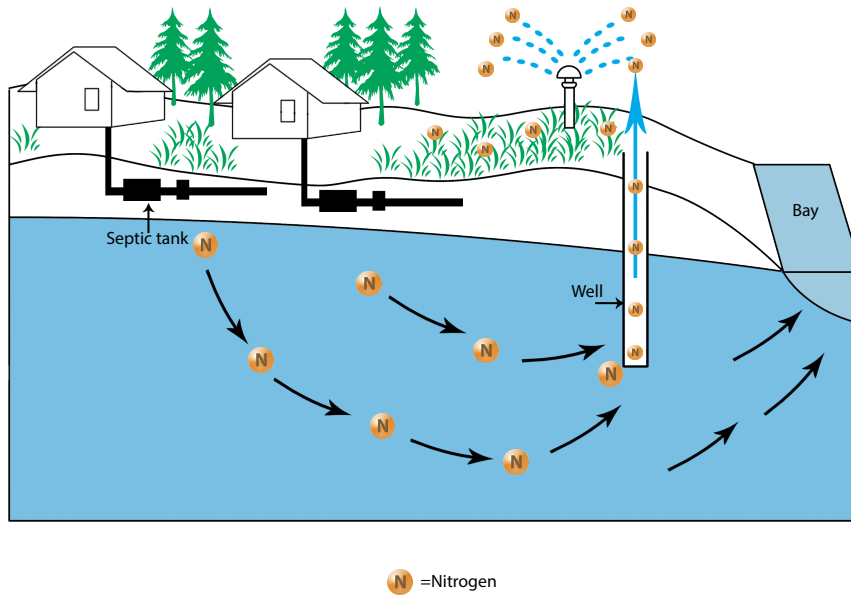


FERTIGATION WELLS PRIMER

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Fertigation refers to combining fertilizers in irrigation water as it is applied. This technology has been increasingly applied in the turfgrass industry (including golf courses) as an efficient management technique.

Fertigation wells are designed around the principle of recapturing excess nutrients (including nitrogen and phosphorus) that are commonly found in the groundwater in developed areas and recycling them to vegetated (including turfgrass) surfaces that can efficiently attenuate the nutrients. Recapturing and recycling these nutrients prevents them from discharging to downgradient lakes, ponds, streams, and coastal waters. Another advantage of using on-site fertigation wells is to reduce the demand on our public drinking water supplies.

Ideal locations for fertigation wells are downgradient of septic systems where high nitrogen (and possibly phosphorus) concentrations are found in groundwater. They must be sited in compliance with state and local laws to ensure protection against pathogens (MADEP Title 5 requires 25 feet separation). Ideal receiving locations for the fertigation water include turfgrass areas such as residential lawns, golf courses, athletic fields and other landscaped areas. According to the Massachusetts Estuary Program (MEP) reports and the Cape Cod Commission guidance, turfgrass areas are estimated to attenuate 80% of the nitrogen that is applied as fertilizers.

This technology has been successfully utilized at the Pinehills community in Plymouth, MA for several years. At the Pinehills, a series of three fertigation wells were installed downgradient of the wastewater treatment plant that discharges treated, nutrient-enriched effluent to the ground and

the fertigation wells recover and recycle nutrient-rich this water to nearby golf courses. This creates a win-win situation, removing the nutrients from the groundwater and providing a recycled fertilizer product as a replacement for commercial (imported) fertilizers.