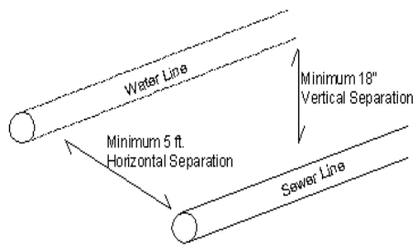
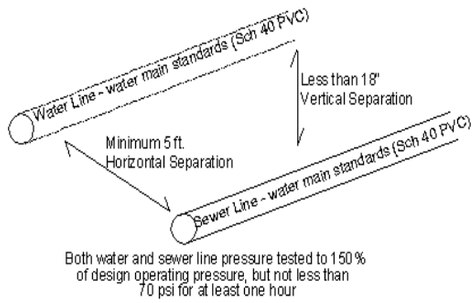
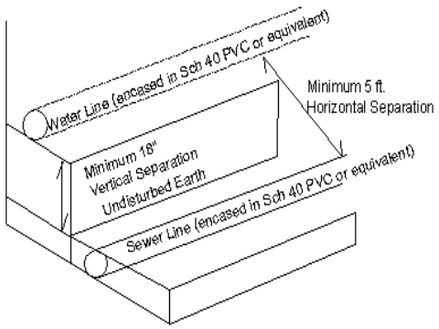
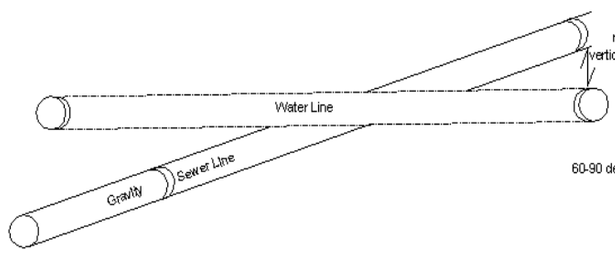
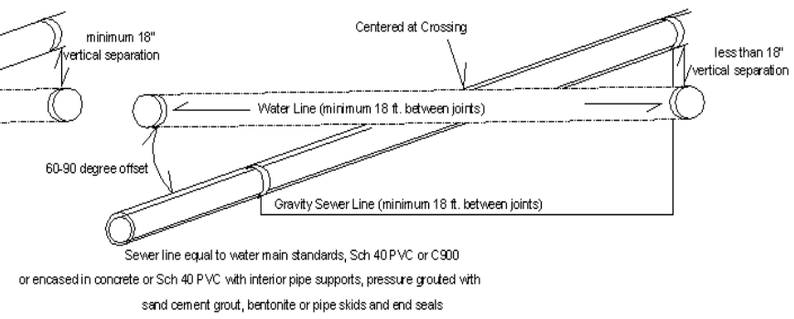
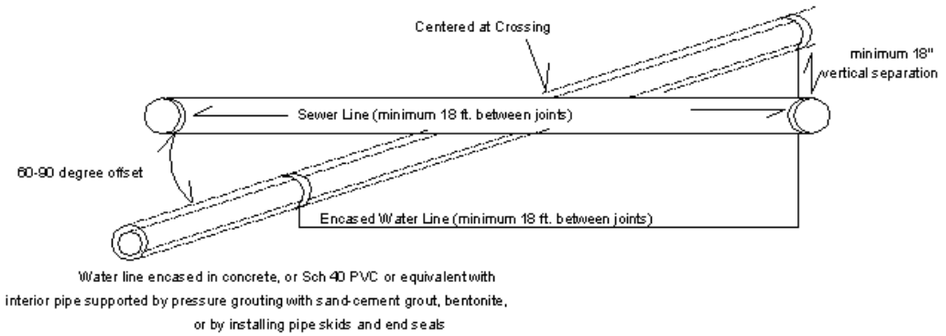
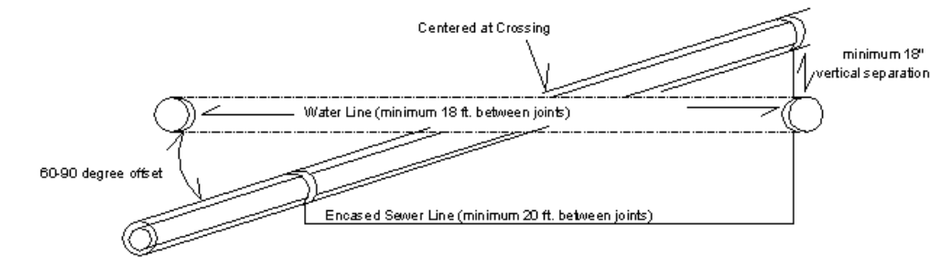
Northeast Tri County Health District Mitigation Measures for Sewer & Water Line Reduced Separation or Crossings

The following are conditions and mitigation measures for water and sewer lines which do not meet the required minimum 10-foot separation as per NETCHD Regulation 01-2007. The first option should be to comply with the minimum 10-foot separation. However, if this separation cannot be reasonably maintained, reduced separation and crossings will be allowed if the following mitigation measures are met. The conditions of the water and sewer line reduced separation or crossing must be shown on the sewage system design along with the specific mitigation measures that will be used. The installation of the lines must then follow the approved design and will be verified during the final inspection of the on-site sewage system. If the prescribed mitigation measures listed below cannot be achieved, the reduced separation or crossing will not be approved.

If the condition is:	The mitigation measures required are:	Diagram:
1. **Gravity or Pressure** sewer line less than 10 feet horizontally or less than 18 inches vertically from water line (lines parallel, not crossing)	• Place lines in separate trenches a minimum of 5 feet apart with water line 18 inches higher than top of sewer line. If this is done, no other mitigation measures are required. • If the vertical separation between the two lines is less than 18 inches, sewer line & joints must be equivalent to water main standards (example: Sch40 PVC, C900 PVC) and pressure tested to 150% of design operating pressure, but not less than 70 psi for at least 1 hour. • If the sewer and water lines are in the same trench, both must be encased in Sch 40 PVC or equivalent. In addition, water line must be a minimum of 5-feet horizontally and 18 inches above sewer line on bench of undisturbed earth. • If using steel or ductile iron casing, design consideration for corrosion protection should be considered.	Figure 1. Separate Trench (minimum 18" vertical separation/ 5' horizontal separation)  Figure 2. Separate Trench (less than 18" vertical separation/ 5' horizontal separation)  Figure 3. Common Trench (minimum 18" vertical separation/ 5' horizontal separation) 
2. **Gravity** sewer line crossing UNDER water line	• The top of the sewer line must be at least 18 inches below the water line. If this is done, then no other mitigation measures are required. • If the vertical separation is less than 18 inches, sewer line & joints must be equivalent to water main standards (example: Sch 40 PVC, C900 PVC), or if standard pipe, must be encased in concrete, or Sch 40 PVC or equivalent, with interior pipe supported by pressure-grouting with sand-cement grout, bentonite, or by installing pipe skids and end seals. • Length of the Sch 40 PVC or equivalent sewer line or encasing line must be at least 18 feet, centered at the point of crossing, with no joints in that 18 feet. • The crossing must be as close to 90° as possible, being no less than 60°. • If using steel or ductile iron casing, design consideration for corrosion protection should be considered.	Figure 1. Gravity Sewer Crossing UNDER Water Line (minimum 18" vertical separation)  Figure 2. Gravity Sewer Crossing UNDER Water Line (less than 18" vertical separation) 

3. Gravity sewer line crossing OVER water line	• The sewer line must be at least 18 inches above the crown of the water line. • Sewer line and joints must be equivalent to ASTM Standard 3034. • Length of the sewer line must be at least 18 feet, centered at the point of crossing with no joints in that 18 feet. • The crossing must be as close to 90° as possible, being no less than 60°. • There must be adequate structural support for the sewer line to prevent excessive deflection of joints and settling on and breaking of the water line. • The water line, regardless of material, must be encased in concrete, or Sch 40 PVC or equivalent, with interior pipe supported by pressure-grouting with sand-cement grout, bentonite, or by installing pipe skids and end seals. • If using steel or ductile iron casing, design consideration for corrosion protection should be considered.	Figure 1. Gravity Sewer Crossing OVER Water Line (minimum 18" vertical separation)  Water line encased in concrete, or Sch 40 PVC or equivalent with interior pipe supported by pressure grouting with sand-cement grout, bentonite, or by installing pipe skids and end seals
4. Pressure sewer line crossing UNDER water line **OR** parallel less than 10 horizontal feet from water line	• Sewer line must be at least 18 inches below water line. • Sewer line must be encased in concrete, or Sch 40 PVC or equivalent, with interior pipe supported by pressure-grouting with sand-cement grout, bentonite, or by installing pipe skids and end seals. • The encasing line must be at least 20 feet long (not 18 feet) and centered at point of crossing. • If using steel or ductile iron casing, design consideration for corrosion protection should be considered.	Figure 1. Pressure Sewer Line Crossing UNDER Water Line OR Parallel Less Than 10 Horizontal Ft. from Water Line  Sewer line encased in concrete, or Sch 40 PVC or equivalent with interior pipe supported by pressure grouting with sand-cement grout, bentonite, or by installing pipe skids and end seals
5. Pressure sewer line crossing OVER water line.	Not allowed.	

References: Criteria for Sewage Works Design, Section C1-9, Washington Department of Ecology, Publication 98-37 WQ, January 1978, Revised August 2008.
Granting Waivers from State On-Site Sewage System Regulations, Washington Department of Health, July 2007.
Northeast Tri County Health District, Regulation 01-2007 On-Site Sewage Systems, Section 12, Table II "Minimum Horizontal Separations, April 18, 2007

Approved: March 2009