

Minnesota Attorney General: Administrative Rules Proceedings

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STATE OF MINNESOTA

DEPARTMENT ATTORNEY GENERAL-MPCA

Office Memorandum

TO : JERRY ANDERSON
Special Assistant
Attorney General

DATE: 4/1/81

FROM : MARLENE E. SENECHAL
Special Assistant
Attorney General

PHONE: 6-7346

SUBJECT: TEMPORARY SEWAGE SLUDGE DISPOSAL RULES

As required by 1 MCAR § 1.204, I am enclosing the following documents:

1. The original and three copies of the temporary rule as adopted;

2. Two copies of the order adopting the rule;

3. Certificate of Board's resolution adopting the rule;

4. Order for publication;

5. Certificate of Board's resolution ordering publication;

6. Rule as proposed;

7. Findings of fact and conclusions;

8. Written comments received by the Agency;

9. Certificate of compliance with rulemaking procedures; and

10. Errata sheet (noting minor corrections to the rule as proposed which are not discussed in the Findings of Fact and Conclusions).

MES:sjg
Enclosures

Our File No. 688

RULE REVIEW CHECKLIST

DATE RULE RECEIVED 4/7
DATE FOR REVIEW N/A
DATE DUE 4/14

Adopted w/a hearing _____
Adopted w/o a hearing _____
Temporary rule X

Approved _____ Disapproved _____ Returned to Agency _____

Resubmitted _____ Due _____
Approved _____ Disapproved _____ Returned to Agency _____

Date filed w/Secretary of State _____

✓ Rule as Adopted

✓ Rule as Proposed see SR.

✓ Order Adopting 3.24.81

___ Notice of Intent to Solicit Outside Opinion

✓ Order for rulemaking
_____ Date of Hearing

✓ Certificate of Board's Authorizing Resolution

N/A Notice of rulemaking
_____ Sufficiency

NA Affidavit of Mailing Notice of rulemaking
_____ At least 30 days prior to hearing/adoption

N/A Mailing list Certificate

✓ Publication in State Register
12.8.80 At least ~~30~~/20 days prior to ~~hearing~~/adoption

N/A Hearing Examiner's Report

N/A Chief Hearing Examiner's Report(s)
_____ Approving H.E.'s Report
_____ Approving agency action

✓ Agency's Findings of Fact

N/A LCRAR Report or agency Affidavit

✓ Certificate of Board's Resolution Adopting Rules

N/A Order Approving Incorporation by Reference

N/A Statement of Need and Reasonableness

N/A Petition for Adoption of a Rule

___ Record (~~includes transcript or tape, exhibits~~, comments received by agency, ~~requests for a hearing, and other relevant materials~~)

✓ Certificate of Compliance w/Rulemaking Procedures

N/A Affidavit of Mailing Notice of Submission to Attorney General

N/A Notice of Submission to the Attorney General

STATE OF MINNESOTA

COUNTY OF RAMSEY

MINNESOTA POLLUTION

CONTROL AGENCY

In the Matter of the Proposed Adoption of Temporary Rules of the Minnesota Pollution Control Agency Governing Sewage Sludge Disposal, 6 MCAR § 4.8050

ORDER ADOPTING TEMPORARY RULE

The above-entitled matter was published in the State Register on December 8, 1980 as a proposed temporary rule pursuant to Minnesota Statutes Section 15.0412, Subdivision 5. After affording interested and affected persons an opportunity to submit written data and views within 20 days of the publication date, reviewing and considering the data and views, and determining that the above-captioned rule is needed and reasonable,

NOW, THEREFORE, IT IS ORDERED that this rule identified as 6 MCAR § 4.8050 is adopted this 24th day of March, 1981, pursuant to authority vested in the Minnesota Pollution Control Agency by Minnesota Statutes, Section 116.07, Subdivision 4 (1980).

MINNESOTA POLLUTION CONTROL AGENCY

Louis J. Breimhurst

LOUIS J. BREIMHURST
Executive Director

Art Engelbrecht

ART ENGELBRECHT
CHAIRMAN

POLLUTION CONTROL AGENCY

4.8050 Temporary Sewage Sludge Disposal Standards

A. Intent

Improper design, location and operation of sewage sludge disposal ~~facilities~~ sites adversely affect the public health, safety and welfare by causing pollution, impairment and destruction of the State's natural resources. In accordance with the authority granted in Minn. Laws 1980, chapter 564, article XI, section 6, this rule establishes temporary standards for the design, location and operation of sewage sludge disposal ~~facilities~~ sites and provides procedures for administration of this rule. It is the intent of this rule to maximize the beneficial use or recycling of sewage sludge, while ensuring that the public health, safety and welfare is not impaired by such practices.

B. Definitions.

For the purpose of this rule, the following terms shall have the meanings defined herein:

Adequate drainage - A system, designed according to or equivalent to Soil Conservation Service engineering criteria, which will remove excess water from land by means of subsurface drains.

Agency - the Minnesota Pollution Control Agency

Animal feed - Any crop grown for consumption by animals, such as pasture crops, forage, and grain.

Available nitrogen - ~~Nitrogen which can be readily absorbed by growing plants or leached by percolating waters.~~ Nitrogen which is present in inorganic forms that are useable by plants, and which may be determined by procedures set out in Table 3, Appendix B.

Background soil pH - The pH of the soil prior to the addition of substances ~~intended to~~ that alter the hydrogen ion concentration.

Cation Exchange Capacity (CEC) - A measure of the potential quantity of readily exchangeable positive ions that the soil can attract and retain, expressed in milliequivalents

per 100 grams of soil. ~~(See Appendix A)~~ The CEC may be estimated on the basis of soil texture and organic matter content using procedures set out in Appendix A, or by direct analysis, either by the summation method for distinctly acid soils or the sodium acetate method for neutral, calcareous, or saline soils. ("Methods of Soil Analysis, Agronomy Monograph No.9" C. A. Black, ed., American Society of Agronomy, Madison, Wi. pp.891-901, 1965.)

~~Class A Sewage Treatment System - As determined using 6 MCAR 5.002.~~

Continuous storage - The storage of sewage sludge for a period greater than ~~six~~ seven months at a ~~facility~~ site not located at the place of sewage sludge generation. Sewage sludge is continuously delivered and removed from the ~~facility~~ site on a regular rotational basis depending on the surplus of or demand for sewage sludge.

Crops for direct human consumption - Crops that are consumed by humans without processing to minimize pathogens prior to distribution to the consumer.

Dewatered sewage sludge - Sewage sludge with sufficient solids content such that it has no free water and can be transported and handled as a solid material.

Director - The Executive Director or other designated representative of the Minnesota Pollution Control Agency.

Disease Vector - Rodents, flies, and mosquitoes capable of transmitting disease to humans.

Disposal - As defined in Minnesota Laws 1980, Chapter 564, Art. I, Sec. 3, Subd. 9, which is the discharge, deposit, injection, dumping, spilling, leaking, or placing of any waste into or on any land or water so that the waste or any constituent thereof may enter the environment or be emitted into the air, or discharged into any waters, including ground waters.

Dry run - A drainage pathway, either natural, altered, or artificial, with definable banks, which is capable of conducting confined runoff from adjacent lands.

Fallow - Land that is uncropped and kept cultivated throughout a growing season.

Food-chain crops - Tobacco, crops grown for human consumption, and animal feed for animals whose products are consumed by humans.

~~Heavy metals - Usually, but not always, those metals which have specific gravities greater than 5.0; including but not limited to, cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), and zinc (Zn).~~

Hundred year flood plain - As defined in 6 MCAR 4.8051 for flood plain, which is, the areas adjoining a watercourse which has been or hereafter may be covered by a large flood known to have occurred generally in Minnesota and reasonably characteristic of what can be expected to occur on an average frequency in the magnitude of the 100 year recurrence interval.

Incorporation - The mixing of sewage sludge with topsoil, concurrent with application or within 48 hours thereafter, by means such as injection, discing, mold-board plowing, chisel plowing or rototilling to a minimum depth of six inches.

Interim storage - The storage of dewatered sewage sludge for a period of ~~six months or less at a landspreading sewage sludge disposal facility~~ greater than one month but not exceeding seven months at a landspreading site not located at the place of sewage sludge generation. Sewage sludge is delivered to the ~~facility~~ site with intentions of being landspread as soon as conditions permit, where it cannot be immediately spread because of soil conditions, snow depths, wet periods, cropping seasons, or periods of conflicting land use.

Landspreading - Placement of sewage sludge in or on soil at rates where the quantity of nutrient and non-nutrient elements and soil conditioning materials is consistent with the biochemical assimilative capacity of the soil-plant systems.

Leachate - Liquid that has passed through or emerged from sewage sludge or sewage sludge amended soil and contains soluble, suspended or miscible materials removed from such wastes.

~~Lease - Any oral or written agreement between a political subdivision and a landowner.~~

Pasture crops - Crops such as legumes, grasses, grain stubble and stover which are consumed by animals while grazing.

Pathogens - Organisms, chiefly microorganisms, including viruses, but also including all forms of animal parasites, that are capable of producing an infection or disease in a susceptible host.

Perched water table - As defined in 6 MCAR 4.8022.

Person - As defined in Minn. Stat. 116.06, Subd. 8, which is any human being, any municipality or other governmental or political subdivision or other public agency, any public or private corporation, any partnership, firm, association, or other organization, any receiver, trustee, assignee, agent, or other legal representative of any of the foregoing, or any other legal entity, but does not include the Pollution Control Agency. Pursuant to Minnesota Laws 1980, Chapter 564, Art. I, Sec. 3, Subd. 23, person shall also not include the Waste Management Board.

Political subdivision - As defined in Minnesota Laws 1980, Chapter 564, Art. I, Sec. 3, Subd. 24, which is any municipality, corporation, governmental subdivision of the state, local government unit, special district, or local or regional board, commission, or authority authorized by law to plan or provide for waste management.

Process to Further Reduce Pathogens (PFRP) - Composting - ~~Using the within-vessel composting method, the sewage sludge is maintained at operating conditions of 55°C or greater for three days. Using the static aerated pile composting method, the sewage sludge is maintained at operating conditions of 55°C or greater for three days. Using the windrow composting method, the sewage sludge attains a temperature of 55°C or greater for at least 15 days during the composting period and during the high temperature~~

~~period, there must be a minimum of five turnings of the windrow.~~

The aerobic thermophilic decomposition of organic constituents to a relatively stable, humus-like material. High temperature composting methods which will further reduce pathogens are:

windrow - an unconfined composting process involving periodic aeration (mixing) of uninsulated compost piles. At least five turnings must occur during a period of fifteen days when the temperature of the mixture is at least 55°C.

static aerated pile - an unconfined composting process involving mechanical aeration

of insulated compost piles. The sewage sludge in the insulated pile is maintained at operating conditions of 55°C or greater for three days.

within vessel - a confined composting process involving mechanical mixing of compost under controlled environmental conditions so that the sewage sludge is maintained at operating conditions of 55°C or greater for three days.

Heat drying - A process by which dewatered sewage sludge cake is dried by direct or indirect contact with hot gases, and moisture content is reduced to 10 percent or lower. Sewage sludge particles must reach temperatures in excess of 80°C, or the wet bulb temperature of the gas stream in contact with the sewage sludge at the point where it leaves the dryer must be in excess of 80°C.

Heat treatment	-	a process by which liquid sewage sludge is heated to temperatures of 180°C for 30 minutes.
Thermophilic aerobic digestion	-	A process by which liquid sewage sludge is agitated with air or oxygen to maintain aerobic conditions at residence times of 10 days at 55-60°C. ~~with a volatile solids reduction of at least 38 percent~~. The level of volatile solids in the sewage influent must be reduced by at least 38 percent after processing.
Other methods	-	Other methods or operating conditions are acceptable if pathogens and vector attraction of the sewage sludge (volatile solids) are reduced to an extent equivalent to the reduction achieved by any of the above methods.

Process to Significantly Reduce Pathogens (PSRP)	- Aerobic digestion	- A process conducted by agitating sewage sludge with air or oxygen to maintain aerobic conditions at residence times ranging from 60 days at 15°C to 40 days at 20°C. ~~with a volatile solids reduction of at least 38 percent~~. The level of volatile solids in the sewage influent must be reduced by at least 38 percent after processing
	Air drying -	A process by which liquid sewage sludge not exceeding nine inches in depth is allowed to drain and/or dry on under-drained sand beds, or paved or unpaved basins. ~~in which the sludge is at a depth of nine inches.~~ A minimum of three months is needed, two months of which temperatures average on a daily basis above 0°C.

Anaerobic digestion - A process conducted in the absence of air at residence times ranging from 60 days at 20°C to 15 days at 35°C to 55°C. ~~with a volatile solids reduction of at least 38 percent~~. The level of volatile solids in the sewage influent must be reduced by at least 38 percent after processing.

Composting - Using the within-vessel, static aerated pile, or windrow composting methods, the sewage sludge is maintained at minimum operating conditions of 40°C for 5 days. For four hours during this period the temperature exceeds 55°C.

Lime stabilization - A process by which sufficient lime is added to produce a pH of 12 after 2 hours of contact.

Other methods - Other methods or operating conditions are acceptable if pathogens and vector attraction of the sewage sludge (volatile solids) are reduced to an extent equivalent to the reduction achieved by any of the above methods.

Public access control - Conditions which will control unauthorized access to the site. Fencing or posting of appropriate signs is necessary if the site is likely to be frequented by the general public. If the site is remote, or used for agricultural purposes, fencing and posting are not required if inadvertant public contact is deemed unlikely.

Residential development - A concentration of human residences equaling or exceeding ten residences within ten acres.

Root crops - Plants whose edible parts are grown below the soil surface.

Sewage sludge - ~~As defined in Minnesota Laws 1980, Chapter 564, Art. I, Sec. 3, Subd. 29, which is~~ The solids and associated liquids in municipal wastewater which are encountered and concentrated by a

municipal wastewater treatment plant. ~~for disposal at a sewage sludge disposal facility.~~ Sewage sludge does not include incinerator residues and grit, scum, or screenings removed from other solids during treatment.

~~Sewage sludge disposal facility~~ - ~~As defined in Minnesota Laws 1980, Chapter 564, Art. I, Sec. 3, Subd. 30, which is property owned or leased by a political subdivision and used for interim or final disposal or landspreading of sewage sludge.~~

~~a. Dedicated sewage sludge disposal facility is any facility that is devoted to and managed for the primary function of sewage sludge storage, composting, or landspreading.~~

~~b. Non-dedicated sewage sludge disposal facility is any facility that is devoted to and managed for the primary function of crop production, around which sewage sludge landspreading and interim storage is scheduled and managed.~~

Sewage sludge solids - The total, oven-dry (105°C) solids in sewage sludge.

Site - Publicly or privately owned or leased property used for landspreading, composting, or continuous storage of sewage sludge.

Soil pH - A measure of the acidity or alkalinity of soil. A soil pH value of 7.0 is neutral. The value is obtained by sampling the soil to the depth of nine inches and analyzing by the electrometric method. ("Methods of Soil Analysis, Agronomy Monograph No. 9," C. A. Black, ed., American Society of Agronomy, Madison, Wisconsin, pp.914-926, 1965.)

Soil texture - The relative proportion of the soil separates sand, silt and clay.

Coarse texture: USDA textural classification sands and loamy sands. ~~and sandy loams.~~

Medium texture: USDA textural classification sandy loams, loams, silt loams, and silts.

Fine texture: USDA textural classification clay loams and clays.

Spray application - Liquid sewage sludge application by sprinkling devices such as center pivots and stationary or movable spray irrigation mechanisms.

Spring - Any natural surface discharge of ground water large enough to flow in a small rivulet.

Surface application - Sewage sludge spread on the surface of the land and not incorporated into the soil within 48 hours of application.

Temporary storage - The storage of dewatered sewage sludge for a period of less than one month at a landspreading site not located at the place of sewage sludge generation.

Ten year flood plain - The lowland and relatively flat areas adjoining surface waters which are inundated by a flood, which can be expected to occur, on an average, of once in ten years; or the land area to which flood waters have a ten percent chance of inundating in any given year.

USDA - United States Department of Agriculture.

Vegetation - Low density - Plant systems characterized by the production of bunch grasses and sparse, slow growing broadleaf and woody vegetation.

- high density - plant systems characterized by sod forming grasses and the production of dense, rapidly growing broadleaf and woody vegetation.

Water table - As defined in 6 MCAR 4.8022 with the exception of a perched water table condition which will not be considered as a water table.

C. Applicability.

~~1. This rule shall apply only to persons identified in Section C.2. utilizing sewage sludge disposal practices which involve landspreading, composting or storage. Incineration of sewage sludge is governed by 6 MCAR 4.0028. Disposal of sewage sludge in sanitary landfills is governed by 6 MCAR 4.6001-.6011.~~

~~2. Paragraphs F and G, shall apply to:~~

~~a. All political subdivisions.~~

~~b. All persons who own or operate dedicated sewage sludge disposal facilities.~~

~~3. Permits and letters of approval~~

~~a. The following persons shall obtain a State Disposal System Permit pursuant to this rule subject to the following conditions if the sewage sludge disposal facility is not presently permitted or approved by the Agency:~~

~~(1) Class A Sewage Treatment Systems, Other Than Systems Under The Control of The Metropolitan Waste Control Commission~~

~~(a) If a political subdivision owns the sewage sludge disposal facility, the political subdivision shall be the applicant and permittee.~~

(b) If a person other than a political subdivision owns the dedicated sewage sludge disposal facility, the owner, the operator, and the political subdivision shall be co-applicants and co-permittees.

(2) Metropolitan Waste Control Commission Sewage Treatment Systems

(a) If the Metropolitan Waste Control Commission owns the sewage sludge disposal facility, the Metropolitan Waste Control Commission and the Metropolitan Council shall be co-applicants and co-permittees.

(b) If a person other than the Metropolitan Waste Control Commission owns the dedicated sewage sludge disposal facility, the owner, the operator, and the Metropolitan Waste Control Commission shall be co-applicants and co-permittees.

b. If a political subdivision, including the Metropolitan Waste Control Commission, operates a Class A Sewage Treatment System and a person other than the political subdivision owns the non-dedicated sewage sludge disposal facility, the political subdivision shall obtain a Letter of Approval pursuant to this rule if the sewage sludge disposal facility is not presently permitted or approved by the Agency.

c. Applicants required under Section C.3.a.(1) and under Section C.3.b. by political subdivisions other than the Metropolitan Waste Control Commission shall be submitted within 60 days of the effective date of this rule. If such applications are submitted in a timely manner and if such person is in compliance with Sections F and G of this rule, such persons shall not be deemed in violation of the Permit or Letter of Approval requirements of this rule. Permits required under Section C.3.a.(2) and Letters of Approval required of the Metropolitan Waste Control Commission under Section C.3.b. shall be issued prior to the usage of the proposed sewage sludge disposal facility.

1. Landspreading and Temporary and Interim Storage

a. The following persons shall comply with the requirements of Section F - Requirements for Landspreading and Temporary and Interim Storage of Sewage Sludge:

(1) Political subdivisions that landspread sewage sludge

(2) Persons who own or lease landspreading sites that meet criteria in C.1.b.(2) and (3).

(3) Persons who are under contract to (1) or (2) above to landspread sewage sludge.

b. The persons identified in C.1.a. shall obtain, and be co-permittees of, a State Disposal Systems Permit if they operate a sewage sludge landspreading site which meets the following criteria:

(1) The sewage sludge is generated by the Metropolitan Waste Control Commission, and

(2) The landspreading site is greater than 40 acres in size, and

(3) The sewage sludge is proposed to be landspread at the site for five (5) or more consecutive years, or the cumulative loading of lead, zinc, copper, nickel, or cadmium to the landspreading site will exceed 80% of the maximum allowable limit as provided in Sections F.2. and F.3.

c. The Metropolitan Waste Control Commission shall obtain a Letter of Approval for sewage sludge landspreading sites not meeting the criteria set forth in Section C.1.b.(2) and (3) unless they possess a current approval from the Agency.

2. Composting and Continuous Storage

a. The following persons shall comply with the requirements of Section G - Requirements for Composting and/or Continuous Storage of Sewage Sludge

(1) Political subdivisions that continuously store or compost sewage sludge.

(2) Persons who own or lease a site used for the continuous storage or composting of sewage sludge.

(3) Persons that are under contract to (1) or (2) above to conduct a continuous storage or composting operation.

b. The persons identified in C.2.a. shall obtain, and be co-applicants and co-permittees of, a State Disposal Systems Permit if they continuously store or compost sewage sludge generated by any sewage treatment system.

3. Incineration

Incineration of sewage sludge is governed by 6 MCAR 4.0028.

4. Landfilling

Disposal of sewage sludge in sanitary landfills is governed by 6 MCAR 4.6001-4.6012.

5. Applications required under C.2.b. must be submitted within 60 days of the effective date of this rule, with the exception of applications by the Metropolitan Waste Control Commission. The Metropolitan Waste Control Commission must submit an application prior to conducting the proposed sewage sludge management operation.

D. Contents of Applications For Letter of Approval and Permit

1. Applications for Letters of Approval for ~~non-dedicated~~ sewage sludge disposal ~~facilities~~ sites shall include the following specific information, plus any other information necessary to determine the potential impact of the proposed ~~facility~~ operations on ground water, surface water, soil, vegetation or air.

a. Sewage sludge characterization, to include:

(1) Description of the method, retention times, temperatures, and chemical doses used to stabilize the sewage sludge.

(2) Physical and chemical characteristics of the sewage sludge to include:

(a) total solids.
(b) total volatile solids.
(c) pH.
(d) nitrogen (kjeldahl, ammonia, and nitrate).
(e) total heavy metals (zinc, copper, lead, nickel, cadmium, chromium, mercury).
(f) total polychlorinated biphenyls (PCBs).

(g) other parameters that may be necessary include:

(i) soluble salts.

(ii) specific microorganism populations.

(iii) fats, oils and greases.

(iv) toxic organic compounds.

~~(3) Description of industrial contributors to the sewer system which may discharge toxic organic chemicals, the type and quantity of chemicals discharged, evaluation of the concentrations of such chemicals in the sewage sludge and the significance of such concentrations.~~

b. Site characterization, to include:

(1) Copies of soil survey maps, if available, and topographic maps ~~plat maps~~ delineating the boundaries of the specific landspreading and stockpiling area and providing the legal description, including township, range, section and quarter sections.

(2) Acreage of the site.

(3) Name and address of landowner.

(4) Map or aerial photo which shows the location of and approximate distance to each of the following features, if within ¼ mile of the site:

(a) surface waters, including dry runs, streams, springs, flowages, ponds, lakes, or wetlands.

(b) ten year flood plains for ~~non-dedicated facilities~~ Letter of Approval applications and hundred year flood plains for ~~dedicated facilities~~ Permit applications.

(c) sinkholes, caves, rock outcrops, mines, pits or quarries.

(d) potable water supply wells or surface intakes.

(e) places of habitation, business or recreational areas.

(f) property lines.

(g) road rights of way.

(h) airports.

(5) Approximate degree (percent) of landslopes at the site.

(6) Approximate depths to ~~ground water~~ the water table and bedrock as obtained from Soil Conservation Service soil survey maps or maps of comparable or greater detail or by actual site investigations.

(7) Approximate quantity of sewage sludge previously applied at site.

(8) Soil test results from at least one composite sample taken from at least 15 locations to a depth of 9 inches for each 40 acres of landspreading area. Required parameters include:

(a) USDA textural classification.

(b) organic matter percent.

(c) extractable phosphorus (Bray's No. 1 extractant).

(d) exchangeable potassium (ammonium acetate extractant).

(e) pH (1:1 w/w soil-water suspension).

~~(f) lime requirement to pH 6.5.~~

(f) ~~(g)~~ soluble salts (specific conductance-mmhos/cm).

(g) ~~(h)~~ cation exchange capacity ~~(as estimated from the procedures set out in Appendix A).~~

c. ~~Facility~~ Site management, to include:

(1) Description of the proposed method(s) of sewage sludge disposal.

(2) Name and address of the person who will be operating and managing the proposed sewage sludge disposal ~~facility~~ site.

(3) Description of the ~~lease for~~ agreement for sewage sludge application to the site.

(4) Maximum annual application rate (tons of sewage sludge solids/acre/year, based on nitrogen or cadmium additions whichever is limiting).

(5) Description of the crops to be grown or dominant vegetation at the site and the intended use of the crops.

(6) Estimated cumulative sewage sludge loading rate at the site (tons of sewage sludge solids/acre, based on cumulative heavy metal limits).

(7) Description of how public access to the site is proposed to be limited.

d. Provisions for interim sewage sludge storage at the site when it is unavailable or inaccessible for immediate landspreading.

(1) Description of the necessity for storage at the site.

(2) Location of the storage area delineated on maps submitted pursuant to Section D.1.b.(1) of this rule.

(3) Description of how sewage sludge is to be stored.

(4) Acreage of the sewage sludge storage area.

(5) Quantity of sewage sludge to be stored.

(6) Expected duration of storage before landspreading.

(7) Description of precautions or practices to minimize or prevent leachate, runoff or nuisance conditions from the storage area.

2. Application for Permit

Applications for State Disposal System Permits ~~for dedicated sewage sludge and disposal facilities~~ shall include the following specific information, plus any other information necessary to determine the potential impact of the ~~facility~~ operation on ground water, surface water, soil, vegetation or air.

a. Sewage sludge characterization as prescribed in Section D.1.a. of this rule.

b. Site characterization as prescribed in Section D.1.b of this rule, plus the following information:

(1) Description of surface and subsurface characteristics at and within ¼ mile of

the site. Specific characteristics that shall be considered include soils, surficial and bedrock geology, surface waters, surface and subsurface drainage and ground water elevations and flow.

(2) A discussion of the potential for surface runoff or drainage from the ~~facility~~ site to surface water and/or low areas having shallow water tables. A description of any provisions or practices that will be utilized to control surface runoff or drainage.

(3) A discussion of the potential for leachate generation during and following rainfall events and subsequent movement to ground water. A description of the provisions or practices that will be utilized to control leaching and protect ground water quality.

(4) A discussion of the potential for pathogen movement from the proposed ~~facility~~ site to the surrounding environment via wind currents and disease vectors. A description of the provisions or practices that will be utilized to control pathogen dispersions.

(5) A discussion of the potential for odor generation impacting the surrounding area. A description of the provisions or practices that will be utilized to control odors. Land use and zoning within ¼ mile of the ~~facility~~ site shall also be described.

c. Information prescribed in Sections D.1.b.(7) and (8) need not be submitted for composting or continuous storage sewage sludge disposal ~~facilities~~ sites, but a map showing the locations of and distance to all nursing homes and hospital within ½ mile shall be submitted for composting sites.

d. Description of management provisions at landspreading ~~sewage sludge disposal facilities~~ sites as prescribed in Section D.1.c. of this rule.

e. Description of management and operational provisions at composting sewage ~~sludge disposal facilities~~ sites, which shall include:

(1) Types of bulking agent to be used.

(2) Ratio of sewage sludge to bulking agent.

(3) Method to be used for mixing the sewage sludge with the bulking agent.

(4) Estimated temperatures that the compost will attain and the period of time the temperatures will be sustained.

(5) Length of time compost will be cured.

(6) The quantity and source of sewage sludge to be delivered to the facility on a weekly or monthly basis, whichever is more applicable.

(7) A comprehensive survey of proposed and potential users and markets of the sewage sludge compost. A description of the methods and areas of distribution.

f. Description of management and operational provisions at continuous storage ~~sewage sludge disposal facilities~~ sites as prescribed in Section D.1.d of this rule. Also, the quantity and source of sewage sludge to be delivered to the ~~facility~~ site on a weekly or monthly basis, whichever is more applicable.

E. Administration of Letter of Approval and Permit Programs

1. Administration of State Disposal System Permit<u>s</u> ~~for dedicated sewage sludge disposal facilities~~ shall be governed by rule 6 MCAR 4.8036.

2. Administration of Letters of Approval ~~for non-dedicated sewage sludge disposal facilities~~ shall be governed by the following procedures:

a. Review.

All applications shall be reviewed for completeness by the Director. If the application is incomplete ~~or otherwise deficient~~, the Director shall promptly advise the applicant of such incompleteness. ~~or deficiency.~~ Further processing of the application may be suspended until the applicant has supplied the necessary information. ~~or otherwise corrected the deficiency.~~

b. Preparation of Preliminary Determinations.

The Director shall make a preliminary determination regarding a completed application. This preliminary determination

shall include a proposed determination to issue or to deny the approval sought in the application.

(1) If the preliminary determination is to deny an approval, the Director shall notify the applicant in writing and include the specific reasons for denial. The applicant may request an appearance before the Agency to appeal the denial pursuant to Agency rules of procedure, 6 MCAR 4.3003.

(2) If the preliminary determination is to issue an approval, the procedures set out in Sections E.2.c. and E.2.d. shall apply.

c. Public Participation

(1) The Director shall provide notice of the application and a copy of the draft Letter of Approval to the following persons and other persons known by the Director to have an interest in the proposed approval.

(a) Applicant.

(b) Owner and occupier of land proposed to be used for sewage sludge disposal.

(c) City or township and county officials of area where sewage sludge disposal ~~facility~~ site is located.

(2) Any interested person, including the applicant, may within 14 days following the date of issuance of the notice submit written comments on the application and the proposed approval to the Director.

(3) All written comments submitted during the comment period shall be retained and considered in the formulation of final determinations concerning the application.

d. Final Determination.

(1) The Director shall attempt to resolve all comments prior to a final determination concerning the application. If such comments have been resolved, the Director shall issue or deny the approval.

(2) If all comments cannot be resolved, the application shall be presented to the Agency, who shall issue or deny the approval.

(3) All persons submitting comments on the application and the proposed approval shall be notified of the final determination concerning the application.

e. Denial of Approval.

Approval shall be denied if:

(1) The proposed ~~sewage sludge disposal facility~~ site does not comply with this rule and other applicable state or federal laws or rules; or

(2) Such approval is likely to cause pollution, impairment or destruction of the air, water, land or other natural resources of the State and there is a feasible and prudent alternative.

f. Modification, Suspension and Revocation of Letters of Approval.

A Letter of Approval may be modified, suspended or revoked in accordance with the requirements of 6 MCAR 4.8036.

g. Duration of Approvals.

The Letter of Approval shall establish the term of the approval. In no case shall such term exceed the term of the political subdivision's National Pollutant Discharge Elimination System or State Disposal System sewage treatment system permit.

h. Enforcement.

A Letter of Approval issued to a political subdivision pursuant to this rule shall become part of the political subdivision's National Pollutant Discharge Elimination System or State Disposal System sewage treatment system permit and shall be enforceable to the same extent as the permit.

F. REQUIREMENTS FOR ~~SEWAGE SLUDGE DISPOSAL FACILITIES USED FOR~~ LANDSPREADING AND TEMPORARY AND INTERIM STORAGE OF SEWAGE SLUDGE

1. Disease Control.

The landspreading of sewage sludge shall be managed in such a manner to minimize the potential for disease transmission to animals and humans.

a. Sewage sludge shall, at a minimum, be treated by a Process to Significantly Reduce Pathogens (PSRP) prior to landspreading.

b. Sewage sludge shall be treated by a Process to Further Reduce Pathogens (PFRP) in the following cases:

(1) If crops for direct human consumption are to be grown within 18 months of sewage sludge application and there will be contact between the sewage sludge and the edible portion of the crop.

(2) Public access to the landspreading ~~facility~~ site is not controlled for 12 months.

c. If sewage sludge is to be applied to land used for pasturing livestock or for growing forage crops, the pasturing or harvesting of the crop shall not

be permitted for at least one month following the last sewage sludge application unless the sewage sludge was treated by a PFRP.

2. Soil pH and Cadmium Application

The landspreading of sewage sludge shall be managed in such a manner to minimize the potential for cadmium uptake by food-chain crops.

a. The pH of the soil/sewage sludge mixture shall be 6.5 or greater at the time of each sewage sludge application or shall be adjusted to and maintained at 6.5 or greater immediately after sewage sludge application and before growing food-chain crops.

b. Annual cadmium application shall not be more than 0.5 pounds per acre on land used for the production of tobacco, leafy vegetables or root crops grown for human consumption. For other food-chain crops, the annual cadmium application shall not exceed two pounds per acre.

c. Cumulative cadmium application shall not exceed:

SOIL CATION EXCHANGE CAPACITY (meq/100g)	MAXIMUM CUMULATIVE CADMIUM APPLICATION (LBS/A)	
	Background Soil pH Less Than 6.5*	Background Soil pH 6.5 or Greater
0-5	5	5
5-15	5	10
>15	5	20

* For soils with a background pH of less than 6.5, the cumulative cadmium application rate can be the same as for soils with a background pH of 6.5 or greater provided that the pH of the soil/sewage sludge mixture is adjusted to and maintained at 6.5 or greater whenever food-chain crops are grown.

3. Cumulative Heavy Metal Additions

The total quantity of sewage sludge applied to a ~~facility~~ site shall be managed in such a manner to prevent excessive heavy metal accumulation in the soil and sub-

sequent potential plant and food-chain toxicity. Sewage sludge application to a ~~facility~~ site shall be terminated when the sum addition of any one metal equals the level given below for that particular metal and soil.

Metal	Total Heavy Metal Addition (LBS/A)		
	Soil Cation Exchange Capacity (meq/100g)		
	0-5	5-15	> 15
Lead	500	1000	2000
Zinc	250	500	1000
Copper	125	250	500
Nickel	50	100	200

4. Sewage Sludge Application Rates

The landspreading of sewage sludge shall be conducted in such a manner to minimize nitrate movement to ground water and minimize the build-up of soluble salts in soil.

a. Sewage sludge application rates, combined with other known nitrogen sources, shall supply no more nitrogen than the amount required by the crop to be grown. The rate of sewage sludge application shall be determined using the method outlined in Appendix B.

b. Sewage sludge application to a ~~facility~~ site shall be suspended whenever the electrical conductivity of a saturation extract of soil exceeds four millimhos/centimeter (soluble salt test).

5. Persistent Organic Chemical Limitations

The landspreading of sewage sludge shall be managed in such a manner to minimize the build-up of polychlorinated biphenyls (PCBs) and other persistent organic chemicals in soil.

a. Sewage sludge containing concentrations of PCBs equal to or greater than 10 mg/kg (dry weight) shall be incorporated into the soil when applied to land used for producing food-chain crops.

b. Sewage sludge containing concentrations of PCBs equal to or greater than 50 mg/kg (dry weight) shall not be landspread.

~~c. Sewage sludge application rates and the operation of a facility shall be managed such that the threat of contamination by toxic organic chemicals to surface water, ground water, soil and vegetation is minimized.~~

6. Separation Distances

The landspreading of sewage sludge shall be managed in such a manner as to include adequate buffer zones. The buffer zones shall suitably isolate the ~~facility~~ operation, thereby reducing potential impacts to neighboring residents, potable water supplies, ground water and surface waters.

a. For medium and fine textured soils, at least 3 feet of soil shall exist between the soil surface and the water table and/or bedrock. For coarse textured soils and sandy loams, this separation distance shall be at least 6 feet.

b. A distance of at least 200 feet from any potable water supply well, with the exception of test or monitoring wells, shall be maintained.

c. ~~A distance of at least 50 feet from any property line or road right-of-way shall be maintained.~~ The land application of sewage sludge shall be conducted such that sewage sludge is not applied to adjoining property or to road right-of-ways.

d. A distance of at least ~~500~~ 200 feet from any place of habitation and a distance of at least 600 feet from any residential development ~~or~~ business or area used for recreational purposes shall be maintained, unless written permission is obtained from the appropriate party.

e. Separation distances prescribed in parts c. and d. above shall be increased 6-fold where sewage sludge is applied by pressurized spray.

f. A distance of at least 200 feet for coarse-textured soils and at least 300 feet for medium and fine textured soils shall be maintained from any dry run, pond, lake, stream, spring, ~~flowage,~~ or ten year flood plain ~~shall be maintained~~ where sewage sludge is surface applied during the months of May to October, inclusive. ~~This~~ These separation distances shall be doubled (400 and 600 feet) where sewage sludge is surface applied during the months of November to April, inclusive.

g. A distance of at least 100 feet from any dry run, pond, lake, stream, spring, ~~flowage,~~ or ten year flood plain shall be maintained where sewage sludge is ~~injected or immediately~~ incorporated into the soil.

7. Temporary Sewage Sludge Storage.

The temporary stockpiling of dewatered sewage sludge at a site shall be managed in such a manner to minimize the potential for adverse environmental effects. The sewage sludge stockpiled at a site shall be landspread as soon as possible.

a. Separation distances for temporary sewage sludge stockpiles shall be the same as those presented in Section F.6.a., F.6.b., F.6.d. and F.6.f. for sewage sludge landspreading.

b. Temporary sewage sludge stockpiles shall not be located within 200 feet of any road right of way or adjoining property without the written permission of the owner.

c. Temporary storage of sewage sludge is prohibited for a period in excess of one month.

~~7.~~ 8. Interim Sewage Sludge Storage

The interim stockpiling of dewatered sewage sludge at a ~~facility~~ site shall be managed in such a manner to minimize the potential for adverse environmental effects. The sewage sludge stockpiled at a ~~facility~~ site shall be landspread as soon as possible.

a. Interim sewage sludge stockpiles shall be placed at least 1000 feet from any place of habitation, business, area used for recreation, or potable water supply well, unless written permission is obtained from the appropriate party.

b. Interim sewage sludge stockpiles shall be placed at least 1000 feet from any dry run, pond, lake, stream, spring, ~~flowage~~, or ten year flood plain, unless the stockpiles are bermed to a height of 1 foot or if the stockpiles are downgradient from the features mentioned, in which case the separation distance may be reduced to 200 feet.

c. Interim sewage sludge stockpiles shall not be allowed on land with greater than 2% slope, unless the stockpiles are bermed to a height of 1 foot, in which case the maximum land slope may be increased to 6%.

d. Interim sewage sludge stockpiles shall not be ~~stockpiled~~ located on soils ~~of~~ having ~~permeability~~ permeabilities greater than 6 inches per hour throughout the top six feet, unless the stockpiles are underlain by an impervious or absorbent material, such as clay, crushed and packed limestone, plastic, straw or woodchips.

e. ~~A~~ Wherever interim sewage sludge stockpiles are located, a minimum distance of 6 feet shall exist between the soil surface and the water table. ~~wherever sewage sludge is stockpiled~~.

f. Interim storage of sewage sludge is prohibited for a period in excess of ~~six~~ seven months.

~~8.~~ 9. Prohibited Sites and Other Limitations

a. Sewage sludge shall not be disposed of on or into any cave, sinkhole or wetland. ~~mine, gravel pit, or quarry, or wetland, or on any land without the owner's permission~~. Except as part of a reclamation project, sewage sludge shall not be disposed of in or on any mine, gravel pit or quarry.

b. Sewage sludge shall not be applied on any land without the permission of the owner.

~~b.~~ c. Sewage sludge shall not be applied to coarse sands or gravel soils.

~~c.~~ d. Organic soils (peat) shall not be utilized for sewage sludge application unless adequately drained.

~~d.~~ e. ~~Individual~~ Daily surface applications of liquid sewage sludge shall not exceed:

coarse textured soil---25,000 gallons per acre
medium textured soil---15,000 gallons per acre
fine textured soil ---10,000 gallons per acre

~~e.~~ f. Sewage sludge shall not be applied to land that is to be left in fallow during the summer months (May to September, inclusive).

~~f.~~ g. Surface application of sewage sludge shall not be allowed on land with a slope greater than 6%. Sub-surface application or immediately incorporated application of sewage sludge shall not be allowed on land with a slope greater than 12%.

~~g.~~ h. Sewage sludge shall be applied to land in such a manner as to provide uniform spreading (application) over the entire site.

~~h.~~ i. The boundary of a ~~an application~~ landspreading site shall be identified prior to and during application with the use of conspicuous flags placed every 100 feet along its border unless apparent boundaries, such as fence rows, roads, tree lines, steep slopes, etc., exist.

~~9.~~ 10. Requirement for Record-keeping and Annual Reporting

a. A record-keeping system shall be initiated and maintained by the political subdivision to verify compliance with the rules and limitations herein. The information recorded in such a system shall include the following:

(1) Required sewage sludge composition data pursuant to Section D.1.a.

(2) Soil test data for application sites used during the year, pursuant to Section D.1.b.(8).

(3) The location of the landspreading and stockpile sites on a topography or soil survey map and the number of acres to which sewage sludge was applied.

(4) The amount of sewage sludge applied (tons sewage sludge solids/acre).

(5) The known amount of available nitrogen applied per year (lbs/acre).

(6) The amount of cadmium, zinc, lead, nickel, and copper applied per year and cumulatively (lbs/acre).

(7) Vegetation grown on each site during the year.

(8) A description of any adverse environmental, health, or social effects, complaints, management problems, or other difficulties encountered during the year due to sewage sludge disposal.

(9) Results of any other required monitoring, i.e., ground water, soils, vegetative tissue, etc.

(10) A report of any action not in conformance with the Letter of Approval, Permit, or this rule.

b. The records and information prescribed above shall be organized into a report to be submitted annually to the Agency no later than 60 days following the end of the reporting year (by March 1). If any of the information was submitted as part of an application for a Permit or Letter of Approval it need not be re-submitted.

G. Requirements for ~~Sewage Sludge Disposal Facilities Used for~~ Composting and/or Continuous Storage of Sewage Sludge

1. Disease Control

a. Sewage sludge shall be treated by a PSRP and/or by a PFRP prior to storage or composting, unless, in the case of composting, the composting operation qualifies as a PSRP or a PFRP.

b. Composting ~~sewage sludge disposal facilities~~ operations shall not be located within ¼ mile of any hospital or nursing home.

c. Public access to composting and continuous storage sewage sludge disposal ~~facilities~~ sites shall be controlled.

2. General Limitations

a. ~~The operation of a~~ A continuous storage ~~sewage sludge disposal facility~~ site shall be ~~conducted~~ managed in such a manner as to minimize ground water and surface water pollution, soil contamination, public health, safety and welfare hazards, and nuisance conditions.

b. The operation of a composting ~~sewage sludge disposal facility~~ site shall be conducted in such a manner as to minimize ground water and surface water pollution, soil contamination, public health, safety and welfare hazards, and nuisance conditions.

c. Necessary precautions and safeguards shall be undertaken in the disposal/distribution of sewage sludge compost such that ground water and surface water pollution, soil contamination, public health, safety and welfare hazards, and nuisance conditions are minimized.

d. The removal and final disposal of sewage sludge from a continuous storage sewage sludge disposal ~~facility~~ site shall comply with all requirements and limitations set forth in Section F of this rule.

e. A ~~facility~~ site used for sewage sludge composting or continuous storage shall not be utilized as a ~~facility~~ site for final disposal. Sewage sludge or sewage sludge compost shall be removed from the ~~facility~~ site regularly (periodically) for final disposal.

3. Record-keeping and Annual Reporting

a. A record-keeping system shall be initiated and maintained by the permittee to verify compliance with the requirements and limitations herein. The information recorded in such a system shall include the following:

(1) Required sewage sludge composition data as outlined in Section D.1.a. of this rule.

(2) The quantity of sewage sludge delivered to the ~~facility~~ site.

(3) The quantity of sewage sludge or sewage sludge compost removed from the ~~facility~~ site.

(4) A list of the locations to which the sewage sludge or sewage sludge compost was delivered after removal from the composting or continuous storage sewage sludge disposal ~~facility~~ site.

(5) A description of the precautions and safeguards employed in the disposal/distribution of sewage sludge compost.

(6) Results of any required monitoring, i.e., ground water, surface water, soil, etc.

(7) A description of any adverse environmental, health, or social effects, complaints, management problems, or other difficulties encountered ~~due to the operation of the sewage sludge facility~~ as a result of sewage sludge continuous storage or composting operations.

(8) A report of any action not in compliance with the Permit or this rule.

b. The records and information prescribed above shall be organized into a report to be submitted quarterly to the Agency no later than 60 days following the end of the reporting quarter.

H. Severability.

If any provision of this rule or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions of this rule or application of any other part of this rule which can be given effect without application of the invalid provision. To this end the provisions thereof are declared to be severable.

I. Variance.

~~In any cases where upon application of the responsible person or persons, the Agency finds that by reason of exceptional circumstances the strict enforcement of any provision of this rule would cause undue hardship, that disposal of the sewage sludge is necessary for the public health, safety or welfare, or that strict conformity with this rule would be unreasonable, impractical or not feasible under the circumstances, the Agency in its discretion may permit a variance therefrom upon such conditions as it may prescribe for prevention, control or abatement of pollution in harmony with the general purpose of this rule and the intent of applicable state and federal laws.~~

Any person may apply for a variance from any requirements of this rule. Such variances shall be applied for and acted upon by the Agency in accordance with Minn. Stat. 116.07 subd.5 (1980) and other applicable statutes and rules.

Appendix A

Estimate of Soil Cation Exchange Capacity

Using the values of soil texture and organic matter percentage, as determined by appropriate soil test procedures, a particular soil's cation exchange capacity can be estimated by using the table given below:

Cation Exchange Capacity

(milliequivalents/100 gms)

	Soil Organic Matter Level		
Texture	Low (<2%)	Medium (2-4%)	High (>4%)
Coarse	0 - 5	5 - 15	5 - 15
Medium	5 - 15	5 - 15	> 15
Fine	> 15	> 15	> 15

NOTE: It is recognized that soil cation exchange capacity (CEC) is not the only factor important in setting levels of metal additions to soil. It is used as an index which is proportional to the ability of a soil to minimize or limit heavy metal availability. Other soil chemical processes that are proportional to exchange reactions and also reduce the availability of heavy metals are sorption and precipitation reactions and metal complexation.

Appendix B

Determination of Sewage Sludge Application

Rate Based on Crop Nitrogen Requirements

Sewage sludge application rates shall be based upon sewage sludge nitrogen availability, carry-over nitrogen supplied by past sewage sludge applications, available nitrogen added by manures or fertilizers, soil texture, and crop nitrogen requirements and yield goals.

Step 1

Based on cropping practices and soil texture, determine the maximum allowable available nitrogen level from Table 1 or 2.

Step 2

Determine carry-over nitrogen from the previous years sewage sludge application using the following formula:

~~Carry-over N = (% organic sewage sludge N) x (lbs./acre)~~

~~(tons sewage sludge solids applied per acre)~~

Carry-over N (lbs./acre)=(% organic sewage sludge N)x(tons sewage sludge solids applied per acre)

If sewage sludge was not applied the previous year, carry-over nitrogen is zero.

Step 3

Subtract carry-over nitrogen and nitrogen added from other sources (e.g. fertilizer, animal manure), if known, from the maximum allowable available nitrogen level.

Step 4

Determine the available nitrogen in sludge using the appropriate formula in Table 3.

Step 5

Divide the maximum allowable available nitrogen level (lbs./acre) from Step 3 by the available nitrogen in sludge (lbs./ton) from Step 4 to obtain the sewage sludge application rate in tons of solids per acre per year.

TABLE 1

Maximum Allowable Available Nitrogen Levels for Various Crops, Yields and Soil Textures

Crop	Yield/Acre	Maximum Allowable Available Nitrogen Level (lbs./acre) ------ Soil Texture ------ Coarse	Medium	Fine
Alfalfa	4 ton	180	210	230
	6 ton	280	340	370
Barley	80 bushel	100	110	120
Bluegrass	3 ton	180	210	230
Corn	75 bushel	100	120	130
	100 bushel	130	150	160
	125 bushel	150	180	190
	150 bushel	180	210	230
	175 bushel	210	250	270
Oats	75 bushel	80	90	100
	100 bushel	130	150	160
Soybeans	30 bushel	120	140	150
	40 bushel	180	210	230
	50 bushel	230	270	300
	60 bushel	280	340	370
Wheat	50 bushel	100	120	130
	75 bushel	160	180	190

TABLE 2

Maximum Allowable Available Nitrogen

Levels for Non-Cropped, Non-Harvested Areas

Degree of Vegetative Cover	Maximum Allowable Available Nitrogen Level (lbs/acre)		
	Soil Texture		
	Coarse	Medium	Fine
High density	75	100	125
Low density	50	75	100

TABLE 3

Formulas for Determination of Available Nitrogen in Sewage Sludge

(pounds of available nitrogen per ton of sewage sludge solids)

Type of Stabilization	Application Method	Formula
Digested	Surface . . .	(% organic-N x 4) + (% NH_3-N x 10)
	Incorporated or Injected .	(% organic-N x 4) + (% NH_3-N x 15)
Chemically or Physically Stabilized or Unstabilized	Surface . . .	(% organic-N x 6) + (% NH_3-N x 10)
	Incorporated or Injected .	(% organic-N x 6) + (% NH_3-N x 15)

APPROVED AS TO FORM AND LEGALITY

4-10 1981

WARREN SPANNAUS, ATTORNEY GENERAL

BY _____

SPECIAL ASSISTANT ATTORNEY GENERAL

G/SW1/SAS/GLA

Public Utilities Commission

CITY OF BABBITT
BABBITT, MINNESOTA 55706
(218) 827-3647

COMMISSIONERS
•Eldo F. Jordan
•Don Cole
•Ervin Hanson

P.U.C. CLERK - TREASURER
Elaine Postudensek

December 17, 1980

RECEIVED
DEC 22 1980
MINN. POLLUTION CONTROL AGENCY

Rodney E. Massey, P.E.
Chief, Ground Water Section
Division of Water Quality
Minnesota Pollution Control Agency
1935 West County Road B-2
Roseville, MN 55113

Dear Mr. Massey:

We have reviewed the 4.8050 Temporary Sewage Sludge Disposal Standard referred to in your letter of December 4, 1980.

To the best of our knowledge the City of Babbitt complies with all the standards. In reference to requirement F Item #9, we suggest that the Agency supply and send out a standard form for this reporting. The form could be sent out in January of each year.

Babbitt is ready, willing and able to make the annual report referred to. However, we did not receive the Recommendation of August, 1978 and would not have known or reported it as required, had we not called your office to ask for it.

Thank you.

Sincerely,

Eldo Jordan

Eldo Jordan, Chairman

Elaine Postudensek

Elaine Postudensek, PUC
Clerk-Treasurer

lk

GWH
~~SAS~~
GLA

UNIVERSITY OF MINNESOTA
TWIN CITIES

Department of Soil Science
1529 Gortner Avenue
St. Paul, Minnesota 55108

RECEIVED
DEC 23 1980
MINN. POLLUTION
CONTROL AGENCY

December 18, 1980

Mr. Rodney E. Massey
Chief, Ground Water Section
Division of Water Quality
Minnesota Pollution Control Agency
1935 West County Road B-2
Roseville, Minnesota 55113

Dear Mr. Massey:

I wish to thank you for sending me the 4.8050 Temporary Sewage Sludge Disposal Standards. This information will be incorporated into my teaching and I would appreciate receiving similar material (s) as it becomes available.

I have no problem with the standards save one. You have done a very good job of giving definitions, which I find more often than not in legislation, regulations and standards is the greatest shortcoming. However, one term is missing from your list of definitions, which if included might over come my concern.

I question the reason for not permitting sewage sludge to be applied to land if it is to be fallowed during the summer (May to September inclusive). Certain types of fallowing might lead to mineralization and leading of nitrogen. However, I would regard some types of fallowing as a perferred way of handling on land application of sewage materials.

I think you need to precisely define what you mean by fallow.

Sincerely,

Russell S. Adams, Jr.

Russell S. Adams, Jr.
Professor

RSA/lmh

6400/SAS/6LA

MANKATO

202 East Jackson Street Box 3368 Mankato, MN 56001 Phone (507) 625-3161

December 18, 1980

RECEIVED
DEC 22 1980

Mr. Rodney E. Massey
Division of Water Quality
Minnesota Pollution Control Agency
4935 West County Road B2
Rosedale, MN. 55113

RE: Temporary Sewage Sludge Disposal Standards

Dear Rodney:

We have received your correspondence of December 4, 1980, with regard to the above and would submit the following questions for your consideration.

First, we would propose that the reduction for volatile solids be less than the 38 per cent proposed. It is our experience that a reduction of this percentage would be almost impossible for us to obtain and I feel quite sure that this would be difficult for many plants with the anerobic digestion process.

Second, would be the testing of various fields where sludge is disposed and that is we would wonder if each of the fields would require annual testing, as this would create a very costly situation for us with approximately 60 fields that we have utilized for sludge disposal.

We would also like to know whether the 1981 annual update report on sludge disposal is required now or will that depend on whether or not these standards are passed and if permit approved for our facility.

It is our understanding this new permit would also require information on industrial contributors which were not required with the last disposal plan. Would this apply to all the various industrial contributors or only those with potential hazardous types of waste?

Thanks Rod for your notice and we will be waiting to hear from you with regard to the above questions.

Sincerely,

William V. Lacina
Supt. of Water & Sanitation Utility

WVL:jlc

Mankato is an affirmative action, equal opportunity employer.

Western Lake Superior Sanitary District

27TH AVENUE WEST & THE WATERFRONT / DULUTH, MINNESOTA 55806 / PHONE 218/722-3336

December 22, 1980

RECEIVED
DEC 29 1980
MINN. POLLUTION CONTROL AGENCY

Ms. Terry Hoffman
Executive Director
Minnesota Pollution Control Agency
1935 West County Road B-2
Roseville, MN 55113

Subject: Temporary Sewage Sludge Disposal Standards

Dear Ms. Hoffman:

The Sanitary District has received your Agency's notice of intent to establish temporary sewage sludge standards and the Agency's request for comments on the proposed standards. As you know, the Sanitary District has been employing land application of sewage sludge as a means of sludge disposal. While we ultimately intend to incinerate sludge, the date our incinerator will be fully operational is unknown. Until the incinerator is fully operational, we intend to use land application as our primary means of sludge disposal. Land application will also be our backup method for sludge disposal in the future if we cannot incinerate for some reason. Because of the District's reliance on land application, we are very concerned about your Agency's intent to adopt temporary disposal standards.

The District has been conducting its land application program under the Agency guidelines issued in August 1978. These guidelines have proven to be quite effective in controlling land application and after spreading 197,000 wet tons on 6,000 acres of farmland, the District has not caused any adverse environmental or health effects. Our staff has become experienced in dealing with the guidelines and can now review potential application sites and determine their acceptability for use much faster than when we first started the land application program. After reviewing the proposed Temporary Sewage Disposal Standards, the District can see that it will take a good deal of time for our staff to become familiar with the new regulations. Because the proposed standards are only temporary and not subject to public hearing, we feel it is unfair to adopt new regulations. Instead, the District recommends the Agency adopt the existing guidelines as temporary standards.

Adoption of the existing guidelines as temporary standards will allow practitioners of land application to continue their current land application programs until permanent regulations are adopted. Adopting new standards at this time and then revising those standards one or two years down the road is unfair to agencies using land application; particularly since the current guidelines are adequately protecting the environment.

The Sanitary District, along with several other agencies in Minnesota, has expended a great deal of effort becoming versed in land application. Our staff has done extensive monitoring of the impact of land application on water quality and has become experienced in the practical problems of a day-to-day land application program. I'm sure you'll agree that there is no substitute for practical experience when it comes to understanding the complexity of waste disposal problems.

The Sanitary District supports strong regulations governing sewage sludge disposal because we feel that good regulations will help to develop public confidence in land application. However, the development of good regulations cannot take place without the assistance of the people who are practicing land application. The Sanitary District recommends the Agency create an advisory committee made up of agencies using land application for sludge disposal, farmers using sludge for soil conditioning and county agricultural extension officers who have been working with both farmer and sludge generators. These people have a wealth of information about land application and that knowledge should be used by the Agency as a valuable resource.

As you know, Article XI, Section 14, of the 1980 Minnesota Waste Management Act states:

> "By January 1, 1981, in consultation with the Department of Health, the Agency shall prepare and submit a report on sewage sludge disposal to the legislative commission. The report shall be based on the available information and shall recommend appropriate strategies, procedures and programs to abate potential health hazards resulting from sewage sludge disposal facilities. The report shall: (a) analyze the potential health hazards resulting from sewage sludge disposal facilities and methods of abatement; (b) examine existing regional, state and federal regulations regarding pretreatment of industrial wastewater and efforts which are being or could be made by industry to pretreat their industrial wastewaters; (c) analyze the need and potential effect of state regulations on concentrations of toxic and hazardous substances in industrial wastewater effluent; summarize the duties and relationships among government entities responsible for sewage and sewage sludge treatment and regulation."

The information that is required in the above referenced report should be considered in the development of new sludge disposal standards. Because of the importance of this information, it is the position of the District that it is inappropriate to establish new standards prior to the completion and public comment on the agency sludge report to the legislative commission.

In addition, the Sanitary District believes the proposed temporary standards do not comply with some of the provisions of the 1980 Minnesota Waste

Management Act. Article XI, Section 5, Subdivision 2, of the Act states:

> ". . . in adopting standards, the Pollution Control Agency shall give due recognition to the fact that elements of control which may be reasonable and proper in densely populated areas of the state may be unreasonable and improper in sparsely populated or remote areas of the state, and it shall take into consideration in this connection such factors . . ."

Article XI, Section 6, Subdivision 4, states:

> "The Agency shall adopt such rules and standards for the disposal of sewage sludge, addressing the intrinsic suitability of land, the volume and rate of application of sewage sludge of various degrees of intrinsic hazard, design of disposal facilities, and operation of disposal facilities and disposal sites . . ."

It is the position of the Sanitary District that the proposed rules do not recognize the difference in control necessary for urban vs. rural areas and that the standards do not consider the difference in sludge from different areas. Each sludge is different and should be treated as a unique product.

The District fully understands the Agency's legislative directive to adopt temporary standards and the citizen pressures all parties involved in sludge disposal, including the Agency, are facing. However, the current guidelines are based on the best available information and are working well. The elevation of these guidelines to the status of temporary standards will fulfill the legislative directive and help to ease public concern about sludge disposal.

The District would like to work closely with the Agency to develop new Sewage Sludge Disposal Standards and offers its experience and expertise in land application to assist the Agency in the development of strong disposal standards. We are attaching specific comments on the draft standards; however, it is difficult to adequately express our position in writing and we strongly recommend the formation of a working committee to review the standards.

Regulations controlling land application impacts many interests in Minnesota ranging from the farmers who utilize sludge to the urban dwellers who generate sludge. Land application is becoming a major process for sludge disposal and any regulations put into effect to control land application should be subject to close scrutiny from all parties involved.

Sincerely,

James A. Johnson

JAJ/lf
Enclosure
cc: Mr. Louis J. Breimhurst, Director, Division of Water Quality
Mr. Rodney Massey, Surface and Groundwater Section
MPCA Board Members

Western Lake Superior Sanitary District

27TH AVENUE WEST & THE WATERFRONT / DULUTH, MINNESOTA 55806 / PHONE 218/722-3336

WESTERN LAKE SUPERIOR SANITARY DISTRICT
COMMENT ON PCA PROPOSED TEMPORARY
SEWAGE SLUDGE DISPOSAL STANDARDS

B. DEFINITIONS

Continuous Storage -	This definition is unclear. Please clarify.
Interim Storage -	Should be changed to " . . . for a period greater than one month, but less than six months . . . "
Process to Significantly Reduce Pathogens (PSRP) - Lime Stabilization -	Present pH requirement of 11.5 is adequate and should not be changed.
Sewage Sludge Disposal Facility -	a. Dedicated SSDF - Does this mean continual input-output or a static pile or both? A clarification of this definition is necessary.
Soil Texture -	What is the reasoning behind the reclassification of sandy loam from "Medium" to "Coarse" textured soils. At least 50% of the farmland used by the District is sandy loam and we have had no adverse impact from the present guideline limits. Practitioners of land application should be given the opportunity to do percolation tests, if they do not feel the classification given by the soil lab reflects the percolation rate.
Surface Application -	Farmers should be given at least 7 days or 168 hours to complete discing of fields. This would give adequate time to allow for poor weather and equipment problems.

C. APPLICABILITY

Section 3.b -	Clarification of this section is requested to identify who will issue the letter of approval (Agency, Director, etc.).

D. CONTENTS OF APPLICATIONS FOR . . .

Section 1.a.(1) and (2)-	The frequency of chemical and physical characteristic reports is unclear. Are these reports necessary for each application or on a quarterly basis? The actual quantity of sludge applied to farmland is based on actual samples of the sludge to be spread.
Section 1.a. (3) -	The Agency already has this information and should not be needed on each application.
Section 1.b.(1) -	Why are plat maps necessary? U.S.G.S. maps show locations of buildings. Legal descriptions are included.
Section 1.b.(4)(b) -	Identification of these limits is impossible unless Corps of Engineers has already established flood plains. Much agricultural land is located in flood plains. Sludge is not applied during flood periods.
Section 1.b.(g)(f) -	Special testing is necessary to determine these requirements. What purpose do they serve?
Section 2.c. -	This implies a health hazard from application of sludge. We have had no problem with air transportation of bacteria, which would be required to affect patients at hospitals or nursing homes. This section is unnecessary.
Section 2.f. -	It appears that "continuous" in this section should be "interim".

E. ADMINISTRATION OF LETTER OF APPROVAL AND PERMIT PROGRAMS

Section 2a -	Response by Agency should be done within 48 hours.
Section 2b -	Time limit for Agency determination should be established. We suggest 5 days.
Section 2b(1) -	We submit that 10 days is adequate time for a review and makes it much easier for us to maintain application sites.
Section 2c(2) -	Ten days is adequate for a response from interested parties.
Section 2d(1) -	Thirty days time should be the maximum required to make a determination whether to issue or deny the permit.

F. REQUIREMENTS FOR SEWAGE SLUDGE DISPOSAL FACILITIES USED FOR LAND-SPREADING OF SEWAGE SLUDGE

General Comment on Section F - The requirements for landspreading sludge should vary with the type of sludge and its actual characteristics. All sludge is not the same; each sludge is unique and should be treated that way. Treatment works with good pretreatment programs or little industry should not be penalized because other areas have more contaminants in their sludge.

Section 1.b.(2) -	Public Access Control - Unless sludge is spread on public land, this item is unnecessary, particularly in light of Minnesota's trespass law.
Section 1.c. -	Why is this increased from two weeks to a month? Current requirement is adequate.
Section 5 -	Please define "other persistent organic chemicals" and the monitoring requirements.
Section 6.c. -	If sludge is incorporated, it should be permitted to apply up to the property line. If surface applied, a 25 foot setback is suitable.
Section 6.d.-	Limits of 100 feet if incorporated and 200 feet if surface applied, are suitable. Recreation areas should be public facilities.
Section 6.f. -	Coarse texture soil separation distances have been increased. Why? Old distances were adequate.
Section 7a -	1000 feet is excessive. We recommend 300 feet.
Section 7b -	300 feet, if slope less than 6%, and 100 feet if stockpile bermed, are more than sufficient based on our monitoring experience.
Section 7c -	We recommend the following wording: "Sewage sludge stockpiles shall be allowed on land with greater than 2% slope, provided the stockpiles are bermed to a height of one foot, in which case the maximum land slope may be increased to 6%."
Section 7d -	We recommend the following wording: "Sewage sludge may be stockpiled on soils of permeability greater than 6 inches per hour, provided the stockpiles are underlain by an impervious or absorbent material, such as clay, crushed and packed limestone, plastic, straw or wood chips."

Section 7e - We recommend these standards be based on soil percolation rates rather than distance and apply only to stockpiles left in place longer than 90 days.

Section 7f - We recommend the following wording: ". . . interim storage of sewage sludge is permitted for a maximum period of six months."

Section 8a - This section prohibits the use of sludge to restore mines and gravel pits. These types of areas should be treated differently than wetlands.

Section 8b - How is "coarse sand" defined? Seive analysis, percolation, etc.

Section 8c - How is "adequate drainage" defined?

Section 8d - These limits should be based on soil percolation and sludge characteristics.

Section 8e - What is the reasoning behind this section? How about winter crops?

Section 8h - This item is unnecessary except in cases where there are significant problems with identification of the boundary.

Section 9a - Most of the information required in the annual reports is required to be submitted in the application. Why is it necessary to do this twice?

GWM/SAS/GLA

TKDA

ENGINEERS ARCHITECTS PLANNERS

TOLTZ, KING, DUVALL, ANDERSON
AND ASSOCIATES, INCORPORATED

2500 AMERICAN NATIONAL BANK BUILDING
SAINT PAUL, MINNESOTA 55101
612/292-4400

December 24, 1980

Minnesota Pollution Control Agency
1935 West County Road B 2
Roseville, Minnesota 55113

Attention: Mr. Rodney E. Massey, P.E.
Chief, Ground Water Section
Division of Water Quality

Re: Your December 4, 1980 letter to Mr. Norm Wenck

Dear Mr. Massey:

In accordance with your referenced letter, the attached comments are provided for your use/consideration in issuing the proposed temporary standards for sewage sludge disposal as published in the December 8, 1980 State Register.

Since the period of time available for comment on this proposed temporary rule has been short, we may provide additional comments for your use/consideration in developing a permanent rule.

We appreciate your request for our comments and thank you for alerting us to the publication of this proposed temporary rule.

Yours very truly,

TOLTZ, KING, DUVALL, ANDERSON
AND ASSOCIATES, INCORPORATED

Dennis R. Martenson

Dennis R. Martenson, P.E.
Member
CEC/M EPA/MPCA Liaison Committee

DRM:cms
Enclosure
cc: Bob Roskopf, RCM
Norm Wenck, E. A. Kickok
Bob Brown, Ellerbe
Don Stormwall, Soil Exploration
Duane Prew, TKDA
Earl Oxley, CEC/M

COMMENTS FROM CONSULTING ENGINEERS' COUNCIL/MINNESOTA

ON

PROPOSED TEMPORARY STANDARDS FOR SEWAGE SLUDGE DISPOSAL

GENERAL COMMENTS

1. Since these temporary standards would be issued for only 90 days, it would appear to us that their effective administration would be difficult. Therefore, if a temporary standard must be issued before the "permanent rule", would it be possible to issue the previous "Recommendations" (August 1978) with some minor revisions as a temporary standard?

2. What happened to the requirement for a "Solids Disposal Plan" for Class B, C and D plants as previously required in the MPCA "Recommendations" (August, 1978) and included in the NPDES requirements?

3. Have these proposed temporary standards been adequately coordinated with the requirements of the Minnesota Waste Management Act?

4. We did not note any reference to Class D plants being included in this temporary rule.

SPECIFIC COMMENTS

A. Intent

   1. We believe the initial introductory sentence is too strong.

   2. We believe the intent should be more fully and clearly described.

B. Definitions

   1. Presently, some needed definitions are not included, e.g. dedicated site and non-dedicated site.

   2. We believe it would be desirable to include in the definitions the basis for determination of measured parameters.

   3. Air drying definitoon is extremely broad. In Minnesota liquid sludge in a paved basin will usually not dry.

D. Contents of Applications for Letter of Approval and Permit

1. a. (2) We believe the minimum number of analytical results to be reported should stipulated.

(3) This information on industrial contributors may not be available for some time in the future.

2. c. What is the basis for this requirement as it relates to nursing homes and hospitals?

E. Administration of Letter of Approval and Permit Programs

2. c. (2) Fourteen (14) days for the submission of written comments is inconsistent with the facility planning public participation requirements.

F. Requirements for Sewage Sludge Disposal Facilities Used for Landspreading of Sewage Sludge

8. e. Why? Wouldn't the nitrogen limit for non-harvest situation as described in August, 1978 "Recommendations" be adequate?

9. a. (1) Does this require other than Class A plants to obtain analyses for mercury, chromium and PCB?

(6) What about mercury, chromium and PCB? Is there a good reason why they were not included?

APPENDIX

The applicability of Table 2 is unclear.

BEM/GWM/SAS/GLA

W. & G. Rehbein Bros., Inc.

7087 20th Avenue North • Hugo, Minn. 55038

Phone 426-1345

December 26, 1980

Minnesota Pollution Control Agency
Ground Water Division
1935 W. Co. Road B-2
Roseville, MN 55113

Attn: Steve Stark

Dear Mr. Stark:

The following letter is to address the proposed rules and regulations for land application of sewage sludge.

We feel the comments we are about to make will help maximize the beneficial use of land application of sludge.

It is our intent that our proposed changes will benefit the farmer as well as the surrounding communities and yet meet necessary environmental safety standards for sludge.

We intend to address each section separately of the PCA's 48050 Temporary Sewage Sludge Disposal Standards, as it pertains to us.

SECTION B - DEFINITIONS:

Interim Storage: We feel the interim storage should be allowed up to 7 months. We feel this is necessary because it often takes the farmer over 6 months from the time of planting to harvest. This, of course, is dependent upon the fall weather conditions.

SECTION C - NO COMMENT

SECTION D - FACILITY MANAGEMENT:

Part 7: We are not clear as to what is meant by limiting public access and feel this should be addressed in more detail.

SECTION E - NO COMMENT

SECTION F - SOIL PH AND CADMIUM APPLICATION:

Part a: Please reword as follows: If the soil PH is less than 6.5, a sufficient quantity of lime shall be applied to the soil and/or before the time of sludge spreading to raise the soil PH to 6.5.

SEPARATION DISTANCES:

Part c: We feel that 50 feet from any property line is too far. I have discussed this with many farmers and they have expressed that this would be a great hardship upon them. Having to have special fertilizer and separate nitrogen application for these areas would be costly as well as time-consuming.

At the present time, we can see no scientific reason for this 50' distance. We feel that this part should be reworded to:

If sludge is incorporated, sludge may be spread such that no material crosses or contacts property lines. If sludge is surface applied, sludge shall be applied no closer than 10 feet to the property line, unless approval is obtained from adjoining property owners. Sludge may be spread to the edge of the right-away unless factors identified during site investigation indicate that further setbacks are necessary.

Part d: We feel that 50 feet is inappropriate and unreasonable. A distance of 100 feet when incorporated and 200 feet when surface applied is more than adequate.

Part f: The definition for dry run, spring, flowage, pond and drain ditch is unclear. Could we have more definition so that we may consider the proposed definitions.

Part g: We feel that distance should be a function of slope.

Slope	Feet
0 to 2%	25'
29 to 4%	50'
4% to 6%	75'
>6%	100'

7. INTERIM SEWAGE SLUDGE STORAGE:

Part A: We feel that it is important to carefully select a stockpiling site. The 1000 feet minimum is too much for most of the farms in the metro area. A distance of 300 feet should be more than sufficient. The 1000' minimum would eliminate most of the small farms around the Twin City area, and these are the farmers that need it.

Part B: Once again, we feel that a distance of 300 feet would most benefit the farmer and yet have no adverse effect on the environment. If the stockpile was down gradient, 100 feet would be sufficient.

Part F: As we mentioned before, we think stockpile time should be extended up to 7 months. The reason for this is because it may take the farmer 6 months or more from planting to harvest. We also feel we should start a new section called temporary stockpiling. We feel that stockpiles that are spread within thirty days of delivery to the site could meet the same requirements as spreading.

We hope that our proposed ideas can be incorpoarted with the Minnesota Pollution Control Agency guidelines. To be successful with a land applicaiton program, we feel that it must be easy to use, inexpensive, and environmentally safe.

Thank you for your consideration.

Sincerely yours,

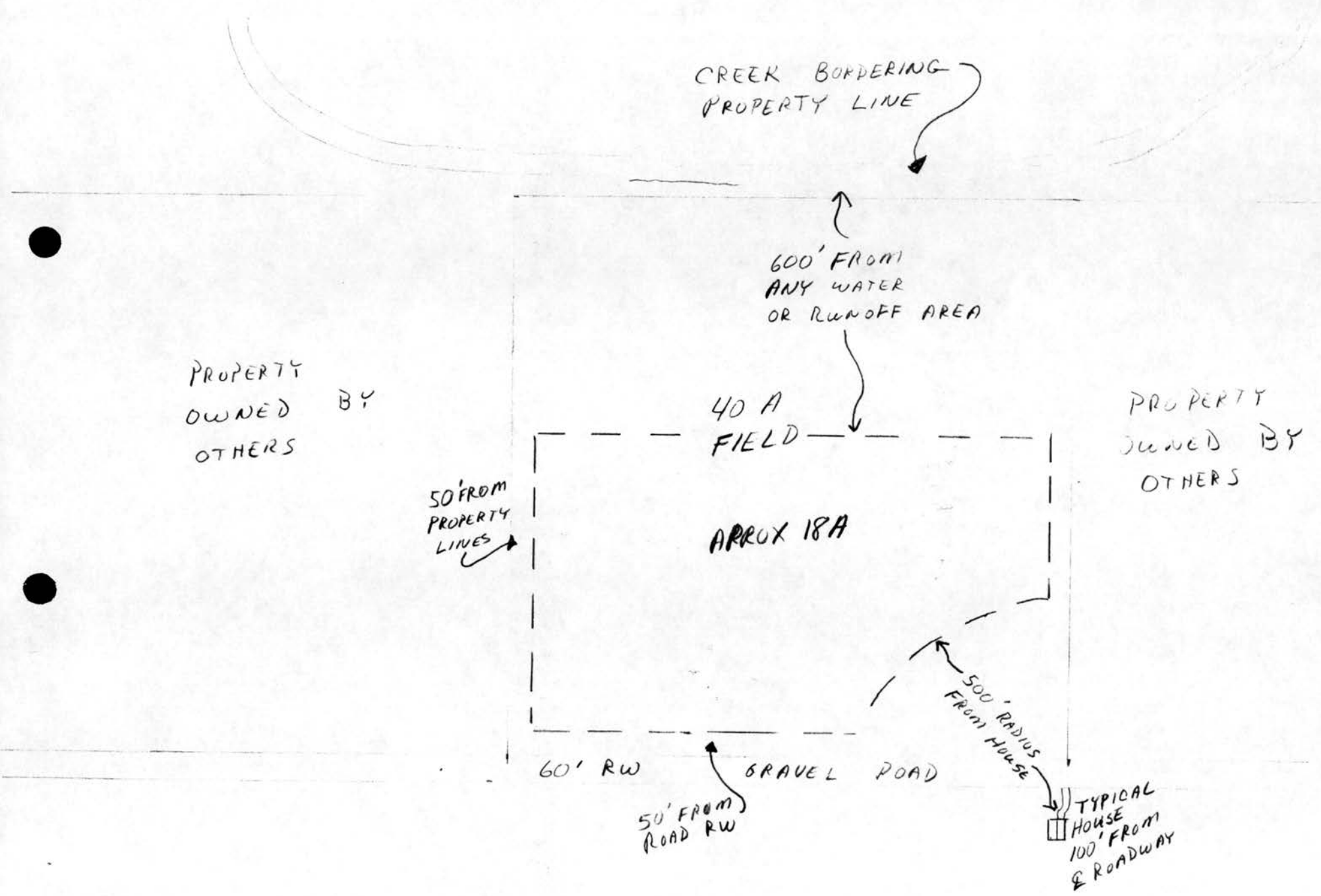
W. & G. Rehbein Bros., Inc.

Michael E. Granger

Michael E. Granger

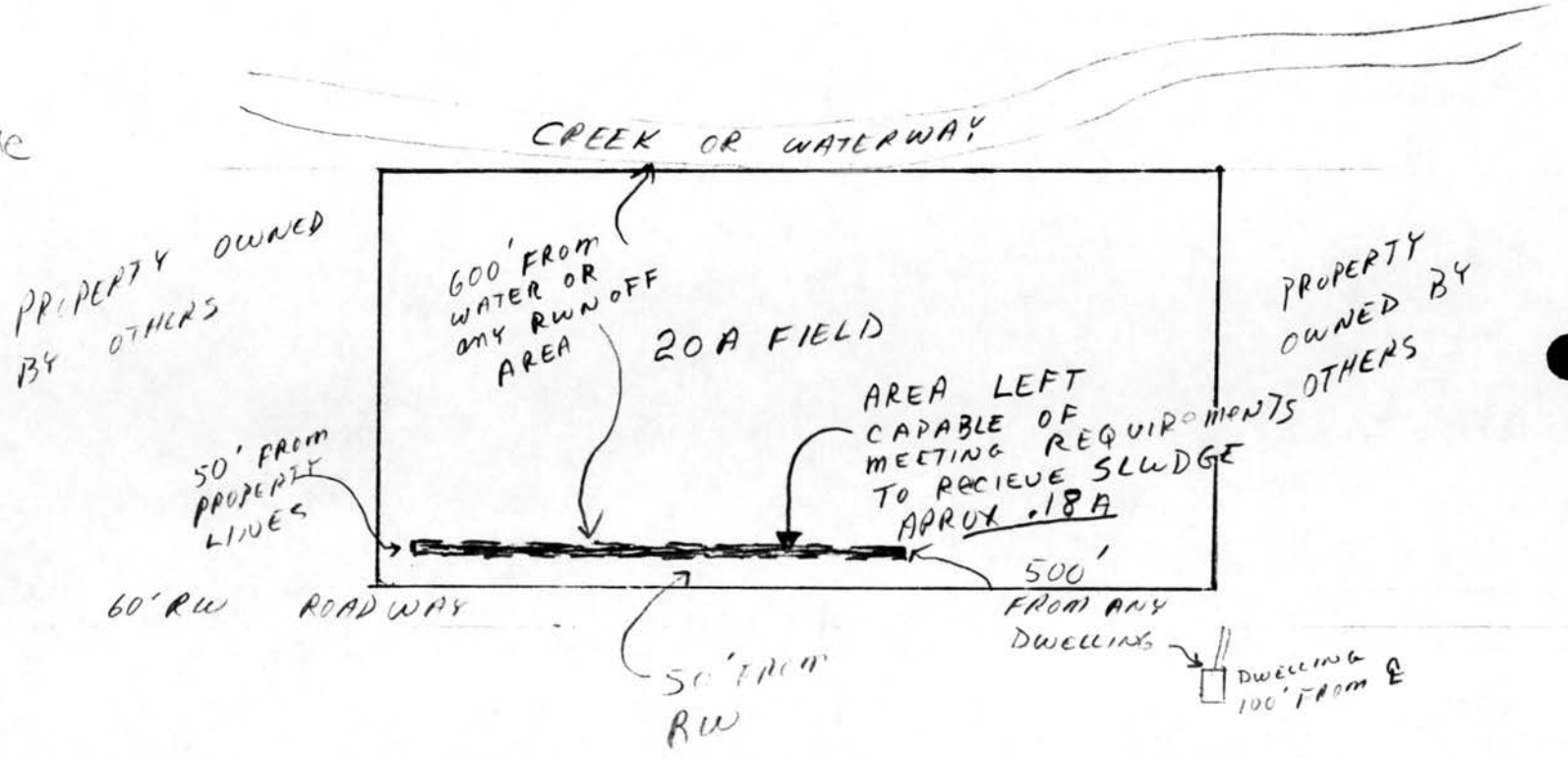
Agricultural Research & Dev. Div.

SCALE 1" = 30'

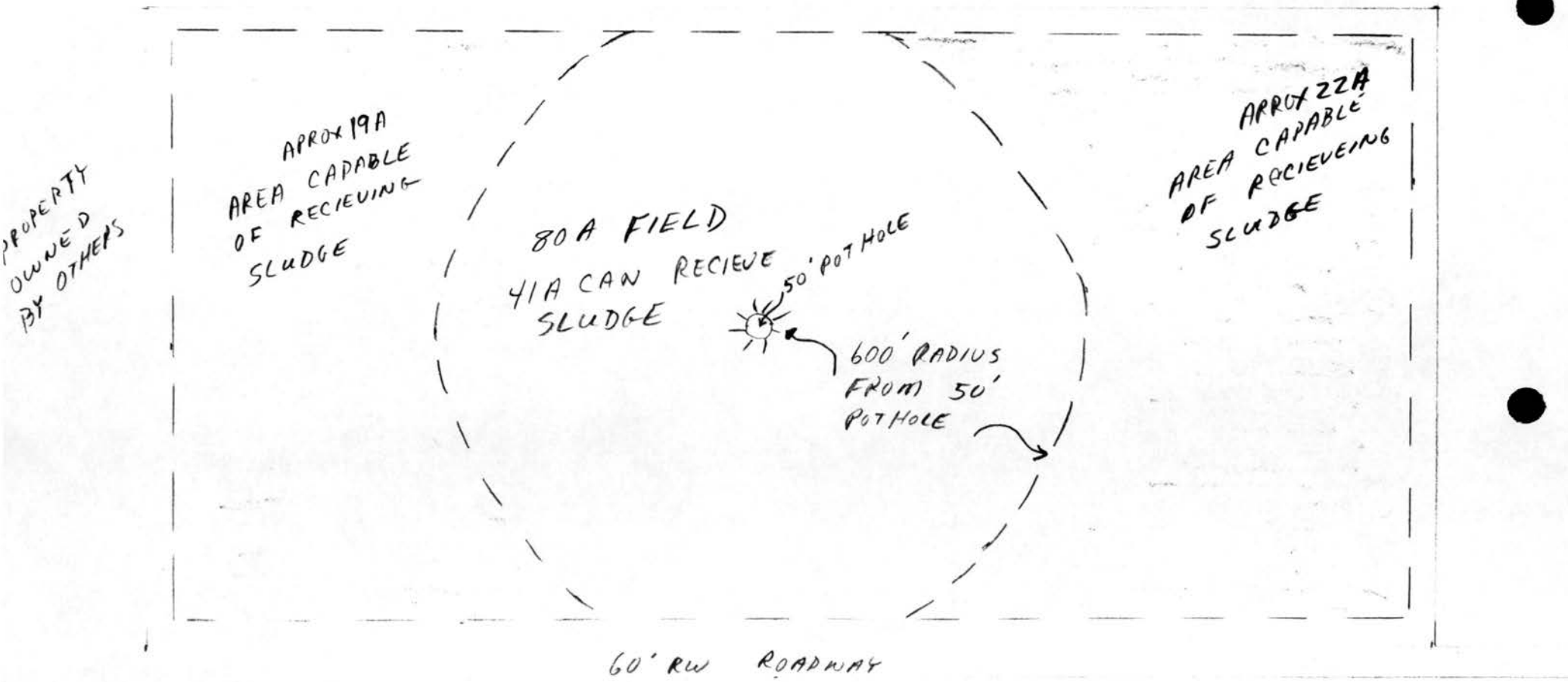

CREEK BORDERING PROPERTY LINE
600' FROM ANY WATER OR RUNOFF AREA
PROPERTY OWNED BY OTHERS
40 A FIELD
PROPERTY OWNED BY OTHERS
50' FROM PROPERTY LINES
ARROX 18A
500' RADIUS FROM HOUSE
60' RW
GRAVEL ROAD
50' FROM ROAD RW
TYPICAL HOUSE 100' FROM ℄ ROADWAY

SCALE 1" = 30'

Distance 5'
to water table



SCALE 1" = 30'


PROPERTY OWNED BY OTHER'S
APROX 19A AREA CAPABLE OF RECIEVING SLUDGE
80A FIELD
41A CAN RECIEVE SLUDGE
50' POT HOLE
600' RADIUS FROM 50' POT HOLE
APROX 22A AREA CAPABLE OF RECIEVING SLUDGE
60' RW ROADWAY

PLANNING, ZONING AND
ENVIRONMENTAL SERVICES
(612) 448-3435 EXT. 225



CARVER COUNTY COURTHOUSE
600 EAST 4TH
CHASKA, MINNESOTA 55318

COUNTY OF CARVER

RECEIVED
DEC 29 1980
MINN. POLLUTION
CONTROL AGENCY

December 26, 1980

Rod Massey
Chief, Ground Water Section
Division of Water Quality
Minnesota Pollution Control Agency
1935 W. County Rd. B2
Roseville, MN 55113

Rod,

The following comment is my basic concern on the Proposed Temporary Rule Governing Sewage Sludge Disposal. Carver County is very concerned about sewage sludge disposal and is looking forward to officially working with you on developing the permanent rules.

On my review of these proposed rules it became apparent that these temporary rules provided a needed higher level of protection than the current guidelines for sludge disposal. But, appeared to not be in conformance with the general E.P.A. Rules, in particular, the hazardous Waste Regulations, which identify sewage sludge as hazardous waste and must be evaluated by the hazardous waste criteria and proven to be non hazardous to be handled in the manner you propose. This is of particular concern to me in dealing with sludge from the Metropolitan Waste Control Commission Disposal System. The basis of my concern is that on review of current information it appears that as high as 50% of the chemical waste generated in the State of Minnesota is possibly sewered into the metropolitan disposal system, the volume could be as high as 12,000,000 gallons per year. This material is sewered in a virtually unregulated manner because of the lack of an adequate regulatory position by the M.W.C.C. and the failure to undertake a strong pretreatment position by the M.P.C.A. and M.W.C.C.

It is my feeling that the sewage sludge generated by the metropolitan disposal system should be considered a hazardous waste, and be so handled to provide the required degree of protection to our soil, ground waters and surface waters as well as the health and safety of the public.

Sincerely,

William J. Dilks, E.H.S.
Environmental Program Coordinator

GROUNDWATER SECTION
MINNESOTA POLLUTION CONTROL AGENCY
I935 West County Road B - 2
Roseville, Minnesota 55II3

Response To 4.8050
Temporary Sewage Sludge
Disposal Standards

Larry W. Brokke
6795 20th Avenue
Hugo, Minn.55038

December 29,I980

4.8050 Temporary Sewage Sludge Disposal Standards

B. Definitions.

Background soil ph - Background soil ph needs clearification as to the substances intended to alter the hydrogen iron concentration. Background soil ph is also somewhat confusing, in its present form, as shown in section C, soil cation exchange capacity chart.

Continuous storage - Continuous storage should be further categorized to include short-term storage. The storage of sewage sludge should not exceed a period of more than thirty (30) days at a facility that is not located at the place of sewage sludge generation.

Interim storage - The interim storage category must be extended to seven (7) months. Example: Most crops are planted in May, therefore stockpiling will start in May. Corn crops seem to be the biggest consumer of sludge. The weather condition for the I980 growing season led to harvest start up at the end of October. Consequently, many of the permitted sites were not ready for sludge application until November. Weather conditions during the planting, growing and harvesting season will be a deciding factor in the length of the stock piling period. For this regulation to be complied with, from a practical standpoint, the interim storage should be extended to seven (7) months.

Incorporation - A minimum depth of six (6) inches or more, whatever is adequate should be written into this definition making it clear that depth is important during incorporation. At this depth it should eleminate the burning of planted seeds. Specific wording should be constructed for filter cake sludge. When large clumps of sludge that range from ten (I0) inches to twenty (20) inches in diameter are present on the field they must be broken up and spread over the field. This would eleminate a high concentration of sludge in one area which will lead to crop burn or kill. I have discovered these types of clumps on site inspections. The cause seems to stem from frozen sludge that was spread by a farm manure spreader that has only one bettor bar. The use of this type of spreader should be eleminated during winter months and or when sludge is frozen. The 2505 Terragator had been designed for sludge spreading and does an adequate job with frozen sludge. There are more bettor bars mounted close together to break up the sludge.

Soil texture - Sandy loams have been classified as a medium texture soil in MPCA recommendations of August I978. Than why has it been reclassified as a course textured soil. I raise the question in as much as many of the soils I have come across are of this type. The water table and or bedrock distance will now change by adding three (3) feet of soil separation distance. This may eliminate a number of land application sites. If this reclassification is necessary, do to scientific data and additional research since I978, than I guess there is nothing we can do. Let us take a good look at the reason for making the change.

C. Applicability.

Why must B,C, and D plants meet only paragraphs F and G ? Must all plants submit a permit before land application of sewage sludge can be activated? What criteria must they submit to PCA?

D. Contents of Applications For Letter of Approval and Permit

A. Sewage sludge characterization, to include:

(3) Description of industrial contributors to the sewer system which may discharge toxic organic chemicals; This regulation can not be emphasized enough, the MWCC needs to increase its efforts in this area. The primary responsibility for enforcing pretreatment standards is placed on certain publicly owned treatment works (primarily those with flows greater than five (5) million gallons per day mgd) through the requirements that such POTW's develop local pretreatment programs. The general pretreatment regulations can control the municipal sludge quality, inhance disposal operations and increasing the time element for sludge to be land applied by decreasing the pollutants in the sludge.

* Section 403.8 (a) of the General Pretreatment regulation specifies that a municipality will be required to develop a pretreatment program if its flow exceeds five (5) mgd and if it receives pollutants which interfere with the operation of the POTW. Section 403.3 of the regulations define the term interference to include "prevention of sewage sludge use or disposal by the POTW in accordance with section 405 of the Act." Therefore, if it were to be demonstrated that a POTW with an average flow in excess of five (5) mgd received pollutants from industrial users which prevented the POTW from complying with the applicable requirments of section 405 of the Act, that POTW would be required to develop a POTW pretreatment program.

Data obtained from the EPA Standards

* Section 403.8(a) of the pretreatment regulation also specifies that the NPDES State, or EPA in cases of non-NPDES States, may elect to require the development of a local pretreatment program to address sludge concerns where the POTW has a flow of five (5) mgd or less. In defining this discretion, the regulation states that the Regional Administrator or State Director, "may require that a POTW with a design flow of five (5) mgd or less develop a POTW pretreatment program if he finds that the nature or volume of the industrial influent, treatment process upsets, violations of POTW effluent limitations, contamination of municipal sludge, or other circumstances warrent."

If MWCC will enforce the pretreatment regulations most important, presently reduces the cadmium levels. We could increase our tons/acre and also increase the length of time we can apply sludge on a returning bases to a particular piece of land.

B. Site characterization, to include:

(4) If maps or aerial photos do not have A through H, within I/4 mile, is the information required?

(6) Is it necessary to take borings to determine the approximate depths to ground water and bedrock? Can we rely on soil maps to determine this? In areas where ground water may be a big concern we need to require borings, also where soil maps are very old it may be advisable.

(8) As in the past guideline we need to outline depth of soil sample and number of test per composite for each forty (40) acres.

H. Cation exchange capacity: This table is easy to follow, the categories are clear. If we were to try and determine cec directly at each site it would create more paper work and have little advantage.

* Data obtained from the EPA Standards

C. Facility management, to include:

(7) Public access to the site: Be more descriptive on what is required. Trees around field, fences around field, signs, etc.?

2. Application for Permit: I think you want to remove the word (and) before disposal facilities.

C. Distance to all nursing homes and hospitals:

Is there a health hazard to nursing homes and hospitals, if so, would you explain. Need interpretation for use in public relations with sludge.

E. Administration of Letter of Approval and Permit Programs.

C. Public Participation:

(2) It may be advisable to discuss extending the public notice from fourteen (I4) days to thirty (30) days outside the seven (7) county area. This will give them more time to include the sludge application on the counties or townships regular agenda, and be advertised publicly. Therefore, if they are opposed to the sludge application, work on the permit, such as scheduling, staking, field work sheets, etc., need not be prepared. Example: Farms such as W. & G. Rehbein in Isanti County and Chisago County, where MPCA can not over rule counties. Certainly, apoint of discussion.

D. Final Determination.

(2) If all comments cannot be resolved: Any person can submit written comments, many of which will not be resolved. Many verbale comments have been made the last few months and on that bases, counties have stopped land applications.of sludge. These comments for the most part are not substantiated by any scientific data or research, just emotionally stimulated accusations. I would like a better explanation of <u>resolve</u>.

F. REQUIREMENTS FOR SEWAGE SLUDGE DISPOSAL FACILITIES USED FOR LAND-SPREADING OF SEWAGE SLUDGE

I. Disease Control:

B. Sewage sludge shall be treated by a Process to Further Reduce Pathogens (PFRP) in the following cases:

(2) No trespassing signs every two hundred (200) feet where there is no fences, is this a controlled access?

2. Soil ph and Cadmium Application

A. The ph of the soil/sewage sludge mixture: This is very workable as worded and gives the flexibility necessary for quickliming when required.

C. Soil Cation Exchange Capacity table: this table is simplictic and direct, good work.

4. Sewage Sludge Application Rates

A. Sewage sludge application rates: The carry over nitrogen from previous years of sewage sludge can be determined. It is stated that if sewage sludge was not applied the previous year, carry over nitrogen is zero. Should there be any concern for nitrogen additions by the land owner? Looking for a Clearification on this.

Appendix B, table 2: define table 2 more clearly, high-low density.

6. Seperation Distances

C. The emphasis for a buffer zone is primarily public relations which is necessary,but it also must be economically feasible. A distance of fifty (50) feet from any property line eliminates a considerable amount of land that in turn will need chemical fertilizer and additional work for the farmer. If there is no other possibility, fine. It may work as follows:

If sludge is incorporated within forty-eight (48) hours, sludge may be spread such that no material crosses or contracts property lines. If sludge is surface applied, it shall be applied no closer than twenty-five (25) feet from property line, unless approval has been obtained from property owner. Sludge can be spread to edge of right-a-way unless factors identified during site investigation by MPCA indicate further set backs are required.

D. Change to read as follows: A distance of at least one hundred (I00) feet from any place of habitation, business or area used for recreational purpose shall be maintained when incorporated and two hundred (200) feet when surface applied. These distances can be reduced with approvals of occupants. The distance of five hundred (500) feet will eliminate many metro farms, by this I mean farms within the seven (7) county area. The strongest effect will occur at twenty to fortyfive (20-45) miles were the largest influx of population growth is occuring. Within that spectrum many homes are being built next to metro farms. The most important requirement for the sucessful use of sewage sludge in a farming operation are landowner arrangements and public exceptance. Land application of sewage sludge as we have experianced is a very controversial issue amongst the public at large, created by a lack of education and understanding. The coverage by the news media of late on hazardous waste as well as sewage sludge is connecting the two as one and making the public more concerned and confused than ever. If we leave the five hundred (500) feet in with the stipulation unless written permission is obtained from the appropriate party, we would eliminate many of the permitted field we have done in the past I am sure and deny many new landowners permits in the future, especially in the metro area. The Yotter permit would be a good example of the point I am trying to make. This permit is in the PCA file, but I don't recall the site number. Review these sites using the new proposed distances. Some of the homes do not show up on the maps and some do. I would certainly be more than aggreeable to discuss this with you.

F.

It would be advisable to add definitions for dry run, springs, foliage and pond to Section B. Entitled definitions. Listing the above terms with clear definitions will eliminate most conflict and controversy, I think. A three hundred (300) foot distance during the months of May to October where surface applied should not poss any insurmountable problem, for the applicator. They will need to organize the operation for immediate incorporation. During these months agricultural land is unavailable or severely limited in availability. Some safe alternatives to farm land could be landfills, composting, mines, gravel pits, etc. These uses could be easily incorporated within forty-eight (48) hours after delivery. This also confirms my request for a seven (7) month stock piling change, as the majority of the sludge will have to be stockpiled. A distance of six hundred (600) feet where sewage sludge is surface applied during the months of November to April does raise some concern. Is six hundred (600) feet absolutely necessary? How was that figure arrived at? If it can be reduced it would be of great assistance from the stand point of locating sites. I also understand it must also receive public acceptance. The contractor must recognize what alternatives will be necessary to implement a year round spreading program. He must schedule land permits for surface appling during November to April by eliminating lakes, streams, etc. If possible the distance could be reduced to two hundred (200) feet on slops of 0 - 3%, over 3% back to six (600) feet a point of discussion

G.

When sewage sludge is immediately incorporated, slopes should be considered. Site inspection by MPCA can be the deciding factor in determining the following table recommendation:

DISTANCE	SLOPE
25	0 to 2%
50	2 to 4%
75	4 to 6%
I00	Greater than 6%

I suggest this especially in regards to the metro farms and 20,30 acre fields. A combination of the one hundred (I00) feet distance and fifty (50) feet property line distance would eliminate many of these fields. Only a small portion of the field could recieve sludge, therefore, it would no longer be economically feasible to the farmer. Again site selection becomes a deciding factor in organization for the land application program. If at all possible we should not eliminate the metro farmer. We should not adapt new standards because of public controversy. Hopefully we can develop a public affairs education program to discuss the benefits and problems, keeping everyone informed, correct problems when they occur. Public education should lead to public acceptance. I feel the present program lacks the necessary public education and public relations aspect and if not corrected will lead to additional controversy. Such as banning of land application in counties and townships and one sided coverage by the news media involving sewage sludge. There must be continual attention given to public acceptance, eliminate the misunderstandings, recognize and answer objections and concerns as soon as possible.

As of I2/26/80, we have five (5) counties objecting to land application of sewage sludge. I see no one, at the present, dealing with the problem. Some agency or outside concern must be given the responsibility. If not implemented in the near future the program will suffer. With the plans to shut off the burners at the metro plant in June, this must be taken under immediate consideration.

7. Interim Sewage Sludge Storage

A. A separation distance of five (500)hundred feet whenever possible but at least three hundred (300) feet minimum for stockpiles.

B. A separation distance of three hundred (300) feet should be sufficient here. To accept the distance as written the majority of 30, 40, 50 acres sites would be eliminated from stockpiling.

A pond one hundred (I00) feet long, lake, stream, spring running along one end of a 40 acre field would not meet stockpiling distances. A 40 acre site surrounded by adjoining property owners would have a fifty (50) foot set-back. This is a reduction of I5% of the field. Obviously you maybe surrounded by only one or two property owners, but you must also consider your homes, ponds, streams, etc.

F. Increase to seven (7) months as previously explained in Section B.

8. Prohibited Sites and Other Limitations

G. Please explain (adequately drained).

H. When does this need to be carried out?

9. Requirement for Record-keeping and Annual Reporting

A.

3. Stockpile sites should be located on maps also. It looks very possible that many tons of sludge will be stockpiled for seven (7) months. We may want to monitor this area for additional research.

9. Define monitoring of ground water. What are the requirements for soils and vegetative tissue monitoring?

It may be helpful to include under Section F, prohibited sites and other limitations in the following:

During the winter months when the sewage sludge is most vulnerable to freezing while in transit special precaution should be taken in handling the sewage sludge once it has been frozen inside the trailer. The trailers must be enclosed in a heated building over night to thaw out. Because of the moisture in the sludge, if you were to try and haul the sludge to a site, any distance away, it would only freeze again. Consequently, the sewage sludge must be dumped. This would most likely be the contractors responsibility therefore, the trailer would be at his building. I would recommend that appropriate precaution be taken at some area where the sludge could be dumped and contained. This area could also be utilizied for washing the trailers when just small amounts of sludge are stuck or frozen in the trailers. A clay base which was bermed to a height of one (I) foot with a small pond for run-off could be constructed. Here all problems with frozen sludge, sludge that is simply stuck in the trailers, weekly cleaning of trailers and cleaning of spreaders, such as the 2505 Terragator and other sludge spreaders could be carried out. When done properly I think this method would be environmentally safe and hopefully acceptable to all the parties involved. It would promote public relations, where as consideration has been given to the city, county or township involved. It should also receive public acceptance. These types of activities will and are taking place, if not controlled in some way, the public will make this a controversial issue, pointing fingers at PCA and MWCC for no control of the program as in the past.

G. REQUIREMENTS FOR SEWAGE SLUDGE DISPOSAL FACILITIES USED FOR COMPOSTING AND/OR CONTINUOUS STORAGE OF SEWAGE SLUDGE

I. Disease Control

C. This section on composting seems very well defined and clear cut. There have been many, many years of research done on composting of sewage sludge. We have compiled data on rules, health aspects, engineering, quality control, economic characteristics and marketing. A number of cities across the United States are presently composting, for example : Beltsville Md., Bangor, Maine, Durham, New Hampshire, Orange County, Los Angeles County, Calif., to name just a few. A composting operation in the metro area will give us yet another additional outlet for sludge. We have a never ending source of sludge, marketing channels are available. The MWCC should organize information, compile bid documents and put out contracts for bids.

Summation:

Land application and composting of sewage sludge are the most promising methods for disposal. When managed effectively it is economical for municipalities and environomentally safe. Land application of sewage sludge also reduces the farmers commercial fertilizer use. The importance of public education cannot be over-emphasized. Other municipalities and/or their representatives spend a great deal of effort into gaining public acceptance. Minnesota must develope a program in this area. The temporary sewage sludge disposal standards that have been introduced will assure that the sludge disposal operation will be conducted safely. The MPCA must keep a close control on the week to week activities of the land application program, to insure the standards are being followed.

The standards are the back bone of a well organized sewage sludge program.

My comments have been based on research involving interviews and trips to other land application programs.

In addion I have been consulting for the past seven (7) months for the MWCC contractor, advising in the organization and implementation of the land application program.

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December 29, 1980

Rodney E. Massey, P.E.
Chief, Ground Water Section
Division of Walter Quality
Minnesota Pollution Control Agency
1935 West County Road B2
Roseville, Minnesota 55113

Re: Proposed Temporary Rule Governing Sewage Sludge Disposal
6 MCAR § 4.8050
Our File No. MW135-055
MWCC - Interim Sludge

Dear Sir:

I am writing you on behalf of our client, the Metropolitan Waste Control Commission, in response to your request for comments on the above-mentioned proposed rule published at 5 S.R. 935 (December 8, 1980).

Before beginning a detailed analysis of the technical rule itself, a discussion of the 1980 legislation, particularly the provisions affecting the Commission, is necessary. The 1980 legislation dealt with sludge in general and the Commission's sewage sludge function specifically.

Laws 1980, ch. 564, Article I, Section 3, enacting Minn. Stat. § 115A.03, established some of the definitions which have been adopted in the proposed rule, specifically the definition of "sewage sludge" and the definition of "sewage sludge disposal facility". Regarding the Commission, several new provisions were adopted in Laws 1980, ch. 564, Article X, Sections 3 and 4. Minn. Stat. § 473.516 was amended to clarify the Commission's specific sewage sludge functions. Minn. Stat. § 473.516, subd. 2 (1980) sets forth a general requirement that the Commission contract with private parties whenever feasible for the construction, maintenance, and operation of waste facilities. Section 473.516, subd. 3 (1980) is a limitation on the authority of local government to enact restrictions on certain Commission and private activity. It provides that local government cannot impose restrictions on a Com-

mission waste facility or on "the sale, gift, delivery, storage, use and disposal of sewage sludge of the Commission on private land as a soil conditioner or amendment", except to the extent that both the Metropolitan Council and the MPCA approve such restrictions. Section 473.516, subd. 4 (1980) goes on to require that a sewage sludge disposal facility of the commission and a "site used for the disposal of sewage sludge of the commission" must have a MPCA permit "issued pursuant to the agency rules for permitting sewage sludge disposal facilities and sites."

In addition to these general provisions, Section 473.153 was enacted to regulate the means by which the Commission acquired and operated sewage sludge disposal facilities. Section 473.153, subd. 1 provides that, except as allowed under subdivision 7, all sewage sludge disposal facilities of the Commission are to be established under a Metropolitan Council siting process. This process, delineated in subdivisions 2 through 6, will provide at least one sewage sludge disposal facility by Fall, 1982. However, until that time, there is a mortorium on Commission sewage sludge disposal facilities, except as provided in subdivision 7. That subdivision creates two exceptions. First, existing sewage sludge disposal facilities may continue to operate. Secondly, "to the same extent and upon the same conditions as sewage sludge may be applied on private property," the Commission may landspread sewage sludge for up to four years on any site it owns.

Given that background, the Commission hereby submits the following specific comments regarding the proposed rule:

1. B. Available nitrogen - Although the definition refers to both absorbtion by plants and leaching, the formulas for determining available nitrogen in Table 3 deal only with plant uptake. No means are available for calculating leachable nitrogen. Therefore, the phrase "or leached by percolating waters" should be deleted.

2. B. Background soil pH - This definition varies from the EPA definition at 40 CFR §257.3-5(c)(2) by the incorporation of a requirement that the added substance be <u>intended</u> to alter the pH. This change was apparently made to avoid the problem in ths EPA definition which refers to all agricultural nutrients which alter pH, although often not intended to do so. However, to avoid the ambiguous "intent" language which would also apply to some fertilizers other than sewage sludge, we propose the deletion of "the addition of substances intended to alter the hydrogen ion concentration" and substitute "landspreading or the addition of sub-

stances in preparation for landspreading." That will avoid the overbreath of the EPA definition and avoid the ambiguity of the MPCA proposal.

3. B. Cation exchange capacity - This definition, like other measurement parameters in the proposed rule, should include a measurement and/or analytical technique. In view of our recommendation that actual measurement by soil test should be permitted (see comments on D.1.b.(8)(h) below), the reference to "See Appendix A" should be deleted.

4. B. Heavy metals - This definition, by use of the phrases "Usually, but not always" and "but not limited to", is excessively vague and violates the specificity requirement of the definition of "rule" in Minn. Stat. § 15.0411, subd. 3 (1978). It illegally grants too much agency discretion in determining whether a substance is a heavy metal. Under the rulings of both the Office of Administrative Hearings and the Attorney General, such language must be deleted.

5. B. Incorporation - Unlike the proposed definition, the EPA definition at 40 CFR § 257.3-5(c)(5) does not contain a time limitation. It is anticipated by the Commission that in the case of large, relatively distant, landspreading sites it will require up to ten (10) days for delivery and several more for actual landspreading. If the sludge is not applied within 48 hours under the current definition, the sludge will be classified as being in interim storage with the attendant requirements. We propose an additional definition: "Temporary storage - The storage of dewatered sewage sludge for a period not in excess of thirty (30) days at a landspreading sewage sludge disposal facility or site not located at the place of sewage sludge generation." This will allow for time to deliver and spread sludge without classification as interim storage. The "interim storage" classification would not apply anyway in such a case because delay is due to simple logistics, not any of the factors referred to in the definition of "interim storage".

6. B. Interim Storage - The six month limitation should be changed to seven months because field conditions in the Fall may necessitate that crops be left in the field for up to seven months.

7. B. Lease - This is discussed along with "sewage sludge disposal facility" below.

8. B. PFRP - Composting-Since the only parameters related to pathogen reduction are time and temperature, there is no reason why

the time should be greater for windrow than for within-vessel or static aerated pile. Also a definition of static aerated pile composting should be incorporated.

9. B. PSRP - Aerobic/Anaerobic digestion. Residence time should be defined as solids residence time (SRT) or hydraulic retention time. SRT is preferred. Also, in lightly loaded plants it may be difficult to demonstrate a 38% reduction in volatile solids. There is no need for a specified % reduction if the only concern is the reduction of pathogens which is simply a factor of time and temperature. The purpose of these proposed rules is to reduce pathogens, not to regulate waste treatment plants.

10. B. PSRP - Air drying. There is no purpose in specifying a depth of nine inches. The purpose would be better served by requiring not more than "x" inches, i.e. a maximum depth. Also, air drying after digestion should be specified as a PFRP.

11. B. Sewage sludge disposal facility - The rule properly adopts the definition from the 1980 legislation. However, the term is used in the rules in a manner not intended by the Legislature. In the early drafts of the 1980 legislation, the sewage sludge provisions only dealt with landspreading on public lands. Therefore, the definition of "sewage sludge" referred only to "sewage sludge disposal facility" which is defined as only public land. However, later drafts of the legislation included provisions dealing with application of sewage sludge to private land in addition to landspreading on Commission land. See Minn. Stat. § 473.153, subd. 7 ("sewage sludge . . . applied on private property"); § 473.516, subd. 3 ("disposal of sewage sludge of the Commission on private land as a soil conditioner or amendment"); § 473.516, subd. 4 ("site used for the disposal of sewage sludge of the commission", "agency rules for permitting sewage sludge disposal facilities and sites"). In referring to the private facilities, the term "sewage sludge disposal facility" was not used. (Unfortunately, through oversite the limiting reference to "sewage sludge disposal facility" was not deleted from the definition of "sewage sludge"). However, the proposed rule has used the term "sewage sludge disposal facility" to refer to sites owned by persons other than political subdivisions. See §§ 4.8050 C.3.a.(1)(b), a.(2)(b), and b. The proposed rule attempts to finesse this issue by relying on the reference to "property owned or leased by a political subdivision" in the definition of "sewage sludge disposal facility" and by defining "lease" as "any oral or written agreement between a political subdivision and a landowner." While this is an understandable effort to solve a legislative oversight, such a definition of

"lease" is both contrary to the legislative intent and absurd on its face. By inserting the reference to a "lease" in the definition of "sewage sludge disposal facility" the Legislature was attempting to close a possible "escape hatch" in the prohibition in Minn. Stat. § 473.153 against new Commission sewage sludge disposal facilities sited outside of the Metropolitan Council process. By referring to "lease", the Legislature wished to foreclose the possibility of the Commission entering into a lease to avoid the Section 473.153 moritorium. Thus, the proposed definition of "lease" goes beyond the intent of the Legislature. Moreover, if the rule categorizes all agreements by the Commission with landowners to spread sludge as a "lease" within the meaning of the definition of "sewage sludge disposal facility", a creditable argument could be made that any applications of Commission sewage sludge on private land are prohibited except as part of the Metropolitan Council siting process since these would be new "sewage sludge disposal facilities" prohibited by the moritorium. This argument, if successful, would result in the entire shutdown of the private land program. Finally, the proposed definition of "lease" is totally contrary to the usual and customary use of the term. An agreement with a landowner which does not grant any property interest is not a lease. At the most, an agreement to allow landspreading would constitute a license, not a property interest. Therefore, the term "lease" should be given its usual and customary meaning. Furthermore, a new term referring to sewage sludge application on private land, such as "sewage sludge disposal site", should be added in B. and appropriate amendments should be made in the rest of the rule.

The definition of "sewage sludge disposal facility" also distinquishes between "dedicated" and "non-dedicated" facilities based upon whether the "primary function" is sludge disposal or crop production. The distinction apparently came from the MPCA's sewage sludge guidelines since the EPA criteria does not have such classifications. However, the distinction is unworkable and highly ambiguous. Since crop production is essential to landspreading and, therefore, there is no objective difference in the two classifications, the definitions must rely on some subjective intent of the operator. Not only is such a distinction difficult to make in practice, but the legal concept upon which it is based has been rejected. In County of Grudy v. Soil Enrichment Materials Corporation, 9 Ill. App. 3d 746, 292 N.E. 2d 755, 759-60 (1973), the Illinois court rejected any distinction between whether sewage sludge spreading was primarily for an agricultural purpose or whether it was for primarily a waste disposal purpose.

In addition, the distinction makes very little difference in the proposed rule. The MPCA Guidelines did recognize such a distinction in Section C.9.b. by allowing the application of heavy metals on dedicated sites in amounts in excess of that permitted on non-dedicated sites. Based upon that distinction, the Legislature apparently assumed that different limitations might generally apply to Commission-owned facilities as contrasted with privately owned facilities. See Minn. Stat. § 473.153, subd. 7 (the Commission may establish its own new sites, but only "to the same extent and upon the same conditions as sewage sludge may be applied on private property"). However, the proposed rule makes no distinction regarding application rates for heavy metals or any other parameter. The only distinctions are administrative. It appears that a State Disposal System Permit is required for all dedicated sites and non-dedicated sites owned by a political subdivision, while a Letter of Approval is all that is required for a privately owned non-dedicated site. See C.3. (However, that distinction is not made explicitly, nor is it consistently applied. See D.2.) The provisions relating to applications also rely on the two classifications. See D.2. Similarly, the provisions on administration, E., recognize the distinction. However, nothing in F. relating to the requirements for landspreading recognizes the distinction. Therefore, the Commission proposes that the distinction between "dedicated" and "non-dedicated" facilities be abolished on the grounds that it is contrary to the legislative intent, inherently ambiguous, practically unworkable, legally suspect, and not needed for the proposed rule.

12. B. Soil pH - This definition is incomplete in two respects. First, it should also state that "pH is the logarithm of the reciprocal of the hydrogen ion concentration expressed in moles per liter". This is more technically accurate and it is taken from 40 CFR § 257.3-5(c)(7) and the proposed MWCC rules, 6 MCAR § 6.011 0., 5 S.R. 355 (September 8, 1980). Also, the measurement method should be specified. We propose the following language taken from EPA criteria at 40 CFR § 257.3-5 (c)(9):

> The value is obtained by analyzing by the electrometric method. ("Methods of Soil Analysis, Agronomy Monograph No. 9," C.A. Black, ed., American Society of Agronomy, Madison, Wisconsin, pp. 914-926, 1965).

Two additional definitions should be added: "Surface soil - The soil to a depth of nine inches (e.g. plow depth)" and "Subsoil - The soil below the surface soil to a depth of six feet or the water-

table, whichever is less." These definitions, which are incorporated elsewhere in our recommendations, will allow a distinction to be drawn between soil which is plowed and soil which is subject to leaching.

13. B. Soil Texture - Soil texture analysis tends to be very subjective unless a sieve analysis is conducted. Therefore, a sieve analysis should be permitted at the option of the applicant for a determination of soil texture.

14. B. Course and medium texture - It is unclear why sandy loam was transferred from medium texture in the MPCA Guidelines to coarse texture in the proposed rule.

15. C.1. This provision refers to "storage" which is not defined in the proposed rule. The definitions do refer to both "continuous" and "interim" storage and both exclude storage "located at the place of sewage sludge generation". We propose that C.1. be clarified by adding the phrase "not located at the place of sewage sludge generation" after "storage". Such an amendment would also be consistent with the 1980 legislation. Minn. Stat. § 473.153, subd. 7 (1980) allows the Commission to continue to operate "existing sewage sludge disposal facilities." The intent here was, in part, to allow the Commission to continue to use the Metropolitan plant for short term storage of sludge. The definition of "sewage sludge disposal facility" was drafted so as to allow this activity by, somewhat inartfully, including in the definition "interim" disposal. By excluding all storage at the place of sewage sludge generation from the rule, the agency would clarify an ambiguity and maintain consisting with the legislation.

16. C.2. This provision indicates that all political subdivisions must meet the requirements in Paragraphs F. and G., but C. 3.a. (1) and b. indicate that only political subdivision with Class A Sewage Treatment Systems must obtain Permits or Letters of Approval. It makes little sense to require Class B, C and D plants to meet the requirements of F. and G., but not require Permits or Letters of Approval. Also, the persons identified by C.2 (to whom C.1. indicates that the proposed rule applies) should include all operators, as discussed below.

17. C.3.b. First, the limitation to Class A Sewage Treatment Systems is contrary to the 1980 legislation, at least with regard to the Commission. Minn. Stat. § 473.516, subd. 4, clearly requires all privately owned sites used to dispose of Commission sewage sludge to have an MPCA permit "issued pursuant to agency rules

for permitting sewage sludge disposal facilities and sites", regardless of the size of the treatment plant generating the sewage sludge.

Secondly, C.3.b. should require operators of private sites to join with the political subdivision in obtaining and being obligated under the Letter of Approval. This would be consistent with the co-permittee status of operators under C.3.a.(1)(b) and (2)(b) and the abolition of the distinction between dedicated and non-dedicated sites. In addition, such a revision would greatly assist in the enforcement of the rules' standards by binding the operators of the vast majority of sewage sludge operations. Of course, farmers owning private land used for landspreading should not be covered by this rule or be parties to Letters of Approval. They have little or no control over landspreading on their property and making them bound by the rule would greatly discourage their participation.

18. D.1. The reference to "plus any other information necessary . . . air" is excessively vague and violates the specificity requirement of Minn. Stat. § 15.0411, subd. 3. It grants unbridled discretion to the director to ask whatever additional information he desires, without any specified standards. Therefore, the application should be limited to the information specified in the rule itself.

19. D.1.a.(2) The rule does not indicate the number of analyses or the analytical methods required. In addition, the rule does not specify whether it is a single value, an average, range, or frequency distribution which is required. Furthermore, the rule does not specify the time period in which the sampling and analysis of sewage sludge is to be conducted.

20. D.1.a.(2)(g). The reference to "other parameters that may be necessary" grants excessive discretion to the agency in deciding whether to require other parameters. In order to resolve such a defect, it should be re-written to state that "the following parameters shall be included". The use of the term "may" in this context is prohibited by the Office of Administrative Hearings and the Attorney General. Also, exactly what soluable salts, microorganism populations, and toxic organic compounds, other than PCB's, are being referred to? Finally, the agency should seriously consider deleting references to toxic organic substances. Such analysis is very expensive to perform. Moreoever, EPA has decided not to address these organics in its present interim final regulations because current information is inadequate to support specific standards. 44 F.R. 53449, 53454 (September 13, 1979).

20. D.1.a.(3). The Commission's industrial waste staff has concluded that the description of industrial contributors will not be available for two or three years pursuant to its pretreatment program. Therefore, this requirement is totally unfeasible as applied to the Commission.

21. D.1.b.(4). It should be clarified as to whether a map or an aerial photo is required if none of the specified features are within 1/4 mile.

22. D.1.b.(6). The rule should specify how the ground water depth is to be determined. The rule should specify whether soil maps may be used or whether actual sampling is necessary.

23. D.1.b.(8). The rule should specify the depth of the sample (nine inches) and the number of grabs per composite to be taken (six to twelve grabs per composite). The applicant should also have the option of reporting and utilizing in his calculations parameters of subsoil samples in lieu of surface soil characteristics. This is because the finest soil in either the surface soil or the subsoil controls leachate. Finally, D.1.b.(8)(a) should refer to "USDA textural classifications" so as to be consistent with the rule's definitions.

24. D.1.b.(8)(h). The rule should also permit the actual determination of cation exchange capacity directly by soil tests.

25. D.1.c.(3). The rule should refer to the landspreading agreements rather than a "lease".

26. D.1.c.(6). It is unclear what is meant by "estimated cummulative sewage sludge loading rate". At the very least a sample calculation should be included. It could mean the maximum amount of sewage sludge which could be applied to the site in the future assuming no change in sewage sludge characteristics. It could also be a calculation, based upon prior applications, of the amount of cadmium which will have been applied after the proposed application.

27. D.2. The "and" in the first line should be deleted. In addition, the provision relating to "any other information" is illegal for the same reasons specified regarding D.1.

28. D.2.c. The map regarding nursing homes and hospitals should be deleted since the 1/2 mile criteria is unrelated to the separation distances in F.6.

29. E.2.a. Nowhere are deficiencies other than incompleteness specified in the rule. The provision violates the specificity requirement of Minn. Stat.§ 15.0411, subd. 3 and illegally delegates excessive discretion to the director to suspend the processing of applications upon a finding of a "deficiency". Therefore, all references to "deficiency "should be deleted.

30. E.2.c.(2). The comment period of 14 days should be expanded to 30 days in townships since additional time may be necessary to enable local government to comment without calling a special meeting.

31. E.2.d. This provision refers to the director resolving public comments prior to final determination regarding an application. Nowhere is the term "resolved" defined. Does it refer to the comment submittor withdrawing all objections to the application or does it allow the director to determine whether all "meritorious" objections are resolved? If the latter, excessive and illegal discretion is vested in the director.

Moreover, this unique device, under which apparently any objector can require any application to be presented to the agency board, is contrary to both the spirit and the letter of the 1980 legislation regarding the Commission. Minn. Stat. § 473.516, subd. 3 (1980) provides that counties and local units of government may impose restrictions on sewage sludge disposal "only to the extent authorized and approved" by the Metropolitan Council and the MPCA "in accordance with . . . agency permits and rules." That statute sets forth the sole means for local prohibitions of land disposal of the Commission's sewage sludge. The agency's statutory authority to adopt these temporary rules does not expand upon these local limitations. By giving any person, subject to MPCA board override, a veto over any sewage sludge site, the rule directly contravenes the 1980 legislation which strictly limits local controls. E.2.d. is contrary to the letter of the 1980 amendments which sought to exclude local restrictions except to the extent to which they are enacted into ordinances and are approved, as ordinances, by the Metropolitan Council and the MPCA. The rule also violates the spirit of the 1980 amendments which sought to remove excessive local restrictions from the siting process by explicitly granting permitting authority to the MPCA which, unlike local government or private individuals, has the expertise to properly evaluate these issues. While public participation is certainly valuable and should be encouraged, the public should not be given veto power over the agency staff which is the effect of the rule as drafted. By forcing every application to go to the MPCA Board, op-

ponents of sewage sludge disposal can greatly delay and effectively cripple the Commission's sludge disposal program. Therefore, any references to the need for public comments to be "resolved" prior to issuance of a Letter of Approval by the director should be deleted.

32. E.2.h. Although C.2.b. and C.3.a.(1)(b) and (2)(b) make private owners and operators of dedicated facilities bound by the rule and co-permittees, E.2.h. provides no means of enforcing the rule against them since only the political subdivision is a party to the NPDES or SDS permit. In addition, it is elsewhere recommended in this letter that all operators of facilities be parties to the Letter of Approval or SDS permit. Therefore, this provision should be modified to provide that "Private persons who are parties to an SDS permit or Letter of Approval shall be subject to all the applicable remedies which are available to the agency under the relevant NPDES or SDS permit." This revision will assure that the agency can enforce criminal and civil remedies against violating operators and owners (dedicated sites only) where their acts, rather than the acts of the political subdivision, result in the violation of the permit or Letter of Approval.

33. F.1.b.(2). The requirement of controlled public access is ambiguous. Therefore, based upon the EPA's own explanation of the concept at 44 F.R. 53456 (September 13, 1979), the Commission proposes the following additional language:

> Public access shall not be deemed to be uncontrolled by reason of the absence of fencing unless sewage sludge is applied to areas frequented by and available to the general public (e.g. park lands, golf courses). Farm land not available for use by the general public shall not require fencing in order for public access to be deemed controlled.

34. F.2.a. The present wording is awkward and ambiguous. Also, it should take account of the fact that the soil horizon with the highest pH controls leachate. It should be reworded as follows:

> If both the surface soil pH and the subsoil pH are less than 6.5, a sufficient quantity of lime shall be applied to the soil at or before the time of sewage sludge landspreading in order to raise the surface soil pH to 6.5.

35. F.4.a. The Commission cannot effectively control or monitor the other nitrogen additions by an owner on privately owned sites. This is particularly true regarding nitrogen added after sewage sludge application. Therefore, the phrase "combined with other nitrogen sources" should be deleted. Also, the MPCA should consider adopting a limitation for publically-owned facilities based solely on maintaining groundwater quality, as is the case under the EPA criteria, 40 CFR § 257.3-5(a).

36. F.5. The comments made regarding organics in D.1.a.(2)(g)(iv) are applicable here. In addition, "animal feed" should be substituted for "food-chain crops" in F.5.a. as is the case under 40 CFR § 257.3-5(b).

37. F.6.c. These distances are excessive and beyond the MPCA Guidelines. The 50 foot distance will necessitate the owner fertilizing in the large buffer zone, often decreasing the attractiveness of landspreading to the owner. The provision should be revised to read that:

> If sewage sludge is incorporated, sewage sludge may be applied up to the edge of the property line. If sewage sludge is surface applied, a distance of at least 25 feet from any property line shall be maintained, unless permission is obtained from the adjoining property owner. Sewage sludge may be spread to the edge of any road right of way unless the director determines that a setback is necessary to avoid potential impacts to the road right-of-way.

38. F.6.d. The 500 foot requirement in the proposed rule far exceeds the 100 foot requirement for injection or immediate incorporation and the 200 foot requirement for surface spreading in the MPCA Guidelines. The Commission proposes that those more realistic separation distances be adopted. Also, the reference to "the appropriate party" is vague and "the owner" should be substituted.

39. F.6.f. The terms "dry run," "pond," "spring," and "flowage" should be defined.

40. F.6.g. First, these same terms should be defined. Secondly, "injected or immediately" should be deleted since the definition of "incorporation" includes injection and specifies the maximum time (48 hours) allowed for mixing after application.

Thirdly, separation distances should realistically be a function of slope, as follows:

Slope	Separation (feet)
0 to 2%	25
2 to 4%	50
4 to 6%	75
Greater than 6%	100

41. F.7.a. Three hundred, rather than 1000, feet is sufficient for stockpiling. Again, "the appropriate party" should be changed to "the owner".

42. F.7.b. The distances should be change to 300 feet for stockpiles and 100 feet where downgradient. The revised distances are sufficient.

43. F.7.d. Since the least permeable soil controls leachate, this should provide that stockpiling is not permitted "where the permeability of all surface soil and subsoil horizons exceed six inches per hour". The rule should also specify to what depths the impervious or absorbent material is required.

44. F.7.f. This should be changed to seven months in accordance with the recommended change in the definition of "interim storage."

45. F.8.a. Sewage sludge may be very useful in reclaiming mines, gravel pits, quarries, etc. Therefore, such use should be permitted with the approval of the director. The provision should be revised as follows:

> Sewage sludge shall not be disposed of on any land without the owner's permission nor shall it be disposed of on or into any cave, sinkhole, mine, gravel pit, quarry, or wetland, except as part of a reclamation project and with the written authorization of the director.

46. F.8.b. As indicated in our other comments, it is the soil with the lowest permeability that controls the rate of leaching. Therefore, the provision should be revised to read as follows:

> Sewage sludge shall not be applied where there are only coarse sands or gravel soil (as determined by USDA textural classifications) in the surface soil and subsoil.

47. F.8.c. The phrase "adequately drained" is highly ambiguous and should be defined or parameters such as relationship to the watertable should be included.

48. F.8.d. The phrase "individual surface applications" is ambiguous. The rule should specify how often such individual applications of the maximum gallonage may be made. If those limits refer to total permitted per growing season, they should be revised to address total nitrogen and cadmium loadings.

49. F.8.h. Since the purpose of boundary markers is to avoid spreading in buffer areas and not to permanently identify the sludge application area, the provision should require that the boundary be identified "during application". Given farming practices, permanent markers are not feasible and they do not serve any access control purpose.

50. F.9.a.(1). This raises the same ambiguities referred to in D.1.a. regarding how often sewage sludge analysis must be made and it should be clarified.

51. F.9.a.(9). There is no reference to "other required monitoring i.e. ground water, soils, vegetative tissue, etc." in any other part of the rule. Unless this monitoring is elsewhere specified and made mandatory for all parties, illegal discretion is given the agency and this provision must be deleted.

52. F.9.b. Since much of this information will already have been filed with the agency as part of the application, the phrase "unless already filed with the agency" should be added in order to avoid duplicative copying.

53. G.1.c. The meaning of the requirement that public access be controlled should be specified in the same manner as recommended for F.1.b.(2).

54. G.2.c. The phrase "necessary precautions and safequards" is too indefinite. The provision leaves unclear whether there are any specific limitations on the final disposal of compost. For example, does F., which G.2.d. indicates is applicable to the disposal of sewage sludge from a continuous facility, also apply to compost? Is composting only regarded as a PSRP or PFRP with the sludge to be disposed accordingly? If so, what additional "precautions and safequards" are required?

55. G.3.a.(6). The reference to "other required monitoring" is defective for the same reasons referred to regarding F.9.a.(9).

56. I. The phrase indicating that the agency "in its discretion may permit a variance therefrom upon such conditions as it may prescribe" violates the previously mentioned specificity requirement of the Office of Administrative Hearings and the Attorney General by granting the agency discretion to grant or deny a variance where the specified criteria have been met. Reference should also be made to Laws 1980, ch. 615, sec. 3, effective August 1, 1981, amending Minn. Stat. §15.0412, subd. 1a, providing that an agency must have rules setting forth the standards "by which variances shall be granted or denied" (emphasis supplied). The proposed rule should be revised to provide that "the agency shall grant a variance therefrom upon such conditions as it shall prescribe".

57. Appendix B. In keeping with the recommended revision to F.4.a., the reference to "available nitrogen added by manures or fertilizers" and "nitrogen added from other sources (e.g. fertilizer, animal manure)" in Step 3 should be deleted. Tracking of the amount of other nitrogen added on private sites by farmers is neither feasible nor necessary.

58. Table 1. Reference should be made to "allowable available nitrogen" in order to be consistent with the rule's definition and Table 3.

59. Table 2. There should be a heading and, again, reference should be made to "allowable available nitrogen". Also, the difference between high and low density vegetative cover should be explained.

The Metropolitan Waste Control Commission welcomes the opportunity to submit comments on the proposed rule. Staff members and I are available to answer any questions which you may have regarding our comments.

I would greatly appreciate being notified when this temporary rule is submitted to the Attorney General and who at the Attorney General's office will be reviewing the rule. In view of the short time allotted for Attorney General review, I would request that this notification be by a telephone call, either to myself or Robert Polta of the Commission (222-8423). If available, I would also like to examine the rule as submitted to the attorney General at that time.

Sincerely,

Larry M. Wertheim

cc: Robert Polta
James Sipe
George Lusher
Walter Johnson
Wilber Blain
Jack Frost

STATE OF MINNESOTA

COUNTY OF RAMSEY

MINNESOTA POLLUTION

CONTROL AGENCY

In the matter of the Proposed
Adoption of Temporary Rules of
the Minnesota Pollution Control
Agency Governing Sewage Sludge
Disposal, 6 MCAR 4.8050

FINDINGS OF FACT
AND CONCLUSIONS

The above-entitled matter came on for decision before the Minnesota Pollution Control Agency (Agency) on the 24th day of March, 1981. After affording all interested persons an opportunity to submit written data and views on the proposed temporary rule within 20 days of the publication date, having considered the written comments submitted to the Agency within the comment period, and having considered all of the evidence adduced upon the records, files and proceedings herein, the Agency makes the following:

FINDINGS OF FACT

1. On November 25, 1980, the Order for Publication authorizing the publication of the proposed temporary rule was executed.

2. On December 8, 1980, a Request for Public Comment and the proposed temporary rule were published at 5 State Register 935, et seq.

3. The comment period, as set out in the Request for Public Comment, expired December 29, 1980.

4. Within the comment period, the Agency received nine written comments in response to the Request for Public Comments: Eldo Jordan and Elaine Postudensek, Public Utilities Commission, City of Babbitt (dated December 17, 1980); Russell S. Adams, Jr., University of Minnesota (dated December 18, 1980); William V. Lacina, City of Mankato (dated December 18, 1980); James A. Johnson, Western Lake Superior Sanitary District (dated December 22, 1980); Dennis R. Martenson, TKDA (dated December 24, 1980); Michael E. Granger, W. & G. Rehbein Bros., Inc. (dated December 26, 1980); William J. Dilks, County of Carver (dated December 26, 1980); Larry M. Brokke (dated December 29, 1980); and Larry M. Wertheim, Holmes & Graven (dated December 29, 1980).

In addition two written comments were received after the comment period expired: Robert F. Roskopf and Dwayne E. Nelson, RCM (dated January 5, 1981); and Allen Frechette, County of Scott (dated January 5, 1981).

5. The Agency finds that certain modifications of the proposed rule are supported by the data and views submitted to the Agency within the comment period. In specific, the Agency makes the following findings with respect to each of the comments received within the comment period:

a. Comments regarding Section A - Intent.

(1) The comment was made that the intent should be more fully and clearly described. The proposed statement of intent appeared to stress only maximizing the beneficial use or recycling of sewage sludge. The Agency is also concerned with ensuring the public health, safety and welfare. Thus, the statement of intent has been expanded to express these considerations.

(2) The comment was made that "facility" should be changed to "site". See response under B. "Sewage sludge disposal facility" for justification.

b. Comments regarding Section B - Definitions

(1) Adequate drainage: A request was made to define "adequate drainage" as used in former D.8.c. Before sludge can be applied to land having a high water table, the water table must be lowered to provide a suitable volume of non-saturated soil to treat the applied sludge. The removal of water by subsurface drainage is very slow (unsuitable) if the drainage system is improperly designed. Therefore, the Agency must be assured of the adequacy (proper design) of the subsurface drainage system to determine if the water table has been lowered throughout the proposed landspreading site. For this reason a definition which establishes minimum requirements for adequate drainage has been added to the rule.

(2) Available nitrogen: A comment was made that there is no method for calculating leachable nitrogen using Table 3, therefore, reference to it should be deleted. The term has been redefined to emphasize that the Agency is considering plant useable nitrogen and that this value can be determined using Table 3.

(3) Background soil pH: The comment was made that the proposed definition of background soil pH varies from the one EPA used in their sludge disposal regulation. The wording has been changed to be consistent with that of the EPA landspreading criteria (40 CFR Part 257).

(4) Cation Exchange Capacity: The comment was made that the definition of cation exchange capacity should include a measurement technique. The definition was revised to allow the measurement of cation exchange capacity either by using Appendix A, which provides an estimate of cation exchange capacity, or by specific soil measurement which provides an actual value for cation exchange capacity.

(5) Class A Sewage Treatment System : Due to the changes in Section C this term is no longer needed. See comments on Section C for Agency justification of the change.

(6) Continuous storage: The comments with resultant changes made in the definition of interim storage (increase duration to 7 months from 6 months) makes it necessary to change the definition of continuous storage to be consistent. Since interim storage is allowed no longer than 7 months, continuous storage must now be any storage for a period greater than 7 months.

(7) Continuous Storage: The comment was made that "facility" should be changed to "site". See response under the definition of "Sewage sludge disposal facility" for justification.

(8) Dry run: The comment was made that a definition of dry run was necessary. A separation distance from areas that may transport contaminants to surface waters via runoff or surface drainage water must be maintained when sludge is spread. A dry run is such an area. Water transported in a dry run may eventually reach and impact ponds, lakes, or streams. For these reasons, the meaning of dry run must be clear and therefore has been added to the definitions.

(9) Fallow: The comment was made that a definition of fallow was necessary. There are several types of fallow. Fallow may be idle land, grazing land, or just bare soil. Sludge should not be spread on soil that is to be kept bare throughout the summer months. The reason for this is that nutrients such as nitrogen, if not taken up by a plant, may leach to and impact ground water drinking supplies. Therefore, the definition of fallow has been added to this rule and shall mean bare soil.

(10) Heavy metals: The comment was made that the definition of heavy metals is vague, violates the specificity requirement of Minn. Statute 15.0411, subd. 3 (1978), and illegally grants too much Agency discretion in determining whether a substance is a heavy metal. Wherever the term heavy metal is used throughout the rule it specifies exactly which heavy metals are being considered. For this reason, the definition of heavy metal is unnecessary and has been deleted.

(11) Incorporation: A comment was made that minimum depth should be included in the definition of incorporation. Incorporation may be required in two instances: 1) to prevent odors or 2) to prevent the transport of sludge with runoff water when sludge is applied to steep slopes. If sludge is not "diluted" by mixing with at least 6 inches of soil, odors or movement with runoff is possible. For this reason, a minimum depth has been specified in the definition.

(12) Interim storage: The comment was made that the period for interim storage should be increased to 7 months to allow for a full crop growing season. This is justifiable, it does take up to 7 months for growth and harvesting of many crops. Therefore, the definition has been changed so that stockpiles are allowed for 7 months. Due to the addition of a temporary storage category (0 to 1 month) interim storage will start 1 month after sludge is delivered to a landspreading site. See the definition of "Temporary storage" for further justification.

(13) Interim storage: The comment was made that "facility" should be changed to "site". See response under the definition of "Sewage sludge disposal facility" for justification.

(14) Lease: The comment was made that the definition of lease is both contrary to the legislative intent of the Waste Management Act and "absurd on its face". The proposed definition of lease was intended to eliminate an apparent oversight in the Waste Management Act (WMA). The WMA gives the Agency the authority to promulgate rules on sewage sludge disposal. The definition of sewage sludge in the WMA is sludge generated

"to be disposed of at a sewage sludge disposal facility." The definition of sewage sludge disposal facility in the WMA is land "owned or leased by a political subdivision." The WMA does not define lease. From a literal reading of these definitions only, the WMA gives the Agency the authority to regulate sludge disposal at facilities owned or leased by political subdivisions. This would mean that the Agency would not have authority over the majority of sludge disposal situations -- landspreading on private farmland. In Minn. Statutes 1980, Section 116.07, Subd. 4, the Agency is mandated to adopt rules for the disposal of sewage sludge, including such factors as the "operation of disposal facilities and disposal sites". Clearly, the use of the term "facility" in the definition of "sewage sludge" was inadvertant and not meant to constrain the Agency from protecting public health and the environment as a result of the disposal of sewage sludge on private farmland. To ensure the legislative intent is met, the Agency used the definition of lease to mean any "agreement" between a political subdivision and a landowner to allow landspreading. The Agency agrees that the proposed definition of "lease" is not consistent with the common usage of the term. This definition has therefore been eliminated. However, the Agency maintains its authority over the disposal of sewage sludge at any site, whether it be a "facility" or a privately owned site. The Agency has, therefore, modified the definition of sewage sludge to delete reference to disposal facilities. In addition, the Agency has added the term "site" to refer to both publicly and privately owned disposal sites.

(15) PFRP Composting: The comment was made that because pathogen reduction by composting is related to time and temperature, the definitions of composting methods should more accurately convey this. After considering the comments on composting it was apparent that there are some misconceptions of the different composting methods. For instance, one comment stated that the outside layer of a static aerated pile is at a temperature just above ambient conditions. This is not necessarily the case, since static piles have a thick blanket of insulation covering the entire pile. This insulation maintains the entire pile at approximately the same temperature. Another comment was made stating that there is no reason why windrows must be composted for a greater time period than static piles. Windrows are not insulated, therefore, the outside compost mixture does not reach elevated temperatures. For this reason the windrows have to be periodically turned to mix the pile and thereby ensure that every bit of compost reaches an elevated temperature (55°C). Because of these misunderstandings, the definition of each PFRP method of composting was expanded.

(16) PFRP - Thermophilic aerobic digestion; PSRP - aerobic digestion; PSRP - anaerobic digestion: The comment was made that it would be difficult to reduce volatile solids by 38% during digestion alone. This is especially true if the sludge entering a digester has already been partially digested by an extended aeration process. Such a process would significantly reduce volatile solids before the sludge was loaded to the digester and an additional 38% of volatile solids reduction would be very difficult. The comment is quite accurate. The volatile solids reduction requirement in the proposed temporary rule was taken from Federal regulations for sludge which is to be landspread (40 CFR Part 257). After consulting with EPA staff on

the interpretation of this regulation, it was explained that the 38% reduction was from the time the sewage entered the treatment facility to the time that sludge was removed from the digesters. The original definition could be interpreted as requiring a 38% reduction from the time solids entered the digester until solids were removed from the digester. For this reason, the period when volatile solids are to be reduced is specified in the three definitions of digestion.

(17) PSRP air drying: The comment was made that there is no purpose in specifying a depth of nine inches. The purpose of the definition would be better served by specifying a maximum allowable depth. The Agency intent was to allow sludge to air dry at a depth of no more than 9 inches. Above this depth sludge does not dry adequately, but thinner layers are acceptable. For this reason, the definition was changed to allow air drying at a depth not exceeding 9 inches.

(18) Public access control: The comment was made that public access control should be more specifically defined. Public access control to a disposal site is addressed in this rule at F.1.b.(2) and G.1.c. Federal regulations (40 CFR Part 257) require public access control in certain situations. For this reason, a definition has been provided that is consistent with EPA's interpretation of public access control and to provide adequate flexibility for various situations in the State.

(19) Residential development: There is an addition to F.6.d. which requires a 600 foot separation from residential developments. The reason for this change is discussed in Section F. Because of this change, residential

development must be defined. The definition is the same one used in 1978 Agency guidelines for sludge disposal and should be familiar to those people associated with sludge disposal.

(20) Sewage sludge: As argued under the discussion of "lease", there appears to have been an oversight in defining sewage sludge by restricting sewage sludge to that which is disposed of at a publicly owned or leased facility. To avoid possible confusion to persons relying solely on the rule, rather than the entire context of the WMA, the Agency has revised the definition of "sewage sludge" to delete reference to "facility".

(21) Sewage sludge disposal facility: The comment was made that the term "sewage sludge disposal facility" is used in the rule in a manner contrary to the legislative intent of the WMA. The legislation does not apply to both publicly and privately owned sludge disposal sites. A separate term for privately owned sites should be used. The Agency agrees that the legislature did not intend that the term "facility" refer to privately owned sites. In the proposed temporary rule, the Agency attempted to overcome the inconsistency of the WMA by incorporating an unusual definition of lease into the rule. However, as a result of comments received on this matter, the Agency feels that an additional term, "site", would be more appropriate to refer to both publicly owned facilities and privately owned operations. The term "sewage sludge disposal facility" is no longer used in the rule. The term "facility" has been deleted or changed to "site" or "operation" at the following locations: Section A, Section B. Continuous storage,

Interim storage, Section C, Section D, D.1, D.1.C., D.1.c.(2), D.2.d., D.2.e., D.2.f., E.1, E.2, E.2.c. (1)(c), E.2.e.(1), F.1.b.(2), F.3, F.4.b, F.6, F.8, Section G, G.1.b, G.1.c., G.2.a., G.2.b., G.2.d., G.2.e., G.3.a.(2), G.3.a.(3), G.3.a.(4), and G.3.a.(7).

(22) Sewage sludge disposal facility: dedicated and non-dedicated: The comment was made that the terms "non-dedicated" and "dedicated" are unnecessary, ambiguous and unworkable. Because the terms only serve to distinguish between sites which must apply for a Permit and those which must apply for a Letter of Approval, they should be deleted. The Agency agrees that these distinctions are unnecessary due to changes which have been made in Section C to more specifically describe the applicability requirements. Therefore, the terms "dedicated" and "non-dedicated" have been deleted from the rule. These changes and deletions do not change the intent of the rule.

(23) Site: The comment was made that an additional definition should be added to describe sewage sludge application to private land. As discussed under "Sewage sludge disposal facility", the Agency feels that the legislature did not intend that this rule govern only sewage sludge disposal at "sewage sludge disposal facilities" which is defined as property owned or leased by a political subdivision. The Agency feels the legislature wanted this rule to govern sludge disposal on private property also. Therefore, the term "site" is now used throughout the revised proposed temporary rule to mean any property, either publicly or privately owned where sewage sludge is landspread, composted, or continuously stored. This definition

of "site" includes both "sewage sludge disposal facilities" as defined in the Waste Management Act (WMA), and private property which does not fit the WMA's definition of "sewage sludge disposal facility".

(24) Soil pH: The comment was made that the definition of the pH should be consistent with the Federal regulation definition (40 CFR Part 257), and should state the method of measurement. The original definition of pH was a simplified definition. Many of the people using the rule will be technically educated and experienced and will require a technical definition. These people will also need to know what measurement of soil pH is acceptable to the Agency. For these reasons the definition was expanded to be consistent with the EPA definition of soil pH.

(25) Soil texture: A comment was made questioning the classification of sandy loam soil as a coarse textured soil. Sandy loam was put into the coarse texture category because the separation distances to ground water for medium and fine texture soils (3 feet, see F.6.a) would not afford the necessary protection of ground water from contaminants that may leach through a rapidly permeable sandy loam soil. However, sandy loams should be classified as a medium textured soil when computing crop nitrogen requirements (Appendix B), Cation Exchange Capacities (Appendix C), and separation distances to surface waters (new F.6.f). Therefore, sandy loams were placed in the medium texture category, but were placed with coarse-textured soils in relation to groundwater separation distances (F.6.a).

(26) Spring: A comment was made that the term "spring" required definition. So that the intent of the regulations that require a separation distance to springs will be fully understood and will not be misinterpreted, a definition of "spring" has been included in the revised temporary rule.

(27) Temporary storage: A comment was made that temporary storage category should be included. This would allow for time to deliver and spread sewage sludge without the site being classified as an "interim storage"area. There is a need to distinguish between interim storage (1 to 7 month) and short-term storage (less than 1 month) at landspreading sites. Separation distances required for long-term (interim) storage are too restrictive and would prevent temporary stockpiling and subsequent use on the many small farms that are common to the periphery of metropolitan areas. Short-term storage is necessary to provide adequate time for equipment and sludge to be transported to a site. Because of this logistics problem, a temporary storage category has been added with its own limitations. (See new F.7.)

(28) Vegetation: The comment was made that the applicability of Table 2 is unclear and that the differences between high and low density vegetative cover should be more clearly explained. Table 2 presents maximum nitrogen application rates for land that is not used to grow a harvested crop. Because of apparent difficulties with the interpretation and use of Table 2 a definition of vegetation (high and low density) has been included.

c. Comments regarding Section C - Applicability.

(1) Comments were received that indicated that the requirements for dedicated and non-dedicated sites are not clear and that such distinctions are unnecessary, unworkable and ambiguous. Because the differences between the two classes of facilities are only administrative, a different, simpler standard of applicability should be devised for the temporary rule. The Agency agrees that the difference between "dedicated disposal facilities" and "non-dedicated disposal facilities" is not clear in the permit requirements. Section C was rewritten because of confusion over the intent of the Agency. It was not possible to incorporate the suggested changes on the use of "dedicated" and "non-dedicated" and "facility" and "site" and also to clarify the requirements for Permits and Letters of Approval without major revisions. It was the intent of the Agency to require a Permit for sludge disposal sites which might pose a greater potential for adverse environmental effects as a result of the size of the site or the frequency of sludge application, and to require only a Letter of Approval for the smaller scale, more common use of sludge on farmland as a soil amendment. Thus, the administrative burden on small sites would be decreased. Permit applications are required to provide additional information on subsurface conditions and impact on surrounding areas from runoff, pathogens and odors.

Section C, as it is rewritten, divides sites which require a Permit from sites which require a Letter of Approval on the basis of site acreage, length of use, and expected metal applications. Forty

acres was selected as a traditional agricultural land unit that would separate small farms from larger operations which would receive greater amounts of sludge. Five consecutive years of use was chosen as a dividing point between permitted sites and "Letter of Approval" sites because five years is the average duration of the permit period. The maximum amount of metals that can be applied to land is the same for both types of sites. However, it is more likely that the maximum level will be reached at a Permitted site than at a Letter of Approval site. The Agency feels that as this level is approached, the site should be reviewed under the requirements for a Permit.

(2) C.2: Comments were made regarding an apparent contradiction, that the proposed temporary rule did not require applications from facilities other than Class A sewage treatment plants yet required all facilities to comply with Paragraphs F and G of the rule. In addition, it appears that the efficient administration of Section C will be difficult in the 90 days that the temporary rule will be in effect. These comments have stimulated much concern and have raised several logistical questions. First of all, the proposed temporary rule required that applications be submitted within 60 days of the effective date of the rule. Secondly, the temporary rule would only be in effect for 90 to 180 days. This would mean that at least 30 applications would have to be reviewed and approved or denied within this time period assuming one application submitted per Class A sewage treatment system. More realistically, the expected number of applications would be between 60 and 100. The staff available to review these applications (2 people) will have to devote much of their time to preparing testi-

mony, developing public participation programs, soliciting outside opinions, attending public hearings, etc. in preparation of promulgating the permanent rule. Also, it is possible that some of the criteria and limitations are likely to change after a few months when the permanent rule is published. This would involve the reevaluation of all the permits issued under the temporary rule. By decreasing the required applications, there will be adequate time to evaluate the sites which will present the greatest potential for adverse effects.

The basic legislative intent for the temporary rule is to establish enforceable technical requirements for sewage sludge disposal. A comprehensive permit program is not necessary. However, the Waste Management Act requires that each sludge disposal facility or site used by the MWCC have an Agency permit issued pursuant to Agency rules for permitting sewage sludge disposal facilities and sites. Thus, the Agency, at a minimum, must have permit provisions for MWCC. In addition applications from all political subdivisions that propose to conduct continuous storage or composting operations is considered necessary because of the greater potential hazard they may present. However, there are expected to be very few, possibly no, applications for continuous storage and composting operations during the effective period of the temporary rule. The permanent rule will address Permit applicability to a much greater extent.

d. Comments regarding Section D. - Contents of Application.

(1) D.1.a.(3): Several comments were received that stated that the description of industrial contributors duplicates the information required

for the industrial pretreatment program and should be deleted. A comment was also made that the description of industrial contributors is necessary to ensure that the cadmium and toxic organic compounds in sludge are reduced. This information cannot be obtained within the effective term of the temporary rule and will duplicate information which is being required by the pretreatment program. It is not the intent of this rule to improve the quality of sewage sludge, this is being addressed by pretreatment regulations. Because this provision cannot be observed within the term of the temporary rule and will complicate and duplicate information that is currently being compiled, this provision has been deleted from the temporary rule.

(2) D.1.b.(1): The comment was made that the requirement for plat maps should be deleted. The Agency feels that the information provided by plat maps is not necessary at this time, therefore, the requirement has been deleted.

(3) D.1.b.(1): The comment was made that stockpile sites should also be located on maps. The Agency agrees with this recommendation for two reasons. First, it is necessary to know the location of stockpiles to determine if the operation complies with the rule. Secondly, if a problem arises sometime in the future, after the program is completed, the stockpile location will be known and can be monitored. Therefore, this provision has been added to the rule.

(4) D.1.b.(6): The comment was made that acceptable means of determining the depth of ground water should be included. The temporary rule has been changed to specify the acceptable means of determining the

water table. Maps provided by the Soil Conservation Service indicate the depth to ground water. If SCS maps are not available, any map of comparable quality or the results of field investigations are acceptable in the application.

(5) D.1.b.(8): The comment was made that the number of samples in a composite and the depth of sampling should be specified. The University of Minnesota soil testing laboratory recommends that 15 samples should be taken to make one composite sample from a 40 acre field, and the soil should be sampled to a depth of 9 inches. These recommendations are being incorporated into the temporary rule in response to the comments made.

(6) D.1.b.(8): A comment was made that the need for the determination of the lime requirements to raise soil pH to 6.5 is unclear. The Agency agrees that it is not necessary for the Agency to know the amount of lime required to adequately raise the soil pH, it is only necessary to know the soil pH prior to landspreading. Therefore, this requirement has been deleted from the temporary rule.

(7) D.1.b.(8)(g) (formerly D.1.b.(8)(h): Comments were received stating that the proposed method for determining cation exchange capacity is adequate, direct measurement should not be required although it should be allowed. The temporary rule has been changed to allow determination of cation exchange capacity by the estimation method as presented in Appendix A, or by direct measurement methods as presented in the definitions. Because either method will satisfy Agency requirements, the provision that only the procedures in Appendix A be observed has been deleted.

(8) D.1.c.(3): A comment was made that the rule should refer to "agreements" rather than to "lease". A discussion of the deletion of "lease" is included under Section B. Because the use of "lease" is not necessary, "agreement for sewage sludge application to the site" has been used in the temporary rule.

e. Comments regarding Section E - Administration.

E.2.a: The comment was made that the use of "deficient" is vague and should be deleted if it cannot be more specifically explained. Because the necessary application information is presented in detail in Section D, the Agency agrees that the use of "incomplete" is sufficient and the synonym "deficient" is not necessary and has been deleted from the temporary rule.

f. Comments regarding Section F - Requirements.

(1) F.4.a: The comment was made that municipalities cannot effectively control or monitor other nitrogen additions by an owner of privately owned sites. This is particularly true regarding nitrogen addition added after sewage sludge application. Therefore, it was suggested that the phrase "combined with other nitrogen sources" be deleted. The Agency agrees that it would be unreasonable to expect municipalities to control nitrogen addition after sludge had been applied to a privately-owned site. Furthermore, the municipality has no legal jurisdiction to order a private landowner not to apply fertilizer to his land. Therefore, this limitation (F.4.a) has been modified to include only other nitrogen sources known to the municipality.

(2) F.5.c: To be consistent with the deletion of D.1.a.(3), F.5.c should also be deleted. The EPA chose not to regulate toxic organic chemicals, except PCBs, in its regulations on sewage sludge disposal due to lack of sufficient information on the topic. The Agency agrees that the proposed limitation was somewhat unreasonable since there is little or no guidance for municipalities directing them how to specifically operate and manage a program so that the "threat of contamination by toxic organic chemicals to surface water, ground water, soil and vegetation is minimized". Based on the information available at this time, the Agency feels that if the other limitations in the temporary rule are adhered to, the threat of contamination will be minimized. A search of the literature available pertaining to the land application of toxic organic chemicals will be conducted before the permanent rule is proposed. Based on findings of the literature search, limitations on toxics organics will be considered.

(3) F.6.c: Comments were received stating that fifty foot separation distance from property lines is unreasonable, excessive and would decrease the attractiveness of sludge landspreading to a farmer since he would have to fertilize this buffer area around a site. The intent of the original limitation was to ensure that sludge would not contact adjoining property. A fifty foot separation distance is not necessary to provide this protection. Therefore, the wording of F.6.c. was changed to reflect the intent of the Agency.

(4) F.6.d. - F.6.f: Comments were received stating that the separation distances are inappropriate and unreasonable. The proposed separation distances far exceed those recommended in MPCA's guidelines

for sludge landspreading. The comments received indicate that the proposed separation distances would cause considerable disruption of current programs and because the proposed distances where developed without public participation, the Agency feels that it is reasonable to adopt the separation distances set forth in MPCA's guidelines for the effective term of the temporary rule. To date the Agency has not observed significant problems with these distances. We will receive public comment and reevaluate the distances for the permanent rule.

(5) F.6.f.-F.6.g: Comments were received stating that the terms dry run, spring, and flowage should be defined. When defining these terms for Section B it was found that flowage is not a commonly used term and has therefore been deleted from the list of surface water types. The other terms (pond, lake, stream, etc.) will include any feature that may be considered a flowage.

(6) F.6.g: The comment was made that the phrase "injected or immediately" should be deleted since the definition of "incorporation" includes injection and specifies the maximum time (48 hours) allowed for mixing after application. The Agency agrees that this comment is accurate, and therefore, the phrase "injected or immediately" has been deleted.

(7) F.7: It was recommended that a new category of "temporary storage" be added for a period not in excess of 30 days. The "interim storage" classification would not apply to many situations because the need for temporary storage is the simple logistics of the time needed for delivery of sludge and equipment, not any of the factors referred to in the definition

of "interim storage." It was suggested that the stockpiles which are spread within thirty days of delivery should have the same (separation distance) requirements as landspreading. The need for a "temporary storage" category was previously responded to in Section B. "Temporary Storage". The Agency feels that it is reasonable to provide such a classification. A one month duration should be adequate for the delivery of sludge and equipment to a site. The separation distances used for landspreading have been adequate for short-term storage in the past. Different separation distances may be indicated after the public comment period for the permanent rules.

(8) F.8 (formerly F.7): The addition of the proposed "temporary storage" category made it necessary to emphasize that the limitations in F.8. are for "interim storage". Consequently the word "interim" was placed in several locations within the limitations of Section F.8.

(9) F.8.b. (formerly F.7.b): The term "flowage" was removed for reasons given under F.6.f. and F.6.g.

(10) F.8.d. (formerly F.7.d): A comment was received stating that since the least permeable soil horizon controls leachate, this limitation should provide that stockpiling is not permitted "where the permeability of all surface soil and subsoil horizons exceed six inches per hour." The Agency feels that this comment is accurate and reflected the original intent, therefore, the wording has been changed so that sludge may not be stockpiled in areas that have highly permeable soils for a six foot depth (minimum water table depth).

(11) F.8.e. (formerly F.7.e.): The structure of this sentence (limitation) was rearranged so that the adjective "interim" could be inserted before stockpile. The intent of the limitation remains the same.

(12) F.8.f. (formerly F.7.f.): This provision was changed from six to seven months for the reasons discussed in Section B "Interim Storage".

(13) F.9.a. (formerly F.8.a.): The comment was made that sewage sludge may be very useful in reclaiming mines, gravel pits, quarries, etc. Therefore, such use should be permitted. The Agency agrees with this comment. Sludge has been used successfully in Minnesota to reclaim mine spoil dumps and in other states to reclaim open strip mines. Consequently, the limitation was rewritten to allow sludge use in the reclamation of mines, gravel pits, and quarries.

(14) F.9.b. (formerly F.8.a.): The Agency feels that in order to prevent confusion due to the altered wording of F.9.a., a separate paragraph was added to address the prohibition of sludge landspreading without the landowners permission. Nothing has been added or deleted from the rule, it has only been changed into a clearer format.

(15) F.9.e. (formerly F.8.d.): The comment was made that the phrase "individual surface applications" is ambiguous. It was suggested that the rule specify how often such individual applications of the maximum gallonage may be made. Liquid application in excess of the stated maximum gallonages can result in ponding and resultant odor and nuisance conditions. The

stated maximum gallonage should easily infiltrate into the soil during the period of one day. To ensure that liquid sludge application rates do not result in ponding, the word "individual" has been changed to "daily". This alteration does not change the intent of this limitation.

(16) F.9.i. (formerly F.8.h.): A comment was made that the provision should require that the boundary be identified "during application" or specify when boundary identification must be employed. The intention of the Agency is to ensure that the boundaries of a landspreading site be known to the person that is applying the sludge. For this to take place, the site boundaries must be marked prior to application. Therefore, the wording of this limitation has been changed to "The boundary of a landspreading site shall be identified prior to and during application...".

(17) F.10.a.(3) formerly F.9.a.(3)): This paragraph was amended to include stockpile sites for the reasons discussed under Section D.1.b.(1).

(18) F.10.b. (formerly F.9.b.): The comment was made that since much of the information required in the annual report will already have been filed with the Agency as part of the application, the phrase "unless already filed with the Agency" should be added in order to avoid unnecessary duplication. The Agency feels that it is unreasonable and unnecessary to ask for the same information twice. Duplicate information causes an unnecessary burden for the applicant and wastes scarce file space at the Agency. For this reason, the recommendation has been incorporated into F.10.b.

i. Comments regarding Section I - Variance.

Comments were received that suggested rewording of the variance provision. The Agency has changed the variance paragraph to be less specific. Specific aspects of each variance must be addressed as the situation arises. Therefore, for purposes of the temporary rule, no reference is made to conditions under which a variance might be granted. Such conditions must be established by the Agency on a case by case basis.

j. Comments regarding Appendix B - Determination of Sewage Sludge Application Rate Based on Crop Nitrogen Requirements.

(1) Step 1: A comment was made stating that the allowable "available" nitrogen should be addressed rather than simply the "allowable" nitrogen. Available nitrogen has been re-defined to clarify its application in the rule. "Allowable" nitrogen was frequently used in the proposed temporary rule, in Appendix B. "Available" has been added to the term to be consistent with the definition and intent of the tables and procedures of Appendix B.

(2) Step 3: The comment was made that the person applying the sludge may not know the amount of nitrogen from other sources and should not be responsible for this knowledge. The Agency has changed the wording of this step has been changed so that "known" nitrogen sources are added into the equation. A similar change has been made at F.4.a.

(3) Table 2: A comment was received that a heading for this table is necessary to clarify its meaning. The heading for this table was inadvertently omitted from the proposed temporary rule. A heading which reads "Maximum Allowable Available Nitrogen Levels for Non-Cropped, Non-Harvested Areas" has been added.

Two sets of comments were received after the final date of the comment period. The changes that were suggested could not be implemented in the revision of the temporary rule but will be retained for use in the development of the permanent rule.

CONCLUSIONS

A. The Agency duly acquired and has jurisdiction in this matter.

B. The Agency has statutory authority to promulgate and adopt the proposed rule.

C. All relevant substantive and procedural requirements of statutes and rules have been properly complied with.

D. All of the modifications to the proposed rule are supported by the data and views submitted to the Agency within the comment period.

Dated: March 24, 1981.

MINNESOTA POLLUTION CONTROL AGENCY

LOUIS J. BREIMHURST
Executive Director

ART ENGELBRECHT
Chairman

STATE OF MINNESOTA

COUNTY OF RAMSEY

MINNESOTA POLLUTION

CONTROL AGENCY

In the Matter of the Proposed
Adoption of Temporary Rules of
the Minnesota Pollution Control
Agency Governing Sewage Sludge
Disposal, 6 MCAR § 4.8050

ORDER FOR PUBLICATION

IT IS ORDERED this 25th day of November, 1980, that the proposed temporary rules in the above-entitled matter be published in the State Register.

MINNESOTA POLLUTION CONTROL AGENCY

TERRY HOFFMAN
Executive Director

CERTIFICATE OF BOARD'S

AUTHORIZING RESOLUTION

I, Louis J. Breimhurst, do hereby certify that I am the Executive Director of the Minnesota Pollution Control Agency, an agency duly authorized under the laws of the State of Minnesota, and that the following is a true, complete and correct copy of a resolution adopted at a meeting of the Minnesota Pollution Control Agency, duly and properly called and held on the 25th day of November, 1980, that a quorum was present at said meeting, that a majority of the Board voted for the resolution, and that said resolution is set forth in the minutes of said meeting and has not been rescinded or modified.

BE IT RESOLVED, that the Minnesota Pollution Control Agency authorizes publication of proposed, amended, temporary rules governing sewage sludge management and disposal and that the Executive Director be and is hereby granted the authority and is directed to sign an Order of the Minnesota Pollution Control Agency directing the publication in the State Register of such proposed temporary rules as well as perform any and all acts incidental thereto.

IN WITNESS WHEREOF, I have hereunto subscribed my name this 3rd day of April, 1981.

Louis Breimhurst
LOUIS J. BREIMHURST
Executive Director

MARYANNE GIBBONS
NOTARY PUBLIC - MINNESOTA
RAMSEY COUNTY
My Commission Expires Sept 26, 1985

Maryanne Gibbons
Notary Public

Pollution Control Agency
Water Quality Division

Proposed Temporary Rule Governing Sewage Sludge Disposal

Request for Public Comment

Notice is hereby given that the Minnesota Pollution Control Agency has proposed the following temporary rule for the purpose of implementing provisions of Laws of 1980, ch. 564, art. XI, sect., 6, relating to sewage sludge disposal.

All interested persons are hereby afforded the opportunity to submit their comments on the proposed rule for 20 days immediately following publication of this material in the *State Register* by writing to:

Rodney E. Massey, P.E.
Chief, Ground Water Section
Division of Water Quality
Minnesota Pollution Control Agency
1935 W. County Rd. B2
Roseville, Minnesota 55113
Phone: (612) 296-7218

The temporary rule may be revised on the basis of comments received. Any written material received shall become part of the record in the adoption of the temporary rule.

Since temporary rules can remain in effect by law, for no more than 180 days from their effective date, permanent rules will be proposed and a public hearing will be held on the proposed permanent rules at some time in early 1981. A formal Notice of Hearing will appear at the appropriate time in the *State Register*.

Terry Hoffman
Executive Director
Minnesota Pollution Control Agency

Temporary Rule as Proposed

6 MCAR § 4.8050 Disposal of sewage sludge.

6 MCAR § 4.8050 Temporary sewage sludge disposal standards

A. Intent. Improper design, location and operation of sewage sludge disposal facilities adversely affect the public health, safety and welfare by causing pollution, impairment and destruction of the state's natural resources. In accordance with the authority granted in Minn. Laws of 1980, ch. 564, art. XI, § 6, this rule establishes temporary standards for the design, location and operation of sewage sludge disposal facilities and provides procedures for administration of this rule. It is the intent of this rule to maximize the beneficial use or recycling of sewage sludge.

B. Definitions. For the purpose of this role, the following terms shall have the meanings defined herein:

Agency—the Minnesota Pollution Control Agency.

Animal feed—Any crop grown for consumption by animals, such as pasture crops, forage, and grain.

Available nitrogen—Nitrogen which can be readily absorbed by growing plants or leached by percolating waters.

Background soil pH—The pH of the soil prior to the addition of substances intended to alter the hydrogen ion concentration.

Cation exchange capacity—A measure of the potential quantity of readily exchangeable positive ions that the soil can attract and retain, expressed in milliequivalents per 100 grams of soil. (See Appendix A)

Class A Sewage Treatment System—As determined using 6 MCAR § 5.002.

Continuous storage—The storage of sewage sludge for a period greater than six months at a facility not located at the place of sewage sludge generation. Sewage sludge is continuously delivered and removed from the facility on a regular rotational basis depending on the surplus of or demand for sewage sludge.

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Crops for direct human consupmtion—Crops that are consumed by humans without processing to minimize pathogens prior to distribution to the consumer.

Dewatered sewage sludge—Sewage sludge with sufficient solids content such that it has no free water and can be transported and handled as a solid material.

Director—The Executive Director or other designated representative of the Minnesota Pollution Control Agency.

Disease vector—Rodents, flies, and mosquitoes capable of transmitting disease to humans.

Disposal—As defined in Minnesota Laws of 1980, ch. 564, art. 1, § 3, subd. 9, which is the discharge, deposit, injection, dumping, spilling, leaking, or placing of any waste into or on any land or water so that the waste or any constituent thereof may enter the environment or be emitted into the air, or discharged into any waters, including ground waters.

Food-chain crops—Tobacco, crops grown for human comsumption, and animal feed for animals whose products are consumed by humans.

Heavy metals—Usually, but not always, those metals which have specific gravities greater than 5.0; including but not limited to, cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), and zinc (Zn).

Hundred year flood plain—As defined in 6 MCAR § 4.8051 for flood plain, which is, the areas adjoining a watercourse which has been or hereafter may be covered by a large flood known to have occurred generally in Minnesota and reasonably characteristic of what can be expected to occur on an average frequency in the magnitude of the 100 year recurrence interval.

Incorporation—The mixing of sewage sludge with topsoil, concurrent with application or within 48 hours thereafter, by means such as injection, discing, mold-board plowing, chisel plowing or rototilling.

Interim storage—The storage of dewatered sewage sludge for a period of six months or less at a landspreading sewage sludge disposal facility not located at the place of sewage sludge generation. Sewage sludge is delivered to the facility with intentions of being landspread as soon as conditions permit, where it cnanot be immediately spread because of soil conditions, snow depths, wet periods, cropping seasons, or periods of conflicting land use.

Landspreading—Placement of sewage sludge in or on soil at rates where the quantity of nutrient and non-nutrient elements and soil conditioning materials is consistant with the biochemical assimilative capacity of the soil-plant systems.

Leachate—Liquid that has passed through or emerged from sewage sludge or sewage sludge amended soil and contains soluble, suspended or miscible materials removed from such wastes.

Lease—Any oral or written agreement between a political subdivision and a landowner.

Pasture crops—Crops such as legumes, grasses, grain stubble and stover which are consumed by animals while grazing.

Pathogens—Organisms, chiefly microorganisms, including viruses, but also including all forms of animal parasites, that are capable of producing an infection or disease in a susceptible host.

Perched water table—As defined in 6 MCAR § 4.8022.

Person—As defined in Minn. Stat. § 116.06, subd. 8, which is any human being, any municipality or other governmental or political subdivision or other public agency, any public or private corporation, any partnership, firm, association, or other organization, any receiver, trustee, assignee, agent, or other legal representative of any of the foregoing, or any other legal entity, but does not include the Pollution Control Agency. Pursuant to Minnesota Laws of 1980, ch. 564, art. 1, § 3, subd. 23, person shall also not include the Waste Management Board.

Political subdivision—As defined in Minnesota Laws of 1980, ch. 564, art. 1, § 3, subd. 24, which is any municipality, corporation, governmental subdivision of the state, local government unit, special district, or local or regional board, commission, or authority authorized by law to plan or provide for waste management.

Process to further reduce Pathogens (PFRP)—Composting—Using the within-vessel composting method, the sewage sludge is maintained at operating conditions of 55°C or greater for three days. Using the static aerated pile composting method, the sewage sludge is maintained at operating conditions of 55°C or greater for three days. Using the windrow composting method, the sewage sludge attains a temperature of 55°C or greater for at least 15 days during the composting period and during the high temperature period, there must be a minimum of five turnings of the windrow.

Heat drying—A process by which dewatered sewage sludge cake is dried by direct or indirect contact with hot gases, and moisture content is reduced to

10 percent or lower. Sewage sludge particles must reach temperatures in excess of 80°C, or the wet bulb temperature of the gas stream in contact with the sewage sludge at the point where it leaves the dryer must be in excess of 80°C.

Heat treatment—a process by which liquid sewage sludge is heated to temperatures of 180°C for 30 minutes.

Thermophilic aerobic digestion—A process by which liquid sewage sludge is agitated with air or oxygen to maintain aerobic conditions at residence times of 10 days at 55-60°C, with a volatile solids reduction of at least 38 percent.

Other methods—Other methods or operating conditions are acceptable if pathogens and vector attraction of the sewage sludge (volatile solids) are reduced to an extent equivalent to the reduction achieved by any of the above methods.

Process to Significantly Reduce Pathogens (PSRP)—Aerobic digestion—A process conducted by agitating sewage sludge with air or oxygen to maintain aerobic conditions at residence times ranging from 60 days at 15°C to 40 days at 20°C, with a volatile solids reduction of at least 38 percent.

Air drying—A process by which liquid sewage sludge is allowed to drain and/or dry on underdrained sand beds, or paved or unpaved basins in which the sludge is at a depth of nine inches. A minimum of three months is needed, two months of which temperatures average on a daily basis above 0°C.

Anaerobic digestion—A process conducted in the absence of air at residence times ranging from 60 days at 20°C to 15 days at 35°C to 55°C, with a volatile solids reduction of at least 38 percent.

Composting—Using the within-vessel, static aerated pile, or windrow composting methods, the sewage sludge is maintained at minimum operating conditions of 40°C for 5 days. For four hours during this period the temperature exceeds 55°C.

Lime stabilization—A process by which sufficient lime is added to produce a pH of 12 after 2 hours of contact.

Other methods—Other methods or operating conditions are acceptable if pathogens and vector attraction of the sewage sludge (volatile solids) are reduced to an extend equivalent to the reduction achieved by any of the above methods.

Root crops—Plants whose edible parts are grown below the soil surface.

Sewage sludge—As defined in Minnesota Laws of 1980, ch. 564, art. I, § 3, subd. 29, which is the solids and associated liquids in municipal wastewater which are encountered and concentrated by a municipal wastewater treatment plant for disposal at a sewage sludge disposal facility. Sewage sludge does not include incinerator residues and grit, scum, or screenings removed from other solids during treatment.

Sewage sludge disposal facility—As defined in Minnesota Laws of 1980, ch. 564, art. I, § 3, subd. 30, which is property owned or leased by a political subdivision and used for interim or final disposal or landspreading of sewage sludge.

a. Dedicated sewage sludge disposal facility is any facility that is devoted to and managed for the primary function of sewage sludge storage, composting, or landspreading.

b. Non-dedicated sewage sludge disposal facility is any facility that is devoted to and managed for the primary function of crop production, around which sewage sludge landspreading and interim storage is scheduled and managed.

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Sewage Sludge Solids—The total, oven-dry (105°C) solids in sewage sludge.

Soil pH—A measure of the acidity or alkalinity of soil. A soil pH value of 7.0 is neutral.

Soil texture—The relative proportion of the soil separates sand, silt and clay.

Coarse texture—USDA textural classification sands, loamy sands and sandy loams.

Medium texture—USDA textural classification loams, silt loams, and silts.

Fine texture—USDA textural classification clay loams and clays.

Spray application—Liquid sewage sludge application by sprinkling devices such as center pivots and stationary or movable spray irrigation mechanisms.

Surface application—Sewage sludge spread on the surface of the land and not incorporated into the soil within 48 hours of application.

Ten year flood plain—The lowland and relatively flat areas adjoining surface waters which are inundated by a flood, which can be expected to occur, on an average, of once in ten years; or the land area to which flood waters have a ten percent chance of inundating in any given year.

USDA—United States Department of Agriculture.

Water table—As defined in 6 MCAR § 4.8022 with the exception of a perched water table condition which will not be considered as a water table.

C. Applicability.

1. This rule shall apply only to persons identified in C.2. utilizing sewage sludge disposal practices which involve landspreading, composting or storage. Incineration of sewage sludge is governed by 6 MCAR § 4.0028. Disposal of sewage sludge in sanitary landfills is governed by 6 MCAR §§ 4.6001-4.6011.

2. Paragraphs F. and G. shall apply to:

a. All political subdivisions.

b. All persons who own or operate dedicated sewage sludge disposal facilities.

3. Permits and letters of approval.

a. The following persons shall obtain a State Disposal System Permit pursuant to this rule subject to the following conditions if the sewage sludge disposal facility is not presently permitted or approved by the agency:

(1) Class A Sewage Treatment Systems, Other Than Systems Under The Control of The Metropolitan Waste Control Commission.

(a) If a political subdivision owns the sewage sludge disposal facility, the political subdivision shall be the applicant and permittee.

(b) If a person other than a political subdivision owns the dedicated sewage sludge disposal facility, the owner, the operator, and the political subdivision shall be co-applicants and co-permittees.

(2) Metropolitan Waste Control Commission Sewage Treatment Systems.

(a) If the Metropolitan Waste Control Commission owns the sewage sludge disposal facility, the Metropolitan Waste Control Commission and the Metropolitan Council shall be co-applicants and co-permittees.

(b) If a person other than the Metropolitan Waste Control Commission owns the dedicated sewage sludge disposal facility, the owner, the operator, and the Metropolitan Waste Control Commission shall be co-applicants and co-permittees.

b. If a political subdivision, including the Metropolitan Waste Control Commission, operates a Class A Sewage Treatment System and a person other than the political subdivision owns the non-dedicated sewage sludge disposal facility, the political subdivision shall obtain a Letter of Approval pursuant to this rule if the sewage sludge disposal facility is not presently permitted or approved by the agency.

c. Applicants required under C.3.a.(1) and under C.3.b. by political subdivisions other than the Metropolitan Waste Control Commission shall be submitted within 60 days of the effective date of this rule. If such applications are submitted in a timely manner and if such person is in compliance with Sections F and G of this rule, such persons shall not be deemed in violation of the Permit or Letter of Approval requirements of this rule. Permits required under C.3.a.(2) and Letters of Approval required of the Metropolitan Waste Control Commission under C.3.b. shall be issued prior to the usage of the proposed sewage sludge disposal facility.

D. Contents of applications for Letter of Approval and Permit.

1. Applications for Letters of Approval for non-dedicated sewage sludge disposal facilities shall include the following specific information, plus any other information necessary to determine the potential impact of the proposed facility on ground water, surface water, soil, vegetation or air.

a. Sewage sludge characterization, to include:

(1) Description of the method, retention times, temperatures, and chemical doses used to stabilize the sewage sludge.

(2) Physical and chemical characteristics of the sewage sludge to include:

(a) total solids.

(b) total volatile solids.

(c) pH.

(d) nitrogen (kjeldahl, ammonia, and nitrate).

(e) total heavy metals (zinc, copper, lead, nickel, cadmium, chromium, mercury).

(f) total polychlorinated biphenyls (PCBs).

(g) other parameters that may be necessary include:

(i) soluble salts.

(ii) specific microorganism populations.

(iii) fats, oils and greases.

(iv) toxic organic compounds.

(3) Description of industrial contributors to the sewer system which may discharge toxic organic chemicals, the type and quantity of chemicals discharged, evaluation of the concentrations of such chemicals in the sewage sludge and the significance of such concentrations.

b. Site characterization, to include:

(1) Copies of soil survey maps, if available, topographic maps, plat maps delineating the boundaries of the specific landspreading area and providing the legal description, including township, range, section and quarter sections.

(2) Acreage of the site.

(3) Name and address of landowner.

(4) Map or aerial photo which shows the location of and approximate distance to each of the following features, if within ¼ mile of the site:

(a) surface waters, including dry runs, streams, springs, flowages, ponds, lakes, or wetlands.

(b) ten year flood plains for non-dedicated facilities and hundred year flood plains for dedicated facilities.

(c) sinkholes, caves, rock outcrops, mines, pits or quarries.

(d) potable water supply wells or surface intakes.

(e) places of habitation, business or recreational areas.

(f) property lines.

(g) road rights of way.

(h) airports.

(5) Approximate degree (percent) of landslopes at the site.

(6) Approximate depths to ground water and bedrock.

(7) Approximate quantity of sewage sludge previously applied at site.

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(8) Soil test results from at least one composite sample for each 40 acres of landspreading area. Required parameters include:

(a) USDA classification.

(b) organic matter percent.

(c) extractable phosphorus (Bray's No. 1 Extractment).

(d) exchangeable potassium (ammonium acetate extractant).

(e) pH (1:1 w/w soil-water suspension).

(f) lime requirement to pH 6.5.

(g) soluble salts (specific conductance-mmhos/cm).

(h) cation exchange capacity (as estimated from the procedures set out in Appendix A).

c. Facility management, to include:

(1) Description of the proposed method(s) of sewage sludge disposal.

(2) Name and address of the person who will be operating and managing the proposed sewage sludge disposal facility.

(3) Description of the lease for the site.

(4) Maximum annual application rate (tons of sewage sludge solids/acre/year, based on nitrogen or cadmium additions whichever is limiting).

(5) Description of the crops to be grown or dominant vegetation at the site and the intended use of the crops.

(6) Estimated cumulative sewage sludge loading rate at the site (tons of sewage sludge solids/acre, based on cumulative heavy metal limits).

(7) Description of how public access to the site is proposed to be limited.

d. Provisions for interim sewage sludge storage at the site when it is unavailable or inaccessible for immediate landspreading.

(1) Description of the necessity for storage at the site.

(2) Location of the storage area delineated on maps submitted pursuant to D.1.b.(1) of this rule.

(3) Description of how sewage sludge is to be stored.

(4) Acreage of the sewage sludge storage area.

(5) Quantity of sewage sludge to be stored.

(6) Expected duration of storage before landspreading.

(7) Description of precautions or practice to minimize or prevent leachate, runoff or nuisance conditions from the storage area.

2. Application for permit. Applications for State Disposal System Permits for dedicated sewage sludge and disposal facilities shall include the following specific information, plus any other information necessary to determine the potential impact of the facility on ground water, surface water, soil, vegetation or air.

a. Sewage sludge characterization as prescribed in D.1.a. of this rule.

b. Site characterization as prescribed in D.1.b. of this rule, plus the following information:

(1) Description of surface and subsurface characteristics at and within ¼ mile of the site. Specific characteristics that shall be considered include soils, surficial and bedrock geology, surface waters, surface and subsurface drainage and ground water elevations and flow.

(2) A discussion of the potential for surface runoff or drainage from the facility to surface water and/or low areas having shallow water tables. A description of any provisions or practices that will be utilized to control surface runoff or drainage.

(3) A discussion of the potential for leachate generation during and following rainfall events and subsequent movement to ground water. A description of the provisions or practices that will be utilized to control leaching and protect ground water quality.

(4) A discussion of the potential for pathogen movement from the proposed facility to the surrounding

environment via wind currents and disease vectors. A description of the provisions or practices that will be utilized to control pathogen dispersions.

(5) A discussion of the potential for odor generation impacting the surrounding area. A description of the provisions or practices that will be utilized to control odors. Land use and zoning within ¼ mile of the facility shall also be described.

c. Information prescribed in D.1.b.(7) and (8), need not be submitted for composting or continuous storage sewage sludge disposal facilities, but a map showing the locations of and distance to all nursing homes and hospital within ½ mile shall be submitted.

d. Description of management provisions at landspreading sewage sludge disposal facilities as prescribed in D.1.c. of this rule.

e. Description of management and operational provisions at composting sewage sludge disposal facilities which shall include:

(1) Types of bulking agent to be used.

(2) Ratio of sewage sludge to bulking agent.

(3) Method to be used for mixing the sewage sludge with the bulking agent.

(4) Estimated temperatures that the compost will attain and the period of time the temperatures will be sustained.

(5) Length of time compost will be cured.

(6) The quantity and source of sewage sludge to be delivered to the facility on a weekly or monthly basis, whichever is more applicable.

(7) A comprehensive survey of proposed and potential users and markets of the sewage sludge compost. A description of the methods and areas of distribution.

f. Description of management and operational provisions at continuous storage sewage sludge disposal facilities as prescribed in D.1.d. of this rule. Also, the quantity and source of sewage sludge to be delivered to the facility on a weekly or monthly basis, whichever is more applicable.

E. Administration of Letter of Approval and Permit Programs.

1. Administration of State Disposal System Permit for dedicated sewage sludge disposal facilities shall be governed by rule 6 MCAR § 4.8036.

2. Administration of Letters of Approval for non-dedicated sewage sludge disposal facilities shall be governed by the following procedures:

a. Review. All applications shall be reviewed for completeness by the director. If the application is incomplete or otherwise deficient, the director shall promptly advise the applicant of such incompleteness or deficiency. Further processing of the application may be suspended until the applicant has supplied the necessary information or otherwise corrected the deficiency.

b. Preparation of preliminary determinations. The director shall make a preliminary determination regarding a completed application. This preliminary determination shall include a proposed determination to issue or to deny the approval sought in the application.

(1) If the preliminary determination is to deny an approval, the director shall notify the applicant in writing and include the specific reasons for denial. The applicant may request an appearance before the Agency to appeal the denial pursuant to Agency rules of procedure, 6 MCAR § 4.3003.

(2) If the preliminary determination is to issue an approval, the procedures set out in E.2.c. and E.2.d. shall apply.

c. Public participation.

(1) The director shall provide notice of the application and a copy of the draft Letter of Approval to the following persons and other persons known by the Director to have an interest in the proposed approval.

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(a) Applicant.

(b) Owner and occupier of land proposed to be used for sewage sludge disposal.

(c) City or township and county officials of area where sewage sludge disposal facility is located.

(2) Any interested person, including the applicant, may within 14 days following the date of issuance of the notice submit written comments on the application and the proposed approval to the director.

(3) All written comments submitted during the comment period shall be retained and considered in the formulation of final determinations concerning the application.

d. Final determination.

(1) The director shall attempt to resolve all comments prior to a final determination concerning the application. If such comments have been resolved, the director shall issue or deny the approval.

(2) If all comments cannot be resolved, the application shall be presented to the agency who shall issue or deny the approval.

(3) All persons submitting comments on the application and the proposed approval shall be notified of the final determination concerning the application.

e. Denial of approval. Approval shall be denied if:

(1) The proposed sewage sludge disposal facility does not comply with this rule and other applicable state or federal laws or rules; or

(2) Such approval is likely to cause pollution, impairment or destruction of the air, water, land or other natural resources of the state and there is a feasible and prudent alternative.

f. Modification, suspension and revocation of Letters of Approval. A Letter of Approval may be modified, suspended or revoked in accordance with the requirements of 6 MCAR § 4.8036.

g. Duration of approvals. The Letter of Approval shall establish the term of the Approval. In no case shall such term exceed the term of the political subdivision's National Pollutant Discharge Elimination System or State Disposal System sewage treatment system permit.

h. Enforcement. A Letter of Approval issued to a political subdivision pursuant to this rule shall become part of the political subdivision's National Pollutant Discharge Elimination System or State Disposal System sewage treatment system permit and shall be enforceable to the same extent as the permit.

F. Requirements for sewage sludge disposal facilities used for landspreading of sewage sludge.

1. Disease control. The landspreading of sewage sludge shall be managed in such a manner to minimize the potential for disease transmission to animals and humans.

a. Sewage sludge shall, at a minimum, be treated by a Process to Significantly Reduce Pathogens (PSRP) prior to landspreading.

b. Sewage sludge shall be treated by a Process to Further Reduce Pathogens (PFRP) in the following cases:

(1) If crops for direct human consumption are to be grown within 18 months of sewage sludge application and there will be contact between the sewage sludge and the edible portion of the crop.

(2) Public access to the landspreading facility is not controlled for 12 months.

c. If sewage sludge is to be applied to land used for pasturing livestock or for growing forage crops, the pasturing or harvesting of the crop shall not be permitted for at least one month following the last sewage sludge application unless the sewage sludge was treated by a PFRP.

2. Soil pH and cadmium application. The landspreading sewage sludge shall be managed in such a manner to minimize the potential for cadmium uptake by food-chain crops.

a. The pH of the soil/sewage sludge mixture shall be 6.5 or greater at the time of each sewage sludge application or shall be adjusted to and maintained at 6.5 or greater immediately after sewage sludge application and before growing food-chain crops.

b. Annual cadmium application shall not be more than 0.5 pounds per acre on land used for the production of tobacco, leafy vegetables or root crops grown for human consumption. For other food-chain crops, the annual cadmium application shall not exceed two pounds per acre.

c. Cumulative cadmium application shall not exceed:

SOIL CATION EXCHANGE CAPACITY (meq/100g)	MAXIMUM CUMULATIVE CADMIUM APPLICATION (LBS/A)	
	BACKGROUND SOIL pH LESS THAN 6.5*	BACKGROUND SOIL pH 6.5 OR GREATER
0-5	5	5
5-15	5	10
> 15	5	20

* For soils with a background pH of less than 6.5, the cumulative cadmium application rate can be the same as for soils with a background pH of 6.5 or greater provided that the pH of the soil/sewage sludge mixture is adjusted to and maintained at 6.5 or greater whenever food-chain crops are grown.

3. Cumulative heavy metal additions. The total quantity of sewage sludge applied to a facility shall be managed in such a manner to prevent excessive heavy metal accumulation in the soil and subsequent potential plant and food-chain toxicity. Sewage sludge application to a facility shall be terminated when the sum addition of any one metal equals the level given below for that particular metal and soil.

Metal	Total Heavy Metal Addition (LBS/A) Soil Cation Exchange Capacity (meq/100g)		
	0-5	5-15	> 15
Lead	500	1000	2000
Zinc	250	500	1000
Copper	125	250	500
Nickel	50	100	200

4. Sewage sludge application rates. The landspreading of sewage sludge shall be conducted in such a manner to minimize nitrate movement to ground water and minimize the build-up of soluble salts in soil.

a. Sewage sludge application rates, combined with other nitrogen sources, shall supply no more nitrogen than the amount required by the crop to be grown. The rate of sewage sludge application shall be determined using the method outlined in Appendix B.

b. Sewage sludge application to a facility shall be suspended whenever the electrical conductivity of a saturation extract of soil exceeds four millimhos/centimeter (soluble salt test).

5. Persistent organic chemical limitations. The landspreading of sewage sludge shall be managed in such a manner to minimize the build-up of polychlorinated biphenyls (PCBs) and other persistent organic chemicals in soil.

a. Sewage sludge containing concentrations of PCBs equal to or greater than 10 mg/kg (dry weight) shall be incorporated into the soil when applied to land use for producing food-chain crops.

b. Sewage sludge containing concentrations of PCBs equal to or greater than 50 mg/kg (dry weight) shall not be landspread.

c. Sewage sludge application rates and the operation of a facility shall be managed such that the threat of contamination by toxic organic chemicals to surface water, ground water, soil and vegetation is minimized.

6. Separation distances. The landspreading of sewage sludge shall be managed in such a manner as to include adequate buffer zones. The buffer zones shall suitably isolate the facility, thereby reducing potential impacts to neighboring residents, potable water supplies, ground water and surface waters.

a. For medium and fine textured soils, at least 3 feet of soil shall exist between the soil surface and the water table and/or bedrock. For coarse textured soils, this separation distance shall be at least 6 feet.

b. A distance of at least 200 feet from any potable water supply well, with the exception of test or monitoring wells, shall be maintained.

c. A distance of at least 50 feet from any property line or road right-of-way shall be maintained.

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d. A distance of at least 500 feet from any place of habitation or business or area used for recreational purposes shall be maintained, unless written permission is obtained from the appropriate party.

e. Separation distances prescribed in parts c. and d. above shall be increased 6-fold where sewage sludge is applied by pressurized spray.

f. A distance of at least 300 feet from any dry run, pond, lake, stream, spring, flowage, or ten year flood plain shall be maintained where sewage sludge is surface applied during the months of May to October, inclusive. This separation distance shall be doubled (600 feet) where sewage sludge is surface applied during the months of November to April, inclusive.

g. A distance of at least 100 feet from any dry run, pond, lake, stream, spring, flowage, or ten year flood plain shall be maintained where sewage sludge is injected or immediately incorporated into the soil.

7. Interim sewage sludge storage. The stockpiling of dewatered sewage sludge at a facility shall be managed in such a manner to minimize the potential for adverse environmental effects. The sewage sludge stockpiled at a facility shall be landspread as soon as possible.

a. Sewage sludge stockpiles shall be placed at least 1000 feet from any place of habitation, business, area used for recreation, or potable water supply well, unless written permission is obtained from the appropriate party.

b. Sewage sludge stockpiles shall be placed at least 1000 feet from any dry run, pond, lake, stream, spring, flowage, or ten year flood plain, unless the stockpiles are bermed to a height of 1 foot or if the stockpiles are downgradient from the features mentioned, in which case the separation distance may be reduced to 200 feet.

c. Sewage sludge stockpiles shall not be allowed on land with greater than 2% slope, unless the stockpiles are bermed to a height of 1 foot, in which case the maximum land slope may be increased to 6%.

d. Sewage sludge shall not be stockpiled on soils of permeability greater than 6 inches per hour, unless the stockpiles are underlain by an impervious or absorbent material, such as clay, crushed and packed limestone, plastic, straw or woodchips.

e. A minimum distance of 6 feet shall exist between the soil surface and the water table wherever sewage sludge is stockpiled.

f. Interim storage of sewage sludge is prohibited for a period in excess of six months.

8. Prohibited sites and other limitations

a. Sewage sludge shall not be disposed of on or into any cave, sinkhole, mine, gravel pit, or quarry, or wetland, or on any land without the owner's permission.

b. Sewage sludge shall not be applied to coarse sands or gravel soils.

c. Organic soils (peat) shall not be utilized for sewage sludge application unless adequately drained.

d. Individual surface applications of liquid sewage sludge shall not exceed:

coarse textured soil —25,000 gallons per acre
medium textured soil—15,000 gallons per acre
fine textured soil—10,000 gallons per acre

e. Sewage sludge shall not be applied to land that is to be left in fallow during the summer months (May to September, inclusive).

f. Surface application of sewage sludge shall not be allowed on land with a slope greater than 6%. Subsurface application or immediately incorporated application of sewage sludge shall not be allowed on land with a slope greater than 12%.

g. Sewage sludge shall be applied to land in such a manner as to provide uniform spreading (application) over the entire site.

h. The boundary of an application site shall be identified with the use of conspicuous flags placed every 100 feet along its border unless apparent boundaries, such as fence rows, roads, tree lines, steep slopes, etc., exist.

9. Requirement for record-keeping and annual reporting.

a. A record-keeping system shall be initiated and maintained by the political subdivision to verify compliance with the rules and limitations herein. The information recorded in such a system shall include the following:

(1) Required sewage sludge composition data pursuant to D.1.a.

(2) Soil test data for application sites used during the year, pursuant to D.1.b.(8).

(3) The location of the site on a topography or soil survey map and the number of acres to which sewage sludge was applied.

(4) The amount of sewage sludge applied (tons sewage sludge solids/acre).

(5) The amount of available nitrogen applied per year (lbs/acre).

(6) The amount of cadmium, zinc, lead, nickel, and copper applied per year and cumulatively (lbs/acre).

(7) Vegetation grown on each site during the year.

(8) A description of any adverse environmental, health, or social effects, complaints, management problems, or other difficulties encountered during the year due to sewage sludge disposal.

(9) Results of any other required monitoring, i.e., ground water, soils, vegetative tissue, etc.

(10) A report of any action not in conformance with the Letter of Approval, Permit, or this rule.

b. The records and information prescribed above shall be organized into a report to be submitted annually to the Agency no later than 60 days following the end of the reporting year (by March 1).

G. Requirements for sewage sludge disposal facilities used for composting and/or continuous storage of sewage sludge.

1. Disease control.

a. Sewage sludge shall be treated by a PSRP and/or by a PFRP prior to storage or composting, unless, in the case of composting, the composting operation qualifies as a PSRP or a PFRP.

b. Composting sewage sludge disposal facilities shall not be located within ¼ mile of any hospital or nursing home.

c. Public access to composting and continuous storage sewage sludge disposal facilities shall be controlled.

2. General limitations.

a. The operation of a continuous storage sewage sludge disposal facility shall be conducted in such a manner as to minimize ground water and surface water pollution, soil contamination, public health, safety and welfare hazards, and nuisance conditions.

b. The operation of a composting sewage sludge disposal facility shall be conducted in such a manner as to minimize ground water and surface water pollution, soil contamination, public health, safety and welfare hazards, and nuisance conditions.

c. Necessary precautions and safeguards shall be undertaken in the disposal/distribution of sewage sludge compost such that ground water and surface water pollution, soil contamination, public health, safety and welfare hazards, and nuisance conditions are minimized.

d. The removal and final disposal of sewage sludge from a continuous storage sewage sludge disposal facility shall comply with all requirements and limitations set forth in Section F of this rule.

e. A facility used for sewage sludge composting or continuous storage shall not be utilized as a facility for final disposal. Sewage sludge or sewage sludge compost shall be removed from the facility regularly (periodically) for final disposal.

3. Record-keeping and annual reporting.

a. A record-keeping system shall be initiated and maintained by the permittee to verify compliance with the requirements and limitations herein. The information recorded in such a system shall include the following:

(1) Required sewage sludge composition data as outlined in D.1.a. of this rule.

(2) The quantity of sewage sludge delivered to the facility.

(3) The quantity of sewage sludge or sewage sludge compost removed from the facility.

(4) A list of the locations to which the sewage sludge or sewage sludge compost was delivered to after removal from the composting or continuous storage sewage sludge disposal facility.

(5) A description of the precautions and safeguards employed in the disposal/distribution of sewage sludge compost.

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(6) Results of any required monitoring, i.e., ground water, surface water, soil, etc.

(7) A description of any adverse environmental, health, or social effects, complaints, management problems, or other difficulties encountered due to the operation of the sewage sludge facility.

(8) A report of any action not in compliance with the Permit or this rule.

b. The records and information prescribed above shall be organized into a report to be submitted quarterly to the agency no later than 60 days following the end of the reporting quarter.

H. Severability. If any provision of this rule or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions of this rule or application of any other part of this rule which can be given effect without application of the invalid provision. To this end the provisions thereof are declared to be severable.

I. Variance. In any cases where upon application of the responsible person or persons, the agency finds that by reason of exceptional circumstances the strict enforcement of any provision of this rule would cause undue hardship, that disposal of the sewage sludge is necessary for the public health, safety or welfare, or that strict conformity with this rule would be unreasonable, impractical or not feasible under the circumstances, the agency in its discretion may permit a variance therefrom upon such conditions as it may prescribe for prevention, control or abatement of pollution in harmony with the general purpose of this rule and the intent of applicable state and federal laws.

Appendix A
Estimate of Soil Cation Exchange Capacity

Using the values of soil texture and organic matter percentage, as determined by appropriate soil test procedures, a particular soil's cation exchange capacity can be estimated by using the table given below:

Cation Exchange Capacity
(milliequivalents/100 gms)

	Soil Organic Matter Level		
Texture	Low (<2%)	Medium (2-4%)	High (>4%)
Coarse	0-5	5-15	5-15
Medium	5-15	5-15	>15
Fine	>15	>15	>15

NOTE: It is recognized that soil cation exchange capacity (CEC) is not the only factor important in setting levels of metal additions to soil. It is used as an index which is proportional to the ability of a soil to minimize or limit heavy metal availability. Other soil chemical processes that are proportional to exchange reactions and also reduce the availability of heavy metals are sorption and precipitation reactions and metal complexation.

Appendix B
Determination of Sewage Sludge Application Rate Based on Crop Nitrogen Requirements

Sewage sludge application rates shall be based upon sewage sludge nitrogen availability, carry-over nitrogen supplied by past sewage sludge applications, available nitrogen added by manures or fertilizers, soil texture, and crop nitrogen requirements and yield goals.

Step 1

Based on cropping practices and soil texture, determine the maximum allowable nitrogen level from Table 1 or 2.

Step 2

Determine carry-over nitrogen from the previous years sewage sludge application using the following formula:

$$\text{Carry-over N} = (\%\ \text{organic sewage sludge N}) \times (\text{lbs./acre}) \left(\begin{array}{l}\text{tons sewage sludge solids applied} \\ \text{per acre)}\end{array}\right.$$

If sewage sludge was not applied the previous year, carry-over nitrogen is zero.

Step 3

Subtract carry-over nitrogen and nitrogen added from other sources (e.g. fertilizer, animal manure) from the maximum allowable nitrogen level.

Step 4
Determine the available nitrogen in sludge using the appropriate formula in Table 3.

Step 5
Divide the maximum allowable nitrogen level (lbs./acre) from Step 3 by the available nitrogen in sludge (lbs./ton) from Step 4 to obtain the sewage sludge applications rate in ton of solids per acre per year.

TABLE 1
Maximum Allowable Nitrogen Levels for Various Crops, Yields and Soil Textures

Crop	Yield/Acre	Maximum Allowable Nitrogen Level (lbs./acre) Soil Texture Coarse	Medium	Fine
Alfalfa	4 ton	180	210	230
	6 ton	280	340	370
Barley	80 bushel	100	110	120
Bluegrass	3 ton	180	210	230
Corn	75 bushel	100	120	130
	100 bushel	130	150	160
	125 bushel	150	180	190
	150 bushel	180	210	230
	175 bushel	210	250	270
Oats	75 bushel	80	90	100
	100 bushel	130	150	160
Soybeans	30 bushel	120	140	150
	40 bushel	180	210	230
	50 bushel	230	270	300
	60 bushel	280	340	370
Wheat	50 bushel	100	120	130
	75 bushel	160	180	190

Table 2

Degree of Vegetative Cover	Maximum Allowable Nitrogen Level (lbs/acre) Soil Texture Coarse	Medium	Fine
High density	75	100	125
Low density	50	75	100

Table 3
Formulas for Determination of Available Nitrogen in Sewage Sludge
(pounds of available nitrogen per ton of sewage sludge solids)

Type of Stabilization	Application Method	Formula
Digested	Surface . . .	(% organic — N × 4) + (% NH_3 — N × 10)
	Incorporated or Injected . . .	(% organic — N × 4) + (% NH_3 — N × 15)
Chemically or Physically Stabilized or Unstabilized	Surface . . .	(% organic — N × 6) + (% NH_3 — N × 10)
	Incorporated or Injected . . .	(% organic — N × 6) + (% NH_3 — N × 15)

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ERRATA

(Minor Corrections to the Proposed Temporary Rule
Governing Sewage Sludge Disposal Published in 5.S.R. 935)

Section A. -In the first sentence, "state's" has been changed to "State's."

Section B. -In the definition's introduction, "role" has been changed to "rule."

-In the definition of Interim Storage, "cnanot" has been changed to "cannot."

-In the definition of Landspreading, "consistant" has been changed to "consistent."

-In the definition of Person, S has been deleted from S166.06.

-In the definition of PFRP, "further" and "reduce" have been capitalized.

-In the definition of Sewage Sludge, "the" has been capitalized.

-In the definition of Sewage Sludge Solids, "Sludge Solids" has been reduced to lower case.

Section D. -In D.b.(8).(c)., "Extractment" has been changed to "extractant."

-In D.1.d.7., an s has been added to "practice."

Section E. -In E.2.a., E.2.b., E.2.b.(1)., E.2.c.(1)., E.2.c.(2)., and E.2.d.(1)., "director" has been changed to "Director."

-In E.2.d.(2)., "agency" has been changed to "Agency."

-In E.2.g., "Approval" has been changed to "approval."

Section F. -In F.2., "of" has been added.

-In F.2.c., "BACKGROUND SOIL pH LESS THAN 6.5" and "6.5 OR GREATER" has been reduced to lower case.

-In F.3., "annual reporting" has been changed to "Annual Reporting."

-In F.5.a., a d has been added to "use."

-In G.3.a.(4)., "To" has been deleted.

Section G. -In G.3.b., the a in "agency" has been capitalized.

Appendix B -In Step 5, an s has been added to "ton," and an s was deleted from "applications."

-In Tables 2 and 3, "table" has been capitalized.

CERTIFICATE OF BOARD'S

AUTHORIZING RESOLUTION

I, Louis J. Breimhurst, do hereby certify that I am the Executive Director of the Minnesota Pollution Control Agency, an agency duly authorized under the laws of the State of Minnesota, and that the following is a true, complete and correct copy of a resolution adopted at a meeting of the Minnesota Pollution Control Agency, duly and properly called and held on the 24th day of March, 1981, that a quorum was present at said meeting, that a majority of the Board voted for the resolution, and that said resolution is set forth in the minutes of said meeting and has not been rescinded or modified.

BE IT RESOLVED, that the Minnesota Pollution Control Agency adopts the Minnesota Pollution Control Agency Staff's proposed Findings of Fact, Conclusions and Order Adopting Temporary Rule attached hereto with respect to Temporary Sewage Sludge Disposal Standards, 6 MCAR § 4.8050.

BE IT FURTHER RESOLVED, that the Chairman and Executive Director are hereby authorized to sign the above-described documents.

BE IT FURTHER RESOLVED, that by the next Board meeting, the Staff shall submit names for recommended committee members to serve on an Advisory Committee for the permanent rule. This committee shall be set up under the same format as the WPC 40 Advisory Committee.

IN WITNESS WHEREOF, I have hereunto subscribed my name this 3rd day of April, 1981.

MARYANNE GIBBONS
NOTARY PUBLIC - MINNESOTA
RAMSEY COUNTY
My Commission Expires Sept 26, 1985

Louis Breimhurst
LOUIS J. BREIMHURST
Executive Director

Maryanne Gibbons
Notary Public

STATEMENT OF COMPLIANCE WITH

RULEMAKING PROCEDURES

I, Special Assistant Attorney General Marlene E. Senechal, do hereby declare that I have examined the proposed rules and all related documents and that, based on my examination and my personal familiarity with the applicable procedures, the Administrative Procedure Act, the rules of the Office of Administrative Hearings, and the rules of the Attorney General have been followed. Any exceptions are noted below.

Marlene E. Senechal

MARLENE E. SENECHAL
Special Assistant
Attorney General

Dated: April 1, 1981.