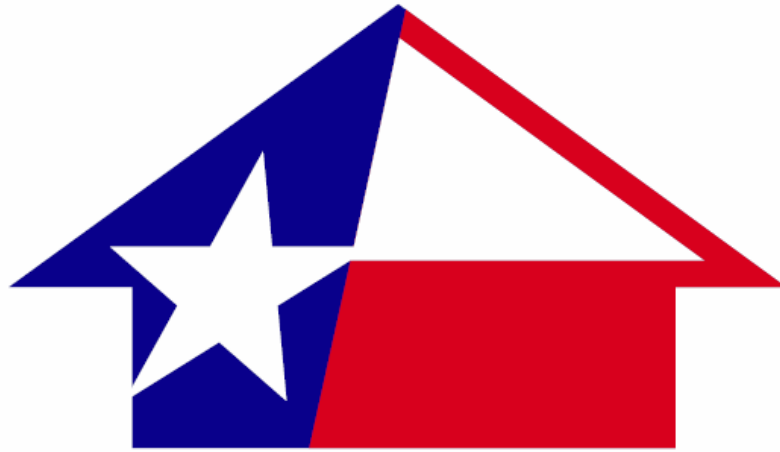




Rain Harvesting & Water Recycling Task Force



Texas Residential Construction Commission ***Quality Construction for Texans***

Report to the Texas Residential Construction Commission

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EXECUTIVE SUMMARY

THE TASK FORCE

The Rain Harvesting and Water Recycling Task Force (task force) of the Texas Residential Construction Commission was formed in April 2004¹ to allow the commission to implement Section 430.004 of the Property Code. The task force was charged with developing design recommendations for residential construction that encourage rain harvesting² and water recycling³ by:

- Identifying the various systems used for rain harvesting and water recycling;
- Identifying the benefits and drawbacks of implementing rain harvesting and water recycling systems in residential dwellings;
- Evaluating standardized design guidelines for rain harvesting and water recycling systems;
- Evaluating and recommending best management practices for rain harvesting and water recycling; and,
- Identifying and recommending educational topics and information delivery to both the public and home building industry regarding residential rain harvesting and water recycling.

TASK FORCE RECOMMENDATIONS

The task force gathered information, shared and explored ideas, and evaluated the cost/benefit of various approaches to rain harvesting and water recycling before developing recommendations for the commission. The task force has refrained from making technical rain harvesting and recycling system recommendations in this report because the variables that must be considered before designing and implementing a system are as numerous as the population of Texas. The task force recommends the commission consider implementing a program to:

Why harvest rainwater?

- *Save money by reducing the volume of water purchased from public systems;*
- *Ensure an adequate water supply;*
- *Conserve Texas's valuable natural water resource for future generations;*
- *Improve the quality of life – rain water is softer for washing and bathing;*
- *Save money by extending the life of plumbing fixtures and appliances;*
- *Avoid interrupted service from centralized water systems or overuse of water from a well; and,*
- *Potentially avoid the cost of accessing public water systems when it is not economically feasible.*

¹ See Appendix A for the membership listing.

² Rain Harvesting: the collection of rain for later use

³ Water Recycling: the planned and deliberate use of harvested waters, rain and waters generated by household functions, for later non-potable use.

- Develop resource information for homeowners and builders/remodelers seeking information on rain harvesting and water recycling;
- Encourage homeowners to implement basic methods of rain harvesting that are practical and easily adapted to new and pre-existing homes;
- Encourage the use of water efficient landscape designs in home construction projects;
- Encourage the selection of water efficient fixtures when constructing or replacing existing fixtures and appliances;
- Encourage builders to incorporate rain harvesting systems as an optional offering in new homes and incorporate passive rain catchment systems into landscape and development designs;
- Include the components of rain harvesting and water recycling systems in the limited warranties and building and performance standards adopted by the Texas Residential Construction Commission; and,
- Support any efforts by the Texas Legislature to increase the use of Section 11.32 of the Tax Code that provides property tax exemptions from local governing bodies for water conservation initiatives installed in residential dwellings.

OVERVIEW

The Rain Harvesting and Water Recycling Task Force held monthly meetings from April 2004 through November 2004. During initial meetings, the task force members evaluated design options of rain harvesting and water recycling systems for incorporation into single-family and duplex dwellings.

The task force quickly concluded that it was not practical to create a design for rainwater harvesting or water recycling in a residential structure since addressing the health issues, diversity in use levels, family needs, weather conditions, local zoning issues and the innumerable variations of house designs could not all be adequately addressed. Instead, the task force believes that each rain harvesting or water recycling system should be designed and built to best address the combination of each consideration in its unique setting. As a result, the task force has included information about the design logic for several commonly employed forms of rainwater harvesting and water recycling, including descriptions and diagrams.

It is imperative that when designing and implementing a system, the expertise reflected in development of state and federal health and safety codes that prescribe the installation of components and the use of harvested or recycled waters be followed completely. The requirements of the Texas Water Development Board and the local water board, the health agencies and the Texas Commission for Environmental Quality should be researched and the appropriate permitting be obtained before beginning work on the installation of any system. When formulating the recommendations, the task force endeavored to assess the most recent information from every regulatory body to evaluate the impact on each recommendation.

Example of Rain Harvesting Potential of a Home	
Square Feet of the Roof Catchment Area	1,200
Divided by 1,000	1.2
Multiply by 550 (to obtain gallons per inch of rain)	660
Multiply by Average Rainfall in the Area	20
Total Rain Harvesting Potential of a Home (<i>gallons per year</i>)	13,200

A true long-term solution to saving our natural resources for tomorrow's Texans, in the end, can only be obtained through educating the consumers of today and tomorrow. Increasing the awareness within the residential construction industry on the advantages and rewards of using sound water conservation practices can also play a major role in making Texas a leader in the incorporation of water-saving systems in residential construction projects. Applying resources to reach these target populations with information about rainwater harvesting and water recycling would assist the state in reaching a long-term solution to water shortages.

RECOMMENDATION 1

Develop resource information for homeowners and builders/remodelers seeking information on rain harvesting and water recycling.

The Texas Residential Construction Commission (commission) has regulatory authority over residential construction performance levels across the state. The commission's information delivery systems, primarily its Web site, attract current and prospective homeowners as well as building professionals. With more than 130,000 residential construction projects registered in the first 12 months, and a greater number of registrations projected annually, it is readily apparent that the commission has wide access to Texas residents who could benefit from the unification of information about rainwater harvesting and water recycling. In addition, the commission can provide information to the more than 18,500 builders/remodelers currently registered at the time of this publication. The task force believes that the commission can be effective in providing rain harvesting and water recycling information materials to a large statewide audience.

Consumers interested in water conservation may abandon even the simplest methods of rain harvesting and water recycling when faced with the wide array of information. In addition to businesses that sell rain harvesting and water recycling products, a multitude of government authorities and regulatory, political and for-profit entities provide information on rain harvesting and water recycling. As a result, the commission must focus on creating a clearing house of easily understood introductory language and relevant resources to retain owner interest in the inclusion of rain harvesting and recycling components in home design and home purchase requests.

Since the commission is required to prepare public interest information describing the functions of the commission, the inclusion of recommended strategies to encourage rain harvesting and water recycling could be accomplished easily and would be helpful to homeowners. The commission can provide a cost-effective, yet high profile, delivery of this information to the public, allowing homeowners and builders/remodelers the choice of including such designs in their construction projects. The commission's Web site should:

- Describe in non-technical language rain harvesting systems and the basics of incorporating such systems into new and existing housing;
- Describe in non-technical language, the information necessary for understanding the proper uses and maintenance of graywater⁴ recycling systems for single family residences;
- Provide access to information for the homeowner to determine the appropriate level of participation in rain harvesting and water recycling;
- Maintain references, web links or contact information about local, federal and state water recycling regulatory agencies with oversight of graywater recycling;

⁴ Graywater is wastewater drained from clothes washing machines, showers, bathtubs, hand washing lavatories, and sinks not used for the disposal of hazardous or toxic ingredients. The term does not include wastewater that has come in contact with toilet waste; from the washing of material, including diapers, soiled with human excreta; or from sinks used for food preparation or disposal.

- Provide general information on the investment, return on investment and tax benefits (Appendix B: Tax Code Sec. 151.355) for the installation of rain harvesting and water recycling systems;
- Provide information on the environmental benefits related to the installation of residential harvesting and recycling system selections including the reduction of public water system usage;
- Produce promotional materials to increase awareness of rain harvesting and water recycling for homeowners and home builders/remodelers; and,
- Introduce events that promote rain harvesting and water recycling.

The commission's Web site received approximately 7,000,000 hits from March 2004 through December 2004. A focused Web site area that serves as a central repository for current information on rain harvesting and water recycling, with links to specific information on method and compliance, will attract repeat Web site visitors, both public and industry related. Information developed for the Web site should take into consideration that:

- Homeowners have opportunities for low-cost rain harvesting projects even after the design and/or construction stage of the home has been completed;
- Rain harvesting and water recycling issues are often misunderstood. By publicizing rain harvesting and water recycling at events, the commission could demonstrate harvesting and recycling as practical for both homeowners and home builders/remodelers; and,
- Encouraging voluntary water conservation habits in the residential environment can produce positive results similar to those produced by the movement for residential solid waste recycling. For example, the City of Austin reports that the diversion of solid waste due to recycling in fiscal years 1991 to 2003 increased 19.37%. In the same time period, the brush and bulk diversion increased 22.04% (Appendix E).

Successfully increasing exposure to the issue of rainwater harvesting and water recycling would develop a heightened awareness of water conservation issues across Texas. Heightened awareness will lead to an increase in the number of Texans that partake in rain harvesting or water recycling measures that will increase their water self-sufficiency and reduce the per capita direct draw on water sources.

RECOMMENDATION 2

Encourage homeowners to implement basic methods of rain harvesting that are practical and easily adapted to new and pre-existing homes.

Many consumers believe that rain harvesting and water recycling systems are health risks and require a large monetary investment and complicated maintenance. However, most basic systems are low-cost and easily maintained to avoid health concerns. Because of the diversity in products, homeowners can choose rain harvesting and water recycling systems designed to meet their specific needs. When choosing a system, maintenance levels, system lifecycles and the anticipated term of occupancy should be considered. The following chart provides information on the most basic systems commonly employed in residential construction.

	CATCHMENT SYSTEM	STORAGE	WATER USE	MAINTENANCE LEVEL	COST LEVEL
Rain Harvesting	Rooftop, Gutters	Barrels or Cisterns	Landscape Irrigation	Minimal	Low
Air Conditioning Condensate Recycling	Condensate Discharge Lines	N/A	Landscape Irrigation	Minimal	Low
Passive Rain Harvesting	Retention Ponds	Ponds	Landscape Irrigation	Minimal to Intermediate	Varies
Passive Rain Harvesting	Landscape Berms	N/A	Erosion Control and Groundwater Recharge	Minimal	Low

RECOMMENDATION 3

Encourage the use of water efficient landscape designs in home construction projects.

With the increasing use of sprinkler systems over the last decade, many municipalities have resorted to water rationing for residential use by restricting water days and time periods. In order to lower the demand for water for landscaping, the use of xeriscaping and other water friendly planting techniques has begun to take hold. Homeowners are realizing that moderating the use of water in dry seasons has financial benefits and helps maintain plentiful, quality water sources.

However, most homeowners are unaware that a little work and planning in designing a landscape could produce large dividends as well. Berms and catchment ponds can be used to reduce the reliance on supplied water by diverting the water already there to meet the needs of the particular landscape. Targeting landscape architects, nurserymen and homeowners with information about the benefits of water efficient landscape designs could pay large dividends to the state's water conservation efforts.

St. Augustine	50 inches per year
Buffalo Grass	25 inches per year
Bermuda	40 inches per year
Zoysia	45 inches per year
St. Augustine/Bermuda mix	45 inches per year

RECOMMENDATION 4

Encourage the selection of water efficient fixtures when installing new or replacement fixtures and appliances.

Ensuring the availability of water actually starts with simple conservation practices, including the installation of low water use plumbing fixtures and water efficient household appliances, moderated use of water in dry seasons, and maintenance of water sources for optimum performance.

The following table shows examples⁵ of water savings when water efficient units are installed:

UNIT	WATER USE
Pre-1980 commode	4.5 – 7.0 gallons per flush
1980 – 1992 commode	3.5 gallons per flush
Low consumption commode (current Texas code requirement)	1.6 gallons per flush
The average faucet uses:	0.5 – 5.0 gallons per minute
Faucet aerators reduce flow by:	1.0 gallon per minute
Standard showerheads use:	4.0 – 7.0 gallons per minute
Low-flow showerheads use:	2.5 gallons per minute (or less)
Standard domestic washing machine uses:	45.0 – 55.0 gallons per load
Water-efficient washing machines uses:	20.0 – 25.0 gallons per load

⁵ New York City Department of Environmental Protection

RECOMMENDATION 5

Encourage builders to incorporate rain harvesting systems as an optional offering in new homes and incorporate passive rain catchment systems into landscape and development designs.

Builders can take proactive measures to encourage homebuyers to consider including rain harvesting systems by incorporating the rainwater harvesting components in their selection packages. Because gutters are not a required residential construction component in all areas of the state, many home builders offer gutters as part of an options package. Home builders could amend their options package to include a rain barrel or other rain harvesting systems that could become part of the total cost of the house, included in the mortgage. The higher average cost for collection systems for larger volumes of water that require a cistern collection system could also be offered and included in the mortgage financing.

RECOMMENDATION 6

Include the components of rain harvesting and water recycling systems in the limited warranties and building and performance standards adopted by the Texas Residential Construction Commission.

Rain harvesting and water recycling designs are rapidly improving. Should performance standards for a specific system design be adopted, the number of standards addressing this issue could become staggeringly high. However, although installation processes and designs may be rapidly improving, the construction components and the expected performance goals are generally generic, allowing the performance functionality to be easily warranted.

For example, there are performance standards identified for gutters and downspouts. The issue of the water being collected by a rain barrel or cistern versus distributed directly onto the ground remains unchanged when evaluating the performance of gutters and downspouts. Likewise, recirculating the harvested waters requires plumbing that has identified performance standards.

Evaluating performance based on the operation of parts and sub-systems rather than the entire system will allow maximum flexibility in design without diminishing the builder/remodeler warranty obligations.

RECOMMENDATION 7

Support any efforts in the Texas Legislature to increase the use of section 11.32 of the Tax Code that provides property tax exemptions from local governing bodies for water conservation initiatives installed in residential dwellings.

The Texas Tax Code §11.32 allows municipalities, school districts, counties and other taxing units to provide tax relief for water conservation. While these tax breaks have primarily been focused on commercial transactions or complete developments, they can be used to encourage rain harvesting and water recycling for residential construction. Legislative action could encourage the expansion of taxing authority programs for residential dwellings which would provide financial incentive to offset the installation costs of rainwater harvesting and water recycling systems.

Tax Code §11.32. CERTAIN WATER CONSERVATION INITIATIVES. The governing body of a taxing unit by official action of the governing body adopted in the manner required by law for official actions may exempt from taxation part or all of the assessed value of property on which approved water conservation initiatives, desalination projects, or brush control initiatives have been implemented. For purposes of this section, approved water conservation, desalination, and brush control initiatives shall be designated pursuant to an ordinance or other law adopted by the governing unit.

REPORT BACKGROUND

In the mid-nineteenth century the prevalence of public water systems guaranteeing the consistent distribution of clean affordable water led to the abandonment of the time-honored methods of rain harvesting and water recycling. Urbanized society, at that time, considered rain harvesting and water recycling to be undesirable for the health and safety of millions of people living in proximity.

However, as the population and its per capita water use increases, areas of Texas are rapidly reaching the maximum capacity of available water resources. The Texas Water Development Board reported that the concern of water quantity is very high among those most involved in water issues. This issue ranks number one among environmental problems in Texas among stakeholders.⁶ Community leaders, planners and the general public are beginning to recognize that water is a limited resource and have begun taking steps to address the growing concern over water. These factors have helped to renew the interest in rain harvesting and water recycling, as well as the:

- Desire for improved water quality;
- Need to provide primary or additional water sources;
- Need to reduce demand on the public water system;
- Desire to decrease environmental costs for centralized water systems; and
- Belief that there are efficiencies, both economical and environmental, to be realized from the use of harvested rainwater and water recycling.

For purposes of this report, rain harvesting is defined as the collection and appropriate storage of rain for later use. Water recycling is defined as the planned and deliberate use of harvested waters for non-potable⁷ use.

Several strategies for rain harvesting and water recycling exist, and perhaps the most basic strategy for rain harvesting and water recycling includes collecting rain and air conditioning condensate⁸ for non-potable use in barrels, cisterns and ponds. Harvesting rain for potable use requires storage, filtration and compliance with health standards. Recycling graywater for non-potable purposes requires careful design and maintenance to ensure that safeguards administered by the Texas Commission on Environmental Quality (Appendix D), the Texas Health and Human Services Commission (Appendix C), Texas Board of Plumbing Examiners and local health authorities are met. The following table identifies several major rainwater harvesting and water recycling systems by category and indicates the perceived complexity of administering each system. Several factors were considered when developing the chart, including evaluating the amount of ongoing maintenance and initial cost level of each system.

⁶ Texas Water Development Board, Statewide Water Conservation Public Awareness Research Study, 2004.

⁷ Non-potable water is considered unsafe or unpalatable for drinking. Potable water is water suitable for drinking.

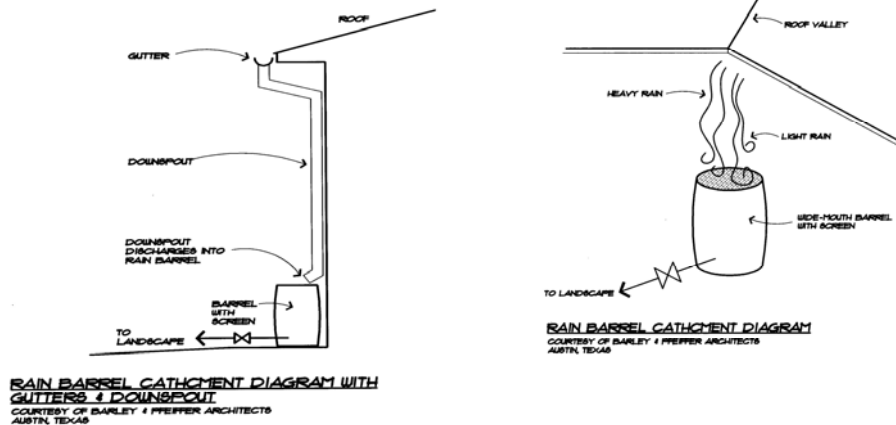
⁸ Air conditioning condensate is the by-product of the process of cooling interior air.

	CATCHMENT SYSTEM	STORAGE & TREATMENT	WATER USE	MAINTENANCE LEVEL	COST
Rain Harvesting	Rooftop, Gutters	Barrels or Cisterns	Landscape Irrigation	Minimal	Low
Air Conditioning Condensate Recycling	Condensate Discharge Lines and Barrells	N/A	Landscape Irrigation	Minimal	Low
Passive Rain Harvesting	Retention Ponds	Ponds	Landscape Irrigation	Minimal to Intermediate	Varies
Passive Rain Harvesting	Landscape Berms	N/A	Erosion Control/ Groundwater Recharge	Minimal	Low
Rain Harvesting for Potable Use	Rooftop & Gutters	Cisterns & Filtering Systems	Potable	Minimal to Intermediate	Moderate
Sewage Recycling (including graywater)	Plumbing System	Septic Tank with Aerobic System	Landscape Irrigation	Intermediate	Moderate
Graywater Recycling	Plumbing System	Cistern with filtering prior to storage and purification prior to use	Non-potable	Complex	Expensive

RAIN HARVESTING:

Basic rain harvesting systems are generally considered to be affordable by most homeowners. The cost can be as little as \$100 to purchase a rain barrel, purchase of which is exempt from state sales tax. Typical downspouts are easily modified to work with a barrel.

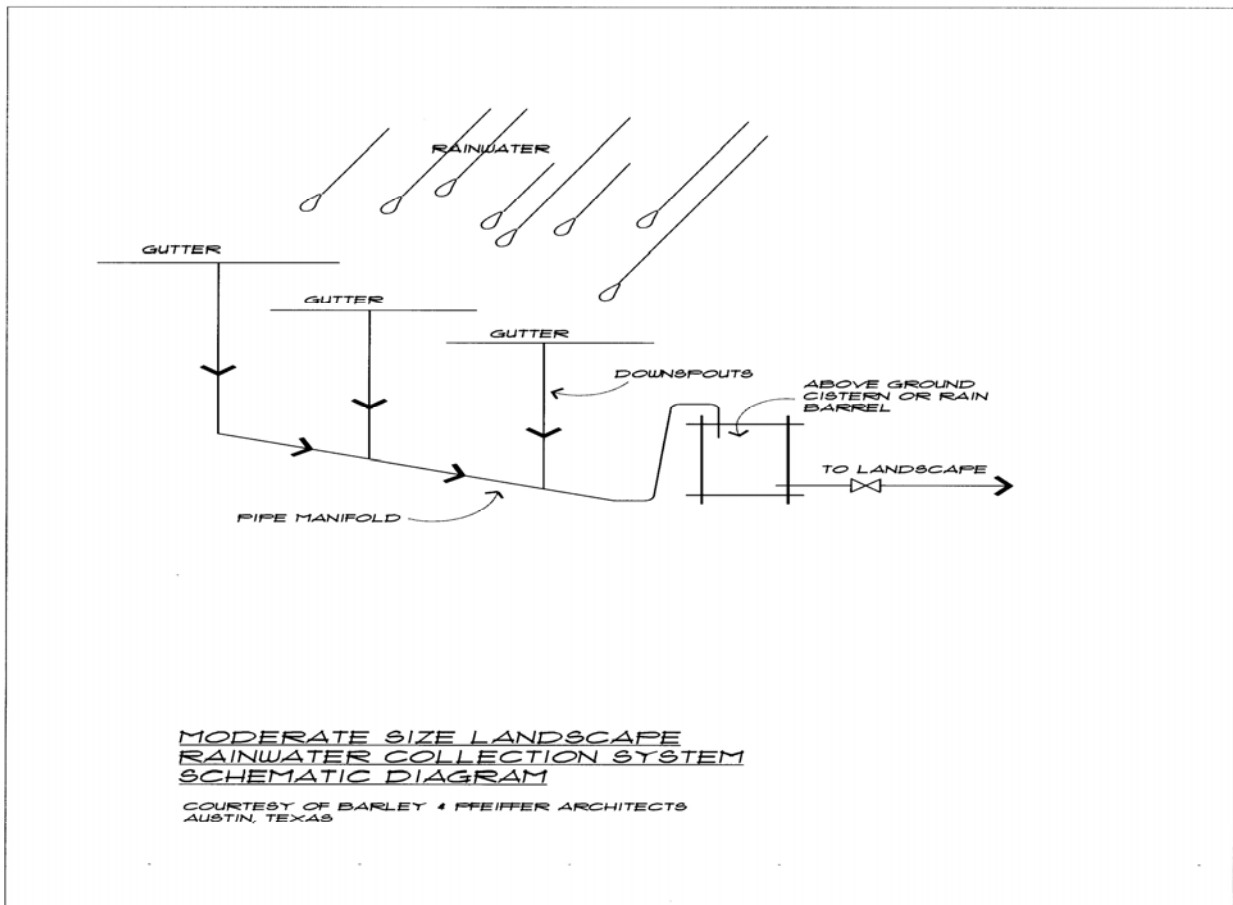
The left side of the diagram illustrates a simple rain barrel catchment design generally incorporated with installed guttering. The diagram on the right illustrates the use of a rain barrel catchment system for roof water runoff that can be employed on a home without a gutter system.



Most of the basic rain harvesting

systems can be assembled with readily available materials by homeowners that have a rudimentary understanding of plumbing and some construction skills.

Cisterns are designed to collect greater quantities of water than barrels. Cisterns may be either above ground or below ground and are more expensive to purchase and install than rain barrel systems. Typically cistern systems are used to supply potable water or to supply irrigation systems. The design and construction of the catchment portion of a cistern system is not difficult, although depending on water use, may be more expensive and time consuming to maintain. The diagram below illustrates the use of an above ground cistern and catchment system. Cisterns are often placed underground to collect and store the largest quantities of harvested water to minimize the land space needed for the system.



Many times, harvesting water for non-potable purposes will result in a financial savings to a homeowner by reducing the amount of water purchased from the producer (usually the local city or Municipal Utility District). In fact, many cities offer rebates for homeowners that purchase rain water harvesting systems.

Rain harvesting also positively impacts the ability of a producer to maintain purified water necessary for use by a public water system. Although Texas has areas and seasons where rainfall is scarce, every area of the state generally produces enough rainfall to make rain harvesting a valid investment and if generally employed throughout the state, would help reduce the state's

dependence on ground water and aquifer systems. The following rain harvesting tables provide information about average rainfalls and the estimated amount that can be harvested based upon the size of a roof and the average rainfall.

Average annual rainfall of certain Texas cities

CITY	Average ANNUAL Rainfall
Abilene	24.40
Amarillo	19.56
Austin	31.88
Brownsville	26.61
Corpus Christi	30.14
Dallas/Fort Worth	33.70
El Paso	8.65
Houston	50.83
Lubbock	18.65
Lufkin	58.54
Midland Odessa	14.96
San Antonio	30.98
Tyler	43.00

Annual yield in gallons based upon roof size and rainfall amount

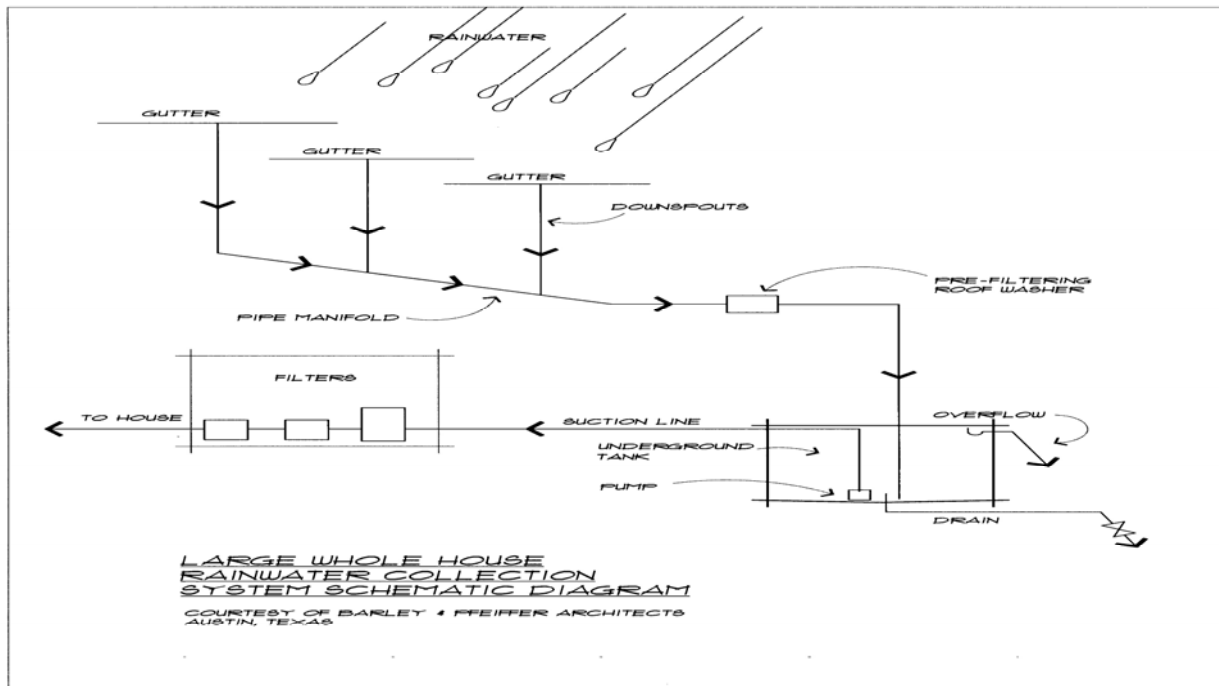
Sq Ft of Roof	Annual Rainfall (in inches)									
	9	15	20	24	28	32	40	44	48	50
1,000	4,950	8,250	11,000	13,200	15,400	17,600	22,000	24,200	26,400	31,900
1,200	5,940	9,900	13,200	15,840	18,480	21,120	26,400	29,040	31,680	38,280
1,400	6,930	11,550	15,400	18,480	21,560	24,640	30,800	33,880	36,960	44,660
1,600	7,920	13,200	17,600	21,120	24,640	28,160	35,200	38,720	42,240	51,040
1,800	8,910	14,850	19,800	23,760	27,720	31,680	39,600	43,560	47,520	57,420
2,000	9,900	16,500	22,000	26,400	30,800	35,200	44,000	48,400	52,800	63,800
2,200	10,890	18,150	24,200	29,040	33,880	38,720	48,400	53,240	58,080	70,180
2,400	11,880	19,800	26,400	31,680	36,960	42,240	52,800	58,080	63,360	76,560

Ponds are often installed simply for the pleasure of having a water element as part of a landscape plan, but they can be easily modified to provide containment collection and distribution services. Additionally, berms are used to create a landscape accent, and when properly designed, control the amount of runoff water and direct it to a collection source.

The calculation to determine the gallons of water that can be harvested is performed by dividing the total square feet of the roof catchment area by 1,000, then multiplying by 550 (to determine gallons collected per one inch of rain), then multiplying by average annual rainfall of the area. The average family water usage each month is between 2,500 – 4,000 gallons.

Potable Water Systems:

Although rain harvesting methods for potable use are more complex to implement than harvesting and recycling for non-potable use, these systems are generally easy to maintain and provide greater flexibility to homeowners. The correct selection of roofing materials is integral to the system's optional functionality. Generally these systems rely on unpainted-metal roofing coated with a non-oil finish since these are smoother, less likely to harbor mildew and avoid discharging other materials that can clog filter systems. Often, these roofs do not comply with homeowner association bylaws for aesthetic purposes and some municipalities have codes prohibiting metal roofs.



Composition roofing materials may shed hydrocarbons used in the fabrication, and surface granules may clog the filter system. In addition, composition shingles, clay tiles and concrete tiles are rough and more porous than metal roofing resulting in a tendency to collect dirt and harbor mildew, which complicates the filtering processes.

These systems operate using a guttering system that transfers water to holding tanks large enough to service potable use. The gutters used for these systems are generally made of aluminum to avoid the introduction of rust into the system. A system is usually designed to limit runs to approximately 50 feet in length and each gutter is usually 6 inches wide with 4 inch downspouts. Other gutter materials commonly used for these systems include copper and galvanized steel coated with zinc and aluminum.

The harvested water is directed through a roof washer or pre-filter prior to moving to the cistern. Once in the cistern, the water is stored until needed and then pumped through a series of filtering and treatment systems before distribution.

GRAYWATER

Graywater cannot be recycled for potable use. Additionally, it is difficult to employ a recycling system for graywater that can generate enough useable water to be cost effective. Graywater recycling components are often expensive and not easily maintained. From a practical perspective, most users interested in graywater recycling have already installed water efficient appliances making it difficult to obtain a water savings impact of sufficient size to warrant the cost of installation and maintenance.

Adding to the difficulty in creating a practical graywater recycling system, the International Construction Code for Residential Construction (IRC) and the International Residential Plumbing Codes (IRPC) do not address some of the installation requirements of a graywater recycling system. Consequently, in areas where construction permitting and inspection are required, it is often difficult to obtain authorization of the plumbing installations necessary for proper operation of a graywater system.

Graywater recycling requires strict adherence to maintenance practices for the health and safety of the consumers as well as for the ecological systems that can be contaminated by improperly recycled or discharged water. The Texas Commission on Environmental Quality warns that:

- Graywater contains biologic contaminants;
- Often creates problems when systems are abandoned or not properly maintained; and,
- Users must guard against blackwater back flow into a graywater system.

Graywater recycling for non-potable use in single-family residences must meet stringent health and environmental standards established by the Texas Commission on Environmental Quality (Appendix D) and local health authorities. Ongoing vigilance is required by homeowners to maintain compliance with all regulations. Most graywater recycling systems are abandoned by the original or subsequent homeowner after five years.

Household waters eligible for recycled use are limited. The homeowner has to be careful to monitor to insure that even these waters are not accidentally tainted. The sources of water that cannot be used are referred to as “blackwater.” Tainting occurs when bacteria and pathogens, usually found in blackwater enter a graywater source. For example, a homeowner may not collect washing machine waters from the items cleaned that were in contact with human waste.

- Graywater sources:
 - Clothes washing machines;
 - Showers, bathtubs, hand washing lavatories; and,
 - Sinks that are not used for disposal of hazardous or toxic ingredients
- Blackwater sources:
 - Toilet waste;
 - Waters drained from the washing of toxic materials, including diapers soiled with human excreta; and
 - Sinks used for food preparation or disposal.

For the protection of all Texans, there are several agencies that administer water recycling regulations pertaining to graywater. Authorization from at least one, and sometimes several of these agencies, as well as local health departments, is required if the graywater is generated by a private residence and the system is designed to be diverted to an organized and underground water collection system. Despite all of these regulations, health issues resulting from potential system mismanagement are still a concern to individual homeowners and health professionals.

Generating a sufficient amount of water recycled from graywater for household use requires sophisticated filter systems, ongoing maintenance and testing for water quality. Recycled water must be properly stored and filtered according to health guidelines. As it leaves the storage facility, the water is passed through filtration and cleansing systems.

Further, graywater must be handled to protect the quality of surface water and groundwater. As a result, the use of graywater to meet outside needs requires adherence to health standards.

For these reasons, the task force, while including graywater recycling in its study, does not support promoting integration of graywater recycling as part of a single family residential plan for reducing dependence on public water utility systems.

THE ADVANTAGES OF RAIN HARVESTING AND WATER RECYCLING

In many areas, existing public water supplies are reaching their maximum distribution capabilities. Many water utility providers have responded by attempting to limit the number of times water can be accessed, employing tier pricing to encourage decreased usage and limiting the availability of new service.

Environmental concerns have been raised regarding degraded purity levels of the aquifers and lakes that feed wells and public water sources due to the continued exposure to chemicals, petroleum by-product runoff and concentrated levels of natural pollutants. As a result, public water systems use chlorine and other chemicals to make certain that water is safe to drink. Some homeowners prefer not to have chemicals infused into their drinking and household use water because of concerns that range from taste to chemical damage to plants.

Additionally, many areas of the state are provided “hard” water or water that contains minerals and deposits. The use of “hard” water can have negative long-term effects on appliances and plumbing. Rain harvesting systems not only provide “soft,” high quality water, but they reduce the homeowner’s reliance on public water systems.

Single family residences, practicing even the most basic methods of rain harvesting, can reduce the volume of water purchased from centralized water systems. This reduction translates into real dollar savings for the family, reduces stress on natural water sources and reduces the strain on the capabilities of public water and storm water drain systems.

THE DISADVANTAGES OF RAIN HARVESTING AND WATER RECYCLING

Harvesting for Non-potable Purposes:

Harvesting and recycling for non-potable purposes are basic processes. However, when working with any type of water resource, simple health and safety standards must be followed. Standing water stagnates and can create an environment conducive to bacteria growth and insect breeding. For both health and safety reasons, rain barrels and cisterns should be tightly covered and regularly examined for leaks. Installing a recirculation pump in catchment ponds provides continuous water motion reducing the opportunity for stagnation. Hands should be washed after working with the catchment systems or water delivery equipment for standard personal hygiene practices.

Few, if any, municipalities regulate barrel catchment systems; however, standards and requirements regarding the installation of cisterns may be regulated. It is not uncommon for deed restrictive homeowners associations to ban barrel catchment installation for aesthetic reasons. Additionally, municipalities and homeowners associations often regulate the size or depth of a residential pond. It is important to fully research and comply with all regulations before installing a rain harvesting or water recycling system.

Rain Harvesting for Potable Purposes:

Rain harvesting for potable use requires installing and maintaining a filtration and sanitizing system, and although the purity rate of rainwater is relatively good, disinfection is required. To be efficient, these systems usually employ larger than standard gutters, roofing materials that do not shed debris or contaminants, a filtration system and a large capacity underground storage cistern unit. While these systems are not complicated, they do require monitoring and adherence to health standards (Appendix C), thus the intermediate ranking for maintenance.

APPENDIX A

TEXAS RESIDENTIAL CONSTRUCTION COMMISSION RAIN HARVESTING & WATER RECYCLING TASK FORCE

The task force membership includes a representative of the Austin Energy Green Building program, several builders and an architect - all of whom are experienced with the incorporation of rain harvesting and water recycling components into residential construction. In addition, the members have incorporated one or more of these components in their personal homes.

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Austin Energy
Green Building Program
Austin, TX

Chuck Lemmond

Bear Creek Home, Inc.
Austin, TX

APPENDIX B

TAX CODE SECTION 151.355

§151.355. WATER-RELATED EXEMPTIONS. The following are exempted from taxes imposed by this chapter:

- (1) Rainwater harvesting equipment or supplies, water recycling and reuse equipment or supplies, or other equipment, services, or supplies used solely to reduce or eliminate water use;
- (2) Equipment, services, or supplies used solely for desalination of surface water or groundwater;
- (3) Equipment, services, or supplies used solely for brush control designed to enhance the availability of water;
- (4) Equipment, services, or supplies used solely for precipitation enhancement;
- (5) Equipment, services, or supplies used solely to construct or operate a water or wastewater system certified by the Texas Commission on Environmental Quality as a regional system; and,
- (6) Equipment, services, or supplies used solely to construct or operate a water supply or wastewater system by a private entity as a public-private partnership as certified by the political subdivision that is a party to the project.

APPENDIX C

**HEALTH & SAFETY CODE
CHAPTER 341**

HEALTH & SAFETY CODE

TITLE 5. SANITATION AND ENVIRONMENTAL QUALITY

SUBTITLE A. SANITATION

CHAPTER 341. MINIMUM STANDARDS OF SANITATION AND HEALTH PROTECTION

MEASURES

SUBCHAPTER A. GENERAL PROVISIONS

Sec. 341.001. DEFINITIONS. In this chapter:

- (1) "Board" means the Texas Board of Health.
- (2) "Department" means the Texas Department of Health.
- (3) "Drinking water" means water distributed by an individual or public or private agency for human consumption, for use in preparing food or beverages, or for use in cleaning a utensil or article used in preparing food or beverages for, or consuming food or beverages by, human beings. The term includes water supplied for human consumption or used by an institution catering to the public.
- (4) "Human excreta" means the urinary and bowel discharges of a human.
- (5) "Person" means an individual, corporation, organization, government, business trust, partnership, association, or any other legal entity.
- (6) "Privy" means a facility for the disposal of human excreta.
- (7) "Sanitary" means a condition of good order and cleanliness that precludes the probability of disease transmission.
- (8) "Septic tank" means a covered water-tight tank designed for sewage treatment.
- (9) "Toilet" means the hopper device for the deposit and discharge of human excreta into a water carriage system.
- (10) "Tourist court" means a camping place or group of two or more mobile or permanent housing units operated as rental property for the use of transient trade or trailer units housing humans.
- (11) "Water supply" means a source or reservoir of water distributed and used for human consumption.
- (12) "Water supply system operator" means a person

who:

(A) is trained in the purification or distribution of a public water supply;

(B) has a practical working knowledge of the chemistry and bacteriology essential to the practical mechanics of water purification; and

(C) is capable of conducting and maintaining the purification processes in an efficient manner.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989.

Sec. 341.002. RULES FOR SANITATION AND HEALTH PROTECTION. The board may:

(1) adopt rules consistent with the purposes of this chapter; and

(2) establish standards and procedures for the management and control of sanitation and for health protection measures.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989.

SUBCHAPTER B. NUISANCES AND GENERAL SANITATION

Sec. 341.011. NUISANCE. Each of the following is a public health nuisance:

(1) a condition or place that is a breeding place for flies and that is in a populous area;

(2) spoiled or diseased meats intended for human consumption;

(3) a restaurant, food market, bakery, other place of business, or vehicle in which food is prepared, packed, stored, transported, sold, or served to the public and that is not constantly maintained in a sanitary condition;

(4) a place, condition, or building controlled or operated by a state or local government agency that is not maintained in a sanitary condition;

(5) sewage, human excreta, wastewater, garbage, or other organic wastes deposited, stored, discharged, or exposed in such a way as to be a potential instrument or medium in disease transmission to a person or between persons;

(6) a vehicle or container that is used to transport garbage, human excreta, or other organic material and that is

defective and allows leakage or spilling of contents;

(7) a collection of water in which mosquitoes are breeding in the limits of a municipality or a collection of water that is a breeding area for *Culex quinquefasciatus* mosquitoes that can transmit diseases regardless of the collection's location other than a location or property where activities meeting the definition of Section 11.002(12)(A), Water Code, occur;

(8) a condition that may be proven to injuriously affect the public health and that may directly or indirectly result from the operations of a bone boiling or fat rendering plant, tallow or soap works, or other similar establishment;

(9) a place or condition harboring rats in a populous area;

(10) the presence of ectoparasites, including bedbugs, lice, and mites, suspected to be disease carriers in a place in which sleeping accommodations are offered to the public;

(11) the maintenance of an open surface privy or an overflowing septic tank so that the contents may be accessible to flies; and

(12) an object, place, or condition that is a possible and probable medium of disease transmission to or between humans.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 2003, 78th Leg., ch. 130, Sec. 1, eff. May 27, 2003.

Sec. 341.012. ABATEMENT OF NUISANCE. (a) A person shall abate a public health nuisance existing in or on a place the person possesses as soon as the person knows that the nuisance exists.

(b) A local health authority who receives information and proof that a public health nuisance exists in the local health authority's jurisdiction shall issue a written notice ordering the abatement of the nuisance to any person responsible for the nuisance. The local health authority shall at the same time send a copy of the notice to the local municipal, county, or district attorney.

(c) The notice must specify the nature of the public health nuisance and designate a reasonable time within which the nuisance must be abated.

(d) If the public health nuisance is not abated within the

time specified by the notice, the local health authority shall notify the prosecuting attorney who received the copy of the original notice. The prosecuting attorney:

(1) shall immediately institute proceedings to abate the public health nuisance; or

(2) request the attorney general to institute the proceedings or provide assistance in the prosecution of the proceedings, including participation as an assistant prosecutor when appointed by the prosecuting attorney.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 1993, 73rd Leg., ch. 648, Sec. 1, eff. Sept. 1, 1993.

Sec. 341.013. GARBAGE, REFUSE, AND OTHER WASTE. (a) Premises occupied or used as residences or for business or pleasure shall be kept in a sanitary condition.

(b) Kitchen waste, laundry waste, or sewage may not be allowed to accumulate in, discharge into, or flow into a public place, gutter, street, or highway.

(c) Waste products, offal, polluting material, spent chemicals, liquors, brines, garbage, rubbish, refuse, used tires, or other waste of any kind may not be stored, deposited, or disposed of in a manner that may cause the pollution of the surrounding land, the contamination of groundwater or surface water, or the breeding of insects or rodents.

(d) A person using or permitting the use of land as a public dump shall provide for the covering or incineration of all animal or vegetable matter deposited on the land and for the disposition of other waste materials and rubbish to eliminate the possibility that those materials and rubbish might be a breeding place for insects or rodents.

(e) A person may not permit vacant or abandoned property owned or controlled by the person to be in a condition that will create a public health nuisance or other condition prejudicial to the public health.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989.

Sec. 341.014. DISPOSAL OF HUMAN EXCRETA. (a) Human excreta in a populous area shall be disposed of through properly managed sewers, treatment tanks, chemical toilets, or privies

constructed and maintained in conformity with the department's specifications, or by other methods approved by the department. The disposal system shall be sufficient to prevent the pollution of surface soil, the contamination of a drinking water supply, the infection of flies or cockroaches, or the creation of any other public health nuisance.

(b) Effluent from septic tanks constructed after September 4, 1945, shall be disposed of through:

(1) a subsurface drainage field designed in accordance with good public health engineering practices; or

(2) any other method that does not create a public health nuisance.

(c) A privy may not be constructed within 75 feet of a drinking water well or of a human habitation, other than a habitation to which the privy is appurtenant, without approval by the local health authority or the board. A privy may not be constructed or maintained over an abandoned well or over a stream.

(d) The superstructure and floor surrounding the seat riser and hopper device of a privy constructed and maintained in conformity with the department's specifications shall be kept in a sanitary condition at all times and must have adequate lighting and ventilation.

(e) Material and human excreta removed from a privy vault or from any other place shall be handled in a manner that does not create a public health nuisance. The material and human excreta may not be deposited within 300 feet of a highway unless buried or treated in accordance with the instructions of the local health authority or the board.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989.

Sec. 341.015. SANITATION OF ICE PLANTS. (a) A person may not go on the platform covering the tanks in which ice is frozen in an ice factory unless the person is an officer, employee, or other person whose duties require that action.

(b) An employee whose services are required on tanks shall be provided with clean shoes or boots that may not be used for any other purpose.

(c) Ice contaminated with sand, dirt, cinders, lint, or

other foreign substance may not be sold or offered for sale for human consumption.

(d) Water used in the manufacturing of ice must be from an approved source and be of a safe quality.

(e) An ice plant operator shall provide sanitary handwashing and toilet facilities for the employees of the plant.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989.

Sec. 341.016. SANITATION OF BUSINESSES; OCCUPATIONAL HEALTH AND SAFETY. (a) A person may not use or permit to be used in a business, manufacturing establishment, or other place of employment a process, material, or condition known to have a possible adverse effect on the health of the person's employees unless arrangements have been made to maintain the occupational environment in a manner that such injury will not occur.

(b) An industrial establishment shall be continually maintained in a sanitary condition.

(c) The department shall make available to the state's citizens:

(1) current information concerning minimum allowable concentrations of toxic gases; and

(2) environmental standards that relate to the health and safety of the employees of industrial establishments in this state.

(d) The department shall survey industrial establishments to study industrial health and sanitation issues, including water supplies and distribution, waste disposal, and adverse conditions caused by processes that may cause ill health of industrial workers.

(e) The department shall give each surveyed establishment a summary of the studies and findings under Subsection (d) and make necessary recommendations for the adequate protection of the health, safety, and well-being of the workers.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989.

Sec. 341.017. SANITATION FACILITIES FOR RAILROAD MAINTENANCE-OF-WAY EMPLOYEES. (a) The board shall adopt reasonable rules to require railroads to provide adequate sanitation facilities for railroad maintenance-of-way employees.

(b) The department may sue in a court of competent jurisdiction to compel compliance with a rule adopted under this section.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989.

Sec. 341.018. RODENT CONTROL. (a) A person who possesses an enclosed structure used or operated for public trade and who knows that the structure is infested with rodents shall:

(1) attempt to exterminate the rodents by poisoning, trapping, fumigating, or other appropriate means; and

(2) provide every practical means of eliminating rats in the structure.

(b) A public building that is constructed after September 4, 1945, must incorporate rat-proofing features.

(c) The board shall promote rodent control programs in rat-infested areas and in localities in which typhus fever has appeared.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989.

SUBCHAPTER C. SANITARY STANDARDS OF DRINKING WATER; PROTECTION OF
PUBLIC WATER SUPPLIES AND BODIES OF WATER

Sec. 341.031. PUBLIC DRINKING WATER. (a) Public drinking water must be free from deleterious matter and must comply with the standards established by the commission or the United States Environmental Protection Agency. The commission may adopt and enforce rules to implement the federal Safe Drinking Water Act (42 U.S.C. Section 300f et seq.).

(b) In a public place or an establishment catering to the public, a common drinking cup may not be used.

(c) Drinking water may not be served except in sanitary containers or through other sanitary mediums.

(d) In this section, "common drinking cup" means a water or other beverage receptacle used for serving more than one person. The term does not include a water or other beverage receptacle that is properly washed and sterilized after each use.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 1993, 73rd Leg., ch. 353, Sec. 3, eff. Sept. 1, 1993; Acts 1997, 75th Leg., ch. 1010, Sec. 6.18, eff. Sept. 1, 1997.

Sec. 341.0315. PUBLIC DRINKING WATER SUPPLY SYSTEM

REQUIREMENTS. (a) To preserve the public health, safety, and welfare, the commission shall ensure that public drinking water supply systems:

- (1) supply safe drinking water in adequate quantities;
- (2) are financially stable; and
- (3) are technically sound.

(b) The commission shall encourage and promote the development and use of regional and areawide drinking water supply systems.

(c) Each public drinking water supply system shall provide an adequate and safe drinking water supply. The supply must meet the requirements of Section 341.031 and commission rules.

(d) The commission shall consider compliance history in determining issuance of new permits, renewal permits, and permit amendments for a public drinking water system.

Added by Acts 1997, 75th Leg., ch. 1010, Sec. 6.19, eff. Sept. 1, 1997.

Sec. 341.032. DRINKING WATER PROVIDED BY COMMON CARRIER. (a) Drinking water provided by a common carrier or the common carrier's agent shall be taken only from supplies certified as meeting the standards established by the commission. The drinking water shall be kept and dispensed in a sanitary manner.

(b) A watering point must meet the standards of sanitation and water-handling practices established for those purposes by the commission. The commission shall certify each watering point that meets those standards.

(c) If a sanitary defect exists at the watering point, the commission shall issue a supplemental certification showing that the watering point is only provisionally approved. If a sanitary defect continues after the expiration of a reasonable time provided to correct the defect, the commission shall notify the common carrier not to receive drinking water at the watering point involved.

(d) In this section:

(1) "Common carrier" means a licensed firm, corporation, or establishment that solicits and operates public freight or passenger transportation service, including a vehicle

employed in that transportation service.

(2) "Watering point" means a place where drinking water is placed aboard a vehicle operated as a common carrier. Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 1995, 74th Leg., ch. 76, Sec. 11.12, eff. Sept. 1, 1995.

Sec. 341.033. PROTECTION OF PUBLIC WATER SUPPLIES. (a) A person may not furnish drinking water to the public for a charge unless the production, processing, treatment, and distribution are at all times under the supervision of a water supply system operator holding a license issued by the commission under Chapter 37, Water Code.

(b) An owner, agent, manager, operator, or other person in charge of a water supply system that furnishes water for public or private use may not knowingly furnish contaminated drinking water to a person or allow the appliances of the water supply system to become unsanitary.

(c) The owner or manager of a water supply system furnishing drinking water to at least 25,000 persons shall have the water tested at least once daily to determine its sanitary quality and shall submit monthly reports of the tests to the commission.

(d) The owner or manager of a water supply system furnishing drinking water to less than 25,000 persons shall submit to the commission during each monthly period of the system's operation at least one specimen of water taken from the supply for bacteriological analysis. The population under this subsection shall be determined according to the most recent federal census or other population-determining methods if a federal census is not taken for the area served by the water supply system.

(e) The distribution system of a public drinking water supply and that of any other water supply may not be physically connected unless the other water is of a safe and sanitary quality and the commission approves the connection.

(f) A public drinking water supply may not be connected to a sprinkling, condensing, cooling, plumbing, or other system unless the connection is designed to ensure against a backflow or siphonage of sewage or contaminated water into the drinking water supply.

(g) On discovery of a connection in violation of Subsection (e) or (f), the local health authority shall give written notice to the owner or agent maintaining the condition. The owner or agent shall make the necessary corrections to eliminate the condition.

(h) Subsections (a)-(d) do not apply to the production, distribution, or sale of raw, untreated surface water.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 1995, 74th Leg., ch. 76, Sec. 11.13, eff. Sept. 1, 1995; Acts 2001, 77th Leg., ch. 880, Sec. 18, eff. Sept. 1, 2001.

Sec. 341.034. LICENSING AND REGISTRATION OF PERSONS WHO PERFORM DUTIES RELATING TO PUBLIC WATER SUPPLIES. (a) A person who operates a public water supply on a contract basis must hold a registration issued by the commission under Chapter 37, Water Code.

(b) A person who performs process control duties in production or distribution of drinking water for a public water system must hold a license issued by the commission under Chapter 37, Water Code, unless:

(1) the duties are provided to a transient, noncommunity water system; and

(2) the water system uses groundwater that is not under the influence of surface water.

(c) A person who repairs or tests the installation or operation of backflow prevention assemblies must hold a license issued by the commission under Chapter 37, Water Code.

(d) A person who inspects homes and businesses to identify potential or actual cross-connections or other contaminant hazards in public water systems must hold a license issued by the commission under Chapter 37, Water Code, unless the person is licensed by the Texas State Board of Plumbing Examiners as a plumbing inspector or water supply protection specialist.

(e) Unless the person is licensed by the Texas State Board of Plumbing Examiners, a person must hold a license issued by the commission under Chapter 37, Water Code, if, under a contract, the person:

(1) installs, exchanges, connects, maintains, or services potable water treatment equipment and appliances in public or private water systems; or

(2) analyzes water to determine how to treat influent or effluent water, alter or purify water, or add or remove a mineral, chemical, or bacterial content or substance as part of the complete installation, exchange, connection, maintenance, or service of potable water treatment equipment and appliances.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 1995, 74th Leg., ch. 76, Sec. 11.14, eff. Sept. 1, 1995; Acts 1997, 75th Leg., ch. 333, Sec. 33, eff. Sept. 1, 1997; Acts 2001, 77th Leg., ch. 880, Sec. 19, eff. Sept. 1, 2001.

Sec. 341.035. APPROVED PLANS REQUIRED FOR PUBLIC WATER SUPPLIES. (a) Except as provided by Subsection (d), a person may not begin construction of a public drinking water supply system unless the executive director of the commission approves:

- (1) a business plan for the system; and
- (2) the plans and specifications for the system.

(b) The prospective owner or operator of the system must submit to the executive director a business plan that demonstrates that the owner or operator of the proposed system has available the financial, managerial, and technical capability to ensure future operation of the system in accordance with applicable laws and rules. The executive director:

- (1) shall review the business plan; and
- (2) may order the prospective owner or operator of the system to provide adequate financial assurance of ability to operate the system in accordance with applicable laws and rules, in the form of a bond or as specified by the commission, unless the executive director finds that the business plan demonstrates adequate financial capability.

(c) The prospective owner or operator of the proposed system shall provide to the commission completed plans and specifications for review and approval in accordance with commission rules.

(d) A person is not required to file a business plan under Subsection (a)(1) or (b) if the person:

- (1) is a county;
- (2) is a retail public utility as defined by Section 13.002, Water Code, unless that person is a utility as defined by that section;

(3) has executed an agreement with a political subdivision to transfer the ownership and operation of the water supply system to the political subdivision; or

(4) is a noncommunity nontransient water system and the person has demonstrated financial assurance under Chapter 361 or 382 of this code or Chapter 26, Water Code.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 1991, 72nd Leg., 1st C.S., ch. 3, Sec. 1.023, eff. Aug. 12, 1991; Acts 1995, 74th Leg., ch. 76, Sec. 11.14, eff. Sept. 1, 1995; Acts 1997, 75th Leg., ch. 1010, Sec. 6.20, eff. Sept. 1, 1997.

Sec. 341.0351. NOTIFICATION OF SYSTEM CHANGES. Any person, including a municipality, supplying a drinking water service to the public that intends to make a material or major change in a water supply system that may affect the sanitary features of that utility must give written notice of that intention to the commission before making the change.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 1991, 72nd Leg., 1st C.S., ch. 3, Sec. 1.023, eff. Aug. 12, 1991; Acts 1995, 74th Leg., ch. 76, Sec. 11.14, eff. Sept. 1, 1995. Renumbered from V.T.C.A., Health and Safety Code Sec. 341.035(b) and amended by Acts 1997, 75th Leg., ch. 1010, Sec. 6.20, eff. Sept. 1, 1997.

Sec. 341.0352. ADVERTISED QUALITY OF WATER SUPPLY. A water supply system owner, manager, or operator or an agent of a water supply system owner, manager, or operator may not advertise or announce a water supply as being of a quality other than the quality that is disclosed by the commission's latest rating.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 1991, 72nd Leg., 1st C.S., ch. 3, Sec. 1.023, eff. Aug. 12, 1991; Acts 1995, 74th Leg., ch. 76, Sec. 11.14, eff. Sept. 1, 1995. Renumbered from V.T.C.A., Health and Safety Code Sec. 341.035(c) by Acts 1997, 75th Leg., ch. 1010, Sec. 6.20, eff. Sept. 1, 1997.

Sec. 341.0353. DRINKING WATER SUPPLY COMPARATIVE RATING INFORMATION. The commission shall assemble and tabulate all necessary information relating to public drinking water supplies at least once each year and as often during the year as conditions demand or justify. The information forms the basis of an official

comparative rating of public drinking water supply systems.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 1991, 72nd Leg., 1st C.S., ch. 3, Sec. 1.023, eff. Aug. 12, 1991; Acts 1995, 74th Leg., ch. 76, Sec. 11.14, eff. Sept. 1, 1995. Renumbered from V.T.C.A., Health and Safety Code Sec. 341.035(d) and amended by Acts 1997, 75th Leg., ch. 1010, Sec. 6.20, eff. Sept. 1, 1997.

Sec. 341.0354. HIGHWAY SIGNS FOR APPROVED SYSTEM RATING. A water supply system that attains an approved rating is entitled to erect signs of a design approved by the commission on highways approaching the municipality in which the water supply system is located. The signs shall be immediately removed on notice from the commission if the water supply system does not continue to meet the specified standards.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 1991, 72nd Leg., 1st C.S., ch. 3, Sec. 1.023, eff. Aug. 12, 1991; Acts 1995, 74th Leg., ch. 76, Sec. 11.14, eff. Sept. 1, 1995. Renumbered from V.T.C.A., Health and Safety Code Sec. 341.035(e) by Acts 1997, 75th Leg., ch. 1010, Sec. 6.20, eff. Sept. 1, 1997.

Sec. 341.0355. FINANCIAL ASSURANCE FOR CERTAIN SYSTEMS. (a) The commission may require the owner or operator of a public drinking water supply system that was constructed without the approval required by Section 341.035, that has a history of noncompliance with this subchapter or commission rules, or that is subject to a commission enforcement action to:

(1) provide the executive director of the commission with a business plan that demonstrates that the system has available the financial, managerial, and technical resources adequate to ensure future operation of the system in accordance with applicable laws and rules; and

(2) provide adequate financial assurance of the ability to operate the system in accordance with applicable laws and rules in the form of a bond or as specified by the commission.

(b) If the commission relies on rate increases or customer surcharges as the form of financial assurance, such funds shall be deposited in an escrow account and released only with the approval of the commission.

Added by Acts 1997, 75th Leg., ch. 1010, Sec. 6.20, eff. Sept. 1, 1997.

Sec. 341.0356. ORDER TO STOP OPERATIONS. (a) A public water supply system shall stop operations on receipt of a written notification of the executive director of the commission or an order of the commission issued under this section.

(b) The executive director or the commission may order a public water supply system to stop operations if:

(1) the system was constructed without the approval required by Section 341.035; or

(2) the executive director determines that the system presents an imminent health hazard.

(c) A notification or order issued under this section may be delivered by facsimile, by personal service, or by mail.

(d) A water supply system subject to notification or an order under this section, on written request, is entitled to an opportunity to be heard by the commissioners at a commission meeting.

(e) The public water supply system may not resume operations until the commission, the executive director, or a court authorizes the resumption.

Added by Acts 1997, 75th Leg., ch. 1010, Sec. 6.20, eff. Sept. 1, 1997.

Sec. 341.036. SANITARY DEFECTS AT PUBLIC DRINKING WATER SUPPLY SYSTEMS. (a) A sanitary defect at a public drinking water supply system that obtains its water supply from underground sources shall be immediately corrected.

(b) A public drinking water supply system furnishing drinking water from underground sources may not be established in a place subject to possible pollution by floodwaters unless the system is adequately protected against flooding.

(c) Suction wells or suction pipes used in a public drinking water supply system must be constantly protected by practical safeguards against surface and subsurface pollution.

(d) Livestock may not be permitted to enter or remain in the wellhouse enclosure of a public drinking water supply system.

(e) Public drinking water distribution lines must be

constructed of impervious materials with tight joints and must be a reasonably safe distance from sewer lines.

(f) Water from a surface public drinking water supply may not be made accessible or delivered to a consumer for drinking purposes unless the water has been treated to make it safe for human consumption. Water treatment plants, including aeration, coagulation, mixing, settling, filtration, and chlorinating units, shall be of a size and type prescribed by good public health engineering practices.

(g) A clear water reservoir shall be covered and be of a type and construction that prevents the entrance of dust, insects, and surface seepage.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989.

Sec. 341.037. PROTECTION OF BODIES OF WATER FROM SEWAGE. The commission shall enforce state laws and take other necessary action to protect a spring, well, pond, lake, reservoir, or other stream in this state from any condition or pollution that results from sewage and that may endanger the public health.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 1995, 74th Leg., ch. 76, Sec. 11.15, eff. Sept. 1, 1995.

Sec. 341.038. PROTECTION OF IMPOUNDED WATER FROM DISEASE-BEARING MOSQUITOES. A person that impounds water for public use shall cooperate with the commission and local departments of health to control disease-bearing mosquitoes on the impounded area.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 1995, 74th Leg., ch. 76, Sec. 11.15, eff. Sept. 1, 1995.

Sec. 341.039. GRAYWATER STANDARDS. (a) The commission by rule shall adopt and implement minimum standards for the use and reuse of graywater for:

- (1) irrigation and other agricultural purposes;
- (2) domestic use, to the extent consistent with Subsection (c);
- (3) commercial purposes; and
- (4) industrial purposes.

(b) The standards adopted by the commission under Subsection (a) must assure that the use of graywater is not a

nuisance and does not damage the quality of surface water and groundwater in this state.

(c) The commission may not require a permit for the domestic use of less than 400 gallons of graywater each day if the graywater:

- (1) originates from a private residence;
- (2) is used by the occupants of that residence for gardening, composting, or landscaping at the residence;
- (3) is collected using a system that overflows into a sewage collection or on-site wastewater treatment and disposal system;
- (4) is stored in tanks that:
 - (A) are clearly labeled as nonpotable water;
 - (B) restrict access, especially to children; and
 - (C) eliminate habitat for mosquitoes and other vectors;
- (5) uses piping clearly identified as a nonpotable water conduit, including identification through the use of purple pipe, purple tape, or similar markings;
- (6) is generated without the formation of ponds or pools of graywater;
- (7) does not create runoff across the property lines or onto any paved surface; and
- (8) is distributed by a surface or subsurface system that does not spray into the air.

(d) Each builder is encouraged to:

- (1) install plumbing in new housing in a manner that provides the capacity to collect graywater from all allowable sources; and
- (2) design and install a subsurface graywater system around the foundation of new housing in a way that minimizes foundation movement or cracking.

(e) In this section, "graywater" means wastewater from clothes-washing machines, showers, bathtubs, hand-washing lavatories, and sinks that are not used for disposal of hazardous or toxic ingredients. The term does not include wastewater:

- (1) that has come in contact with toilet waste;
- (2) from the washing of material, including diapers,

soiled with human excreta; or

(3) from sinks used for food preparation or disposal. Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 1993, 73rd Leg., ch. 233, Sec. 2, eff. Aug. 30, 1993; Acts 1995, 74th Leg., ch. 76, Sec. 11.16, eff. Sept. 1, 1995; Acts 2003, 78th Leg., ch. 689, Sec. 2, eff. Sept. 1, 2003.

Sec. 341.040. DEFINITION. In this subchapter, commission means the Texas Natural Resource Conservation Commission. Added by Acts 1991, 72nd Leg., 1st C.S., ch. 3, Sec. 1.024, eff. Aug. 12, 1991. Amended by Acts 1993, 73rd Leg., ch. 353, Sec. 1, eff. Sept. 1, 1993; Acts 1995, 74th Leg., ch. 76, Sec. 11.17, eff. Sept. 1, 1995.

Sec. 341.041. FEES. (a) The commission by rule may charge fees to a person who owns, operates, or maintains a public drinking water supply system. The commission may establish a schedule of fees. The amount of the fees must be sufficient to cover the reasonable costs of administering the programs and services in this subchapter or the federal Safe Drinking Water Act (42 U.S.C. Section 300f et seq.). Among other factors, the commission shall consider equity among persons required to pay the fees as a factor in determining the amount of the fees. The commission may also use the fees to cover any other costs incurred to protect water resources in this state, including assessment of water quality, reasonably related to the activities of any of the persons required to pay a fee under the statutes listed in Section 5.701(q), Water Code.

(b) The commission by rule may assess penalties and interest for late payment of fees owed by persons who own, operate, or maintain public drinking water supply systems. Penalties and interest established under this section may not exceed the rates established for delinquent taxes under Sections 111.060 and 111.061, Tax Code.

(c) Revenues collected by the commission under this subchapter shall be deposited to the credit of the water resource management account.

Added by Acts 1993, 73rd Leg., ch. 353, Sec. 2, eff. Sept. 1, 1993. Amended by Acts 1997, 75th Leg., ch. 333, Sec. 34, eff. Sept. 1,

1997; Acts 2001, 77th Leg., ch. 965, Sec. 3.07, eff. Sept. 1, 2001.

Sec. 341.046. NONAPPLICABILITY OF SUBCHAPTER F. Subchapter F does not apply to this subchapter.

Added by Acts 1993, 73rd Leg., ch. 353, Sec. 2, eff. Sept. 1, 1993.

Sec. 341.047. CRIMINAL PENALTY. (a) A person commits an offense if the person:

(1) violates a provision of Section 341.031;

(2) violates a provision of Section 341.032(a) or (b);

(3) violates a provision of Section 341.033(a)-(f);

(4) constructs a drinking water supply system without submitting completed plans and specifications as required by Section 341.035(c);

(5) begins construction of a drinking water supply system without the commission's approval as required by Section 341.035(a);

(6) violates a provision of Section 341.0351 or 341.0352;

(7) fails to remove a sign as required by Section 341.0354; or

(8) violates a provision of Section 341.036.

(b) An offense under Subsection (a) is a Class C misdemeanor.

(c) If it is shown on a trial of the defendant that the defendant has been convicted of an offense under Subsection (a) within a year before the date on which the offense being tried occurred, the subsequent offense under Subsection (a) is a Class B misdemeanor.

(d) Each day of a continuing violation is a separate offense.

Added by Acts 1993, 73rd Leg., ch. 353, Sec. 2, eff. Sept. 1, 1993.

Amended by Acts 1997, 75th Leg., ch. 1010, Sec. 6.21, eff. Sept. 1, 1997.

Sec. 341.048. CIVIL ENFORCEMENT. (a) A person may not cause, suffer, allow, or permit a violation of this subchapter or a rule or order adopted under this subchapter.

(b) A person who causes, suffers, allows, or permits a violation under this subchapter shall be assessed a civil penalty

of not less than \$50 nor more than \$1,000 for each violation. Each day of a continuing violation is a separate violation.

(c) If it appears that a person has violated, is violating, or threatens to violate a provision under this subchapter, the commission, a county, or a municipality may institute a civil suit in a district court for:

(1) injunctive relief to restrain the person from continuing the violation or threat of violation;

(2) the assessment and recovery of a civil penalty; or

(3) both injunctive relief and a civil penalty.

(d) The commission is a necessary and indispensable party in a suit brought by a county or municipality under this section.

(e) On the commission's request, the attorney general shall institute a suit in the name of the state for injunctive relief, to recover a civil penalty, or for both injunctive relief and civil penalty.

(f) The suit may be brought in:

(1) Travis County;

(2) the county in which the defendant resides; or

(3) the county in which the violation or threat of violation occurs.

(g) In a suit under this section to enjoin a violation or threat of violation of this subchapter, the court shall grant the state, county, or municipality, without bond or other undertaking, any injunction that the facts may warrant including temporary restraining orders, temporary injunctions after notice and hearing, and permanent injunctions.

(h) Civil penalties recovered in a suit brought under this section by a county or municipality shall be equally divided between:

(1) the state; and

(2) the county or municipality that first brought the suit.

Added by Acts 1993, 73rd Leg., ch. 353, Sec. 2, eff. Sept. 1, 1993.
Amended by Acts 1997, 75th Leg., ch. 1010, Sec. 6.22, eff. Sept. 1, 1997.

Sec. 341.0485. WATER UTILITY IMPROVEMENT

ACCOUNT. (a) The water utility improvement account is created outside of the state treasury.

(b) A civil or administrative penalty payable to the state that is collected from a utility for a violation of this subchapter shall be deposited in the account.

(c) The comptroller shall manage the account for the benefit of the commission and shall invest the money and deposit interest and other investment proceeds in the account. The comptroller shall release money from the account in the manner provided by the commission. Money in the account may be used only for:

(1) capital improvements to the water or sewer system of a utility that has paid fines or penalties under this chapter or under Chapter 13, Water Code, that have been deposited in the account; or

(2) capital improvements and operating and maintenance expenses for a utility placed in receivership or under a temporary manager under Section 13.4132, Water Code.

(d) Money used under Subsection (c)(1) for a utility's system may not exceed the amount of the civil or administrative penalties the utility has paid. Capital improvements made with money from the account may not be considered as invested capital of the utility for any purpose. If the utility is sold to another owner, a portion of the sales price equivalent to the percentage of the used and useful facilities that were constructed with money under Subsection (c)(1) shall be immediately distributed equally to the current customers of the utility.

(e) Money used under Subsection (c)(2) may not be considered as invested capital of the utility for any purpose.

(f) In this section, "utility" has the meaning assigned by Section 13.002, Water Code.

Added by Acts 1997, 75th Leg., ch. 1010, Sec. 6.32, eff. Sept. 1, 1997.

Sec. 341.049. ADMINISTRATIVE PENALTY. (a) If a person causes, suffers, allows, or permits a violation of this subchapter or a rule or order adopted under this subchapter, the commission may assess a penalty against that person as provided by this section. The penalty shall not be less than \$50 nor more than \$1,000 for each

violation. Each day of a continuing violation may be considered a separate violation.

(b) In determining the amount of the penalty, the commission shall consider:

(1) the nature of the circumstances and the extent, duration, and gravity of the prohibited acts or omissions;

(2) with respect to the alleged violator:

(A) the history and extent of previous violations;

(B) the degree of culpability, including whether the violation was attributable to mechanical or electrical failures and whether the violation could have been reasonably anticipated and avoided;

(C) the person's demonstrated good faith, including actions taken by the person to correct the cause of the violation;

(D) any economic benefit gained through the violation; and

(E) the amount necessary to deter future violation; and

(3) any other matters that justice requires.

(c) If, after examination of a possible violation and the facts surrounding that possible violation, the executive director of the commission concludes that a violation has occurred, the executive director may issue a preliminary report stating the facts on which that conclusion is based, recommending that a penalty under this section be imposed on the person, and recommending the amount of that proposed penalty. The executive director shall base the recommended amount of the proposed penalty on the factors provided by Subsection (b) and shall consider each factor for the benefit of the commission.

(d) Not later than the 10th day after the date on which the preliminary report is issued, the executive director of the commission shall give written notice of the report to the person charged with the violation. The notice shall include a brief summary of the charges, a statement of the amount of the penalty recommended, and a statement of the right of the person charged to a

hearing on the occurrence of the violation, the amount of the penalty, or both.

(e) Not later than the 20th day after the date on which notice is received, the person charged may give the commission written consent to the executive director's report including the recommended penalty or may make a written request for a hearing.

(f) If the person charged with the violation consents to the penalty recommended by the executive director of the commission or fails to timely respond to the notice, the commission by order shall assess that penalty or order a hearing to be held on the findings and recommendations in the executive director's report. If the commission assesses a penalty, the commission shall give written notice of its decision to the person charged.

(g) If the person charged requests or the commission orders a hearing, the commission shall call a hearing and give notice of the hearing. As a result of the hearing, the commission by order may find that a violation has occurred and may assess a civil penalty, may find that a violation has occurred but that no penalty should be assessed, or may find that no violation has occurred. All proceedings under this subsection are subject to Chapter 2001, Government Code. In making any penalty decision, the commission shall consider each of the factors provided by Subsection (b).

(h) The commission shall give notice of its decision to the person charged, and if the commission finds that a violation has occurred and the commission has assessed a penalty, the commission shall give written notice to the person charged of its findings, of the amount of the penalty, and of the person's right to judicial review of the commission's order. If the commission is required to give notice of a penalty under this subsection or Subsection (f), the commission shall file notice of its decision with the Texas Register not later than the 10th day after the date on which the decision is adopted.

(i) Within a 30-day period immediately following the day on which the commission's order is final, as provided by Subchapter F, Chapter 2001, Government Code, the person charged with the penalty shall:

- (1) pay the penalty in full; or

(2) if the person seeks judicial review of the fact of the violation, the amount of the penalty, or both:

(A) forward the amount of the penalty to the commission for placement in an escrow account; or

(B) post with the commission a supersedeas bond in a form approved by the commission for the amount of the penalty to be effective until all judicial review of the order or decision is final.

(j) If the person charged fails to forward the money for escrow or post the bond as provided by Subsection (i), the commission or the executive director of the commission may refer the matter to the attorney general for enforcement.

Added by Acts 1993, 73rd Leg., ch. 353, Sec. 2, eff. Sept. 1, 1993.

Amended by Acts 1995, 74th Leg., ch. 76, Sec. 5.95(49), (59), eff. Sept. 1, 1995; Acts 1997, 75th Leg., ch. 1010, Sec. 6.23, eff. Sept. 1, 1997.

Sec. 341.050. PENALTIES CUMULATIVE. All penalties accruing under this subchapter are cumulative of all other remedies, and a suit for recovery of any penalty does not bar or affect the recovery of any other penalty or bar any criminal prosecution against a person or any officer, director, agent, or employee of that person.

Added by Acts 1993, 73rd Leg., ch. 353, Sec. 2, eff. Sept. 1, 1993.

SUBCHAPTER D. SANITATION AND SAFETY OF FACILITIES USED BY PUBLIC

Sec. 341.061. TOILET FACILITIES. An operator, manager, or superintendent of a public building, schoolhouse, theater, filling station, tourist court, bus station, or tavern shall provide and maintain sanitary toilet accommodations.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989.

Sec. 341.062. PUBLIC BUILDINGS. A public building constructed after September 4, 1945, shall incorporate the heating, ventilation, plumbing, and screening features necessary to protect the public health and safety.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989.

Sec. 341.063. SANITATION OF BUS LINE, AIRLINE, AND COASTWISE VESSEL. A person managing or operating a bus line or airline in this state, or a person operating a coastwise vessel

along the shores of this state, shall maintain sanitary conditions in its equipment and at all terminals or docking points.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989.

Sec. 341.064. SWIMMING POOLS AND BATHHOUSES. (a) An owner, manager, operator, or other attendant in charge of a public swimming pool shall maintain the pool in a sanitary condition.

(b) The bacterial content of the water in a public swimming pool may not exceed the safe limits prescribed by the board's standards. A minimum free residual chlorine of 2.0 parts for each one million units of water in a public spa and a minimum free residual chlorine of 1.0 part for each one million units of water in other public swimming pools, or any other method of disinfectant approved by the department, must be maintained in a public swimming pool in use.

(c) Water in a swimming pool open to the public may not show an acid reaction to a standard pH test.

(d) A public bathhouse and its surroundings shall be kept in a sanitary condition at all times.

(e) Facilities shall be provided in a public swimming pool for adequate protection of bathers against sputum contamination.

(f) A person known to be or suspected of being infected with a transmissible condition of a communicable disease shall be excluded from a public swimming pool.

(g) The construction and appliances of a public swimming pool must be such as to reduce to a practical minimum the possibility of drowning or of injury to bathers. The construction after September 4, 1945, of a public swimming pool must conform to good public health engineering practices.

(h) Bathing suits and towels furnished to bathers shall be thoroughly washed with soap and hot water and thoroughly rinsed and dried after each use.

(i) Dressing rooms of a public swimming pool shall contain shower facilities.

(j) A comb or hairbrush used by two or more persons may not be permitted or distributed in a bathhouse of a public swimming pool.

(k) The operator or manager of a public swimming pool shall

provide adequate and proper approved facilities for the disposal of human excreta by the bathers.

(l) In adopting rules governing lifesaving equipment to be maintained by a public swimming pool, the board may not require a separate throwing line longer than two-thirds the maximum width of the pool.

(m) In this section, "public swimming pool" means an artificial body of water, including a spa, maintained expressly for public recreational purposes, swimming and similar aquatic sports, or therapeutic purposes.

(n) A county or municipality may:

(1) require that the owner or operator of a public swimming pool within the jurisdiction of the county or municipality obtain a permit for operation of the pool;

(2) inspect a public swimming pool within the jurisdiction of the county or municipality for compliance with this section; and

(3) impose and collect a reasonable fee in connection with a permit or inspection required under this subsection provided the following are met:

(A) the auditor for the county shall review the program every two years to ensure that the fees imposed do not exceed the cost of the program; and

(B) the county refunds the permit holders any revenue determined by the auditor to exceed the cost of the program.

(o) A county or municipality may by order close, for the period specified in the order, a swimming pool within the jurisdiction of the county or municipality if the operation of the pool violates this section or a permitting or inspection requirement imposed by the county or municipality under Subsection (n).

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 1991, 72nd Leg., ch. 339, Sec. 1, eff. Sept. 1, 1991; Acts 2003, 78th Leg., ch. 618, Sec. 1, eff. June 20, 2003.

Sec. 341.065. SCHOOL BUILDINGS AND GROUNDS. (a) A school building must be located on grounds that are well drained and maintained in a sanitary condition.

(b) A school building must be properly ventilated and provided with an adequate supply of drinking water, an approved sewage disposal system, hand-washing facilities, a heating system, and lighting facilities that conform to established standards of good public health engineering practices.

(c) A public school lunchroom must comply with the state food and drug rules.

(d) A public school building and its appurtenances shall be maintained in a sanitary manner.

(e) A building custodian or janitor employed full-time shall know the fundamentals of safety and school sanitation.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989.

Sec. 341.066. TOURIST COURTS, HOTELS, INNS, AND ROOMING HOUSES. (a) A person operating a tourist court, hotel, inn, or rooming house in this state shall:

(1) provide a safe and ample water supply for the general conduct of the tourist court, hotel, inn, or rooming house; and

(2) submit samples of the water at least once a year before May 1 to the department for bacteriological analysis.

(b) A tourist court, hotel, inn, and rooming house must be equipped with an approved system of sewage disposal maintained in a sanitary condition.

(c) An owner or operator of a tourist court, hotel, inn, or rooming house shall keep the premises sanitary and shall provide every practical facility essential for that purpose.

(d) An owner or operator of a tourist court, hotel, inn, or rooming house who provides a gas stove for the heating of a unit in the facility shall determine that the stove is properly installed and maintained in a properly ventilated room.

(e) An owner, operator, or manager of a tourist court, hotel, inn, or rooming house shall maintain sanitary appliances located in the facility in good repair.

(f) Food offered for sale at a tourist court, hotel, inn, or rooming house shall be:

(1) adequately protected from flies, dust, vermin, and spoilage; and

(2) kept in a sanitary condition.

(g) An owner, manager, or agent of a tourist court, hotel, inn, or rooming house may not rent or furnish a unit to a person succeeding a previous occupant before:

(1) thoroughly cleaning the unit; and

(2) providing clean and sanitary sheets, towels, and pillowcases.

(h) An owner, operator, or manager of a tourist court, hotel, inn, or rooming house shall maintain the facility in a sanitary condition.

(i) A tourist court, hotel, inn, or rooming house that does not conform to this chapter is a public health nuisance.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989.

Sec. 341.067. FAIRGROUNDS, PUBLIC PARKS, AND AMUSEMENT CENTERS. (a) A fairground, public park, or amusement center of any kind shall be maintained in a sanitary condition.

(b) Food and beverages sold in a fairground, public park, or amusement center shall be:

(1) adequately protected from flies, dust, vermin, and spoilage; and

(2) kept in a sanitary condition.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989.

Sec. 341.068. RESTROOM AVAILABILITY WHERE THE PUBLIC CONGREGATES. (a) Publicly and privately owned facilities where the public congregates shall be equipped with sufficient temporary or permanent restrooms to meet the needs of the public at peak hours.

(b) The board shall adopt rules to implement Subsection (a), including a rule that in providing sufficient restrooms a ratio of not less than 2:1 women's-to-men's restrooms or other minimum standards established in consultation with the Texas State Board of Plumbing Examiners shall be maintained if the use of the restrooms is designated by gender. The rules shall apply to facilities where the public congregates and on which construction is started on or after January 1, 1994, or on which structural alterations, repairs, or improvements exceeding 50 percent of the entire facility are undertaken on or after January 1, 1994.

(c) In this section:

(1) "Facilities where the public congregates" means sports and entertainment arenas, stadiums, community and convention halls, specialty event centers, and amusement facilities. The term does not include hotels, churches, restaurants, bowling centers, public or private elementary or secondary schools, or historic buildings.

(2) "Restroom" means toilet, chemical toilet, or water closet.

(d) The board may adopt rules consistent with Subsection (c)(1) to define "facilities where the public congregates."

Added by Acts 1993, 73rd Leg., ch. 624, Sec. 1, eff. Sept. 1, 1993.

SUBCHAPTER E. AUTHORITY OF HOME-RULE MUNICIPALITIES

Sec. 341.081. AUTHORITY OF HOME-RULE MUNICIPALITIES NOT AFFECTED. This chapter prescribes the minimum requirements of sanitation and health protection in this state and does not affect a home-rule municipality's authority to enact:

(1) more stringent ordinances in matters relating to this chapter; or

(2) an ordinance under:

(A) Article XI, Section V, of the Texas Constitution;

(B) Article 1175, Revised Statutes; or

(C) Section 51.072, Local Government Code.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989.

Sec. 341.082. APPOINTMENT OF ENVIRONMENTAL HEALTH OFFICER IN CERTAIN HOME-RULE MUNICIPALITIES. (a) In a home-rule municipality, an environmental health officer may be appointed to enforce this chapter.

(b) The environmental health officer must be a registered professional engineer. The officer must file a copy of the officer's oath and appointment with the board.

(c) The environmental health officer shall assist the board in enforcing this chapter and is subject to:

(1) the authority of the board; and

(2) removal from office in the same manner as a municipal health authority.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 1991, 72nd Leg., ch. 597, Sec. 76, eff. Sept. 1, 1991; Acts 1997, 75th Leg., ch. 742, Sec. 1, eff. June 17, 1997.

SUBCHAPTER F. PENALTIES

Sec. 341.091. CRIMINAL PENALTY. (a) A person commits an offense if the person violates this chapter or a rule adopted under this chapter. A person commits an offense if the person violates a permitting or inspection requirement imposed under Section 341.064(n) or a closure order issued under Section 341.064(o). An offense under this section is a misdemeanor punishable by a fine of not less than \$10 or more than \$200.

(b) If it is shown on the trial of the defendant that the defendant has been convicted of an offense under this chapter within a year before the date on which the offense being tried occurred, the defendant shall be punished by a fine of not less than \$10 or more than \$1,000, confinement in jail for not more than 30 days, or both.

(c) Each day of a continuing violation is a separate offense.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 2003, 78th Leg., ch. 618, Sec. 2, eff. June 20, 2003.

Sec. 341.092. CIVIL ENFORCEMENT. (a) A person may not cause, suffer, allow, or permit a violation of this chapter or a rule adopted under this chapter.

(b) A person who violates this chapter or a rule adopted under this chapter shall be assessed a civil penalty. A person who violates a permitting or inspection requirement imposed under Section 341.064(n) or a closure order issued under Section 341.064(o) shall be assessed a civil penalty. A civil penalty under this section may not be less than \$10 or more than \$200 for each violation and for each day of a continuing violation.

(c) If it is shown on the trial of the defendant that the defendant has previously violated this section, the defendant shall be assessed a civil penalty of not less than \$10 or more than \$1,000 for each violation and for each day of a continuing violation.

(d) If it appears that a person has violated, is violating, or is threatening to violate this chapter, a rule adopted under this

chapter, a permitting or inspection requirement imposed under Section 341.064(n), or a closure order issued under Section 341.064(o), the department, a county, a municipality, or the attorney general on request by the district attorney, criminal district attorney, county attorney, or, with the approval of the governing body of the municipality, the attorney for the municipality may institute a civil suit in a district court for:

(1) injunctive relief to restrain the person from continuing the violation or threat of violation;

(2) the assessment and recovery of a civil penalty; or

(3) both injunctive relief and a civil penalty.

(e) The department is a necessary and indispensable party in a suit brought by a county or municipality under this section.

(f) On the department's request, or as otherwise provided by this chapter, the attorney general shall institute and conduct a suit in the name of the state for injunctive relief, to recover a civil penalty, or for both injunctive relief and civil penalty.

(g) The suit may be brought in Travis County, in the county in which the defendant resides, or in the county in which the violation or threat of violation occurs.

(h) In a suit under this section to enjoin a violation or threat of violation of this chapter, a rule adopted under this chapter, a permitting or inspection requirement imposed under Section 341.064(n), or a closure order issued under Section 341.064(o), the court shall grant the state, county, or municipality, without bond or other undertaking, any injunction that the facts may warrant, including temporary restraining orders, temporary injunctions after notice and hearing, and permanent injunctions.

(i) Civil penalties recovered in a suit brought under this section by a county or municipality through its own attorney shall be equally divided between:

(1) the state; and

(2) the county or municipality that first brought the suit.

(j) The state is entitled to civil penalties recovered in a suit instituted by the attorney general.

Acts 1989, 71st Leg., ch. 678, Sec. 1, eff. Sept. 1, 1989. Amended by Acts 1993, 73rd Leg., ch. 648, Sec. 2, eff. Sept. 1, 1993; Acts 2003, 78th Leg., ch. 618, Sec. 3, eff. June 20, 2003.

SUBCHAPTER G. CERTIFICATION OF WATER TREATMENT SPECIALISTS

Sec. 341.101. DEFINITIONS. In this subchapter:

(1) "Commission" means the Texas Natural Resource Conservation Commission.

(2) "Installation of water treatment appliances" includes connecting the appliances to all necessary utility connections in residential, commercial, or industrial facilities.

(3) "Water treatment" means a business conducted under contract that requires experience in the analysis of water, including the ability to determine how to treat influent and effluent water, to alter or purify water, and to add or remove a mineral, chemical, or bacterial content or substance. The term also includes the installation and service of potable water treatment equipment in public or private water systems and making connections necessary to complete installation of a water treatment system.

(4) "Water treatment equipment" includes appliances used to alter or purify water or to alter a mineral, chemical, or bacterial content or substance.

Added by Acts 1981, 67th Leg., p. 3000, ch. 788, Sec. 1, eff. Sept. 1, 1981. Amended by Acts 1985, 69th Leg., ch. 239, eff. Sept. 1, 1985. Renumbered from Vernon's Ann.Civ.St. Art. 6243-101, Sec. 3A and amended by Acts 2001, 77th Leg., ch. 965, Sec. 7.01, eff. Sept. 1, 2001.

Vernon's Ann.Civ.St. Art. 6243-101, Sec. 3A Repealed by Acts 2001, 77th Leg., ch. 880, Sec. 25(3)

Without reference to the redesignation of Vernon's Ann.Civ.St. Art. 6243-101, Sec. 3A as V.T.C.A., Health and Safety Code, Chapter 341, Subchapter G by Acts 2001, 77th Leg., ch. 965, Sec. 7.01, Acts 2001, 77th Leg., ch. 880, Sec. 25(3) repealed Sec. 3A effective September 1, 2001.

Sec. 341.102. WATER TREATMENT SPECIALIST CERTIFICATION PROGRAM. (a) The commission by rule shall establish a program to certify persons qualified to install, exchange, service, and repair

residential, commercial, or industrial water treatment equipment and appliances.

(b) The rules must establish:

(1) standards for certification to ensure the public health and to protect the public from unqualified persons engaging in activities relating to water treatment;

(2) classes of certification;

(3) duration of certification; and

(4) reasonable annual certification fees in an amount sufficient to pay the administrative costs of the certification program, but not to exceed \$150 a year for any class of certification.

Added by Acts 1981, 67th Leg., p. 3000, ch. 788, Sec. 1, eff. Sept. 1, 1981. Amended by Acts 1985, 69th Leg., ch. 239, eff. Sept. 1, 1985. Renumbered from Vernon's Ann.Civ.St. Art. 6243-101, Sec. 3A and amended by Acts 2001, 77th Leg., ch. 965, Sec. 7.01, eff. Sept. 1, 2001.

Sec. 341.103. CERTIFICATION REQUIRED. A person may not engage in water treatment unless the person first obtains a certificate from the commission under the program established under this subchapter.

Added by Acts 1981, 67th Leg., p. 3000, ch. 788, Sec. 1, eff. Sept. 1, 1981. Amended by Acts 1985, 69th Leg., ch. 239, eff. Sept. 1, 1985. Renumbered from Vernon's Ann.Civ.St. Art. 6243-101, Sec. 3A and amended by Acts 2001, 77th Leg., ch. 965, Sec. 7.01, eff. Sept. 1, 2001.

Sec. 341.104. APPLICATION FOR CERTIFICATION. A person desiring to obtain certification under the program established under this subchapter shall file with the commission:

(1) an application in the form prescribed by the commission and containing the information required by the commission; and

(2) the appropriate certification fee.

Added by Acts 1981, 67th Leg., p. 3000, ch. 788, Sec. 1, eff. Sept. 1, 1981. Amended by Acts 1985, 69th Leg., ch. 239, eff. Sept. 1, 1985. Renumbered from Vernon's Ann.Civ.St. Art. 6243-101, Sec. 3A and amended by Acts 2001, 77th Leg., ch. 965, Sec. 7.01, eff. Sept.

1, 2001.

Sec. 341.105. ISSUANCE OF CERTIFICATE. (a) On receipt of an application that meets commission requirements and the required fee, the commission shall issue to a person who meets commission standards for certification a certificate stating that the person is qualified to install, exchange, service, and repair residential, commercial, or industrial water treatment facilities.

(b) All fees received by the commission under this section shall be deposited in the State Treasury to the credit of the General Revenue Fund.

(c) A person who holds a license under Chapter 1301, Occupations Code, is exempt from the requirements of this subchapter.

(d) This subchapter does not apply to an employee of an industrial facility installing or servicing water treatment equipment.

Added by Acts 1981, 67th Leg., p. 3000, ch. 788, Sec. 1, eff. Sept. 1, 1981. Amended by Acts 1985, 69th Leg., ch. 239, eff. Sept. 1, 1985. Renumbered from Vernon's Ann.Civ.St. Art. 6243-101, Sec. 3A and amended by Acts 2001, 77th Leg., ch. 965, Sec. 7.01, eff. Sept. 1, 2001; Acts 2003, 78th Leg., ch. 1276, Sec. 14A.786, eff. Sept. 1, 2003.

APPENDIX D

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY STANDARDS FOR GRAYWATER RECYCLING SYSTEMS AND USE

SUBCHAPTER F: USE OF GRAYWATER SYSTEMS
§§210.81 - 210.85
Effective January 6, 2005

§210.81. Applicability.

(a) This subchapter applies to graywater used for irrigation and other agricultural purposes; for domestic use; for commercial purposes; for industrial purposes; and for institutional purposes.

(b) Reclaimed water use is regulated by Subchapters A - E of this chapter (relating to General Provisions; General Requirements for the Production, Conveyance, and Use of Reclaimed Water; Quality Criteria and Specific Uses for Reclaimed Water; Alternative and Pre-Existing Reclaimed Water Systems; and Special Requirements for Use of Industrial Reclaimed Water).

(c) For the purpose of this subchapter, the term "Site" has the same meaning as defined in Chapter 305, Subchapter A of this title (relating to General Provisions).

Adopted December 15, 2004

Effective January 6, 2005

§210.82. General Requirements.

(a) Graywater is defined as wastewater from:

- (1) showers;
- (2) bathtubs;
- (3) handwashing lavatories;
- (4) sinks that are not used for disposal of hazardous or toxic ingredients;
- (5) sinks not used for food preparation or disposal; and
- (6) clothes-washing machines.

(b) Graywater does not include wastewater from the washing of material, including diapers, soiled with human excreta or wastewater that has come into contact with toilet waste.

(c) Construction of a graywater system, including storage and disposal systems, must comply with this chapter and any requirements of the local permitting authority.

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§210.83. Criteria for the Domestic Use of Graywater.

(a) An authorization is not required for the domestic use of less than 400 gallons of graywater each day if:

(1) the graywater originates from a private residence;

(2) the graywater system is designed so that 100% of the graywater can be diverted to an organized wastewater collection system during periods of non-use of the graywater system and the discharge from the graywater system must enter the organized wastewater system through two backwater valves or backwater preventers;

(3) the graywater is stored in tanks and the tanks:

(A) are clearly labeled as nonpotable water;

(B) must restrict access, especially to children;

(C) eliminate habitat for mosquitoes and other vectors;

(D) are able to be cleaned; and

(E) meet the structural requirements of §210.25(i) of this title (relating to Special Design Criteria for Reclaimed Water Systems);

(4) the graywater system uses piping that meets the piping requirement of §210.25 of this title;

(5) the graywater is applied at a rate that:

(A) will not result in ponding or pooling; or

(B) will not cause runoff across the property lines or onto any paved surface;

and

(6) the graywater is not disposed of using a spray distribution system.

(b) Builders of private residences are encouraged to:

(1) install plumbing in new housing to collect graywater from all allowable sources;

and

(2) design and install a subsurface graywater system around the foundation of new housing to minimize foundation movement or cracking.

(c) A graywater system as described in subsection (a) of this section may only be used:

(1) around the foundation of new housing to minimize foundation movement or cracking;

(2) for gardening;

(3) for composting; or

(4) for landscaping at the private residence.

(d) The graywater system must not create a nuisance or damage the quality of surface water or groundwater.

(e) Homeowners who have been disposing wastewater from residential clothes-washing machines, otherwise known as laundry graywater, directly onto the ground before the effective date of this rule may continue disposing under the following conditions.

(1) The disposal area must not create a public health nuisance.

(2) Surface ponding must not occur in the disposal area.

(3) The disposal area must support plant growth or be sodded with vegetative cover.

(4) The disposal area must have limited access and use by residents and pets.

(5) Laundry graywater that has been in contact with human or animal waste must not be disposed onto the ground surface.

(6) Laundry graywater must not be disposed to an area where the soil is wet.

(7) A lint trap must be affixed to the end of the discharge line.

(f) Graywater systems that are altered, create a nuisance, or discharge graywater from any source other than clothes-washing machines are not authorized to discharge graywater under subsection (e) of this section.

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§210.84. Criteria for Use of Graywater for Industrial, Commercial, or Institutional Purposes.

(a) Authorization. If used in accordance with this subchapter, graywater used for an industrial, commercial, or institutional purpose does not require authorization from the commission.

(b) Graywater systems used for industrial, commercial, or institutional purposes must be designed so that 100% of the graywater can be diverted to an organized wastewater collection system during periods of non-use of the graywater system. The discharge from the graywater system must

enter the organized wastewater system through two backwater valves or backwater preventers.

(c) Graywater, as defined in §210.82(a) of this title (relating to General Requirements), may be used for the following activities.

(1) Process water.

(A) Graywater used for industrial, commercial, or institutional purposes must be treated to a standard that allows the graywater to be used in operational processes.

(B) Treatment described in subparagraph (A) of this paragraph does not require an authorization from the agency.

(2) Landscape maintenance. If graywater is used for landscape maintenance, the graywater must meet the following standards.

(A) If the graywater will be applied in areas where the public may come into contact with the graywater, the graywater must meet the following standards:

(i) Fecal coliform, 20 colony forming units (CFU)/100 milliliters (ml), geometric mean; or

(ii) Fecal coliform (not to exceed), 75 CFU/100 ml, single grab sample.

(B) If the graywater will be applied in areas where the public is not present during the time when irrigation activities occur or disposed of for other uses where the public would not come into contact with the graywater, the graywater must meet the following standards:

(i) Fecal coliform, 200 CFU/100 ml, geometric mean; or

(ii) Fecal coliform (not to exceed), 800 CFU/100 ml, single grab sample.

(3) Dust control. If graywater is used for dust control, the graywater must meet the standards in paragraph (2)(B) of this subsection.

(4) Toilet flushing. If graywater is used for toilet flushing:

(A) the fecal coliform levels must meet the limits in paragraph (2)(A) of this subsection; and

(B) all exposed piping and piping carrying graywater within a building must be either purple pipe or painted purple; all buried piping installed after the effective date of these rules must be either manufactured in purple, painted purple, taped with purple metallic tape, or bagged in

purple; and all exposed piping must be stenciled in white with a warning reading "NON-POTABLE WATER."

(5) Other uses. If graywater is used for other similar activities where the potential for unintentional human exposure may occur, the graywater must meet the fecal coliform limits in paragraph (2)(A) of this subsection.

(d) Graywater used for commercial, industrial, or institutional purposes must be monitored for fecal coliform at least monthly in areas where the public may come into contact with graywater and these records must be maintained at the site. These records must be readily available for inspection by the commission for a minimum of five years.

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§210.85. Criteria for Use of Graywater for Irrigation and for Other Agricultural Purposes.

(a) If used in accordance with this subchapter, graywater used for irrigation and other agricultural purposes does not require authorization from the commission.

(b) Graywater systems used for irrigation and other agricultural purposes must be designed so that 100% of the graywater can be diverted to an organized wastewater collection system during periods of non-use of the graywater system. The discharge from the graywater system must enter the organized wastewater system through two backwater valves or backwater preventers.

(c) Graywater, as defined in §210.82(a) of this title (relating to General Requirements), may be used for the following activities.

(1) Process water.

(A) Graywater used for irrigation and other agricultural purposes may be treated to a standard that allows the graywater to be used in operational processes.

(B) Treatment described in subparagraph (A) of this paragraph does not require an authorization from the commission.

(2) Landscape maintenance. If graywater is used for landscape maintenance, the graywater must meet the following standards.

(A) If the graywater will be applied in areas where the public may come into contact with the graywater, the graywater must meet the following standards:

(i) Fecal coliform, 20 colony forming units (CFU)/100 milliliters (ml), geometric mean; or

(ii) Fecal coliform (not to exceed), 75 CFU/100 ml, single grab

sample.

(B) If the graywater will be applied in areas where the public is not present during the time when irrigation activities occur or disposed of for other uses where the public would not come into contact with the graywater, the graywater must meet the following standards:

(i) Fecal coliform, 200 CFU/100 ml, geometric mean; or

(ii) Fecal coliform, 800 CFU/100 ml, single grab sample.

(3) Dust control. If graywater is used for dust control, the graywater must meet the standards in paragraph (2)(B) of this subsection.

(4) Irrigation of fields. If graywater is used to irrigate fields where edible crops are grown or fields that are pastures for milking animals, the graywater must meet the standards in paragraph (2)(A) of this subsection.

(5) Other uses. If graywater is used for other similar activities where the potential for unintentional human exposure may occur, the graywater must meet the fecal coliform limits in paragraph (2)(A) of this subsection.

(d) Graywater used for irrigation and for other agricultural purposes must be monitored for fecal coliform at least monthly in areas where the public may come into contact with graywater and the records must be maintained at the site. These records must be readily available for inspection by the commission for a minimum period of five years.

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