



When it rains on the Tidewater Farm Road neighborhood in Greenland, rain water flows into nearby Great Bay. Along the way, the rain water is able to pick up pollutants potentially adding to the troublesome water quality problems in the Bay.

In June of 2015, Soak Up the Rain (SOAK) Great Bay added another residential rain garden to the Tidewater Farm Road neighborhood. This is the third installation, along with a rain garden installed in 2013 and a dry well in 2014, that illustrates how simple “Stormwater Solutions” can clean stormwater and reduce the amount of rain water runoff reaching the bay.



The finished rain garden with the reinforced inlet shown in the foreground.

### INTERCEPTING THE FLOW

The new rain garden was built to capture runoff from a section of Tidewater Farm Road where the runoff is directed under the road through a culvert, along the side yard of a residential property, and eventually into Great Bay.

Before the rain garden was installed, runoff had created a muddy channel that showed evidence of carrying pollutants to the Bay. The rain garden was installed along a stretch of the channel. Smaller storms are completely captured in the garden while larger storms overflow back into the channel. As rain water slowly sinks into the garden, the amount of runoff reaching the Bay is reduced and the runoff is cleansed as it soaks in and moves through the soil.



The SOAK crew removing sod in the rain garden area. The channel that the rain garden will intercept is visible behind the crew.

### CREATING THE GARDEN

As the work crew, made up of SOAK Great Bay Team members and volunteers, began to dig, they soon encountered a layer of marine clay. Although this made the digging difficult, the clay was used to build a sturdy and substantial berm at the lower end of the rain garden.

Because the rain garden was built to intercept the existing channel where water flows quickly and with force, the inlet and upper edge of the garden were heavily reinforced with various types of stone and rock to prevent erosion and scouring.



conditions. A mix of perennials, ferns, and shrubs including – Siberian Iris (*Iris Siberica*), Sweet pepper bush (*Clethra alnifolia*), and Marsh marigolds (*Caltha palustris*), Sensitive fern (*Onoclea sensibilis*) and Red-twigged dogwood (*Swida serica*) and others were used in this garden.

the original channel. The outlet was lowered so that the rain garden will hold less water therefore needing less time to completely drain. On the plus side, the fact that the berm was built with clay soil is likely the reason it held up so well despite being newly constructed and tested so rigorously.

Due to observations during this project, the SOAK NH program recommends that rain gardens built on clay soils be more shallow and larger in area than initial design calculations will suggest, if the project area allows it. These adjustments will allow the rain garden to capture the same amount of water while providing a larger surface area for infiltration.

## REDUCING POLLUTANTS

It's estimated that the rain garden captures over 12,000 gallons of runoff every year preventing 17.5 lbs of sediment, 0.07 lbs of phosphorus, and 0.27 lbs of nitrogen from reaching the bay each year.

## WORKING WITH CLAY SOILS

The soil on this site contained a lot of marine clay and within days of building the rain garden, Greenland and surrounding areas experienced a moderately large rain storm: over 1.5" of rain in a 24 hour period. Due to the clay at the bottom of the rain garden, it drained more slowly than expected. The rain garden filled up and breached the outlet and berm. Considering it was newly constructed and undersized for this storm event, it held up very well. The rain garden and berm were not seriously damaged but did need some adjustments.

The SOAK crew poked a few temporary holes in the bottom of the outlet structure, allowing the water to flow out into



Due to clay soils, the rain garden held water for too long. The outlet was lowered to reduce the holding capacity and allow the rain garden to drain more quickly.

Soak up the Rain (SOAK) Great Bay is a pilot, residential stormwater management program under NHDES's voluntary SOAK NH program. SOAK Great Bay is focused on providing assistance to property owners in the Great Bay watershed to reduce stormwater runoff and pollution to the bay. In August 2013, the Great Bay Stewards partnered with NHDES to expand their knowledge of residential stormwater management, receive hands on training to identify potential stormwater issues, and assist homeowners with installing solutions.

The Stewards are currently searching for additional homeowners willing to have their property considered for a SOAK project.

Contact them at:  
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