), or the Illinois Endangered Species Protection Act (Ill. Rev. Stat. 1989, ch. 8, pars. 331 et seq.).

e) The facility shall not cause a violation of Section 404 of the Clean Water Act (33 U.S.C. 1344).

f) The facility shall not cause a nonpoint source of pollution that violates applicable legal requirements implementing an area-wide or statewide water quality management plan that has been approved under Section 208 of the Clean Water Act (33 U.S.C. 1288).

g) The facility shall comply with the technical location standards in Section 816.110.

Section 816.103 Surface Water Drainage

a) Runoff From Disturbed Areas

1) Runoff from disturbed areas resulting from precipitation events less than or equal to the 25-year, 24-hour precipitation event that is discharged to waters of the State shall meet the requirements of 35 Ill Adm. Code 304.

2) All discharges of runoff from disturbed areas to waters of the State shall be permitted by the

2) All discharges of runoff from disturbed areas to waters of the State shall be permitted by the Agency in accordance with 35 Ill. Adm. Code 309.

3) All treatment facilities shall be equipped with bypass outlets designed to pass the peak flow of runoff from the 100-year, 24-hour precipitation event without damage to the treatment facilities or surrounding structures.

4) All surface water control structures shall be operated until the final cover is placed and erosional stability is provided by the vegetative or other cover meeting the requirements of Section 816.116.

5) All discharge structures shall be designed to prevent erosion and scouring of the receiving stream channel.

b) Diversion of Runoff From Undisturbed Areas

1) Runoff from undisturbed areas shall be diverted around disturbed areas to the maximum practical extent.

2) Diversion facilities shall be designed to prevent runoff from the 25-year, 24-hour precipitation event from entering disturbed areas.

3) Runoff from undisturbed areas which becomes commingled with runoff from disturbed areas shall be handled as runoff from disturbed areas and treated in accordance with subsection (a).

4) All diversion structures shall be designed to prevent erosion and scouring in the diversion channel and downstream channels.

5) All diversion structures shall be operated until the final cover is placed and erosional stability is provided by the vegetative or other cover meeting the requirements of Section 816.116.

Section 816.104 Survey Controls

a) The boundaries of all waste disposal units, property boundaries, disturbed areas, and the permit area for facilities subject to the requirements of Section 21 of the Environmental Protection Act (Act) (Ill. Rev. Stat. 1989, ch. 111 1/2, par. 1021) shall be surveyed and marked.

b) All stakes and monuments shall be clearly marked for identification.

c) All stakes and monuments shall be inspected annually and surveyed no less frequently than once in five years. Any missing or damaged stakes and monuments discovered during an inspection shall be replaced in a timely manner.

d) Control monuments shall be established to check vertical elevations. The control monuments shall be established and maintained.

Section 816.105 Operating Standards

a) Phasing of Operations

1) Waste shall be placed in a manner and at such a rate that mass stability is provided during all phases of operation.

2) The phasing of operations at the facility shall be designed in such a way as to allow the sequential construction, filling, and closure of discrete units or parts of units.

3) The operator shall dispose of wastes in a manner which will facilitate the filling to final grade and minimize the operational phase of each discrete unit or parts of units.

b) Size and Slope of Working Face

1) The working face of the unit shall be no larger than is necessary to conduct operations in a safe and efficient manner.

2) The slopes of the working face area shall be no steeper than two-to-one (horizontal-to-vertical) unless the waste is stable at steeper slopes.

c) Equipment

Equipment shall be maintained and available for use at the facility during all hours of operations, so as to achieve and maintain compliance with the requirements of this Part.

d) Utilities

All utilities, including but not limited to heat, lights, power and communications equipment, necessary

for safe operation in compliance with the requirements of this Part shall be available at the facility at all times.

e) Maintenance

The operator shall maintain and operate all systems and related appurtenances and structures in a manner that facilitates proper operations in compliance with this Part.

f) Open Burning

Open burning is prohibited except in accordance with 35 Ill. Adm. Code 200 through 245.

g) Dust Control

The operator shall implement methods for controlling dust to meet the fugitive dust control regulations at 35 Ill. Adm. Code 212.

h) Noise Control

The facility shall be designed, constructed and maintained to minimize the level of equipment noise audible outside the facility. The facility shall not cause or contribute to a violation of 35 Ill. Adm. Code 900 through 905 or of Section 24 of the Act.

i) Mud Tracking

The facility shall implement methods, such as use of wheel washing units, to prevent tracking of mud by hauling vehicles onto public roadways.

Section 816.106 Combustion Waste Sale or Re-Use

Although these regulations deal with the effective disposal management of coal combustion wastes, nothing in this Part is in any way meant to discourage or impede the productive sale or re-use of electric utility fossil fuel combustion byproducts in commerce, including, but not limited to, use as fill materials or as part of coal mine reclamation projects.

Section 816.107 Boundary Control

a) Access to the open face area of the unit and all other areas within the boundaries of the facility shall be restricted to prevent unauthorized entry at all times.

b) A permanent sign shall be posted at the entrance to the facility stating that disposal of chemical and domestic waste is prohibited, and an identification record along with the following information:

1) Permit number, if the facility is subject to the permit requirements of Section 21 of the Act;

2) Hours of operation;

3) The penalty for unauthorized trespassing and dumping;

4) The name and telephone number of the appropriate emergency response agencies who shall be available to deal with emergencies and other problems, if different than the operator; and

5) The name, address and telephone number of the company operating the facility.

Section 816.108 Closure and Written Closure Plan

a) The final slopes and contours shall be designed to complement and blend with the surrounding topography of the proposed final land use of the area.

b) All drainage ways and swales shall be designed to safely pass the runoff from the 100-year, 24-hour precipitation event without scouring or erosion.

c) The final configuration of the facility shall be designed in a manner that minimizes the need for further maintenance.

d) Written closure plan

1) The operator shall maintain a written plan describing all actions that the operator will undertake to close the unit or facility in a manner that fulfills the provisions of the Act, of this Part and of other applicable Parts of 35 Ill. Adm. Code: Chapter I. The written closure plan shall fulfill the minimum information requirements of 35 Ill. Adm. Code 812.114.

2) A modification of the written closure plan shall constitute a significant modification of the permit for the purposes of 35 Ill. Adm. Code 813.Subpart B.

Section 816.109 Post-Closure Maintenance

a) The operator shall treat, remove from the site, or dispose of all ancillary wastes and waste residues from site operations, excluding the fossil fuel combustion wastes themselves, within 30 days after receipt of the final volume of fossil fuel combustion wastes.

b) The operator shall remove all equipment or structures not necessary for the post-closure land use, unless otherwise authorized by permit.

c) Maintenance and Inspection of the Final Cover and Vegetation

1) Frequency of Inspections

A) The operator shall conduct a quarterly inspection of all vegetated surfaces for a minimum of five years after closure, and after five years, the operator may reduce the frequency of annual inspections until settling has stopped and there are no eroded or scoured areas.

B) For landfills, other than those used exclusively for disposing waste generated at the site, inspections shall be continued for a minimum period of 15 years after closure.

2) All rills, gullies and crevices six inches or deeper identified in the annual inspection shall be filled. Areas identified by the operator or the Agency as particularly susceptible to erosion shall be re-contoured.

3) All eroded and scoured drainage channels shall be repaired and lining material shall be replaced if necessary.

4) All holes and depressions created by settling shall be filled and re-contoured so as to prevent standing water.

5) All reworked surfaces, and areas with failed or eroded vegetation in excess of 100 square feet cumulatively, shall be re-vegetated in accordance with the approved closure plan for the facility.

Section 816.110 Facility Location--Technical Requirements

a) No part of a unit shall be located within a setback zone established pursuant to Section 14.2 or 14.3 of the Act.

b) No part of a unit shall be located within the recharge zone or within 366 meters (1200 feet), vertically or horizontally, of a sole-source aquifer designated by the United States Environmental Protection Agency pursuant to Section 1424(e) of the Safe Drinking Water Act (42 U.S.C. 300h-3(e)) unless there is a stratum between the bottom of the waste disposal unit and the top of the aquifer that meets the following minimum requirements:

1) The stratum has a minimum thickness of 15.2 meters (50 feet);

2) The maximum hydraulic conductivity in both the horizontal and vertical directions is no greater than $1x10^{-7}$ centimeters per second, as determined by in situ borehole or equivalent tests; and

3) There is no indication of continuous sand or silt seams, faults, fractures or cracks within the stratum that may provide paths for migration.

c) A facility located within 152 meters (500 feet) of the right-of-way of a township or county road or state or interstate highway shall have its area of active operations screened from view as much as is practical by a barrier of natural objects, fences, barricades, or plants no less than 2.44 meters (8 feet) in height.

d) No part of a unit shall be located closer than 152 meters (500 feet) from an occupied dwelling, school, or hospital that was occupied on the date when the operator first applied for a permit to develop the unit or the facility containing the unit, unless the owner of such dwelling, school, or hospital provides permission to the operator, in writing, for a lesser distance.

e) The facility shall not be located closer than 1525 meters (5000 feet) of any runway used by piston-type aircraft, or within 3050 meters (10,000 feet) of any runway used by turbojet aircraft, unless the Federal Aviation Administration provides the operator with written permission, including technical justification, for a lesser distance.

Section 816.111 Design Period

The design period for electric utility fossil fuel combustion waste disposal units shall be the estimated operating life plus 15 years. For the purpose of this Part, electric utility fossil fuel combustion wastes shall include all fly ash, bottom ash, miscellaneous ashes, air pollution control wastes, scrubber sludges and other combustion wastes produced by the combustion of

fossil fuels for the production of electricity in utility boilers. Further, for the purposes of this Part, disposal shall not include the sale or re-use of electric utility fossil fuel combustion wastes for beneficial purposes, including, but not limited to, use as fill materials or for use in coal mine reclamation projects.

Section 816.112 Foundation and Mass Stability Analysis

a) The material beneath the unit shall have sufficient strength to support the weight of the unit during all phases of construction and operation.

b) The solid waste disposal unit shall achieve a safety factor against bearing capacity failure of 1.5 under static conditions and 1.3 under seismic loadings.

c) The waste disposal unit shall comply with all applicable Department of Transportation regulations governing dikes and berms.

d) In calculating factors of safety, both long-term and short-term conditions shall be considered.

e) The potential for earthquake or blast induced liquefaction, and its effect on the stability and integrity of the unit shall be considered and taken into account in the design. The potential for landslides or earthquake induced liquefaction outside the unit shall be considered if such events could affect the unit.

Section 816.113 Foundation Construction

a) If the in situ material provides insufficient strength to meet the requirements of Section 816.112, the insufficient material shall be removed and replaced with clean materials sufficient to meet the requirements of Section 816.112.

b) All trees, stumps, roots, boulders and debris shall be removed.

c) All material shall be compacted to achieve the strength and density properties necessary to demonstrate compliance with this Part in conformance with a construction quality assurance plan pursuant to 35 Ill. Adm. Code 811.Supbart E.

d) Placement of frozen soil or soil onto frozen ground is prohibited.

e) The foundation shall be constructed and graded to provide a smooth, workable surface on which to construct the liner.

Section 816.114 Liner Systems

a) All units shall be equipped with a liner designed as an integrated system in compliance with the requirements of this Section.

b) The liner shall be stable during all phases of construction and operation. The side slopes shall achieve a minimum static safety factor 1.5 and a minimum seismic safety factor of 1.3 at all times.

c) The liner shall be designed to function for the entire design period, which for the purposes of this regulation shall be the estimated operating life of the facility plus 15 years.

d) Liner System Standards

1) The minimum allowable thickness shall be 0.91 meters (3 feet).

2) The liners shall be compacted to achieve a maximum hydraulic conductivity of $1x10^{-7}$ centimeters per second.

3) The liner shall be compacted to minimize void spaces and support the loadings imposed by the waste disposal operation.

4) The liner shall be constructed from materials compatible with the constituents of the leachate expected to be produced.

5) Modified liners, using standard construction techniques, for hydraulic conductivity and liner thickness may be utilized if equivalent groundwater protection is provided.

6) The modified liner shall operate to achieve equivalent or superior performance to the requirements of this subsection. Equivalent performance shall be evaluated at maximum annual leachate flow conditions.

e) Geomembrane Liners

1) Geomembranes may be used to achieve the performance standards equivalent to the performance

requirements of subsection (d). In general, those performance requirements may be summarized as achieving a maximum hydraulic conductivity of $10^{-7}$ centimeters per second.

2) The geomembrane shall be supported by a compacted base free from sharp objects. The geomembrane shall be chemically compatible with the supporting soil materials.

3) The geomembrane material shall be compatible with the leachate expected to be generated.

4) Geomembrane shall have sufficient strength and durability to function at the site for the design period under the maximum expected loadings imposed by the waste and equipment and stresses imposed by settlement, temperature, construction and operation.

5) Seams shall be made in the field according to the liner manufacturer's specifications. All sections shall be arranged so that the use of field seams is minimized and seams are oriented in the direction subject to the least amount of stress.

f) Slurry Trenches and Cutoff Walls Used to Prevent Migration of Leachate

1) Slurry trenches may be required for some sites to meet these design requirements. If required, slurry trenches and cutoff walls built to contain leachate migration shall be used with a compacted earth liner or geological units with sufficient vertical and horizontal uniformity and low permeability to protect groundwater.

2) Slurry trenches and cutoff walls shall extend into the bottom confining layers or unit to a depth that will establish and maintain a continuous hydraulic connection and prevent seepage.

3) Exploration borings shall be drilled along the route of the slurry trench or cutoff wall to confirm the depth to the confining layer. In situ tests shall be conducted to determine the hydraulic conductivity of the confining layer.

4) Slurry trenches and cutoff walls shall be stable under all conditions during the design period of the facility. They shall not be susceptible to displacement or erosion under stress or hydraulic

gradient.

5) Slurry trenches and cutoff walls shall be constructed in conformance to a construction quality assurance plan, pursuant to 35 Ill. Adm. Code 811.Subpart E, that ensures that all material and construction methods meet design specification.

g) Liner configurations other than those specified in this Section, special construction techniques, and admixtures may be utilized, provided that:

1) The alternative technology or material(s) provide(s) equivalent, or superior, performance to the requirements of this Section;

2) Methods for manufacturing quality control and construction quality assurance can be implemented; and

3) Liner configurations will be site-specific, and may include no liner, liners made of only natural materials, geomembrane liners, or some combination thereof.

Section 816.115 Intermediate Cover

Daily cover for electric utility fossil fuel combustion wastes will generally not be required unless fugitive dust emissions criteria are exceeded. If those emissions criteria are exceeded, then operating adjustments and/or intermediate cover equivalent to that provided by 0.30 meter (1 foot) of compacted clean soil material must be used.

Section 816.116 Final Cover System

a) The unit shall be covered by a final cover consisting of a low-permeability layer overlain by a final protective layer constructed in accordance with the requirements of this Section.

b) Standards for the Low-Permeability Layer

1) Not later than 180 days after placement of the final lift of solid waste, a low-permeability layer shall be constructed.

2) The low-permeability layer shall cover the entire unit and connect with any liner or slurry wall system, as applicable and appropriate.

3) The low-permeability layer shall consist of any one of the following:

A) A compacted earth layer constructed in accordance with the following standards:

i) The minimum allowable thickness shall be 0.3 meter (1 foot); and

ii) The layer shall be compacted to achieve a permeability of not more than $1x10^{-7}$ centimeters per second, and to minimize void spaces; or

iii) Alternative specification may be utilized provided that the performance of the low-permeability layer is equal to, or superior to, the performance of a layer meeting the requirements of subsections (b)(3)(A)(i) and (b)(3)(A)(ii).

B) A geomembrane constructed in accordance with the following standards:

i) The geomembrane shall provide performance equal to, or superior to, the compacted earth layer described in subsection (b)(3)(A);

ii) The geomembrane shall have strength to withstand the normal stresses imposed by the waste stabilization process; and

iii) The geomembrane shall be placed over a prepared base free from sharp objects and other materials which may cause damage.

C) Any other low-permeability layer construction techniques or materials, provided that they provide equivalent or superior performance to the requirements of this subsection.

c) Standards for the Final Protective Layer

1) The final protective layer shall cover the entire low-permeability layer.

2) The thickness of the final protective layer shall be sufficient to protect the low-permeability layer from freezing, and minimize root penetration of the low-permeability layer, but shall not be less than 0.91 meter (3 feet).

3) The final protective layer shall be placed as soon as possible after placement of the low-permeability layer to prevent desiccation, cracking, freezing or other damage to the low-permeability layer.

4) Any other final protective layer construction design may be used as long as that design provides equivalent or superior performance to the requirements of this subsection.

Section 816.117 Hydrogeologic Site Investigations

a) Purpose

The operator shall conduct a hydrogeologic investigation to develop hydrogeologic information for the following uses:

1) Provide information to perform a groundwater impact assessment; and

2) Provide information to establish a groundwater monitoring system.

b) General Requirements

1) The investigation shall be conducted in a minimum of three phases prior to submission of any application to the Agency for a permit to develop and operate a utility fossil fuel combustion waste landfill facility.

2) The study area shall consist of the entire area occupied by the facility and any adjacent related areas, to the extent necessary to characterize the site hydrogeology.

3) All borings shall be sampled continuously at all recognizable points of geologic variation, except that where continuous sampling is impossible or where non-continuous sampling can provide equivalent information, samples shall be obtained at intervals no greater than 1.52 meters (5 feet) in homogeneous strata.

c) Minimum Requirements for a Phase I Investigation

1) The operator shall conduct a Phase I Investigation to develop the following information:

A) Climatic aspects of the study area;

B) The regional and study area geologic setting, including a description of the geomorphology and stratigraphy of the area;

C) The regional groundwater regime including water table depths and aquifer characteristics; and

D) Information for the purpose of designing a Phase II Hydrogeologic Investigation.

2) Specific Requirements

The regional hydrogeologic setting of the unit shall be established by using material from reasonably available and known sources, including, but not limited to, the Illinois Scientific Surveys, the Agency, other State and Federal organizations, water well drilling logs, and previous investigations.

d) Minimum Requirements for a Phase II Investigation

1) Information to be developed

Using the information developed in the Phase I survey, a Phase II study shall be conducted to collect the site-specific information listed below as needed to augment data collected during the Phase I Investigation and to prepare for the Phase III Investigation:

A) Structural characteristics and distribution of underlying strata including bedrock;

B) Chemical and physical properties including, but not limited to, lithology, mineralogy, and hydraulic characteristics of underlying strata including those below the uppermost aquifer;

C) Soil characteristics, including soil types, distribution, geochemical and geophysical characteristics;

D) The hydraulic conductivity of the uppermost aquifer and all strata above it;

E) The vertical extent of the uppermost aquifer;

F) The direction and rate of groundwater flow.

2) Specific Requirements

A) One boring shall be located as close as feasible to the topographical high point, and another shall be located as close as feasible to the topographical low point of the study area.

B) Additional borings may be located at intermediate points at locations and spacings necessary to establish the continuity of the stratigraphic units.

C) Piezometers and groundwater monitoring wells shall be established to determine the direction and flow characteristics of the groundwater in all strata including the uppermost aquifer. Groundwater samples taken from such monitoring wells shall be used to develop preliminary information needed for establishing background concentrations in accordance with subsection (e)(1)(G).

D) Other methods may be utilized to confirm or accumulate additional information. Such methods may be used only as a supplement to, not in lieu of, site-specific boring information. Other methods may include, but are not limited to, geophysical well logs, geophysical surveys, aerial photography, age dating, and test pits.

e) Minimum Standards for a Phase III Investigation

1) Using the information developed during the Phase I and Phase II Investigations, the operator shall conduct a Phase III Investigation. This investigation shall be conducted to collect or augment the site-specific information needed to carry out the following:

A) Verification and reconciliation of the information collected in the Phase I and II investigations;

B) Characterization of potential pathways for contaminant migration;

C) Correlation of stratigraphic units between borings;

D) Continuity of petrographic features including, but not limited to, sorting, grain size

distribution, cementation and hydraulic conductivity;

E) Identification of zones of potentially high hydraulic conductivity;

F) Identification of the confining layer, if present;

G) Concentrations of the following physical and chemical constituents present in the groundwater in each permeable geological unit(s) below the unit, including the uppermost aquifer (Concentrations, except for temperature, pH, and conductance, determined on a dissolved basis):

arsenic
boron
calcium
chemical
chloride
chronium
conductance
dissolved oxygen
magnesium
manganese
pH
selenium
temperature
total dissolved solids

H) Prediction of the seasonal and temporal, naturally or artificially induced, variations in groundwater quality and groundwater flow; and

I) Identification of unusual or unpredicted geologic features, including: fault zones, fracture traces, facies changes, solution channels, buried stream deposits, cross cutting structures and other geologic features that may affect the ability of the operator to monitor the groundwater or predict the impact of the disposal facility on groundwater.

2) In addition to the specific requirements applicable to Phase I and II Investigations, the operator shall collect information needed to meet the minimum standards of a Phase III Investigation by using methods they may include, but not be limited to, excavation of test pits, additional borings

located at intermediate points between boreholes placed during the Phase II Investigation, pl m of piezometers and monitoring wells, and institution of procedures for sampling and analysis.

f) The operator may conduct the hydrogeologic investigati in any number of alternative ways provided that the necessary information is collected in a systematic sequence consisting of at least three phases that is equal to or superior to the investigation procedures o this Section.

Section 816.118 Plugging and Sealing of Drill Holes

All bore holes, including exploration borings that are not converted into monitoring wells, monitoring wells that are no longer necessary to the operation of the site, and other holes that may cause or facilitate contamination of groundwater, shall be sealed in accordance with the following standards:

a) If not sealed or plugged immediately, the hole shall be covered to prevent injury to people or animals.

b) All holes no longer intended for use shall be backfille with materials that are compatible with the geochemistr of the site and with the leachate in sufficient quantities and in such a way as to prevent the creat n of a pathway for contaminants to migrate.

c) For holes in gravels and other permeable strata, where a watertight seal is not necessary to prevent the creation of a pathway, drill cuttings and other earthen materials may be utilized as backfill.

d) All excess drilling mud, oil, drill cuttings, and any other contaminated materials uncovered during or created by drilling shall be disposed of in accordance with the requirements of 35 Ill. Adm. Code 700 through 759, 807, and 809 through 815. Non-contaminated materials may be re-used without disposal.

e) If applicable and appropriate, the operator shall restore the area around the drill hole to its original condition.

Section 816.119 Groundwater Impact Assessment

The impacts of the seepage of leachate from the unit shall be assessed in a systematic fashion using the techniques described in this Section.

a) Procedures for Performing the Groundwater Impact Assessment

1) The operator shall estimate the amount of seepage from the unit during operations. That estimate shall assume:

A) That the minimum design standards for slope configuration, cover, and liner apply; and

B) That the actual design standards planned for the unit apply. Other designs for the unit may be used if determined by the operator to be appropriate to demonstrate the impacts to groundwater, pursuant to subsection (b).

2) The concentration of constituents in the leachate shall be determined from actual leachate samples from the waste or similar waste, laboratory-derived extracts, other available data, or equivalent sources.

3) A contaminant transport model meeting the standards of subsection (c) shall be utilized to estimate the concentrations of the leachate constituents over time and space. The Agency must review a groundwater contaminant transport model for acceptance in accordance with 35 Ill. Adm. Code 813.111.

b) Acceptable Groundwater Impact Assessment

The groundwater contaminant transport (GCT) model results shall be used in the assessment of the groundwater impact. The groundwater impact shall be considered acceptable if the GCT model predicts that the concentrations of all the constituents of the leachate outside the zone of attenuation are less than the applicable groundwater quality standards of Section 816.122, within 100 years of closure of the unit.

c) Standards for the Contaminant Transport Model

1) The model shall have supporting documentation that establishes its ability to represent groundwater flow and contaminant transport and any history of its previous applications.

2) The set of equations representing groundwater movement and contaminant transport must be theoretically sound and well-documented.

3) The numerical solution methods must be based upon sound mathematical principles and be supported verification and checking techniques.

4) The model must be calibrated against site-specific field data developed pursuant to this Part.

5) A sensitivity analysis shall be conducted to measure the model's response to changes in the values assigned to major parameters, specified error tolerances, and numerically assigned space and time segments.

6) Mass balance calculations on selected elements in the model shall be performed to verify physical validity. Where the model does not prescribe the amount of mass entering the system as a boundary condition, this step may be ignored.

7) The values of the model's parameters requiring site specific data shall be based upon actual field or laboratory measurements.

8) The values of the model's parameters which do not require site specific data shall be supported by laboratory test results or equivalent methods documenting the validity of the chosen parametric values.

Section 816.120 Design, Construction and Operation of Groundwater Monitoring Systems

a) All potential sources of discharges to groundwater within the facility, including, but not limited to, all waste disposal units shall be identified and studied through a network of monitoring wells operated during the active life of the facility and for the time after closure specified in accordance with Section 816.108. Monitoring wells designed and constructed as part of the monitoring network shall be maintained along with records that include, but are not limited to, exact well location, well size, type of well, the design and construction practice used in its installation and well and screen depths.

b) Standards for the Location of Monitoring Points

1) A network of monitoring points shall be established at sufficient locations down-gradient with respect to groundwater flow and not excluding the downward direction, to detect any discharge of contaminants from any part of a potential source of discharge.

2) Monitoring wells shall be located in stratigraphic horizons that could serve as contaminant migration pathways.

3) Monitoring wells shall be established within half the distance from the edge of the potential source of discharge to the edge of the zone of attenuation down-gradient, with respect to groundwater flow, from the source.

4) At least one monitoring well shall be located up-gradient of the potential source of discharge in each geologic unit which may serve as a conduit for leachate migration.

5) The network of monitoring points of several potential sources of discharge within a single facility may be combined into a single monitoring network, provided that discharges from any part of all potential sources can be detected.

6) A minimum of one monitoring well shall be established at the edge of the zone of attenuation and shall be located down-gradient with respect to groundwater flow and not excluding the downward direction, from the unit. Such well or wells shall be used to monitor any statistically significant increase in the concentration of any constituent, in accordance with Section 816.122(e) and shall be used for determining compliance with an applicable groundwater quality standard of Section 816.122. An observed statistically significant increase above the applicable groundwater quality standards of Section 816.122 in a well located at or beyond the compliance boundary shall constitute a violation.

c) Maximum Allowable Predicted Concentrations

The operator shall use the same calculation methods, data, and assumptions as used in the groundwater impact assessment to predict the concentration over time and space of all constituents chosen to be monitored in accordance with Section 816.121 at all monitoring points. The predicted values shall be used to establish the maximum allowable predicted concentrations (MAPCs) at each monitoring point. MAPC shall not exceed the standards contained in Section 816.122 unless an adjusted standard is approved by the Board. The MAPCs calculated in this subsection shall be applicable within the zone of attenuation.

d) Standards for Monitoring Well Design and Construction

1) All monitoring wells shall be cased in a manner that maintains the integrity of the bore hole. The casing material shall be inert so as not to affect the collection or integrity of water samples.

2) Wells shall be screened to allow sampling only at the desired interval. Annular space between the borehole wall and well screen section shall be packed with gravel appropriately sized, or utilize compressed, native borehole material where appropriate, to avoid clogging by the material in the zone being monitored. The filter pack shall extend at least 1 foot above the screen. The slot size of the screen shall be designed to minimize clogging. Screens shall be fabricated from material expected to be inert with respect to the constituents of the groundwater to be sampled.

3) Annular space above the well screen section shall be sealed with a relatively impermeable, expandable material such as a cement/bentonite grout, which does not react with or in any way affect the sample, in order to prevent contamination of samples and groundwater and avoid interconnections. The lower seal shall extend to at least 2 feet above the filter pack.

4) The annular space shall be back-filled with expanding cement grout from an elevation below the frost line and mounded above the surface and sloped away from the casing so as to divert surface water away (upper seal).

5) The annular space between the upper and lower seals and in the unsaturated zone may be back-filled with uncontaminated cuttings.

6) All wells shall be covered with vented caps and equipped with devices to protect against tampering and damage.

7) All wells shall be developed to allow free entry of water, minimize turbidity of the sample, and minimize clogging.

8) The transmissivity of the zone surrounding all well screens shall be established by field testing techniques.

9) Other sampling methods and well construction techniques may be utilized if they provide equal or superior performance to the requirements of this subsection.

e) Standards for Sample Collection and Analysis

1) The groundwater monitoring program shall include consistent sampling and analysis procedures to assure that monitoring results will provide a reliable indication of groundwater quality in the zone being monitored.

2) The operator shall utilize procedures and techniques to insure that collected samples are representative of the zone being monitored and that prevent cross contamination of samples from other monitoring wells or from other samples. At least 95 percent of a collected sample shall consist of groundwater from the zone being monitored.

3) The operator shall establish a quality assurance program that provides quantitative detection limits and the degree of error for analysis of each chemical constituent.

4) The operator shall establish a sample preservation and shipment procedure that maintains the reliability of the sample collected for analysis.

5) The operator shall institute a chain of custody procedure to prevent tampering and contamination of the collected samples prior to completion of analysis.

6) At a minimum, the operator shall sample the following parameters at all wells at the time of sample collection and immediately before filtering and preserving samples for shipment:

A) The elevation of the water table;

B) The depth of the well below ground;

C) pH;

D) The temperature of the sample; and

E) Specific Conductance.

Section 816.121 Groundwater Monitoring Programs

a) Detection Monitoring Program

The operator shall implement a detection monitoring program in accordance with the following requirement

1) Monitoring Schedule and Frequency

A) The monitoring period shall begin as soon waste is placed into any unit of a new electric utility fossil fuel combustion was landfill. Monitoring shall continue for a minimum period of five years after closure. The operator shall sample monitoring wells quarterly, or may institute more frequent sampling throughout the time the source constitutes a potential threat to groundwater. For the purposes of this Section, the source shall be considered a threat to groundwater, if the results of the monitoring indicate that the concentrations any of the constituents monitored within the zone of attenuation are above the maximum allowable predicted concentration for that constituent. Sample frequency and protocols shall be contained in the Sampling and Analysis Plan (SAP) proposed by the Agency a part of the facility permit.

B) Beginning two years after closure, the monitoring frequency may change to an annual schedule if the following conditions exist. However, monitoring shall return to the original schedule at any well where a statistically significant change is determine to have occurred in accordance with Section 816.122(e), in the concentration or value of any constituent with respect to the previous sample.

i) All constituents monitored within the zone of attenuation have returned to a concentration where a statistical increase above the maximum predicted concentration is not occurring; and

ii) All constituents monitored within the zone of attenuation are statistically less than or equal to their maximum allowable predicted concentrations for four consecutive quarters.

C) Monitoring beyond the minimum period may be continued if a statistically significant increase is detected in the concentration of any constituent above that measured and recorded during the immediately preceding scheduled sampling.

2) Criteria for choosing constituents to be monitored shall be listed in the Agency-approved SAP, within the following guidelines:

A) The operator shall monitor each well for constituents that will provide a means for detecting groundwater contamination, such that:

i) The constituent appears in, or is expected to be in, the leachate; and

ii) The Board has established for the constituents a groundwater quality standard under the Illinois Groundwater Protection Act (Ill. Rev. Stat. 1989, ch. 111 1/2, pars. 7451 et seq.).

B) Indicator constituents (such as total dissolved solids or some other appropriate parameter), representative of the transport processes of constituents in the leachate, may be chosen for monitoring in place of the constituents the indicator represents. The use of such indicator constituents must be included in an Agency-approved permit SAP.

3) Confirmation of Monitored Increase

A) The confirmation procedures of this subsection shall be used only if the concentrations of the constituents monitored can be measured at or above the practical quantitation limit (PQL). The PQL is defined as the lowest concentration that can be reliably measured within specified limits of precision and accuracy, under routine laboratory operating conditions. The operator shall initiate confirmation procedures of subsection (a)(4)(B) after notifying the Agency, in writing, within 10 days of the following observed increases:

i) The concentration of any constituent exceeds statistically the maximum

allowable predicted concentration at an established monitoring point within the zone of attenuation; and/or

ii) The concentration of any constituent monitored at or beyond the zone of attenuation exceeds the applicable groundwater quality standards of Section 816.122.

B) The confirmation procedures shall include the following:

i) The operator shall verify any observed increase by taking additional samples within 45 days of becoming aware of the initial observation, and shall ensure that the samples and sampling protocol used will detect any statistically significant increase in the concentration of the suspect constituent in accordance with subsection 816.122(e), so as to confirm the observed increase. The operator shall notify the Agency of any confirmed increase before the end of the next business day after becoming aware of the confirmation.

ii) The operator shall, if possible, determine the source of any confirmed increase, which may include, but shall not be limited to, natural phenomena, sampling or analysis errors, or an off-site source.

iii) The operator shall notify the Agency in writing of any confirmed increase and state the source of the confirmed increase, if known, and provide the rationale used in such a determination within ten days of the determination.

b) Assessment Monitoring

The operator shall begin an assessment monitoring program in order to confirm that the solid waste disposal facility is the source of the contamination and to provide information needed to carry out a groundwater impact assessment in accordance with subsection (c). The assessment monitoring program shall be conducted in accordance with the following requirements:

1) The assessment monitoring shall be conducted to collect information to assess the nature and extent of groundwater contamination, which may consist of, but not be limited to, the following steps:

   A) More frequent sampling of the wells in which the observation occurred;

   B) More frequent sampling of any surrounding wells;

   C) The placement of additional monitoring wells to determine the source and extent of the contamination;

   D) Monitoring of additional constituents that might indicate the source and extent of contamination; and

   E) Any other investigative techniques that will assist in determining the nature and extent of the contamination.

2) The operator of the facility for which assessment monitoring is required shall file the plans for an assessment monitoring program with the Agency. If the facility is permitted by the Agency, then the plans shall be filed for review as a significant permit modification pursuant to 35 Ill. Adm. Code 813.Subpart B. The assessment monitoring program shall be implemented within 90 days of confirmation of any monitored increase in accordance with subsection (a)(4) or, in the case of permitted facilities, within 90 days of Agency approval.

3) If the analysis of the assessment monitoring data shows that the concentration of one or more constituents, monitored at or beyond the zone of attenuation, is above the applicable groundwater quality standards of Section 816.122 and is attributable to the electric utility fossil fuel combustion waste disposal facility, then the operator shall determine the nature and extent of the groundwater contamination including an assessment of the potential impact on the groundwater should waste continue to be accepted at the facility and shall implement remedial action in accordance with subsection (d).

4) If the analysis of the assessment monitoring data shows that the concentration of one or more constituents is attributable to the solid waste

disposal facility and exceeds the maximum allowabl predicted concentration within the zone of attenuation, then the operator shall conduct a groundwater impact assessment in accordance with the requirements of subsection (c).

c) Assessment of Potential Groundwater Impact

An operator required to conduct a groundwater impact assessment in accordance with subsection (b)(4) shall assess the potential impacts outside the zone of attenuation that may result from confirmed increases above the maximum allowable predicted concentration within the zone of attenuation, attributable to the facility, in order to determine if there is need for remedial action. In addition to the requirements of Section 816.119, the following shall apply:

1) The operator shall utilize any new information developed since the initial assessment and information from the detection and assessment monitoring programs and such information may be used for the re-calibration of the GCT model; and

2) The operator shall submit the groundwater impact assessment and any proposed remedial action plans determined necessary pursuant to subsection (d) to the Agency within 180 days of the start of the assessment monitoring program.

d) Remedial Action

1) The operator shall submit a plan for the remedial action to the Agency. That plan and all supporting information including data collected during the assessment monitoring shall be submitted within 90 days of determination of either of the following:

A) The groundwater impact assessment performed in accordance with subsection (c), indicates that remedial action is needed; or

B) Any confirmed increase above the applicable groundwater quality standards of Section 816.122 is determined to be attributable to the electric utility fossil fuel combustion waste disposal facility in accordance with subsection (b).

2) If the facility has been issued a permit by the Agency, then the operator shall submit this information as an application for significant

modification to the permit.

3) The operator shall implement the plan for remedial action within 90 days of the following:

   A) Completion of the groundwater impact assessment under subsection (c) that requires remedial action;

   B) Establishing that a violation of an applicable groundwater quality standard of Section 816.122 is attributable to the solid waste disposal facility in accordance with subsection (b)(3); and a variance from the standard is not available and appropriate; or

   C) Agency approval of the remedial action plan, where the facility has been permitted by the Agency.

4) The remedial action program shall consist of one or a combination of one or more of the following solutions:

   A) Retrofit additional groundwater protective measures within the unit;

   B) Construct an additional hydraulic barrier, such as a cutoff wall or slurry wall system;

   C) Pump and treat the contaminated groundwater; or

   D) Any other equivalent technique which will prevent further contamination of groundwater.

5) Termination of the Remedial Action Program

   A) The remedial action program shall continue in accordance with the plan until additional monitoring shows that the concentrations of all monitored constituents are below the maximum allowable predicted concentration within the zone of attenuation, and below the applicable groundwater quality standards of Section 816.122 at or beyond the zone of attenuation, over a period of 4 sampling events per the SAP.

   B) The operator shall submit to the Agency all information collected under subsection (d)(5)(A). If the facility is permitted then the operator shall submit this information as significant modification of the permit.

Section 816.122 Groundwater Quality Standards

a) Applicable Groundwater Quality Standards

1) Groundwater quality shall be maintained beyond the zone of attenuation at the groundwater quality standard established by the Board. For any constituent for which there is not a Board established standard, the standard shall be the background concentration as determined during the site assessment.

2) Any statistically significant increase above an applicable groundwater quality standard established pursuant to subsection (a) that is attributable to the facility an which occurs at or beyond the zone of attenuation within 100 years after closure of the last unit accepting waste within such a facility shall constitute a violation.

3) For the purpose of this Part:

A) "Background concentration" means that concentration of a constituent that is established as the background in accordance with subsection (d); and

B) "Board established standard" is the groundwater quality standard adopted by the Board pursuant to Section 14.4 of the Act or Section 8 of the Illinois Groundwater Protection Act (Ill. Rev. Stat. 1989, ch. 111 1/2, par. 7458).

b) Justification for Adjusted Groundwater Quality Standards

1) An operator may petition the Board for an adjusted groundwater quality standard in accordance with the procedures specified in Section 28.1 of the Act and 35 Ill. Adm. Code 106.410 through 106.416.

2) For groundwater which contains naturally occurring constituents which do not meet the standards in subsection (a), the Board will specify adjusted groundwater quality standards, upon a demonstration by the operator that:

A) The groundwater does not presently serve as a source of drinking water;

B) The change in standards will not interfere with, or become injurious to, any present or potential beneficial uses for such waters;

C) The change is necessary for economic or social development; and

D) The groundwater cannot presently, and will not in the future, serve as a source of drinking water because:

i) It is impossible to remove water in usable quantities;

ii) The groundwater is situated at a depth or location such that recovery of water for drinking purposes is not technologically feasible or economically reasonable;

iii) The groundwater is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption;

iv) The total dissolved solids content of the groundwater is more than 3,000 mg/l and that water is not reasonably expected to serve a public water supply system; or

v) The total dissolved solids content of the groundwater exceeds 10,000 mg/l.

c) Determination of the Zone of Attenuation

1) The zone of attenuation, within which concentrations of constituents in leachate discharged from the unit may exceed the applicable groundwater quality standard of this Section, is a volume bounded by a vertical plane at the property boundary or 100 feet from the edge of the unit, whichever is less, extending from the ground surface to the bottom of the uppermost aquifer and excluding the volume occupied by the waste.

2) Zones of attenuation shall not extend to the annual high water mark of navigable surface waters.

3) Overlapping zones of attenuation from units within a singly facility may be combined into a single zone for the purposes of establishing a monitoring network.

d) Establishment of Background Concentrations

1) The initial monitoring to determine background concentrations shall commence during the hydrogeologic assessment required by Section 816.117. The background concentrations for those parameters identified shall be listed in the SAP and shall be established based on quarterly sampling of wells for at least one year, monitored in accordance with the requirements of the SAP, which may be adjusted during the operation of a facility. Statistical tests and procedures shall be employed, in accordance with subsection (e), depending on the number, type and frequency of samples collected from the wells, to establish the background concentrations. Adjustments to the background concentrations shall be made only if changes in the concentrations of constituents observed in upgradient wells over time are determined, in accordance with subsection (e), to be statistically significant. Background concentrations determined in accordance with this subsection shall be used for the purposes of establishing groundwater quality standards, in accordance with subsection (a). The operator shall prepare a list of the background concentrations established in accordance with this subsection. The operator shall maintain such a list at the facility, shall submit a copy of the list to the Agency for establishing standards in accordance with subsection (a), and shall provide updates to the list within ten days of any change to the list.

2) A network of monitoring wells shall be established upgradient from the unit, with respect to groundwater flow, in accordance with the following standards, in order to determine the background concentrations of constituents in the groundwater:

A) The wells shall be located at such a distance that discharges of contaminants from the unit will not be detectable;

B) The wells shall be sampled at the same frequency as other monitoring points to provide continuous background concentration data, throughout the monitoring period; and

C) The wells shall be established in locations and at depth that account for spatial variability.

3) A determination of background concentrations may include the sampling of wells that are not hydraulically upgradient of the waste unit where:

A) Hydrogeologic conditions do not allow the owner or operator to determine that wells are hydraulically upgradient of the waste; and

B) Sampling at other wells will provide an indication of background concentrations that is representative of that which would have been provided by upgradient wells.

4) If background concentrations cannot be determined on site, then alternative background concentrations may be determined from actual monitoring data from the aquifer of concern, which includes, but is not limited to, data from another landfill site that overlies the same aquifer.

e) Statistical Analysis of Groundwater Monitoring Data

1) Statistical tests shall be used to analyze groundwater monitoring data. One or more of the normal theory statistical tests listed in subsections (e)(3) and (e)(4) shall be chosen first for analyzing the data set or transformations of the data set. Where such normal theory tests are demonstrated to be inappropriate, tests listed in subsection (e)(5) or a test in accordance with subsection (e)(6) shall be used. For any statistical test chosen from subsections (e)(4) or (e)(5), the level of significance (Type 1 error level) shall be no less than 0.01, for individual well comparisons, and no less than 0.05, for multiple well comparisons. The statistical analysis shall include, but not be limited to, the accounting of data below the detection limit of the analytical method used, the establishment of background concentrations and the determination of whether statistically significant changes have occurred in:

A) The concentration of any chemical constituent with respect to the background concentration or maximum allowable predicted concentration; and

B) The established background concentration of any chemical constituents over time.

2) The statistical test or tests used shall be based upon the sampling and collection protocol of Sections 816.120 and 816.121.

3) Monitored data that are below the level of detection shall be reported as not detected (ND). The level of detection for each constituent shall be the minimum concentration of that constituent which can be reliably measured and reported within standard confidence limits, under routine laboratory operating conditions, which is defined as the PQL. The following procedures shall be used to analyze such data, unless an alternative procedure in accordance with subsection (e)(6), is shown to be applicable:

   A) Where the percentage of non-detects in the data base used is less than 15 percent, the operator shall replace NDs with the PQL divided by two, then proceed with the use of one or more of the Normal Theory statistical tests listed in subsection (e)(4);

   B) Where the percentage of non-detects in the data base or data transformations used is between 15 and 50 percent, and the data are normally distributed, the operator shall use Cohen's adjustment to the sample mean and standard deviation, followed by one or more of the tests listed in subsection (e)(4)(C). However, where data are not normally distributed, the operator shall use an applicable non-parametric test from subsection (e)(5);

   C) Where the percentage of non-detects in the database used is above 50 percent, then the owner or operator shall use the test of proportions listed in subsection (e)(4).

4) Normal theory statistical tests

   A) Student t-test including, but not limited to, Cochran's Approximation to the Behren-Fisher (CABF) t-test and Averaged Replicate (AR) t-test.

   B) Parametric analysis of variance (ANOVA) followed by one or more of the multiple comparison procedures including, but not limited to, Fisher's Least Significant Difference (LSD), Student Newman-Kuel

procedure, Duncan's New Multiple Range Tes and Tukey's W procedure.

C) Control Charts, Prediction Intervals and Tolerance Intervals, for which the type I error levels shall be specified by the Agen in accordance with the requirements of 35 I Adm. Code 724.197(i).

5) Non-parametric statistical tests shall include: Mann-Whitney U-test, Kruskal-Wallis test, a non-parametric analysis of variance (ANOVA) for multiple comparisons or the Wilcoxon Rank Sum tes

6) Any other statistical test based on the distribution of the sampling data may be used, if it is demonstrated to meet the requirements of 35 Ill. Adm. Code 724.197(i).

Section 816.123 Final Slope and Stabilization

a) All final slopes shall be designed and constructed to a grade capable of supporting vegetation and which minimizes erosion.

b) All slopes shall be designed to drain runoff away from the cover and which prevents ponding. No permanent standing water shall be allowed anywhere in or on the unit.

c) Vegetation

1) Vegetation shall be promoted on all reconstructed surfaces to minimize wind and water erosion of the final protective cover.

2) Vegetation shall be compatible with the climatic conditions.

3) Vegetation shall require little maintenance.

4) Vegetation shall consist of a diverse mix of native and introduced species that is consistent with the post-closure land use.

5) The root depth of the vegetation shall not exceed the depth of the final protective cover system;

6) Temporary erosion control measures, including but not limited to mulch straw, netting and chemical soil stabilizers, shall be undertaken while vegetation is being established.

d) Structures Constructed Over the Unit

1) Structures constructed over the unit must be compatible with the land use.

2) Such structures must in no way interfere with the operation of a cover system, or any monitoring system.

Section 816.124 Waste Checking Program

The operator shall annually certify the uniformity of the waste being received at the facility. At such time as the processes generating the waste and the projected waste characteristics change significantly, the operator shall, prior to changing the process, demonstrate pursuant to Section 811.119 that the design and SAP are still appropriate. The change shall not be initiated until Agency approval of an amended permit, except that if the Agency has not acted to approve or deny an amendment request within 90 days of receipt of that request, the change shall be considered approved from that time on. For the purposes of this Section, significant changes include, but are not necessarily limited to, changes in fuel type, gross design changes in the combustion process or gross design changes in pollution control equipment affecting the type or quantity of combustion wastes produced.

IT IS SO ORDERED.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 14th day of March, 1991, by a vote of 7-0.

Dorothy M. Gunn

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board