SUBCHAPTER D: ALTERNATIVE COLLECTION SYSTEMS
§§217.90 - 217.100
Effective December 4, 2015

§217.90. Applicability.

This subchapter applies to the design, construction, operation, maintenance, and testing standards for alternative collection systems. Conventional collection systems and reclaimed water conveyance systems are covered in Subchapter C of this chapter (relating to Conventional Collection Systems). This subchapter does not apply to individual private grinder pumps or septic tank effluent pumps that discharge directly into a conventional collection system and are not part of an alternative collection system.

Adopted November 4, 2015 Effective December 4, 2015

§217.91. Edwards Aquifer.

An owner who plans to install an alternative collection system located over the recharge zone of the Edwards Aquifer, as "recharge zone" is defined in §213.3 of this title (relating to Definitions), must design and install the alternative collection system in accordance with Chapter 213 of this title (relating to Edwards Aquifer) in addition to this subchapter.

Adopted November 4, 2015 Effective December 4, 2015

§217.92. Component Sizing.

(a) The components of an alternative collection system must be sized based on existing flow data from a system and service area with similar characteristics, if such data is available. Similar characteristics for sizing alternative collection systems include:

(1) location;

(2) inflow and infiltration characteristics;

(3) peak flows;

(4) pipe materials;

(5) customer base, including sources of wastewater and percent contribution from the wastewater sources; and

(6) any other characteristics required by the executive director.

(b) If flow data from a similar service area with a conventional collection system is used, the engineering report must include the expected effects of inflow and infiltration on the peak flow of the conventional collection system.

(c) Design and construction of an alternative collection system must minimize excess flows from inflow and infiltration.

(d) Roof drains, street drains, or other types of drains that allow entrance of stormwater into an alternative collection system are prohibited.

(e) In the absence of existing data, the sizing of on-site components in an alternative collection system must be based on Table B.1. in Figure: 30 TAC §217.32(a)(3) of this title (relating to Organic Loadings and Flows for New Wastewater Treatment Facilities), in conjunction with the following equation:

Figure: 30 TAC §217.92(e)

Equation D.1.

$$Q = X \times (1 + B)$$

Where:
Q = flow in gallons per day
X = per capita wastewater production in gallons per day
B = number of bedrooms

(f) Design of the off-site components must be based on the maximum flow rate expected, calculated using the following equation:

Figure: 30 TAC §217.92(f)

Equation D.2.

$$Q = (A \times N) + B$$

Where:
Q = Design flow rate (gallons per minute)
A = Design coefficient, typically 0.5
N = Number of equivalent dwelling units served by the off-site component

B = Safety factor, assumed to be 20.0

(1) An equivalent dwelling unit (EDU) is assumed to have an occupancy of 3.5 people. For EDU populations greater than 3.5, the following equation must be used:

Figure: 30 TAC §217.92(f)(1)

Equation D.3.

$$Q = (A_1 \times P) + B$$

Where:
Q = Design flow rate (gallons per minute)
A_1 = Derived from A in Equation D.2. in Figure: 30 TAC §217.92(f), typically 0.15
P = Population to be served
B = Safety factor, assumed to be 20.0

(2) The safety factor, "B,"may be adjusted if higher wastewater flows are anticipated. A discharge from commercial or institutional dischargers must be measured directly or calculated under this subsection.

Adopted November 4, 2015 Effective December 4, 2015

§217.93. General Requirements.

(a) Except where specifically stated in this subchapter, the design of an alternative collection system must comply with the applicable requirements of Subchapter C of this chapter (relating to Conventional Collection Systems).

(b) An owner shall obtain from an engineer:

(1) an operation and maintenance manual that specifies the recommended operating procedures and maintenance practices for the alternative collection system; and

(2) as-built drawings indicating the location of all on-site components of the alternative collection system.

(c) An owner shall certify by letter to the executive director that the requirements in subsection (b) of this section have been met. The letter must include the permit number and name(s) of the owner(s) of the associated wastewater treatment facility.

(d) An intersection of three or more collection pipes must have a manhole.

(e) A manhole must not be located in the flow path of a watercourse, or in an area where surface water accumulates.

(f) An alternative collection system must discharge to a wastewater treatment facility that is permitted by the commission or to a collection system that flows to a wastewater treatment facility permitted by the commission.

Adopted November 4, 2015 Effective December 4, 2015

§217.94. Maintenance and Inspection Program.

An alternative collection system owner shall develop and implement a maintenance and inspection program in accordance with §217.69 of this title (relating to Maintenance, Inspection, and Rehabilitation of the Collection System).

Adopted November 4, 2015 Effective December 4, 2015

§217.95. Alternative Collection System Service Agreements.

(a) An alternative collection system service agreement must be executed between the alternative collection system owner and each real property owner served by the alternative collection system. The service agreement must authorize the collection system owner to place and maintain alternative collection system components on the real property owner's property.

(b) An alternative collection system service agreement must identify the owner of the on-site components and specify the responsible party for the construction and maintenance of the on-site components.

(c) An alternative collection system owner shall submit a copy of the alternative collection system service agreement to the executive director with the summary transmittal letter required in §217.6 of this title (relating to Submittal Requirements and Review Process), for the executive director to review.

(d) An alternative collection system service agreement must include:

(1) a requirement that the alternative collection system owner shall ensure that all existing alternative collection system components and building laterals that will be incorporated into a new or altered alternative collection system must be cleaned, inspected, tested, maintained, altered, or replaced, as necessary, to the satisfaction of the collection system owner before connecting the alternative collection system component to the collection system;

(2) a requirement that the alternative collection system owner shall approve all materials and equipment before incorporating the materials and equipment into any construction or maintenance of an alternative collection system component;

(3) a requirement that the alternative collection system owner shall have an engineer inspect and approve the installation of all new or replacement alternative collection system components before placing the system into service;

(4) a provision that the alternative collection system owner shall have access at all reasonable times to inspect on-site alternative collection system components;

(5) a provision that the alternative collection system owner has the right to make an emergency repair and perform emergency maintenance to any alternative collection system component, including building laterals and on-site collection system components;

(6) a statement of whether the alternative collection system owner or the property owner is responsible for non-emergency maintenance of on-site components;

(7) a statement of whether the alternative collection system owner or the property owner is responsible for paying maintenance costs for on-site components, or how the costs to each party will be determined if responsibility is shared;

(8) a statement of whether the collection system owner or the property owner is responsible for paying the electrical power cost of operating an on-site component, or how the costs to each party will be determined if responsibility is shared;

(9) a payment method, including a payment schedule, for the alternative collection system owner to recover costs paid by the alternative collection system owner that the property owner is responsible for paying;

(10) a payment method, including a payment schedule, for the property owner to recover costs paid by the property owner that the alternative collection system is responsible for paying;

(11) a provision that authorizes the alternative collection system owner to inspect and approve pretreatment units before installation;

(12) a requirement that an on-site component owned by the alternative collection system owner must have an upstream isolation valve;

(13) a requirement that an on-site component must have a service isolation valve located downstream on a service pipe from an on-site component to the collection system;

(14) a provision that service isolation valves must be accessible to the alternative collection system owner at all times, through an easement or other legal agreement or contract between the property owner and the alternative collection system owner; and

(15) a provision that the alternative collection system owner shall have the ability to collect, transport, and dispose of any residual material.

Adopted November 4, 2015 Effective December 4, 2015

§217.96. Small Diameter Effluent Sewers.

(a) Interceptor tank design. Septic tanks used as interceptor tanks must be designed and constructed according to §285.32(b)(1) of this title (relating to Criteria for Sewage Treatment Systems).

(1) An outlet of an interceptor tank must have a commercially available effluent filter designed to remove particles larger than 1/16 inch.

(2) The volume of an equivalent dwelling unit (EDU) interceptor tank must be based on the criteria in Chapter 285 of this title (relating to On-Site Sewage Facilities).

(3) The volume of a multiple equivalent dwelling unit (MEDU) interceptor tank must be calculated using the following equations:

Figure: 30 TAC §217.96(a)(3)

Equation D.4.

$$VT = VR + VN$$

Where:
VT = Total Volume
VR = Reserve Volume = 0.75 x average daily flow (ADF)
VN = Nominal Volume

Equation D.5.

$$VN = VIE + VCZ + VSO$$

Where:
VIE = Volume in gallons between elevation of a tank inlet and a tank outlet (≤ 0.165ADF)
VCZ = Volume in gallons of the clear zone between maximum sludge depth and scum accumulation (1.0 ADF)
VSO = Volume in gallons dedicated to scum and sludge storage (1.85 ADF)

(b) Pretreatment units.

(1) A non-residential contributor to an alternative collection system must provide a method for trapping and removing fats, oils, and grease (FOG) from the wastewater before the wastewater enters an interceptor tank.

(2) A pretreatment unit must have at least two compartments.

(3) The primary compartment volume must be at least 60% of the total tank volume.

(4) A grease trap must meet the same requirements as an interceptor tank with regard to water tightness, materials of construction, and access to contents.

(5) FOG retention capacity, in pounds, must be at least twice the pretreatment unit's flow capacity, in gallons per minute. The FOG retention capacity of a grease trap is the amount of FOG that it can hold before its efficiency drops below 90%.

(6) Plumbing for a pretreatment unit must be designed to prevent wastes, other than FOG, from entering the pretreatment unit.

(7) A pretreatment unit must be designed to allow monitoring of the sludge and FOG levels.

(c) Service pipe design.

(1) Pipe materials used for service pipe must meet or exceed the performance characteristics of American Society for Testing and Materials (ASTM) D 2241 Class 200 polyvinyl chloride (PVC) pipe.

(2) An interceptor tank must include a pumping unit if the interceptor tank's outlet elevation is below the main pipe elevation or if the hydraulic grade line is within a depressed section of a main pipe.

(3) A service pipe for an EDU or MEDU must be sized to transport the highest flow expected from the building, but must not be less than 2.0 inches in diameter.

(4) The diameter of a service pipe must be no greater than the diameter of the collection pipe it is connected to.

(5) A service pipe of an interceptor tank that is subject to periodic backflow must include a check valve that:

(A) is located immediately adjacent to the collection pipe;

(B) is made from a corrosion-resistant material;

(C) provides an unobstructed flow way; and

(D) is a swing type valve with an external position indicator to show the open and closed positions.

(d) Collection system design.

(1) Hydraulic design.

(A) A small diameter effluent sewer (SDES) system with open channel flow must use a design depth of flow of 100% of the pipe diameter.

(B) The minimum flow velocity in a collection pipe must be no less than 1.0 foot per second (fps).

(C) The maximum flow velocity in any portion of an SDES system is 8.0 fps without thrust restraint and 13.0 fps with thrust restraint.

(D) The engineering report must include velocity calculations for each pipe segment.

(E) The elevation of the hydraulic grade-line at peak flow must be lower than an outlet invert of any upstream interceptor tank, unless the interceptor tank has on-site conveyance equipment.

(F) The engineering report must include an analysis for each pipe showing the hydraulic grade line, energy grade line, and ground elevation in relationship to the outlet elevation of each interceptor tank being served by a collection pipe.

(G) The engineering report must include an engineer's analysis of each segment of a variable grade effluent sewer.

(H) Open pipe flow design must use a Manning's "n" value of 0.013.

(I) Pressure flow design must use a Hazen-Williams "C" value of 120.

(J) No pipe in an SDES may be smaller than 2.0 inches in diameter.

(2) Vertical Alignment.

(A) The vertical alignment of an SDES may be variable; however, the overall downhill gradient must allow the pipe to transport the peak flow.

(B) Venting must be provided upstream and downstream of pipe segments that are below the hydraulic grade line.

(C) The pipes must have a uniform profile (i.e., no abrupt or sharp changes in vertical direction).

(D) A collection pipe must have a cleanout that extends to ground level and terminates in a watertight valve box at:

(i) an upstream terminus;

(ii) a minor junction;

(iii) a change in pipe diameter; and

(iv) intervals of no more than 1,000 feet.

(E) Venting at a collection pipe summit must use a wastewater service air release valve or a combination air release and vacuum valve. The valve must be constructed of corrosion-resistant material and located in a vault.

(F) Pipe material used in a collection system must meet the performance requirements of ASTM D 3034 SDR 26 PVC pipe, except for any segment under pressure flow conditions. Under pressure flow conditions, pipe material must meet the performance requirements of ASTM D 2241 Class 200 PVC pipe.

(3) Odor Control. A collection pipe must have permanent odor control devices attached to the line and must prevent nuisance odors. Odor control devices must be accessible for maintenance.

Adopted November 4, 2015 Effective December 4, 2015

§217.97. Pressure Sewers.

(a) Pumps. A pressure sewer system must include a grinder pump or a septic tank effluent pump (STEP).

(b) Exceptions. Except where this section specifically states otherwise, the requirements of this section apply to both grinder pumps and STEPs.

(c) Service Pipe Requirements.

(1) A pressure sewer service pipe that is buried less than 30 inches below ground must incorporate a check valve and a fully closing gate or ball valve at the junction of a collection pipe and a service pipe to allow isolation of the service pipe.

(2) A check valve must allow an unencumbered flow when fully open.

(3) A valve must be made of corrosion-resistant material and must have a position indicator to show its open and closed position.

(4) The minimum size service pipe for an equivalent dwelling unit (EDU) is 1.25 inches.

(5) The minimum size service pipe for a multiple equivalent dwelling unit (MEDU) is 1.5 inches.

(6) A junction to collection pipes must be made with a tee or service saddle and may use solvent weld fittings.

(7) The diameter of a service pipe must be no greater than the diameter of the collection pipe to which it is connected.

(8) Material used in a service pipe must have performance characteristics that are at least equivalent to American Society for Testing and Materials (ASTM) D 2241 Class 200 polyvinyl chloride (PVC) pipe.

(d) On-Site Mechanical Equipment Requirements.

(1) Pump discharge rates must allow the capacity of the pump and the volume of the wet well dedicated for flow attenuation and storage to accommodate the expected peak flow.

(2) A single pumping unit may be used for an EDU. The engineering report must include an analysis that justifies the size of the selected pump(s).

(3) An MEDU must be served by at least two pumps capable of pumping the peak flow with the largest pump out of service. The engineering report must include an analysis that justifies the size of the selected pumps.

(4) The calculations in the engineering report must show that all lift stations and pump chambers are protected against buoyancy forces.

(5) Control panels for all pumps must be at least 2.0 feet above the ground floor elevation of the structure being served by the equipment.

(6) All pipes and appurtenances within a wet well must be corrosion-resistant.

(7) A wet well must include an audiovisual alarm system.

(A) An alarm for an EDU must activate at the high water level specified in the engineering report, plans, or specifications for the project.

(B) An alarm for an MEDU must activate in the event of unit failure or a high water level.

(8) An EDU wet well must have a reserve volume of at least 100 gallons after the activation of a high water alarm.

(9) The reserve volume of an MEDU wet well must equal the volume accumulated during an average two-hour period or 100 gallons, whichever is greater.

(10) A pump located in a STEP chamber that is integrated with an interceptor tank may use the reserve volume of the interceptor tank for the required reserve volume.

(11) A housing that contains mechanical equipment or controls must be watertight if immersion of the mechanical equipment or controls would cause failure.

(12) A control panel or other electrical enclosure must:

(A) be constructed of corrosion-resistant materials;

(B) be watertight;

(C) prevent the migration and venting of odor to the panel or enclosure;

(D) prevent the migration and venting of corrosive or explosive gases to the panel or enclosure; and

(E) bear the seal of the Underwriter Laboratory, Inc. or comply with the National Fire Protection Association 70 National Electrical Code®.

(13) STEP system equipment.

(A) A pump used in a STEP system may be housed either in an interceptor tank or in a separate stand-alone unit.

(B) A pump housed in the interceptor tank of a STEP system must be located in separate chamber from the influent chamber.

(C) The water level in a STEP system pump chamber must not affect the water level in the interceptor tank, to prevent the disturbance of settleable and floatable solids in the interceptor tank.

(D) A design that allows a variable liquid elevation in an interceptor tank is prohibited.

(14) Housing for on-site mechanical equipment and any associated control mechanisms must be:

(A) lockable and tamper-resistant;

(B) constructed of corrosion-resistant material; and

(C) designed to last at least 50 years.

(15) A vault, chamber, wet well, or other structure used to contain wastewater must be:

(A) watertight;

(B) able to withstand any expected structural loading;

(C) constructed of corrosion-resistant material; and

(D) designed to last at least 50 years.

(e) Discharge Pipe Requirements.

(1) A discharge pipe and connections used to join on-site mechanical equipment to a service pipe must be pressure rated at a minimum of 2.5 times the maximum system design pressure.

(2) Pipe material and valves must be corrosion-resistant.

(3) A discharge pipe for a pressure system must include a check valve, a pipe union, and a full closing gate valve or ball valve. A check valve must precede a full closing gate valve.

(4) A ball or gate valve must have a position indicator to show its open and closed positions.

(5) A valve used at an MEDU must be located in a valve box separate from the on-site mechanical equipment.

(f) Collection System Design.

(1) The velocity of wastewater in a grinder pump pressure system main pipe must reach at least 3.0 feet per second at least once per day.

(2) The velocity of wastewater in a grinder pump pressure system main pipe must not be less than 2.0 feet per second nor exceed 8.0 feet per second.

(3) The velocity in a STEP system main pipe must reach at least 1.0 foot per second at least once per day.

(4) A collection system head loss calculation must use a Hazen-Williams "C" factor appropriate to the pipe material. The use of a "C" factor greater than 140 is prohibited.

(5) The pipe used in a pressure collection system must be at least 1.5 inches in diameter.

(6) Pipe material must have the performance characteristics at least equivalent to ASTM D 2241 Class 200 PVC pipe.

(7) A pipe equal to or greater than 3.0 inches in diameter requires elastomeric pipe joints.

(8) A pumping unit affected by less than full flow conditions must incorporate an anti-siphon device.

(9) An isolation valve must be located at:

(A) each intersection of a collection system main pipe;

(B) both sides of a stream crossing;

(C) both sides of an area of unstable soil; and

(D) maximum intervals of 2,500 feet.

(10) An isolation valve must be:

(A) a resilient seated gate valve or ball valve with a position indicator;

(B) constructed from corrosion-resistant materials; and

(C) located in a locked valve box.

(11) Each peak in elevation and each location where air may accumulate due to a difference in flow conditions requires a wastewater air release valve.

(A) A valve orifice must be at least 0.25 inches in diameter.

(B) An air release valve within 50 feet of a residence or building must control odor. An owner shall implement odor control measures necessary to prevent a collection system from becoming a nuisance.

(12) When intermediate pumping of wastewater is required, the design of a collection system lift station must meet the requirements of Subchapter C of this chapter (relating to Conventional Collection Systems).

§217.98. Vacuum Sewer Systems.

(a) A vacuum sewer system is a non-conforming technology. The executive director may review a vacuum sewer in accordance with §217.7(b)(2) of this title (relating to Types of Plans and Specifications Approvals) and the criteria described in this section.

(b) On-Site Component Design.

(1) A building lateral must be constructed using pipe material that has performance characteristics at least equivalent to American Society for Testing and Materials (ASTM) D 2241 Class 160 polyvinyl chloride (PVC) pipe.

(2) A building lateral must use a screened auxiliary vent no less than 4.0 inches in diameter and located no closer than 10.0 feet to a vacuum valve.

(3) A vacuum valve control must be in a tamper-resistant, watertight, and corrosion-resistant structure.

(4) A vacuum valve pit must be watertight to prevent surface and groundwater inflow.

(5) A control mechanism that uses a pressure differential must use atmospheric air supplied by a screened breather on the lateral line.

(6) A vacuum valve must have a minimum capacity of 30 gallons per minute.

(7) A service pipe must be at least 3.0 inches in diameter.

(8) The performance characteristics of a service pipe must meet or exceed the performance characteristics of ASTM D 2241 Class 200 PVC pipe.

(9) A service pipe joint must be made using either vacuum-rated elastomeric gasket or solvent welding.

(10) A vacuum valve and a main pipe must be separated by at least 5.0 feet of service pipe.

(11) If there is a vertical profile change in a service pipe, the vacuum sewer system must have at least 5.0 feet between the vacuum valve and the first profile change, and between the last profile change and the main pipe.

(12) A service pipe must have a minimum slope of 0.2%.

(13) The connection of a service pipe to a main pipe must use a wye and a long radius elbow, oriented so that the invert of the service pipe is higher than the crown of the collection pipe, and must not be located within 6.0 feet of a collection pipe vertical profile change.

(c) Vacuum Sewer System Design.

(1) The performance characteristics of a pipe in a vacuum sewer must meet or exceed the performance characteristics of ASTM D 2241 Class 200 PVC pipe.

(2) A pipe joint must have a vacuum-rated rubber gasket or be solvent welded.

(3) A pipe in a vacuum sewer must be at least 4.0 inches in diameter. A service pipe must be at least 3.0 inches in diameter.

(A) The length of a 4.0 inch diameter vacuum pipe must not exceed 2,000 feet.

(B) The maximum length of a pipe larger than 4.0 inches in diameter must be determined by the amount of friction and lift head loss.

(4) The total available head loss from the farthest input point in a system is 18 feet, consisting of five feet to operate the vacuum valve and 13 feet available for wastewater transport.

(5) A vacuum sewer system must be laid out in a branched pattern designed to balance pressures within the system. A pipe must have a saw-tooth profile that slopes toward a vacuum station.

(6) The design of an upgrade main line transport pipe must reduce the risk of blocking a pipe with trapped sewage.

(7) A collection pipe that is depressed in order to avoid an obstruction must have at least a 20 foot segment centered on the obstruction.

(8) An intersection of collection pipes must include a division valve at both sides of a watercourse crossing, at both sides of an area of unstable soil, and at intervals of no more than 1,500 feet.

(A) A division valve must be either a plug valve or a resilient-seated gate valve capable of sustaining a vacuum of 24 inches of mercury.

(B) A gauge tap must be located downstream of each division valve.

(d) Vacuum station design. The vacuum pump capacity must be the greater of the capacities calculated using the following equations, but not less than 150 gallons per minute:

Figure: 30 TAC §217.98(d)

Equation D.6.

$$Q_{vp} = \frac{A \times Q_{max}}{7.5\mathrm{g/cf}} + B \times N$$

Where:
Q_{vp} = Minimum vacuum pump capacity
A = Variable based on pipe length
Q_{max} = Station peak flow (gallons per minute)
B = Bleed rate of vacuum valve controller (square feet per minute)
N_v = Number of vacuum valves in system
g/cf = gallons per cubic feet

The value of A must be as follows:

Longest Pipe Length (feet.)	A
0-3,000	5
3,001-5,000	6
5,001-7,000	7
7,001-10,000	8
10,001-12,000	9
12,001-15,000	11

Equation D.7.

$$Q = \frac{V}{PDT} \times \log \frac{H_1}{H_2}$$

Where:
Q = Flow rate of vacuum pump (cubic feet per second)
PDT = Time to reduce head from H_1 to H_2 (seconds)
V = Volume of closed system (cubic feet)
H_1 = Initial absolute pressure head (inches of mercury)
H_2 = Final absolute pressure head (inches of mercury)

(e) Vacuum Pumps.

(1) A vacuum pump must be capable of evacuating the system to restore the design vacuum pressure in less than 180 seconds.

(2) The vacuum system must include duplicate vacuum pumps. Each vacuum pump must be capable of delivering 100% of the required airflow and be capable of operating continuously.

(3) A vacuum pump may be either liquid-ring or sliding-vane type. Liquid-ring pumps must be sized at least 15% larger than the necessary vacuum pump capacity.

(4) The transfer pipe must have an electrically or pneumatically controlled plug valve between the collection tank and the reservoir to prevent carryover of liquid into the pump.

(f) Duplicate discharge pumps.

(1) Duplicate discharge pumps are required and must have the capacity to deliver the peak flow with one pump out of service.

(2) A discharge pump must be:

(A) designed for vacuum sewage duty;

(B) equipped with equalizing pipes;

(C) capable of passing a 3.0 inch sphere; and

(D) constructed from corrosion-resistant material.

(3) A discharge pump must use double mechanical shaft seals and have shut-off valves on both the suction and discharge pipes.

(4) The total dynamic head calculation must include the head attributed to overcoming the vacuum in the collection tank.

(5) The available net positive suction head must be greater than the required net positive suction head for the expected vacuum operating range.

(6) The pump suction pipe must be sized 2.0 inches larger than the discharge pipe to prevent wastewater from forming a vortex in the collection tank.

(7) The pump design calculations and pump curves must be included in the engineering report.

(g) Vacuum Reservoir.

(1) A vacuum system that requires a collection tank of 1,600 gallons or more must also include a vacuum reservoir tank with a capacity of at least 400 gallons.

(2) Liquid from a vacuum pump must be piped to the top of the vacuum reservoir tank.

(3) A vacuum reservoir tank must include internal access for periodic cleaning and inspection.

(4) All main pipes must connect to the collection tank.

(5) The wastewater pump suction pipe must lie at the lowest point on the collection tank and away from the main pipe inlet.

(6) The main pipe must enter at the top of the collection tank with the inlet elbows inside the tank turned at an angle away from the pump suction opening.

(7) The collection tank must include probes for liquid level sensing for operation of the discharge pumps.

(8) A vacuum pump must include automatic vacuum switch controls, which must operate based on the liquid level in the reservoir tank.

(9) The collection tank and low system vacuum must include an audiovisual alarm for high liquid level.

(h) An owner shall include a description of the alternative collection system's anti-corrosive protection in the engineering report.

§217.99. Testing Requirements.

(a) Components of an alternative collection system must be tested for water tightness by one of the methods shown in the following table:

Figure: 30 TAC §217.99(a)

Table D.1. - Testing Requirements for an Alternative Collection System

Component	**Type of Test(s)**
Interceptor Tank	Hydrostatic head test for tanks (HHT) or Vacuum test for tanks (VTT)
Buffer Tank	HHT or VTT
Vault, Pit, Wet Wells	HHT or VTT
Service Pipe (Pressure)	Pressure line test (PLT)
Service Pipe (Small Diameter Effluent Sewer (SDES))	Hydrostatic head test for pipe (HHP)
Collection Pipe (Pressure)	PLT
Collection Pipe (SDES)	Low pressure air test for pipe or HHP

(b) Hydrostatic Head Test for Pipe. The total infiltration or exfiltration, as determined by the hydrostatic head test, must not exceed 10 gallons per inch diameter per mile of pipe per 24 hours at a minimum head of 2.0 feet. If the quantity of infiltration or exfiltration exceeds the maximum quantity specified, the owner shall take remedial action to reduce the infiltration or exfiltration to an amount below the specified maximum limits.

(c) Hydrostatic Head Test for Tanks. The test consists of filling the tank to the top and holding the water for 24 hours to determine whether the tank is leaking.

(1) The hydrostatic head test must demonstrate that the tank is not leaking before the placement of backfill around a tank.

(2) The hydrostatic head test for a tank constructed from flexible or semi-rigid material is required after placement and backfilling according to the tank manufacturer's recommendations.

(d) Low-Pressure Air Test. The low-pressure air test must conform to the requirements of §217.57 of this title (relating to Testing Requirements for Installation of Gravity Collection System Pipes).

(e) Pressure Pipe Test.

(1) The test pressure must be a minimum of 25 pounds per square inch or 1.5 times the maximum pipe design pressure, whichever is larger. The maximum allowable leakage must be calculated using the following equation:

Figure: 30 TAC §217.99(e)(1)

Equation D.8.

$$L = \frac{S \times D \times \sqrt{P}}{133200}$$

Where:
L = Leakage (gallons per hour)
S = Length of pipe (feet)
D = Inside diameter of pipe (inches)
P = Pressure (pounds per square inch), gauge

(2) If the leakage exceeds the maximum amount calculated, the owner shall take remedial action to reduce the leakage to an amount within the allowable limit from paragraph (1) of this subsection.

(f) Vacuum Test for a Tank.

(1) The test may begin only after establishing an initial stable vacuum of 4.0 inches of mercury.

(2) The total vacuum loss during a vacuum test must not exceed 1.0 inch loss of mercury vacuum after five minutes.

(3) A tank constructed of flexible or semi-rigid material must not allow more than a 3% change in tank dimensions in any direction while under vacuum.

(4) If the quantity of vacuum loss or if tank deformation equals or exceeds the maximum quantity specified in paragraph (2) of this subsection, then the owner shall take remedial action to reduce the amount of vacuum loss or amount of deformation to comply with this subsection.

Adopted November 4, 2015 Effective December 4, 2015

§217.100. Termination.

(a) An alternative collection system must terminate at a wastewater treatment facility or into a manhole that is part of a conventional collection system.

(b) Release of gases must be controlled by minimizing turbulence in the discharge into a manhole.

(c) An alternative collection system that terminates at a wastewater treatment facility must discharge below the liquid level at the headworks or the influent lift station.

Adopted November 4, 2015 Effective December 4, 2015