Project Background
The town of Cary, N.C., conducted a reclaimed water feasibility study in 1997 to evaluate how best to meet its goals of reducing per capita water consumption by 20 percent by 2015, to preserve the town’s allocation of raw water from its drinking water source, Jordan Lake. In June 2001, Cary became the first municipality in North Carolina to pump reclaimed water to homes and businesses for irrigation and cooling.

Capacity and Type of Reuse Application
The town of Cary treats wastewater for Cary, Morrisville, the Raleigh-Durham International Airport, and the Wake County portion of the Research Triangle Park at its two water reclamation facilities (WRFs). Both the North Cary WRF and South Cary WRF have reclaimed water systems consisting of piping systems as well as bulk reclaimed water distribution stations.

The town of Cary’s reclaimed water system began with several hundred customers in targeted service areas identified through an analysis of high irrigation demands and proximity to the WRFs. The system provides reclaimed water for irrigation and cooling for commercial facilities, lawn irrigation for single and multi-family homes, and irrigation for schools and a recreational complex. The system also includes bulk reclaimed water distribution stations at the town’s two WRFs for filling tanks for uses such as irrigation, road construction, dust control, sewer flushing, and street cleaning (Figure 1).

Cary’s reclaimed water system has a production capacity of approximately 5 mgd (219 L/s). The system produces approximately 1 mgd on a peak day and up to 20 million gallons per month (76,000 m³) during the summer.

The North Cary WRF reclaimed water service area includes a 9 mgd (394 L/s) pump station and 1 million gallon (3,800 m³) storage tank at the North Cary WRF required to meet peak day peak hour demands. It also includes approximately 9 miles (14.5 km) of 4- to 20-in (10- to 51-cm) transmission and distribution mains. The South Cary WRF reclaimed water service area includes a 1.2-mgd (52.5-L/s) pump station at the South Cary WRF and approximately 1.4 miles (2.3 km) of 8- to 12-in (20- to 30-cm) transmission and distribution mains. The reclaimed water pumps at the town’s WRF are shown in Figure 2.

Water Quality Standards and Treatment Technology
The town of Cary’s reclaimed water system was designed to meet the state’s mandatory treatment standards (Table 1). Both WRFs treat wastewater...
using biological nutrient removal and regularly meet
the state reclaimed water quality standards.

Table 1 Minimum state reclaimed water quality
standards

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Daily Maximum</th>
<th>Maximum Monthly Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD5</td>
<td>15 mg/L</td>
<td>10 mg/L</td>
</tr>
<tr>
<td>TSS</td>
<td>10 mg/L</td>
<td>5 mg/L</td>
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<tr>
<td>NH₃</td>
<td>6 mg/L</td>
<td>4 mg/L</td>
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<tr>
<td>Fecal coliform</td>
<td>25 cfu/100mL</td>
<td>14 cfu/100mL</td>
</tr>
<tr>
<td>Turbidity</td>
<td>10 NTU</td>
<td>10 NTU</td>
</tr>
</tbody>
</table>

Project Funding
The total project cost for the reclaimed water system
including both the North Cary and South Cary WRFs
was $11 million. The project was funded through the
town’s capital improvement budget.

Reclaimed water in the town of Cary currently costs
$3.60/1,000 gallons ($0.93/m³), which is the same as
the town’s Tier 1 potable water use rates. Reclaimed
water rates were set less than potable water while
recovering a substantial part of the town’s capital cost
for implementing the system. Use of reclaimed water
allows customers to avoid higher Tier 2, 3, and 4 water
rates that apply to water use greater than 5,000
gallons (19 m³) per month. Reclaimed water
customers are also exempt from the town’s alternate
day watering restrictions. The town does not charge
customers for reclaimed water obtained at its bulk
reclaimed water distribution stations.

Reclaimed Water Program
Management
The town of Cary’s reclaimed water program is
managed by a Reclaimed Water Coordinator, who is
responsible for development of policy
recommendations and selection of program
alternatives; evaluating program effectiveness;
collecting data; working with homeowners, businesses,
and other potential reclaimed water customers;
coordinating programs to encourage the use of
reclaimed water; and inspecting the reclaimed water
system for potential problems such as cross
connections.

During implementation of its initial reclaimed water
program, Cary sponsored numerous public education
efforts, including public information sessions and
hearings, fact sheets, news releases, meetings with

domestic water reclamation and regularly meet
the state reclaimed water quality standards.

Expansion of the Reclaimed Water
Program
The town of Cary is currently expanding its reclaimed
water system into a third service area. The town of
Cary, Wake County, and Durham County are jointly
implementing the Jordan Lake Water Reclamation and
Reuse project. This project will provide reclaimed
water from Durham County’s Triangle Wastewater
Treatment Plant to customers in the Wake County
portion of Research Triangle Park and to the town of
Cary’s Thomas Brooks Park, the site of the USA
Baseball national training center. The service area
also includes some currently undeveloped portions of
northwestern Cary.

The project is being financed by a State and Tribal
Assistance Grant (STAG) from the federal government
(administered by the Environmental Protection
Agency) as well as the town of Cary, Wake County,
and Durham County. The portion of this project serving
the Wake County portion of Research Triangle Park
and some of western Cary began operating in early
2012 and the remainder will be completed in 2013.

The town has recently initiated a comprehensive
master planning study to develop a roadmap for future
expansion of the town’s reclaimed water program.

References
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