

STATE OF NEW MEXICO
NEW MEXICO ENVIRONMENTAL IMPROVEMENT BOARD

IN THE MATTER OF THE PETITION
FOR HEARING TO CONSIDER PROPOSED
AMENDMENTS TO TITLE 20, CHAPTER 7,
PART 3 OF THE NEW MEXICO ADMINISTRATIVE CODE
(GRAYWATER AMENDMENTS).

EIB-03-10

Testimony of Dennis McQuillan
In Support of Proposed Amendments
To N.M. EIB Liquid Waste Disposal Regulations

For Presentation At Hearing
December 16, 2003

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Purpose of Hearing

This public hearing, held by the New Mexico Environmental Improvement Board (EIB), considers amendments to Liquid Waste Disposal Regulations proposed by the New Mexico Environment Department (NMED).

Witness Qualifications

My name is Dennis McQuillan and I have served in a variety of NMED positions for almost 25 years. I am currently employed by the NMED, Field Operations Division. I have extensive experience in the prevention, investigation, and abatement of soil and ground-water pollution. I have delivered technical testimony before the U.S. Congress, the N.M. Legislature, the EIB, the N.M. Water Quality Control Commission, and in state and Federal District Court. Additionally, I have worked as a consultant and freelance writer. I have a Bachelor's degree in Geology from the University of New Mexico, with a minor distributed in Chemistry, Mathematics, and Physics. A copy of my resume is attached.

My testimony will provide an overview of the proposed regulation amendments, including a description of the current regulatory framework, and a discussion of the nature of graywater. Ron Voorhees, M.D. of the N.M. Department of Health will then provide testimony on the human health issues related to gray-water discharges.

Introduction

Statutes and Regulations

The [N.M. Constitution \(Article XX, Section 21\)](#)¹, adopted on January 21, 1911, states:

“The protection of the state's beautiful and healthful environment is hereby declared to be of fundamental importance to the public interest, health, safety and the general welfare. The legislature shall provide for control of pollution and control of despoilment of the air, water and other natural resources of this state, consistent with the use and development of these resources for the maximum benefit of the people.”

The N.M. Board of Public Health adopted “Regulations Prohibiting Insanitary Toilets in Certain Places” on June 28, 1937. The Board also issued a “Policy for Individual Water Supplies and Sewage Disposal Systems” on September 27, 1959.

The N.M. [Environmental Improvement Act](#)² (Sections 74-1-1 through 74-1-16, NMSA, 1978), enacted in 1973, created the EIB and authorized it to adopt environmental

¹ [http://www.amlegal.com/nxt/gateway.dll/New_Mexico/Statutes/type00000.htm/article00240.htm/section00261.htm?f=templates\\$fn=altmain-nf.htm\\$3.0](http://www.amlegal.com/nxt/gateway.dll/New_Mexico/Statutes/type00000.htm/article00240.htm/section00261.htm?f=templates$fn=altmain-nf.htm$3.0)
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management and consumer protection regulations for liquid waste. The EIB adopted Liquid Waste Regulations and amendments thereto in 1973, 1979, 1985, 1989, and 1997. The 1979 regulations were the first to address graywater, and were the only regulations to contain specific permitting rules for graywater systems (Table 1). Later regulations contained more restrictive definitions of graywater, but no specific graywater permitting rules (Table 1). However, the regulations included graywater within the definition of liquid waste. §20.7.3.7 AO. A permit is required for the discharge of untreated liquid waste (unless discharged into a public sewer system). §20.7.3.300. Thus, under current regulations, graywater may not be discharged by a resident for household irrigation without a permit from the Department.

Table 1. Graywater Provisions of EIB Liquid Waste Regulations. The 2003 proposed definition is taken verbatim from House Bill 114.

Regulation Date	Graywater Definition	Specific Rules
1973	none	None
1979	“water carried waste from the kitchen or bathroom sinks, showers, bathtubs, or washing machines”	Section 203
1985	“water carried waste from kitchen (excluding garbage disposal) and bathroom sinks, showers, bathtubs, and washing machines”	Included within definition of liquid waste, permit required
1989	Same as 1985	Same as above
1997	“water carried waste from kitchen (excluding garbage disposal) and bathroom sinks, wet bar sinks, showers, bathtubs, and washing machines. Graywater does not include water carried wastes from kitchen sinks equipped with a garbage disposal, utility sinks, any hazardous materials, or laundry water from the washing of material soiled with human excreta”	Same as above
2003 proposed	“untreated household wastewater that has not come in contact with toilet waste and includes wastewater from bathtubs, showers, washbasins, clothes washing machines and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers or laundry water from the washing of material soiled with human excreta, such as diapers.”	20.7.3.300.J proposed to allow discharge without permit under certain conditions

The 2003 N.M. Legislature passed [House Bill 114](#)³, codified in the Water Quality Act at [74-6-2](#)⁴ and [74-6-4](#)⁵ NMSA 1978, that defined graywater (Table 1) and set protective

² [http://www.amlegal.com/nxt/gateway.dll/New Mexico Statutes/type00852.htm/chapter26521.htm/article26522.htm?f=templates\\$fn=altmain-nf.htm\\$3.0 - JD_ch.74.art.1](http://www.amlegal.com/nxt/gateway.dll/New Mexico Statutes/type00852.htm/chapter26521.htm/article26522.htm?f=templates$fn=altmain-nf.htm$3.0 - JD_ch.74.art.1)

³ <http://legis.state.nm.us/Sessions/03 Regular/FinalVersions/house/HB0114.pdf>
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requirements whereby up to 250 gallons per day of residential graywater may be used for household gardening, composting or landscaping irrigation without a permit. The eleven statutory requirements are designed to protect human health, welfare, animal and plant life, property and the environment. The law also requires compliance with municipal and county graywater ordinances. The definition of graywater in House Bill 114 (Table 1) is consistent with industry standards.

Proposed Amendments to EIB Liquid Waste Regulations

NMED proposes to amend the Liquid Waste Regulations to include the provisions of House Bill 114, as well as seven other stipulated requirements that would provide additional protection of human health, welfare, animal and plant life, property and the environment (Appendix A). The proposed definition of graywater and the proposed requirements of 20.7.3.300.J.1 sections (a) through (k) are taken directly from House Bill 114. After the public notice for this hearing was issued, NMED notified all persons on the EIB mailing list of a public meeting to discuss the proposed amendments, and possible additional protective requirements with regard to graywater recycling. The public meeting was held on November 19, 2003, and resulted in a Stipulation to Support both the proposed amendments and additional protective requirements (Appendix A). The additional requirements, sections (l) through (r) are shown in Appendix A and are recommended by the stipulating parties. The rationale for the proposed requirements of 20.7.3.300.J.1 sections (l)-(r) (Appendix A) is as follows:

- l. *Graywater is not stored longer than 24 hours before being discharged.* If graywater is stored longer than 24 hours before being applied, it can turn septic and create odor problems. Additionally, bacterial populations may grow to concentrations much higher than in raw graywater. The limitation of 24 hours storage is recommended to minimize any nuisances or risk due to exposure to graywater.
- m. *Graywater use for purposes other than irrigation or composting is prohibited, unless a permit for such use is issued by the Department.* Graywater uses for purposes other than specified in House Bill 114 would be prohibited unless a permit is obtained.
- n. *Graywater is not used to irrigate food plants except for fruit and nut trees.* Since graywater contains fecal coliform bacteria, and possibly human pathogens, it should not be used to irrigate food plants other than fruit and nut trees.
- o. *Graywater is discharged to a mulched surface area or to an underground irrigation system.* Discharges of graywater to a mulched surface area, where

⁴ [http://www.amlegal.com/nxt/gateway.dll/New Mexico Statutes/type00852.htm/chapter26521.htm/article26697.htm/section26699.htm?f=templates\\$fn=altmain-nf.htm\\$3.0](http://www.amlegal.com/nxt/gateway.dll/New Mexico Statutes/type00852.htm/chapter26521.htm/article26697.htm/section26699.htm?f=templates$fn=altmain-nf.htm$3.0)

⁵ [http://www.amlegal.com/nxt/gateway.dll/New Mexico Statutes/type00852.htm/chapter26521.htm/article26697.htm/section26702.htm?f=templates\\$fn=altmain-nf.htm\\$3.0](http://www.amlegal.com/nxt/gateway.dll/New Mexico Statutes/type00852.htm/chapter26521.htm/article26697.htm/section26702.htm?f=templates$fn=altmain-nf.htm$3.0)

rapid infiltration would occur, or to an underground irrigation system would reduce the potential for human exposure.

- p. *Graywater is not discharged closer than 100 feet to a watercourse or private domestic well, or closer than 200 feet to a public water supply well. Setback distances, consistent with those for other liquid waste discharges, would reduce the possibility of surface or well water contamination.*
- q. *Graywater does not create a public nuisance. Discharges of graywater should not create a public nuisance, but if someone discharges graywater in a way that does create a public nuisance, the Department will have the ability to take action.*
- r. *For residential units using an on-site liquid waste system for blackwater treatment and disposal, the use of a graywater system does not change the design, capacity, or absorption area requirements for the on-site liquid waste system at the residential unit, and the on-site liquid waste system is designed and sized to handle the combined blackwater and graywater flow if the graywater system fails or is not fully used. On-site liquid waste systems should have design capacities large enough to handle the combined blackwater and graywater flows generated at the site in the event that the graywater system fails or is not fully used.*

Rule-Making Considerations

In making regulations, the EIB is required by Section 74-1-9.B of the N.M. Environmental Improvement Act to,

“give the weight it deems appropriate to all relevant facts and circumstances presented at the public hearing, including but not limited to:

1. character and degree of injury to or interference with health, welfare, animal and plant life, property and the environment;
2. the public interest, including the social, economic and cultural value of the regulated activity and the social, economic and cultural effects of environmental degradation; and
3. technical practicability, necessity for and economic reasonableness of reducing, eliminating or otherwise taking action with respect to environmental degradation.”

Criterion #1 – Injury or Interference

Graywater can contain biological (Table 2) and chemical (Table 3) contaminants at concentrations of potential environmental concern, depending on the method of disposal. Fecal coliform bacteria, including the species *E. coli*, are monitored as indicator

parameters for the microbiological safety of water. Their detection indicates that human pathogens may also be present if someone in the household is infected. Biochemical Oxygen Demand (BOD) is a measure of the oxygen used in meeting the metabolic needs of aerobic microorganisms in water rich in organic matter (as water polluted with sewage). The concentrations of BOD, nitrogen and phosphorous in graywater (Table 3) could cause chemical contamination of ground and surface water if graywater is discharged to these media. BOD can cause, or exacerbate, anoxic conditions in ground water. Nitrogen can cause nitrate contamination of ground water. Nitrogen and phosphorous can cause eutrophication of surface water.

Table 2. Fecal Coliform Bacteria in Household Graywater. (Casanova, et al., 2001)

Factor	Fecal Coliforms (CFU/100 mL)	<i>E. Coli</i> (MPN/100 mL)
With children	4,990	61
Without children	4,250	10
Including kitchen sink water	88,400	95
Excluding kitchen sink water	822	8
In-ground storage	18,200	295
Above-ground storage	643	3
With animals	2,120	35
Without animals	33,400	10

Table 3. Contaminant Concentrations in Residential Wastewater Fractions, mg/L. (U.S. EPA, 1980)

Parameter	Toilet	Garbage Disposal	Graywater (Basins, Sinks, Appliances)	Combined Wastewater
BOD	280	2380	260	360
Suspended Solids	450	3500	160	400
Nitrogen	140	79	17	63
Phosphorous	20	13	26	23

Graywater contains chemical and biological contaminants that could injure or interfere with health, welfare, animal and plant life, property and the environment. It is appropriate, therefore, that the EIB develop graywater regulations that will provide protection of these factors.

Criterion #2 – Public Interest

Graywater use can have benefits to those using it and to the community. Especially in the arid southwest, water is a valuable commodity. To the extent that graywater is used as a supplement or replacement for fresh water, supplies of fresh water can be saved, which is a benefit to the community. Use of graywater can also save money for those using it, because they can save money on utility bills or pumping costs from wells. It also reduces the amount of wastewater entering septic systems, which can potentially reduce groundwater contamination. It can be used to maintain the health of landscaping plants, which provides aesthetic benefits.

The proposed amendments are in the best public interest because they would allow for the recycling/reuse of graywater for beneficial purposes, while minimizing the risks of injury or interference discussed in Criterion #1 above.

The proposed amendments are consistent with the intent of the [N.M. Constitution \(Article XX, Section 21\)](#) (discussed above) in that potential pollution from graywater would be controlled while allowing for its beneficial use.

Criterion #3 – Practicability and Reasonableness

Compliance with the proposed amendments is technically practicable and economically reasonable. Ample technology is available to safely collect, store and discharge graywater. The proposed amendments also would eliminate the requirement of obtaining a permit, provided that all of the specified conditions are met, thereby reducing the cost to the residential user of recycling graywater.

Conclusion

The Department respectfully requests the EIB to amend its Liquid Waste Disposal Regulations, 20.7.3 NMAC, to allow for the discharge of graywater. The Department believes that its proposed amendments will bring the regulations into accord with the intention of the Legislature as expressed in HB 114 (2003), that it will not create an unreasonable risk to human health or the environment, that it will provide benefits, and that it is technically practical.

References Cited

Casanova, L.M., V. Little, R.J. Frye, and C.P. Gerba, 2001, *A Survey of the Microbiological Quality of Recycled Household Graywater*, Journal of the American Water Resources Association, v. 37, no. 5, pp. 1313-1319.

U.S. Environmental Protection Agency (EPA), 1980, *Design Manual, Onsite Wastewater Treatment and Disposal Systems*, Report EPA 625/1-80-012, p. 58.

Appendix A

Proposed Amendments to 20.7.3, NMAC Liquid Waste Disposal Regulations for Graywater

The **additions** to the amendments proposed by NMED in the Notice of Public Hearing consist of changing the terms “applied” and “application” to “discharged” and “discharge”, changing “household gardening” to “household flower gardening”, and adding sections l through r to 20.7.3.300.J.1.

TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 7 WASTE WATER AND WATER SUPPLY FACILITIES
PART 3 LIQUID WASTE DISPOSAL

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20.7.3.7 DEFINITIONS: As used in this Part [20.7.3 NMAC]:

....

J. "black[-]water" means waste from a liquid flushing toilet, urinal [~~or garbage disposal~~], kitchen sinks, dishwashers or laundry water from the washing of material soiled with human excreta, such as diapers;

....

AF. [~~"greywater" means water carried waste from kitchen (excluding garbage disposal) and bathroom sinks, wet bar sinks, showers, bathtubs and washing machines. Greywater does not include water carried wastes from kitchen sinks equipped with a garbage disposal, utility sinks, any hazardous materials, or laundry water from the washing of material soiled with human excreta]~~ "graywater" means untreated household wastewater that has not come in contact with toilet waste and includes wastewater from bathtubs, showers, washbasins, clothes washing machines and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers or laundry water from the washing of material soiled with human excreta, such as diapers;

AO. "liquid waste" means gr[e]ay[]water or blackwater which may contain without limitation human excreta and water carried waste from typical residential plumbing fixtures and activities, including, but not limited to, wastes from toilets, sinks, showers, baths clothes- and dish-washing machines, and floor drains. Specifically excluded from the definition of liquid waste are commercial process wastewaters, roof drainage, mine or mill tailings or wastes, and wastes containing high concentrations of stabilizing or deodorizing agents;

....

20.7.3.200 PROCEDURES:

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A. Liquid Waste System Permits:

(1) No person shall install or have installed a new on-site liquid waste system or modify or have modified an existing on-site liquid waste system, unless that person obtains a permit issued by the Department prior to construction of such installation or modification.

(a) No person shall construct or modify a dwelling on, or transport a dwelling onto, a lot for which an on-site liquid waste system is required unless the Department has issued an on-site liquid waste system permit prior to such construction, modification, or transportation.

(b) No person shall construct, install, repair or modify an on-site liquid waste system unless that person holds a valid contractors license issued by the New Mexico Construction Industries Division, except that a single family residential property owner may construct, install, repair or modify permitted septic tanks and conventional trench or bed disposal fields on his or her own property after obtaining a permit without such a license.

(c) A permit is not required for graywater discharges or for systems designed for the discharge of graywater that meet the requirements of 20.7.3.300.J.

....

20.7.3.300 STANDARDS:

A. General Requirements:

(1) No person shall discharge untreated liquid waste except into a permitted enclosed system, a permitted liquid waste treatment unit, or a public sewer system, except for discharges of graywater pursuant to 20.7.3.300.J. No person shall discharge liquid waste or effluent into a cesspool or effluent disposal well. A privy may be used for the disposal of human excreta and toilet paper, but not for the disposal of other liquid wastes.

....

J. Graywater Discharges:

(1) Graywater discharge of less than 250 gallons per day of private residential graywater originating from a residence for the resident's household flower gardening, composting or landscaping irrigation shall be allowed if:

(a) a constructed graywater distribution system provides for overflow into the sewer system or on-site wastewater treatment and disposal system;

(b) a graywater storage tank is covered to restrict access and to eliminate habitat for mosquitos or other vectors;

(c) a graywater system is sited outside of a floodway;

(d) graywater is vertically separated at least five feet above the ground water table;

(e) graywater pressure piping is clearly identified as a nonpotable water conduit;

(f) graywater is used on the site where it is generated and does not run off the property lines;

(g) graywater is discharged in a manner that minimizes the potential for contact with people or domestic pets;

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(h) ponding is prohibited, discharge of graywater is managed to minimize standing water on the surface and to ensure that the hydraulic capacity of the soil is not exceeded;

(i) graywater is not sprayed;

(j) graywater is not discharged to a watercourse;

(k) graywater use within municipalities or counties complies with all applicable municipal or county ordinances enacted pursuant to Chapter 3, Article 53 NMSA 1978;

(l) graywater is not stored longer than 24 hours before being discharged;

(m) graywater use for purposes other than irrigation or composting is prohibited, unless a permit for such use is issued by the Department;

(n) graywater is not used to irrigate food plants except for fruit and nut trees;

(o) graywater is discharged to a mulched surface area or to an underground irrigation system;

(p) graywater is not discharged closer than 100 feet to a watercourse or private domestic well, or closer than 200 feet to a public water supply well;

(q) graywater does not create a public nuisance; and

(r) for residential units using an on-site liquid waste system for blackwater treatment and disposal, the use of a graywater system does not change the design, capacity, or absorption area requirements for the on-site liquid waste system at the residential unit, and the on-site liquid waste system is designed and sized to handle the combined blackwater and graywater flow if the graywater system fails or is not fully used.

....