

3701-29-15.1 Low pressure distribution.

(A) The low pressure distribution design shall include the entire network configuration including, but not limited to, pipe lengths and size, exterior control panel and alarm information, and calculations used to determine dose volume, orifice flow rates, dosing tank sizing and pump selection within the following specifications:

(1) Distribution network

- (a) Supply network piping including the main, sub-mains, and manifold shall be watertight, rigid solid wall pipe, and shall be properly supported to prevent sagging and damage under normal loads and operating conditions. All network piping and low pressure distribution piping and fittings shall be polyvinyl chloride meeting ASTM Standard D 1785 Schedule 40, 80, or 120 or ASTM D 2241, SDR 13.5, 17, or 21 or equivalent. All fittings shall be pressure rated meeting or exceeding ASTM D 2466.
- (b) Manifold designs shall address freeze protection while assuring uniform distribution. The manifold shall be designed to minimize drain down of laterals into other laterals at a lower elevation between dosing events.
- (c) Lateral pipes shall be three-quarter to two inches in diameter.
- (d) There shall be no more than a ten per cent difference in flow rate between the proximal and distal orifices on each distribution lateral. The system design shall ensure a minimum fluid velocity of two feet per second is maintained in the main and manifold piping during dosing.
- (e) There shall be no more than a fifteen per cent difference in the flow rate between two orifices in different distribution laterals that are to be dosed simultaneously during a single dosing event.
- (f) Laterals shall include valves to allow adjustment of the operating distal pressure at startup to meet design specifications in compliance with this standard. The distal operating pressure of each lateral shall be adjusted at startup to ensure compliance with this rule. Baseline measurements including reconciling the gallons per minute with the design, distal pressures/heights, and dose rates for future O&M and monitoring must be measured and recorded before STS approval by the board of health.
- (g) Low pressure distribution networks shall have an accessible means of measuring design pressure or operating head for both initial baseline measurement and future monitoring of orifice clogging and other network operations and shall include a means of scouring or flushing distribution laterals.

(2) Dose frequency and volume

- (a) Except when the flow restrictive layer is present within twelve inches of the natural ground surface, each dose shall deliver to the distribution area no greater than one-fourth of the daily design flow and at least five times the void volume of the laterals during each twenty-four hour period. When a

flow restrictive layer is present within twelve inches of the natural ground surface, each dose shall deliver no greater than one-eighth of the daily design flow and at least three times the void volume of the laterals during each twenty-four hour period. The board of health may require time dosing for the design to maximize treatment by control of the instantaneous loading rate and dose frequency. For split mounds and zoned low pressure distribution leaching, the dosing frequency shall be equal for each zone within a twenty-four hour period. The dosing volume shall be based on the soil loading rate for each mound or zone.

- (b) When time dosing is used, the selected dose volume and frequency shall ensure that dosing events are spaced uniformly throughout a twenty-four hour period to maximize resting between dosing events. Time dosed controls should prevent premature dosing when less than the daily dose volume is present in the dosing tank.
- (3) Orifices and orifice shielding
- (a) Orifices shall be uniform, clean, and free of all drill cuttings. Lateral pipes must be stabilized when drilling orifices to prevent the pipes from moving and to ensure orifices are drilled perpendicular to the pipe.
 - (b) Orifices must be sized no less than one-eighth inch and spaced a maximum of six feet apart along the lateral.
 - (c) The orifice number and spacing shall provide distribution of no more than six square feet per orifice with an orifice size of not less than one-eighth inch. Orifices must be spaced a minimum of six inches from the end of the lateral.
 - (d) The direction of orifices and the method of orifice shielding shall be specified in the design and shall allow for uniform pressurization and depressurization of the laterals, and drain-back to prevent freezing.
 - (e) The design must specify how the effluent stream from the orifices will be dispersed for uniform distribution. When orifices are positioned up in the twelve o'clock position, the effluent stream must be sprayed against an orifice shield, gravel-less chambers, or similar device. When orifices are positioned down in the six o'clock position to facilitate draining after each dosing cycle, a mechanism to disperse the effluent stream such as an orifice shield, a pad of gravel, or a splash plate shall be provided.
 - (f) When orifice shields are used, they must be strong enough to withstand the weight of the backfill and large enough to protect the orifice from being plugged by gravel.
 - (g) If effluent is to be sprayed upward against the top of gravel-less chambers, the design shall include and follow manufacturer recommendations.
- (4) The selected distal pressure to be maintained at the end of each lateral shall be no less than three feet when using three-sixteenth inch or larger diameter orifices, and no less than five feet when using orifices smaller than three-sixteenth inch.
- (5) Pressure dosed STS shall use either elapsed time meters, event counters, or

flow meters capable of measuring total flow to help determine flow rates and dose volumes. Time dosed STS shall also have control panels with programmable timers, manual pump operation or hand- off- auto switches, test features, and as applicable, adjustable override settings. Adjustable override settings cannot exceed the daily design flow and the override volume cannot exceed the dosing design of the downstream component.

- (6) Dosing tanks and pumps and controls must meet the design and sizing specifications of rule 3701-29-12 of the Administrative Code. The dosing tank size and the pump, exterior control panel, and alarm information shall be included with the design. The design shall indicate the settings or means used to accommodate the dose volume including any drainback to the dosing tank.
- (7) Testing, setting, adjusting and recording of any low pressure distribution components and control panel functions shall be conducted prior to installation approval by the board of health. Flow rate and distal pressure or operating head shall be consistent with STS design specifications and a baseline shall be recorded for future performance monitoring.
- (8) O&M and monitoring devices
 - (a) Inspection ports shall be installed to comply with the following:
 - (i) Pressure distributed leach trenches shall have at least one inspection port placed in each leaching trench for observation of distribution and any ponding at the infiltrative surface. The ports shall be anchored and be accessible with at least a four inch opening and a removable cap; and
 - (ii) Mounds shall have at least three inspection ports spaced at intervals adequate for observation of distribution and any ponding at the sand fill infiltrative surface. The ports shall be anchored and be accessible with at least a four inch opening and a removable cap.
 - (b) Accessible turn-ups shall be provided at the end of each lateral for the purpose of flushing the laterals and testing distal operating head.
 - (c) Shutoff mechanisms with a durable and stable access port shall be provided to isolate portions of the distribution network.
- (B) Sewage treatment systems using low pressure distribution shall be operated, maintained, and monitored as required by the operation permit issued by the board of health. The O&M and monitoring of the entire STS shall be conducted at least annually, or more often as required by a condition of the operation permit. A service agreement for a STS with a pretreatment component shall also include the maintenance and monitoring of all system components. In conjunction with any operation permit conditions or O&M provisions required by the board of health, the O&M of a sewage treatment system utilizing low pressure distribution shall include but is not limited to:
 - (1) Checking for ponding in the distribution area;
 - (2) Checking for surface water infiltration or clear water flows from the dwelling or structures into the system components and around or onto the soil absorption area;

- (3) Checking the vegetative cover for erosion or settling and any evidence of settling or seepage in the area of the soil absorption component;
- (4) Monitoring for proper operation of mechanical devices;
- (5) Monitoring the dose volume and operating pressure head of the distribution system and compare to baseline measurements;
- (6) Flushing of distribution laterals; and
- (7) Review and document event counters, elapsed time meters, flow meters, and alarm conditions where present.

Effective: 01/01/2015

Five Year Review (FYR Dates): 01/01/2020

CERTIFIED ELECTRONICALLY

Certification

09/29/2014

Date

Promulgated Under: 119.03
Statutory Authority: 3718.02
Rule Amplifies: 3718.02