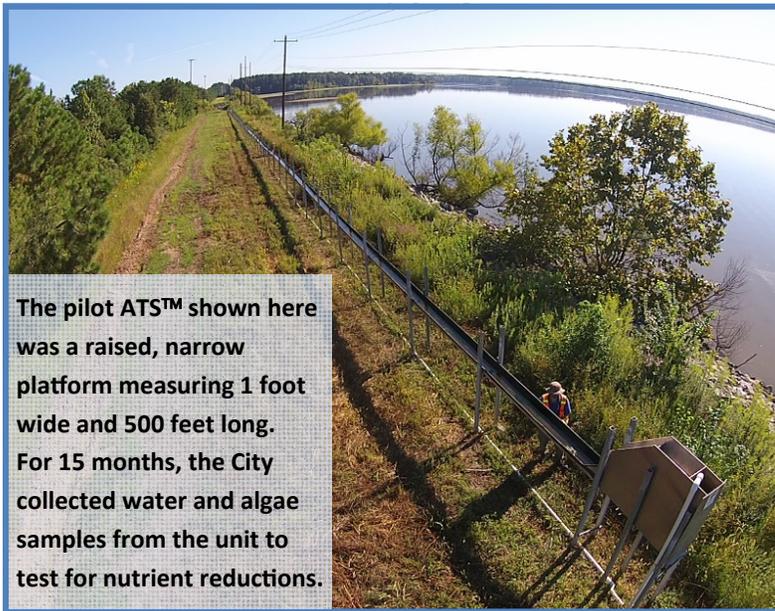


# Algal Turf Scrubber® Pilot Unit Successfully Removes Nutrients from Falls Lake

In 2015, City contractors installed a small-scale version of the Algal Turf Scrubber® (ATS™), called a pilot ATS™, along Falls Lake and Interstate 85 in Durham County. The pilot ATS™ was successful in reducing nitrogen and phosphorus in water collected from Falls Lake. Results from the study suggest that the pilot ATS™ is better than other stormwater control measures (SCMs) at removing nutrients. The City plans to work with consultants to design a full-scale facility that could treat as many as 25 million gallons per day (mgd). Once a site is selected and the ATS™ facility is designed, the City plans to build a full-scale ATS™.

- Falls Lake is polluted due to excess nutrients
- In 2011, the State adopted the Falls Lake Rules to reduce nutrient pollution entering the lake
- The City is investigating new ways to comply with the Falls Lake Rules



The pilot ATS™ shown here was a raised, narrow platform measuring 1 foot wide and 500 feet long. For 15 months, the City collected water and algae samples from the unit to test for nutrient reductions.

The pilot ATS™ successfully removed nutrients at a rate that was better than expected. The pilot ATS™ reduced average nitrogen concentrations by 12% and average phosphorus concentrations by 32%. Periods of drier weather conditions may cause higher nutrient concentrations in Falls Lake. This could result in even higher reductions of nutrients from the lake if a full-scale ATS™ facility were in place.

The total amount of algae and other solids removed from the pilot ATS™ weighed 10,830 lbs. The dry weight of the material was 727 lbs., which contained 9.52 lbs. of nitrogen and 1.31 lbs. of phosphorus. Algae recovered from a full-scale facility would be disposed at a landfill or converted into a reusable material like compost or potting soil.

## ATS™ Pilot Study Results

**Nitrogen reduced by 12%**

**Phosphorus reduced by 32%**

**Cost per Pound of Nitrogen and Phosphorus Removed**

		Nitrogen	Phosphorus
Algal Turf Scrubber®	Most Efficient (Feasibility Study)	\$19	\$67
	Least Efficient (Feasibility Study)	\$648	\$1,534
	Pilot Study	\$67 to \$100	\$381 to \$565
SCM	Most Efficient	\$2,450	\$11,270
	Least Efficient	\$39,573	\$195,214

**Full-scale ATSTM Facility Scenarios**

Facility Info	<b>Facility Size</b>	<b>4 acres</b>	<b>10 acres</b>
	Amount of Water Treated	10 mgd	25 mgd
	Algae Biomass Per Year	270 tons	674 tons
	Nitrogen Removed Over 20 Years	57,120 lbs	142,800 lbs
Costs	<b>Facility Construction</b>	<b>\$3.87M</b>	<b>\$6.24M</b>
	<b>Total Cost for 20 Years</b>	<b>\$7.24M</b>	<b>\$12.4M</b>



Based on these results, the City plans to move forward with a full-scale ATSTM. The City will compare sizes of full-scale facilities ranging from 4 acres to 10 acres that can treat 10 mgd (million gallons per day) to 25 mgd of water. The City will consider the costs to design and construct a full scale facility, as well as the 20-year operation and maintenance costs. The City will also consider site locations, cost of the land, the cost to dispose of or use the dried algae material (biomass), and local partnerships for funding opportunities. The City views a full-scale ATSTM as an important step towards complying with State rules and improving the water quality of Falls Lake.