

### Executive Summary

A former landfill in Lexington County, South Carolina, now provides commercial, public and recreational assets to the community. For more than 25 years, the area that would later become the Lexington County Landfill Superfund site accepted municipal wastes, industrial wastes and petroleum products, which led to site-wide contamination. To make cleanup and reuse happen, Lexington County and its partners worked with the community, site businesses, the U.S. Environmental Protection Agency (EPA) and the South Carolina Department of Health and Environmental Control (SCDHEC). Project priorities included making sure site businesses could remain open during cleanup and designing green remedies compatible with ongoing and potential future uses at the site.

Today, the area is redeveloped and used by several parties. A mini-golf course, a driving range, a practice golf course, a ballpark and a recycling center are all located on site. Lexington County has strived to use green cleanup techniques throughout the process, recycling ground water and using recycled materials when possible. This case study explores the site's cleanup and reuse, illustrating the opportunities and beneficial effects of Superfund redevelopment in action.

### Beneficial Effects

- On-site commercial businesses and a recycling center employ 11 people, providing \$119,000 in annual employment income to the local community.
- Two commercial businesses, a county recycling center, a ballpark and a university golf facility are currently active at the site.
- In 2013, the county-owned site property generated over \$1,588 in tax revenues and had an estimated value of \$90,540.
- In 2013, estimated on-site business sales reached \$115,000.

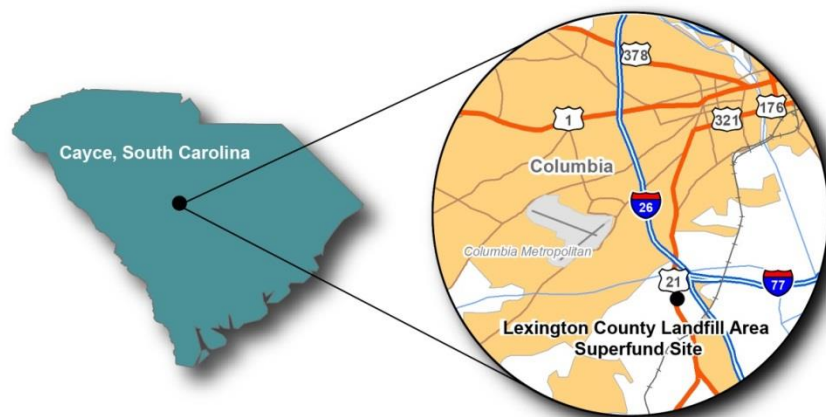


Figure 1. The site's location in Cayce, Lexington County, South Carolina.

## Introduction

When a Superfund site is reused, it can revitalize a local economy with jobs, new businesses, tax revenues and spending. This case study captures the beneficial effects on site and in the community thanks to the new and continued use of the Lexington County Landfill Superfund site.

The 160-acre site is located 3.5 miles south of Columbia, in Cayce, South Carolina (Figure 1). Highway 321 borders the site to the west while a commercial property, woodlands and railroad tracks border the site to the east. Interstate Highway 26 borders the site to the northeast, and forested areas and commercial businesses border the site to the south. A residential subdivision borders the site to the north. According to 2013 Census data estimates, about 12,860 people live in the City of Cayce<sup>1</sup> and 273,752 people live in Lexington County.<sup>2</sup>

## Site History

Historically, the site included three landfill areas, the 321 Landfill, the Old Cayce Dump and the Bray Park Road Dump. Between 1972 and 1988, Lexington County operated the 321 Landfill as a sanitary municipal landfill. The landfill received mostly sanitary domestic waste but also accepted industrial wastes and petroleum products. Lexington County covered and closed the landfill in 1990. During the 1960s, the Old Cayce Dump operated as a solid waste disposal facility. In 1969, the dump closed and Lexington County covered the area with soil. From the mid-1960s to 1970, the cities of Cayce and West Columbia used the Bray Park Dump for waste disposal. Following disposal activities, parties covered Bray Park Dump with several feet of soil.



**Figure 2. Years of landfill operations left the Lexington County Landfill Area Superfund site contaminated.**

EPA and SCDHEC's investigations found that a lack of landfill liners, former disposal practices and failure of the landfill cover resulted in soil and ground water contamination with volatile organic compounds (VOCs) and metals. EPA placed the site on the Superfund program's National Priorities List (NPL) in October 1989.

## Site Cleanup

EPA began investigating the site and evaluating cleanup options. Lexington County led and funded remedy construction activities, with oversight provided by EPA and SCDHEC. Lexington County considered green remedial techniques, and worked with site stakeholders to ensure the area could be reused after remedy construction was complete. Lexington County also worked with on-site businesses such as the Par Tee Driving Range and the Bray Park Road Ball Park to make sure they were able to remain open during cap and ground water treatment facility construction.

---

<sup>1</sup> <http://quickfacts.census.gov/qfd/states/45/4512655.html>

<sup>2</sup> <http://quickfacts.census.gov/qfd/states/45/45063.html>

In September 1994, EPA selected a remedy and issued a Record of Decision (ROD) for the site. EPA amended the remedy in 1999. The final remedy included capping the Old Cayce Dump and the 321 Landfill, landfill gas collection and venting, extraction and treatment of contaminated ground water and leachate by aeration, sampling of surface water and sediment to evaluate further the ecological threat to area wildlife and aquatic biota, and institutional controls. In 1996, EPA and SCDHEC approved the remedial design work plan and Lexington County started construction activities.

Lexington County completed cap construction and ground water treatment system construction in 1999. Lexington County performed over 50 percent of the landfill cover construction activities in-house, using the services of local businesses and incorporating recycled materials into the landfill cover. Lexington County covered the site with a geosynthetic clay liner followed by a layer of tire chips, a fabric filter and 18 inches of soil to support a vegetative cover. Use of the tire chip layer kept 30,000 cubic yards of recycled tires from going to a dump.

The ground water treatment system began operating in 1999. Continuing with efforts to keep remedy construction actions green, Lexington County incorporated an irrigation system into the remedial design for the treatment system. The irrigation system recycles treated ground water to water grass at the site. Reuse of the water from the ground water treatment system maintains healthy vegetation over the landfill cover, which maximizes cover stability and helps support on-site businesses like the Par Tee Driving Range.

## Reuse Efforts

In addition to protecting commercial assets at the property, site stakeholders, including EPA Region 4, SCDHEC, Lexington County, the University of South Carolina (USC), consultants and private developers, recognized the opportunity for new recreation facilities at the site. After developing a partnership with the University of South Carolina in 2009, Lexington County reached out to EPA and SCDHEC in 2010 to discuss locating a university practice facility for the school's golf team on site. The parties engaged in a reuse planning process to allow for future development of the site and continued protection of the remedy. EPA, SCDHEC, Lexington County, and consultants Smith Gardner, Inc. collaborated with USC to support the redevelopment of the northern area of the site

## Green Remediation in Region 4

Green Remediation is the practice of considering all environmental effects of remedy implementation and incorporating options to minimize the environmental footprints of a cleanup.

EPA Region 4 Superfund Division has created a *Clean and Green* policy that builds on the Agency's Green Remediation Strategy and focuses on regional opportunities and priorities. The policy provides a framework to enhance the environmental benefits of cleanup programs in Region 4 by promoting sustainable cleanup technologies and practices.

- **Green Remediation:**  
<http://www.epa.gov/region4/superfund/allresource/greenr/greenr.html>
- **Region 4 Clean and Green Policy:**  
<http://www.epa.gov/region4/superfund/allresource/greenr/cleangreen121713.pdf>
- **EPA Green Remediation Strategy:**  
<http://www.epa.gov/oswer/greenercleanups/strategy.html>



Figure 3. Workers install recycled tire chips as part of the landfill cover.

into a new golf practice facility. Parties designed a facility located atop the 321 Landfill that would protect the remedy. Ultimately, the design would include a 5 to 6 foot buffer zone, depending on the area, between the top of the current landfill cap and the bottom layer of the golf course. This buffer zone would allow developers to excavate when necessary for features such as sand traps.

The Par Tee driving range and Bray Park Road Ball Park, which includes several baseball and sports fields, continue to operate at the site. Since cleanup began, three additional facilities have opened, including Lexington County's Sandhills Collection and Recycling Center, the USC practice facility and the Palmetto Falls Mini-Golf facility, the most recent addition to the Par Tee Golf Center. EPA and SCDHEC assisted Palmetto Falls Mini-Golf with design and approvals for a mini-golf course on the western side of the site. In May 2012, EPA Region 4 presented Lexington County with the Excellence in Site Reuse Award, recognizing Lexington County's efforts to transform a Superfund property into a vibrant community asset.



Figure 4. Site map.

## Local Beneficial Effects

Today, the area is home to three businesses, a park and a practice facility for USC's golf team. The Par Tee Driving Range and Bray Park Road Ball Park remained open throughout cap and ground water treatment facility construction, while the USC golf practice facility, Palmetto Falls Mini-Golf and the county collection and recycling center are recent additions. Together, new and long-time businesses at the site supply the local economy with jobs and provide recreational and recycling services to the local community. This section describes the beneficial effects that resulted from the site's continued use and reuse.

### Lexington County Sandhills Collection and Recycling Center

Lexington County's Sandhills Collection and Recycling Center opened in 2001 on the southwest portion of the site (Figure 5). The collection center is the most used center out of 11 facilities in Lexington County, receiving an average of over 400 tons of yard waste, municipal solid waste and recyclables each month. Between July 2013 and June 2014, the center received over 228,000 deliveries for processing. The collection center is open 12 hours a



Figure 5. The entrance to Lexington County recycling center.

day, four days a week, plus four hours on Sundays. Lexington County works with the Babcock Center, an organization dedicated to the empowerment of individuals with lifelong disabilities, to maintain a center staff of seven part-time employees. The recycling center provides the community with nearly \$62,244 in annual employee income per year and generates an estimated \$25,000 annually in revenue from the sale of recyclable materials.

### **Par Tee Driving Range and Palmetto Falls Mini-Golf**

The Par Tee driving range opened in the early 1990s, taking advantage of the wide-open space where landfills used to operate. Once cleanup began, site stakeholders worked with the owner of the driving range to minimize the impacts of remedial actions on business operations. In 2002, Par Tee expanded, building a miniature golf facility called Palmetto Falls Mini-Golf. The 18-hole miniature golf course (see Figure 6) has a variety of obstacles and features, including waterfalls. Both golf facilities operate out of the same golf shop and both are open seven days a week, from 8 a.m. to 8 p.m. Combined, the two golf facilities form the Par Tee Golf Center, which brings in an estimated \$90,000 in annual business sales and provides almost \$57,000 in annual employee income to the area. The center supplies the community with four jobs, including part-time and grounds-keeping staff, with plans to expand the staff in the future. These golf facilities operate on about 34 acres of the site and serve over 2,500 customers annually.



**Figure 6. Miniature golf course at the site.**

### **Bray Park Road Ball Park**

The Bray Park Road Ball Park has been open for baseball and softball games for over three decades (see Figure 7). Lexington County’s Recreation and Aging Commission operates and maintains the park area, which includes two lighted ball fields and a parking lot. Team parents run a concession stand at the fields to benefit the baseball program.



**Figure 7. Field at Bray Park Road Ball Park.**

### **The Coop**

Design and construction of USC’s new practice facilities took place in two phases. Phase 1 finished in September 2010, and included two greens and four tee boxes. Phase 2 finished in January 2012, and included additional putting greens, bunkers, a fairway area, and entrance and parking improvements. In May 2012, the USC men’s and women’s golf programs unveiled “the Coop,” the first USC facility in Lexington County. Though the facilities are not open for public use, the USC golf team, including 19 players and five coaches, use the practice courses on a daily basis. USC serves as a steward for the 8-acre area, assisting with Lexington County’s site-wide operation and maintenance responsibilities.



Figure 8. Scenes from USC's practice fields.

## Property Value and Tax Revenues

In 2013, county-owned site property generated over \$1,580 in total tax revenues, with an estimated property value of over \$90,500. On-site businesses that produce retail sales and services also generate tax revenues through the collection of sales taxes, which support state and local governments.<sup>3</sup>

## Future Site Use

As Lexington County considers possible uses for remaining site acreage, they will continue to work with EPA and other stakeholders to ensure the long-term protectiveness of the remedy.

## Conclusion

Thanks to the collaboration among EPA, SCDHEC, site business owners, and Lexington County and its partners, the Lexington County Landfill Superfund site is remediated and able to support local businesses, a recycling center and university practice fields. Green cleanup efforts have transformed a property formerly contaminated by municipal waste and years of dumping into a space enjoyed by visitors, residents and students. Coordinated reuse planning efforts not only helped the Par Tee driving range remain open during remedy construction, but also prepared the site for additional commercial, public and private recreational reuse. On-site facilities support local economic growth, providing over 11 jobs and about \$119,000 in annual employee income. Some of these facilities also generate tax revenues and provide the community with a variety of services.

*"The success of our student-athletes depends significantly on having high-quality training facilities ... We at the University of South Carolina are indebted to Lexington County and the many individuals who contributed so much to making this beautiful facility possible."*

– Eric Hyman, South Carolina Athletics Director

For more information about EPA's Superfund Redevelopment Initiative (SRI), visit:  
<http://www.epa.gov/superfund/programs/recycle>.

<sup>3</sup> The city sales tax rate in Lexington County is 7 percent. See the South Carolina Department of Revenue's website for more information: [http://www.sctax.org/NR/rdonlyres/565861B4-6FFF-427F-9527-69663DD253E0/0/ST427\\_04302013.pdf](http://www.sctax.org/NR/rdonlyres/565861B4-6FFF-427F-9527-69663DD253E0/0/ST427_04302013.pdf).



www.epa.gov

Reuse and the Benefit to Community

## Lexington County Landfill Superfund Site

### Technical Appendix

#### Employment Information for On-site Jobs

The Hoovers/Dun & Bradstreet (D&B) database provided information on the number of employees and sales volume for on-site businesses. Hoovers provides information on businesses and corporations. It maintains a database of over 179 million companies globally and over 53 million professional contact names using a variety of sources, including public records, trade references, telecommunication providers, newspapers and publications, and telephone interviews. The Data Universal Numbering System (DUNS) number is a unique nine-digit identification number assigned by Hoovers to each business and its location within the Hoovers database for identifying each business.

#### Wage and Income Information for On-site Jobs

The U.S. Bureau of Labor Statistics (BLS) provided wage and income information. The BLS is a governmental statistical agency that collects, processes, analyzes and disseminates essential statistical data to the American public, the U.S. Congress and other federal agencies in the broad field of labor economics and statistics. The data provided by the BLS has high standards of accuracy and consistently high statistical quality, and impartiality in both subject matter and presentation. Lexington County provided wages for the Lexington County Collection and Recycling Center.

The BLS Quarterly Census of Employment and Wages database provided average weekly wage data for each of the businesses located at the Lexington County Landfill Area Superfund site. Average weekly wage data were identified by matching the North American Industry Classification System (NAICS) codes corresponding with each type of business with weekly wage data for corresponding businesses in Lexington County. If not available at the county level, wage data were sought by state or national level, respectively. In cases where wage data were not available for the six-digit NAICS code, higher level (less detailed) NAICS codes were used to obtain the wage data.

To determine the annual wages (mean annual) earned from jobs generated by each of the businesses located at the Lexington County Landfill Superfund site, the average weekly wage figure was multiplied by the number of weeks in a year (52) and by the number of jobs (employees) for each of the businesses.

**Table 1: Lexington County Landfill Site Businesses: NAICS Code and Title, Employees, Average Weekly Wage, Annual Wage per Employee, Total Annual Wages and Total Annual Business Sales**

On-site Business	NAICS Code <sup>a</sup>	NAICS Title	Employees <sup>c</sup>	Average Weekly Wage (2012) <sup>d</sup>	Annual Wage (Mean Annual) per Employee	Total Annual Wages <sup>e</sup>	Total Annual Business Sales (2013)
Par Tee Driving Range LLC <sup>b</sup>	713940	Fitness and Recreational Sports Centers	4 <sup>f</sup>	\$273	\$14,196	\$56,784	\$90,000
Lexington County Sandhills Collection and Recycling Center	562920	Materials Recovery Facilities	7 <sup>g</sup>	\$171	\$8,892	\$62,244	\$25,000
Bray Park Road Ball Park	713940 <sup>h</sup>	Recreational sports club facilities	NA	\$273	\$14,196	NA	NA
The Coop	713910 <sup>h</sup>	Golf courses (except miniature, pitch-n-putt)	NA	\$330	\$17,160	NA	NA
<b>TOTALS</b>			<b>11</b>			<b>\$119,0028</b>	<b>\$115,000</b>

<sup>a</sup> NAICS code provided in Hoovers database unless otherwise noted.

<sup>b</sup> Business includes Palmetto Falls Mini-Golf.

<sup>c</sup> Employee data is from Hoovers database, except where otherwise indicated.

<sup>d</sup> Average weekly wage per employee is based on BLS Average Weekly Wage data.

<sup>e</sup> Total annual wage figures were derived by multiplying "Employees" by "Annual Wage (Mean Annual) per Employee."

<sup>f</sup> Employee number obtained during July 2014 call with business owner.

<sup>g</sup> Employee number obtained during July 2014 call with the Director of Lexington County Solid Waste Management. All employees are part-time.

<sup>h</sup> NAICS code assumed.

NA: Not available or not applicable.

**Property Values and Local Tax Revenue Generated from Property Taxes**

Property records accessible through Lexington County's online property appraisal database (<http://www.lex-co.com/PCSearch/TaxInfoPropertySearch.asp>) provided data on the most recently assessed value for the county-owned property parcel at the Lexington County Landfill Area Superfund site in June 2014. The website also provided 2013 property tax information for the site property parcel.

**Table 2. Property Value and Tax Summary for Taxes Payable in 2013**

Parcel ID No.	Parcel Address	Total Market Value of Land and Improvements (2013)	Total Property Tax (2013)
006899-03-006	3209 Charleston Highway	\$90,540	\$1,588.32
<b>Totals</b>		<b>\$90,540</b>	<b>\$1,588.32</b>