

TABLE 14-8

SUMMARY OF SEWER SYSTEM COLLECTION TECHNOLOGIES

TECHNOLOGY	RELIABILITY	FLEXIBILITY	ENERGY USE	LAND REQUIREMENTS	PUBLIC ACCEPTANCE	IMPLEMENTATION	RELATIVE CAPITAL COSTS	RELATIVE O&M COSTS
Gravity sewers and lift stations	Very reliable. Longest track record and widely used. Lift stations do require electricity, but generators are typically provided.	Can be expanded to serve additional areas. Initial flows not critical.	Lift stations require energy and typically have emergency generators to keep system operational.	Sewer typically located in street. Land may be required for lift stations. Easements may be required for sewers.	Well-known technology. Deep excavations can cause traffic disruption. Low chance of backups into structures.	Difficult implementation due to deeper excavations and the need for constant slope.	Moderate. Installation cost depends upon topography in area. Lift stations or deep lines can increase costs.	Moderate since lift stations must be maintained. Sewer line requires little maintenance.
Pressure sewers and grinder pumps	Reliable. Large number of grinder pumps and dependence on electricity limit reliability.	They are not suitable for nitrogen removal treatment systems that require organic solids to attain denitrification.	Pumps require energy for operation. System cannot be operated during power failures unless each pump has standby power.	Sewers typically located in street or road ROWs. No land requirements. Easements may be required for sewers.	Each home or group must have a pump. Power outage can cause backup into structures and reduce potential public acceptance.	Easier pipeline installation due to shallower excavations and less critical slopes, but more difficult implementation of grinder pumps on individual properties.	Moderate. Pipelines installed at minimum depth. Pump required at each home or group of homes.	Moderate since grinder pumps must be maintained.
Septic tank effluent pump system	Somewhat reliable. Large number of STEP pumps and dependence on electricity limit reliability.	They are not suitable for nitrogen removal treatment systems that require organic solids to attain denitrification.	Pumps require energy for operation. System cannot be operated during power failure unless each lift station has standby power.	Sewers typically in street. Land requirements for septic tanks and pumps may be on individual properties. Easements may be required for sewers.	Each home must have a pump and septic tank. Odor potential may reduce public acceptance.	Easier installation due to shallower excavations and less critical slopes. May impact nitrogen removal at a treatment plant. More difficult implementation of grinder pumps on individual properties.	Moderate. Pumps required at each home. Lines installed at minimal depth.	High due to maintenance of pumps and operator training. Septic tanks must be pumped periodically.
Septic tank effluent gravity system	Very reliable but less widely used. System does not require mechanical components.	Can be expanded. Initial flows not critical.	Sewers do not require energy. Lift stations require energy and typically have generators to keep system operational.	Sewers typically in street. Land requirements for septic tanks and pumps may be on individual properties. Easements may be required for sewers.	Each home must have a septic tank. Odor potential may lower acceptance. Chance of backup is minimal.	Easier installation due to shallower excavations, but constant slopes must be maintained. Not feasible where septic tank elevations are low. May impact nitrogen removal at a treatment plant.	Moderate. Pipelines installed at shallow depths. Lift stations can increase costs.	Moderate. Sewer line requires little maintenance. Lift stations must be maintained. Additional operating training will be required.
Vacuum sewers	Reliable. Maintaining vacuum pressure limits the reliability of the system; however, no power is required at individual properties for valve pits.	Difficult to expand. Initial flows must be accurately estimated and expansion is limited. More difficult to make future connections if not planned in advance.	Energy is required to maintain vacuum. Power typically supplied by generator during outages. Otherwise no power needed at the valve pits.	Sewers in street or road rights-of-way. Land will be required for vacuum station. Easements required for sewers.	Requires large number of easements. Valve pits are required at each property and vents are required on each gravity lateral reducing public acceptance.	Shallower excavations than gravity sewers; however, more complex system with critical design features that must be installed properly for the system to function properly. High level of testing required during sewer installation.	Moderate. Vacuum station and valve pits are required. Large number of easements required.	High. Valve pits and vacuum stations must be maintained. Seasonal homes require flushing.