TABLE 14-5

SUMMARY OF COMMUNITY/MUNICIPAL DRINKING WATER TECHNOLOGIES AND SECONDARY/ADVANCED WASTEWATER TREATMENT TECHNOLOGIES

DRINKING WATER:

TECHNOLOGY	REGULATORY REQUIREMENTS	SUITABILITY	IMPLEMENTABILITY	PERFORMANCE	LONG-TERM MAINTENANCE	LAND USE	AESTHETIC APPEAL	PUBLIC ACCEPTANCE/ POLITICAL FEASIBILITY	RELATIVE CAPITAL COSTS	RELATIVE O&M COSTS
Municipal Drinking Water Supply	MassDEP regulations for drinking water.	Would provide safe drinking water for the Town of Eastham residents.	Would require planning and siting of a public water supply and installation of monitoring controls, water mains and individual household connections.	In accordance with MassDEP regulations.	Long-term maintenance and upgrades to the system would be required as needed.	Land use would increase from this technology as appropriate water supply zones would need to be established (Zone IIs)	Minimal negative aesthetics.	Expect opinions to be mixed, this technology has not been passed at previous Town Meetings.	High capital costs.	Moderate.

WASTEWATER:

TECHNOLOGY[1]	EFFLUENT QUALITY	MAINTENANCE REQUIREMENTS AND COMPLEXITY OF OPERATION	FLEXIBILITY	ENERGY USE	LAND REQUIREMENTS	POTENTIAL FOR AIR EMISSIONS	PUBLIC ACCEPTANCE	EASE OF IMPLEMENTATION	RELATIVE CAPITAL COSTS	RELATIVE O&M COSTS
Activated sludge / Modified Ludzack-Ettinger process	Effluent N, 5 to 10 mg/l.	Moderately complex.	Moderate flexibility with good process control.	Moderate energy use for aeration.	Relatively small building and equipment footprint required.	Not a significant source of odors.	Moderate. Would require construction of new tanks.	Requires construction of new facilities.	Moderate, compared to other facilities.	Moderate, compared to other facilities.
Rotating biological contactor (RBC)	Effluent N, 6 to 10 mg/L.	Relatively easy operations.	Moderate, with minimal process control.	Low energy use for aeration.	High for large covered process.	Not a source of problems in existing installations.	Moderate. Would require construction of new tanks at high cost.	Requires construction of new facilities.	High capital costs.	Low compared to other facilities.
Sequencing batch reactor (SBR)	Can meet 2 to 4 mg/L total nitrogen when followed by a denitrification filter.	Complex operations.	Unique operator control of process cycles accommodates variable influent flows and loadings.	Aeration and effluent pumping equipment requirements.	Relatively small.	Not a source of problems in existing installations.	Moderate. Reliable technology with proven performance.	Requires construction of new facilities.	Moderate capital costs.	Moderate, compared to other facilities.
Amphidrome	Effluent N, 5 to 10 mg/L. May meet 2 to 5 mg/L with polishing filter.	Relatively new technology with complex operation.	Operator control of processes allows flexibility. Not easy to expand.	Aeration and pumping requirements.	Relatively small.	Not a source of problems in existing installations.	Moderate. Process is gaining popularity in Massachusetts. No large installations exist.	Requires construction of new facilities.	Moderate capital costs for smaller applications.	Moderate. Automated processes reduce costs, maintenance of mechanical equipment increases costs.

TABLE 14-5 (continued)

SUMMARY OF COMMUNITY/MUNICIPAL DRINKING WATER TECHNOLOGIES AND SECONDARY/ADVANCED WASTEWATER TREATMENT TECHNOLOGIES

WASTEWATER (CONTINUED):

TECHNOLOGY[1]	EFFLUENT QUALITY	MAINTENANCE REQUIREMENTS AND COMPLEXITY OF OPERATION	FLEXIBILITY	ENERGY USE	LAND REQUIREMENTS	POTENTIAL FOR AIR EMISSIONS	PUBLIC ACCEPTANCE	EASE OF IMPLEMENTATION	RELATIVE CAPITAL COSTS	RELATIVE O&M COSTS
Zenon (Membrane Bio-reactor)	Effluent N, 5 to 10 mg/L.	Need to clean membrane filters. More complex operations.	High flexibility with good process control.	Aeration and pumping requirements.	Relatively small.	Not a significant source of odors.	Moderate. Very limited use on large scale in Massachusetts. No large installations over 1 mgd exist.	Requires construction of new facilities.	Moderate capital costs for smaller applications.	Moderate. Automated processes reduce costs, maintenance of mechanical equipment and filter maintenance increases costs.
Oxidation ditch modified for additional nitrogen removal	Can meet 3 mg/L on average when followed by a filter.	Limited process control, but good reliability and proven performance.	Somewhat less flexible than other technologies with less process control.	Lower aeration requirements than for MLE processes.	Higher.	Not a source of problems in existing installations.	Moderate. Many successful installations, but requires very large tankage.	Requires construction of new facilities.	High capital costs compared to other facilities.	Moderate compared to other facilities.
Aerated biological filter (Biofor, Biostyr)	Typically provides nitrification but not denitrifica-tion. Would need to be followed by a denitrification filter.	Relatively simple filter operations and maintenance.	Less flexibility and process control.	Aeration and pumping requirements.	Relatively small.	Not a significant source of odors.	Moderate. Requires new facilities.	Requires construction of new facilities.	Moderate capital costs.	Moderate.
Denitrification filter (must be used with one of the above listed processes)	Process can meet 2 to 4 mg/L total nitrogen (and reduce BOD and TSS) with methanol feed and upstream nitrification.	High reliability and proven performance. Relatively simple operations.	Control of methanol feed allows good treatment of variable nitrate loadings. Filtration enhances process flexibility.	Filter backwash and possible effluent pumping.	Relatively small.	Minimal potential.	Moderate. Requires new facilities.	Can be added to end of various treatment trains easily.	Moderate capital costs when used in conjunction with other nitrogen removal processes.	Moderate for methanol feed.