**SUBCHAPTER I: SUBSURFACE DISPOSAL SYSTEMS**

**§217.221. General Provisions.**

1. This subchapter applies to any person who proposes to design and construct a facility that will treat or dispose of domestic or municipal wastewater and who uses a subsurface drip dispersal or low-pressure dosing systems. This subchapter is not applicable to treatment facilities constructed for the purposes of complying with a commission-issued industrial wastewater permit, but is applicable to a subsurface disposal system if it is associated with an industrial wastewater treatment facility.

1. This subchapter establishes the minimum design criteria pertaining to effluent quality necessary to meet state water quality standards. Plans, specifications, and reports for a proposed domestic wastewater project must conform to the requirements of this subchapter.
2. System over 5,000 gallons per day are also subject to the Underground Injection Control (UIC) rules for a Class V injection well (for a fluid distribution system).

**§217.222. Engineering Report.**

1. The applicant shall submit an engineering report that includes the plans and specifications that:

* 1. has been prepared by a licensed professional engineer;

* 1. addresses the proposed design, hydraulic and organic loadings,

and the basis for the design for the subsurface disposal system and the treatment system;

* 1. a scale drawing of all land that is to be part of the subsurface disposal system showing the location of all existing and proposed facilities to include the following:

* + 1. buildings;

* + 1. dispersal zones;

* + 1. treatment facilities;

* + 1. effluent storage;
		2. water wells;
		3. road, and

* + 1. the buffer zones that demonstrate compliance with §222.81

of this title (relating to Buffer Zone Requirements);

* 1. includes the site topography;

* 1. includes storm water run-on prevention and storm water runoff

accommodation; and

* 1. includes any variance requests with supporting documentation.

1. For the systems and processes used to provide treatment of domestic wastewater prior to the wastewater entering the subsurface dispersal system the applicant shall use the design criteria in Chapter 217 of this title (relating to Design Criteria for Domestic Wastewater Systems).

**§217.223. Subsurface Dispersal System Design.**

(a) the permittee shall use the following design components for all subsurface dispersal systems, unless stated otherwise:

* 1. Must have wastewater effluent filters prior to

the effluent entering the subsurface dispersal system. These filters must:

* + 1. effectively filter the peak hydraulic flows; and

* + 1. include control valves and piping that provide filtered

effluent to flush the filters;

* 1. the dosing tank(s) designed to hold at least the following volume:

* + 1. the daily design capacity required by the permit;

* + 1. effluent equal to six times the minimum dose cycle capacity

of the lines plus the capacity of the supply and return manifold; and

* + 1. the following storage capacities as part of the dosing tank(s)

or included in the plant design at another location:

* + - 1. flow equalization storage;
			2. emergency storage; and
			3. return flows from flushing and system drainage;

* 1. a duplex alternating pumping system designed:

* + 1. to dose and flush the dispersal zones and flush the filtration

system; and

* + 1. with pumps sized in accordance with the hydraulic design

calculations in §222.83 of this title (relating to Hydraulic Calculations);

* 1. control system components that are capable of performing the

following functions:

* + 1. flushing of the filter units;

* + 1. delivering a specified preprogrammed volume of effluent to

each dispersal zone;

* + 1. flushing of each lateral with filtered effluent;

* + 1. dosing of chemicals intended to reduce clogging,

such as chlorine or oxidizing chemicals;

* + 1. monitoring alarm conditions;

* + 1. regulating the flow volume to each dispersal zone and to a

sand filter, when applicable;

* + 1. indicating a flow variance when flow varies more than 10%

of the actual average daily flow;

* + 1. regulating pump run times;

* + 1. regulating the number and time of filter backwash and field

flushing cycles; and

* + 1. regulating the flows to the subsurface irrigation field system;

* 1. supply lines and manifolds;

* 1. zones of subsurface irrigation lines;

* 1. effluent manifolds;

* 1. chemical dosing equipment; and
	2. flush return lines that return flushing water to the pre-application system, with provisions made to minimize disturbance of any solids in the settling chamber.

1. The permittee shall submit the hydraulic calculations for the pump and distribution system with the engineering report. The report must address the following.

* 1. Field pressure and flow variation due to friction loss and changes in static head must not exceed plus or minus 10% of the design emitter pressure or flow. The 10% difference must be the difference between any two emitters in the entire system after the start-up process is complete.
	2. The system must be equipped an alarm system for high and low flow conditions and an automatic mechanism to shut down the dispersal system for pressure and flow conditions that would indicate abnormal fluid dynamics were occurring.

1. The permittee shall design the subsurface dispersal system to supply the effluent uniformly throughout each of the dispersal zones in the system.

1. The permittee shall design the subsurface dispersal system to be self-draining to prevent freezing if there is a potential for the soil to freeze to the depth that the pipes and lines of the subsurface area drip dispersal system are located.

1. The permittee shall ensure that the velocity of the flush water shall be at least two feet per second at the end of each dispersal zone or return line during the flushing operation.

1. The permittee shall equip the system with a backflow prevention device to prevent the siphoning of soil and water lines.

1. The permittee must establish stormwater run-on controls to minimize infiltration of precipitation into the dispersal zones.

**§217.224. Subsurface Area Drip Dispersal System Design.**

The permittee shall use the following design components for subsurface area drip dispersal systems:

* + 1. a minimum of dual 100-micron wastewater effluent filters prior to the effluent entering the subsurface area drip dispersal system.

(b) permittee shall submit the hydraulic calculations for the pump and distribution system with the engineering report. The report must address the field pressure and flow variation due to friction loss and changes in static head must not exceed plus or minus 10% of the design emitter pressure or flow. The 10% difference must be the difference between any two emitters in the entire system after the start-up process is complete.

**§217.225. Low-Pressure Dosing System Design**

The permittee shall use the following design components for low-pressure dosing systems:

* 1. Low pressure-dosing systems cannot be installed in soils that become saturated during wet periods of the year or in shallow soils.
	2. Two feet of separation is required between the bottom of the trench and the saturated soil layer or groundwater.
	3. The trench wide shall be 6 to 12 inches

**§217.226 Delivery Systems.**

1. The permittee shall ensure that piping materials used in delivering treated effluent from the treatment facility to the dispersal zones are suitable for effluent and conform to regulations as required by Chapter 217 of this title (relating to Design Criteria for Domestic Wastewater Systems).

1. The permittee shall identify the piping materials by referring to the appropriate ASTM International, American National Standard Institute, or American Water Works Association specification numbers.

1. A permittee shall use a multiple pump system for all systems requiring pumping of effluent to the dispersal zones.

* 1. The permittee shall use pumps rated by the manufacturer for effluent disposal.

* 1. The permittee shall use pumps that are each rated for at least 100% of the design flow.

* 1. The permittee shall include the pumping capacity and pump head calculations in the plans and specifications.

1. The permittee shall ensure that the pump discharge piping includes a check valve, union, and gate valve for each submersible pump installed.

1. The permittee shall use piping and valves made of corrosion-resistant materials for applications subject to corrosive gases.

1. If self-priming pumps are used for subsurface area drip dispersal systems, the permittee shall use pumps that meet at least the minimum requirements listed under §217.61 of this title (relating to Lift Station Pumps), with the exception that the pumps are not required to meet the solids-handling requirement.

1. The permittee shall include a check and gate valve for each unit of the discharge piping for self-priming pumps.

**§217.227. Dispersal Zones.**

1. The permittee must place lines for subsurface drip system emitters between six and 48 inches and for low-pressure dosing system between 12 and 36 inches below the surface of the soil.

1. The permittee shall divide the subsurface dispersal system into a sufficient number of different dispersal zones (at least two dispersal zones) so that the system can operate with the greater of either one dispersal zone or 10% of the total number of dispersal zones out of service.

1. The permittee shall design the dispersal zones so that the dispersal lines follow the contour of the site and shall not exceed 1% lateral slope.

1. The permittee shall include the dispersal zone design in the engineering report, including the following elements:

* 1. the proposed line layout with:
		1. main line sizes and lengths; and

* + 1. individual dispersal line lengths;

* 1. flushing flows;

* 1. static head calculations;

* 1. the total proposed flow in gallons per day;

* 1. total length of piping;

* 1. line spacing;

* 1. total number of lines;
	2. the location each soil moisture meter for each zone; and

* 1. total number of lines to be included per flushing.

1. The permittee shall ensure that subsurface drip system emitter and tubing spacing is on not less than one-foot centers and on not greater than three feet centers, and for low-pressure dosing system spacing is on not less than two foot centers and on not greater than four feet centers, unless an exception is approved by the executive director.

1. The permittee shall disinfect the lines and/or emitters according

to the degree and frequency determined by the design engineer and submitted in the engineering report along with the justification for the degree and frequency of disinfection.

1. The permittee shall equip the subsurface dispersal system with audible and visual alarms that will activate in case of a problem with the system.

* 1. If the subsurface dispersal system is not staffed on a

daily basis, the permittee shall equip the system with a telemetry device that notifies the operator in case of a system malfunction.

* 1. The telemetry system must include the following components:

* + 1. remote access;
		2. audio/visual alarms for:

* + - 1. flow or pressure variances; or

* + - 1. system failure;

* + 1. automated filter;

* + 1. zone flushing; and

* + 1. integrated external monitoring devices if required, such as

soil moisture monitors.

**§217.228. Controls.**

1. The permittee shall use a control system that includes a means of alternating the pumps on successive cycles.

1. The permittee shall use a control system with the following features:

* 1. high water alarm that activates prior to any "lag pump on"

activation;

* 1. pump failure alarm;

* 1. power outage alarm;

* 1. mechanisms for testing and silencing the alarm system; and

* 1. manual resetting after the alarm activates.

1. The permittee shall ensure that all controls recommended by the manufacturer are present and in working order if using a proprietary control system.

1. The permittee shall use telemetering of the alarms.

1. The permittee shall house controls in a weatherproof and intruder resistant enclosure.

1. The permittee shall use controls that meet Underwriter's Laboratories requirements.
2. The permittee shall ensure that installation, maintenance, and replacement of parts of the control system are performed in accordance with the National Electrical Code and all applicable federal, state, and local codes, regulations, and ordinances.

**§217.226. Vertical Separation.**

The permittee must maintain the following vertical separation distances beneath the subsurface area drip dispersal system.

* 1. There must be at least five feet of soil over any sand or gravel

strata.

* 1. There must be at least two feet of soil over any restrictive soil

horizons.

* 1. There must be at least two feet of soil over any permanent or

seasonal saturated zone of groundwater.

* 1. The executive director may impose alternate separation

requirements if necessary to protect human health and the environment.

**§217.227. Storage.**

1. The applicant must design and install temporary storage that equals at least three days of the design flow of the facility for times when the subsurface dispersal system is out of service due to an emergency or scheduled maintenance.

1. In lieu of temporary storage, the executive director may approve an alternate method of disposing of effluent, if an alternate disposal plan is submitted by the applicant.

1. The volume of wastewater used when calculating the required effluent storage as described in this section may not be reduced by the beneficial reuse credit.