

Beyond the South Wake Landfill Study

Project Update

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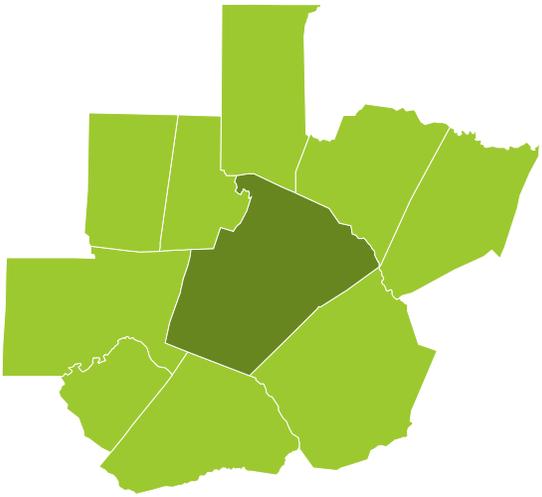
Why are we studying MSW disposal options now?

- The South Wake Landfill has a **finite capacity** to receive waste and may **reach capacity between 2040 and 2045**.
- Because of the **time needed to develop disposal options**, we must begin making crucial infrastructure decisions.
- A complete **range of waste disposal options** needs to be considered to create a plan that meets the County's long-term disposal needs.
- Continuing with the **ILA and possibly developing new partnerships** will be important.

Goals of the Beyond the SWLF Study

1 Objectively evaluate long-term solid waste disposal options

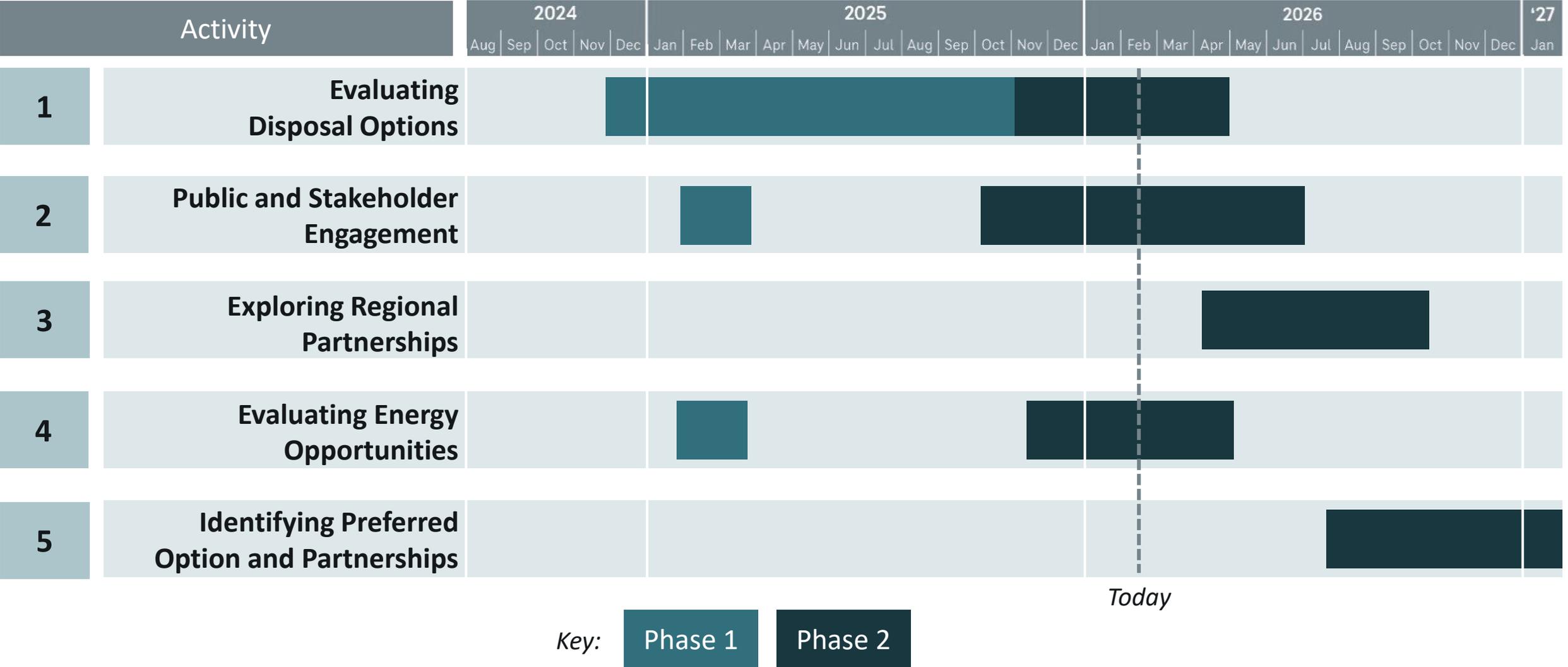
2 Engage stakeholders and the public in the decision-making process



3 Solidify local partnerships and explore regional partnerships

4 Develop an adaptive plan for implementing the preferred option

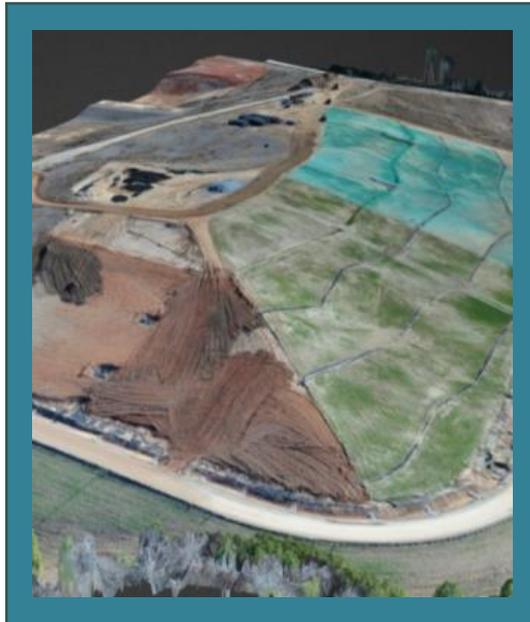
Study Timeline





Disposal Options

Long-term Solid Waste Disposal Options



New Publicly Owned Landfill in Wake County



Hauling and Disposal at Regional Landfill(s)



Alternative Disposal Technologies



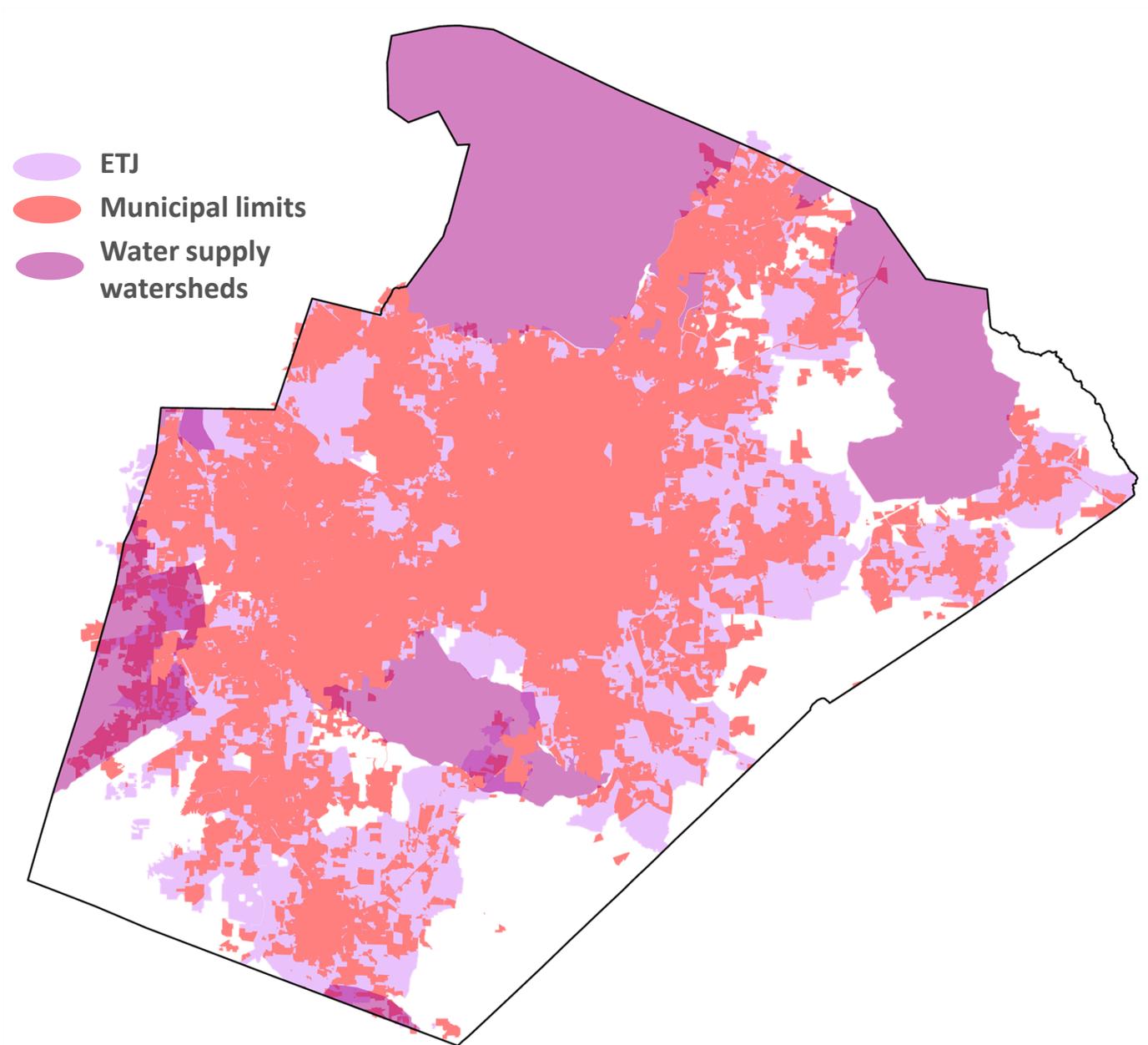
Publicly Owned Waste-to-Energy Facility

New Publicly Owned Landfill in Wake County

Screening Criteria

- 400+ contiguous acres and
- Excluding:
 - Municipal and ETJ limits
 - Airport exclusion zones
 - Water supply watersheds
 - Cultural, natural, or historic resources
 - “Developed” land uses
 - ...and other criteria

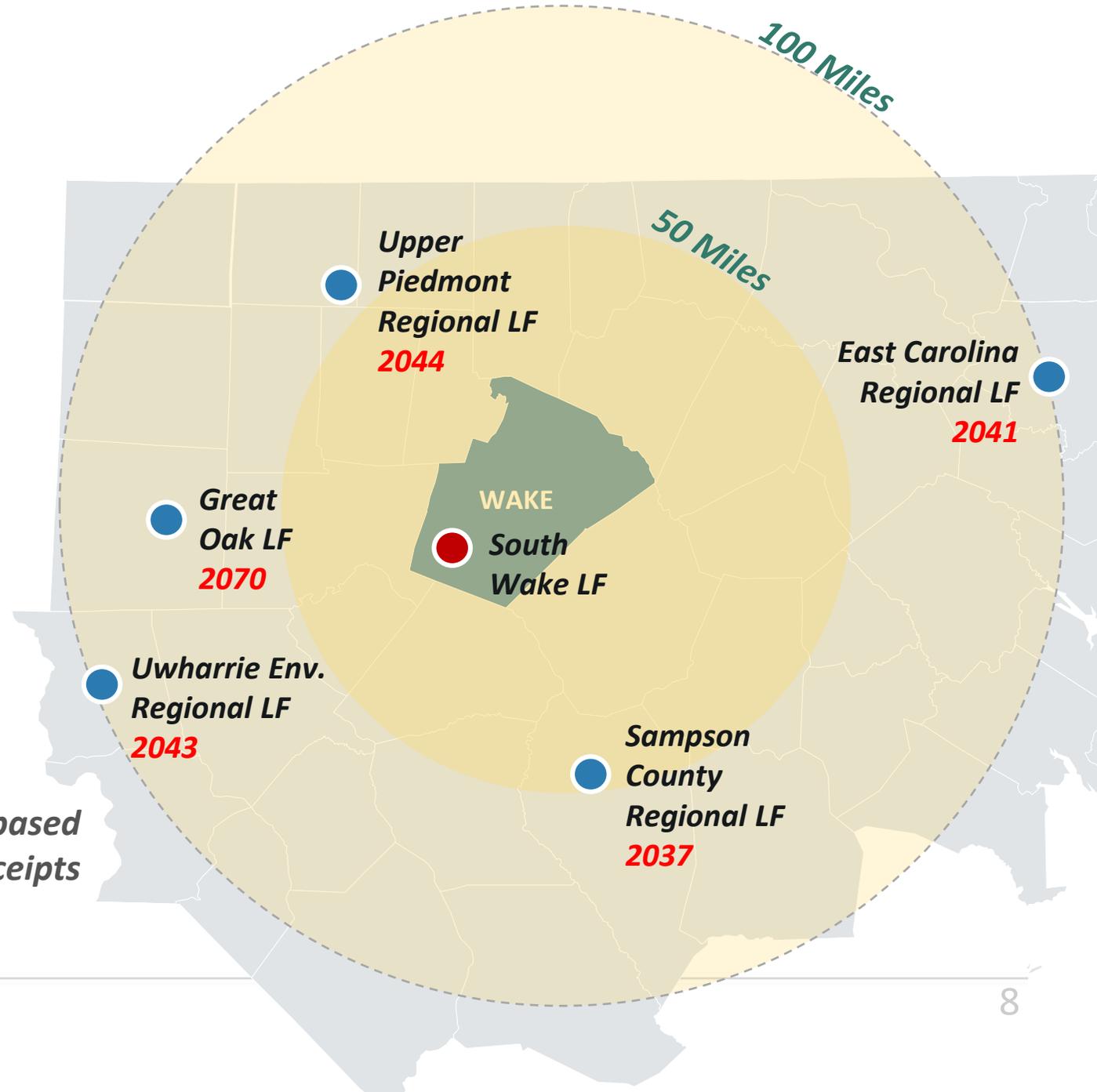
Suitability of several potential areas to be further evaluated



Hauling and Disposal at Regional Landfill(s)

- Four of the five regional landfills could run out of *permitted* airspace before the SWLRF reaches capacity.
- All four regional landfills appear to have room to expand, which could extend their life.

Year at capacity based on FY24 waste receipts



Alternative Disposal Technologies

To be considered for Wake County, a technology must show:

- Demonstrated reliability
- Effectiveness processing mixed MSW
- Ability to scale to the County waste volume
- Minimal pre-processing for incoming waste deliveries
- Minimal residual waste for disposal

Results of Alternative Technology Review:

- None of the technologies have demonstrated the ability to process mixed MSW at scale and present a viable option for Wake County.

- Mechanical/
Biological
Treatment
- Gasification
- Composting
- Pyrolysis
- Anaerobic
Digestion

Waste-to-Energy

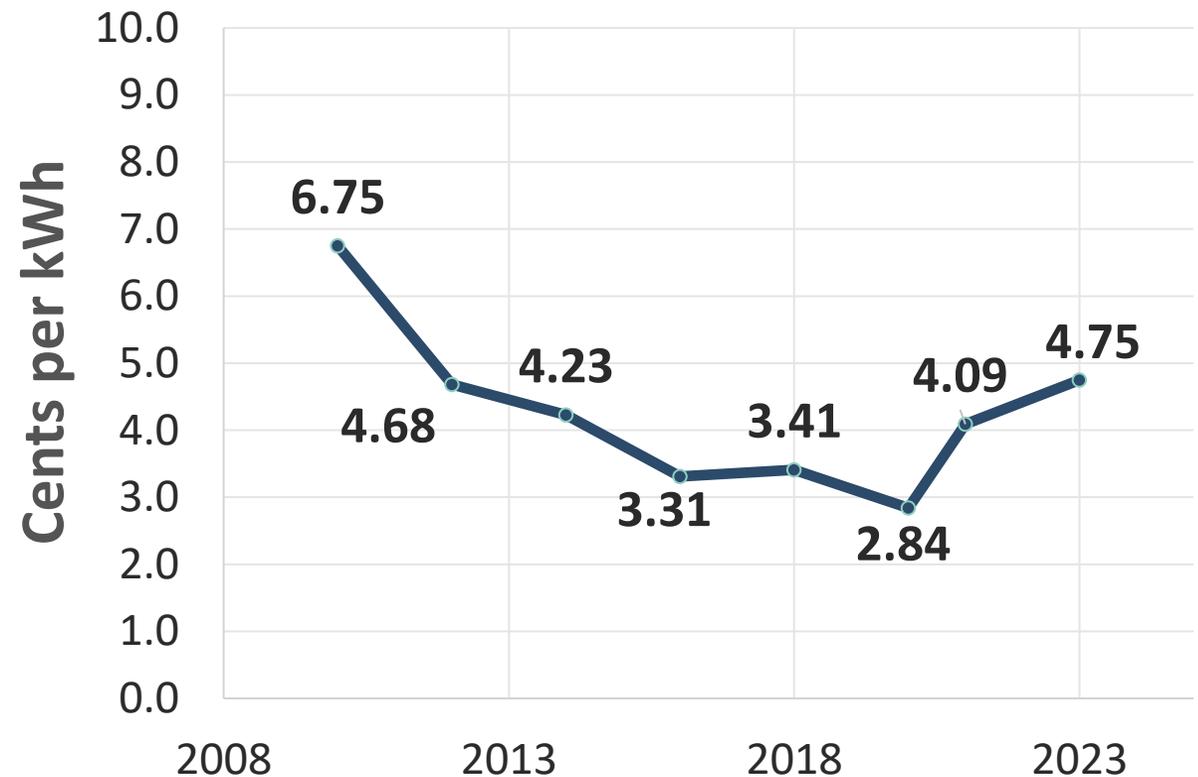
- Mass burn combustion of MSW into energy
- 2,800 WTE plants worldwide
 - 1,000 in Japan, 650 in China, 500 in Europe, and ~63 operating in the U.S.
- Most U.S. WTE plants were constructed prior to 1996
- WTE reduces MSW volume by 90% and allows for metals recovery
- WTE is above landfilling on EPA's "Waste Management Hierarchy"



Waste-to-Energy Challenges

- Duke Energy is required to purchase electricity and capacity at their “**avoided cost**” of generating the power.
- Maximum five-year term of a Power Purchase Agreement **makes it difficult to project a long-term revenue stream** for financing needs.

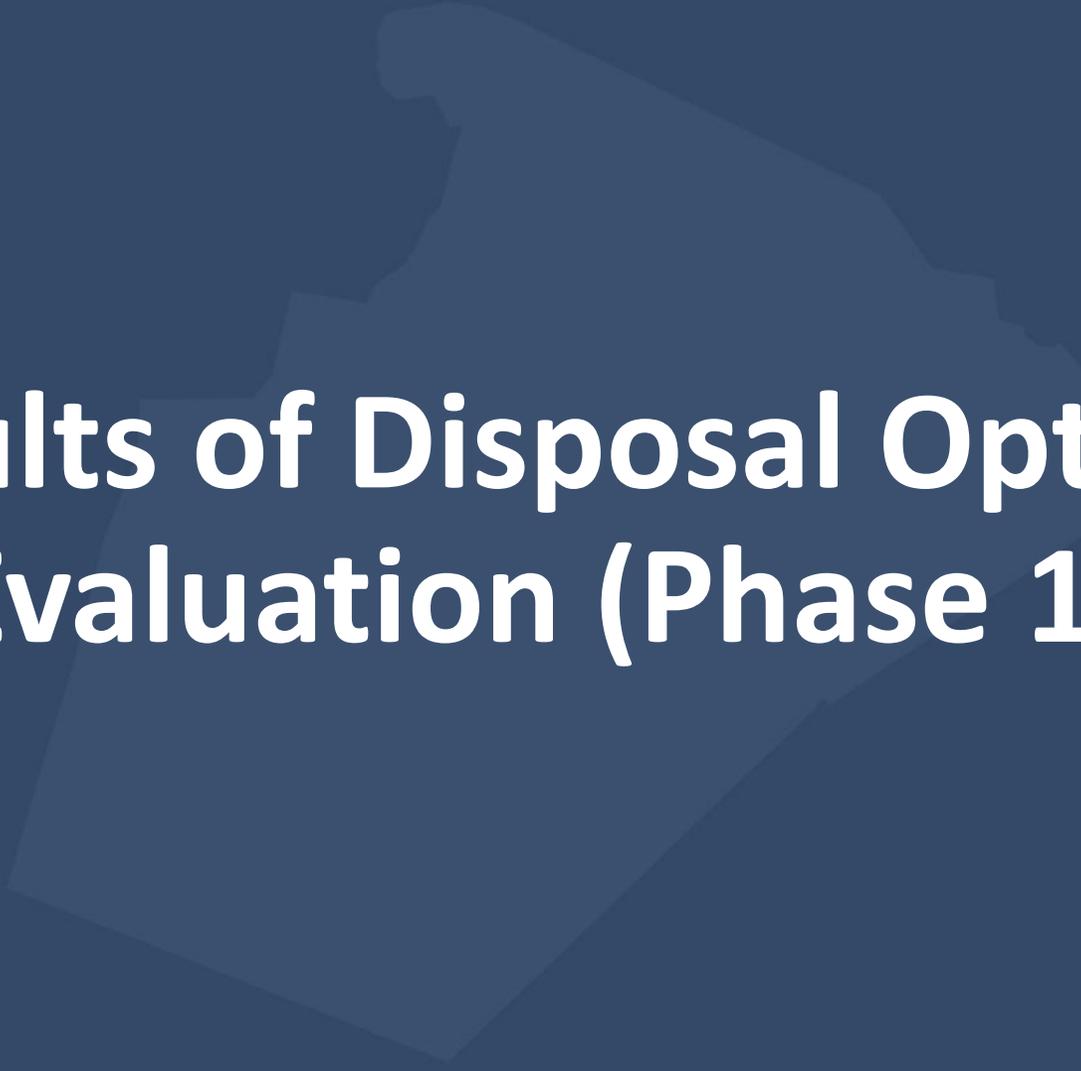
Duke Energy Progress (DEP)
Combined Annualized 10-year
Avoided Energy and Capacity Costs



Waste-to-Energy Opportunities

- **Self-generation** and sale of **thermal energy** (i.e., steam) from cogeneration may be possible if an end-user is on-site or adjacent.
- Pending merger of **Duke Energy companies** or increased **demand** could result in improved regulatory or market conditions.
- If, and to the extent MSW is considered a “renewable energy resource,” a WTE facility may be eligible to generate and sell **Renewable Energy Certificates**.





Results of Disposal Options Evaluation (Phase 1)

Life Cycle Assessment (LCA)

An LCA was performed to evaluate and compare **three example disposal scenarios**, assuming 2,000 tons per day of MSW. The criteria included:

Environmental Performance



Greenhouse gas emissions



Criteria air pollutant emissions

Economic Performance

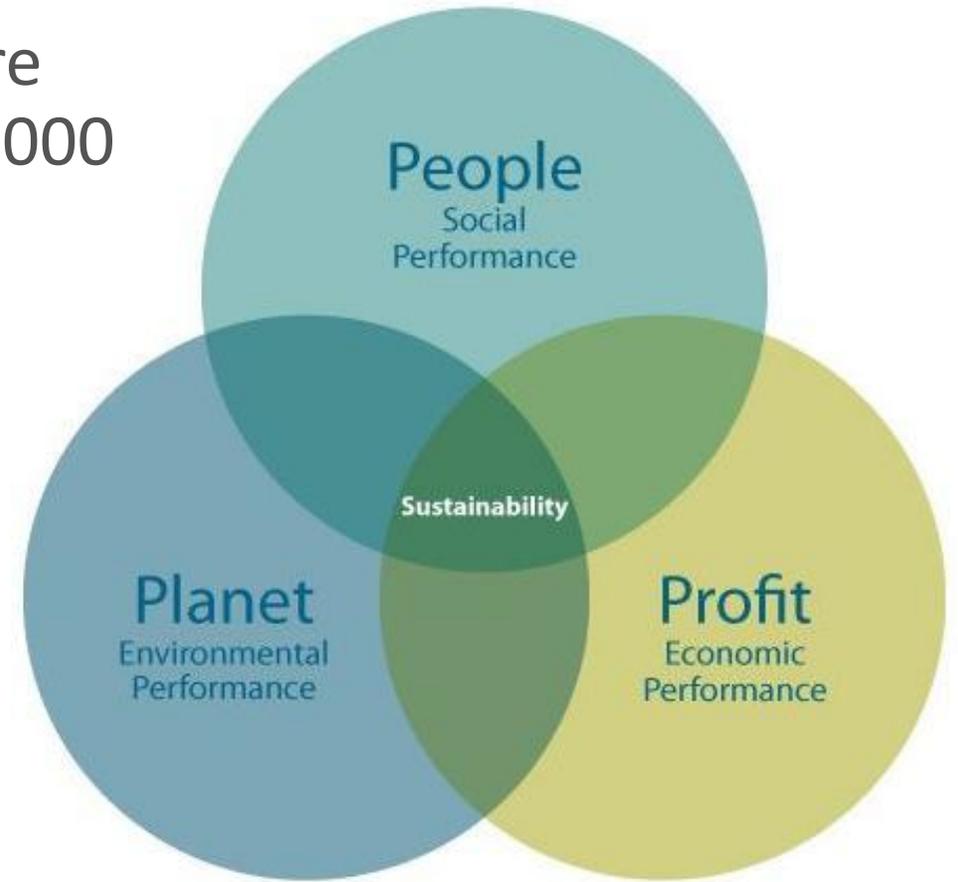


Cost per ton ranges

Social Performance



Vehicle collisions



Triple Bottom Line

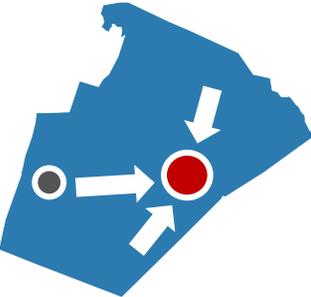
Life Cycle Assessment (LCA)

- Locations of future solid waste facilities have not yet been determined.
- To run the analysis, it was necessary to identify example locations.
- As the Beyond the South Wake Landfill Study progresses, feedback will be gathered regarding the different disposal options as well as potential locations.

The LCA Evaluated 3 Example Scenarios:

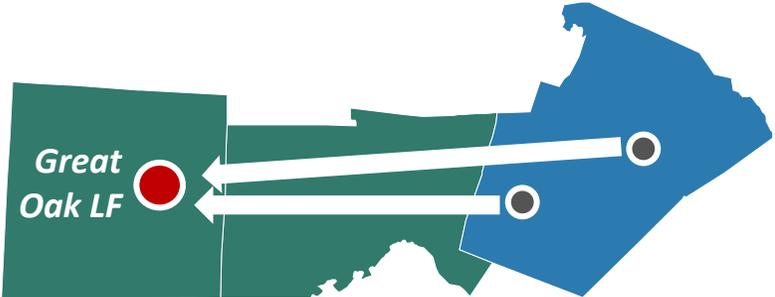
Scenario 1 – A New Landfill in Wake Co.

- ✓ New landfill in eastern Wake County
- ✓ New transfer station at the SWLF
- ✓ Hauling distance of 11,000 miles per day



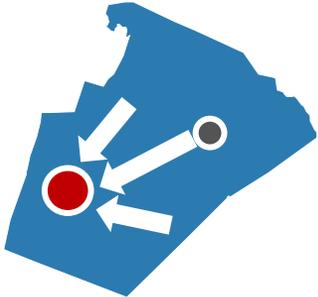
Scenario 2 – Disposal at a Regional Landfill

- ✓ Use of existing East Wake Transfer Station
- ✓ New transfer station at the SWLF
- ✓ Hauling distance of 19,200 miles per day



Scenario 3 – A Waste-to-Energy Facility in Wake Co.

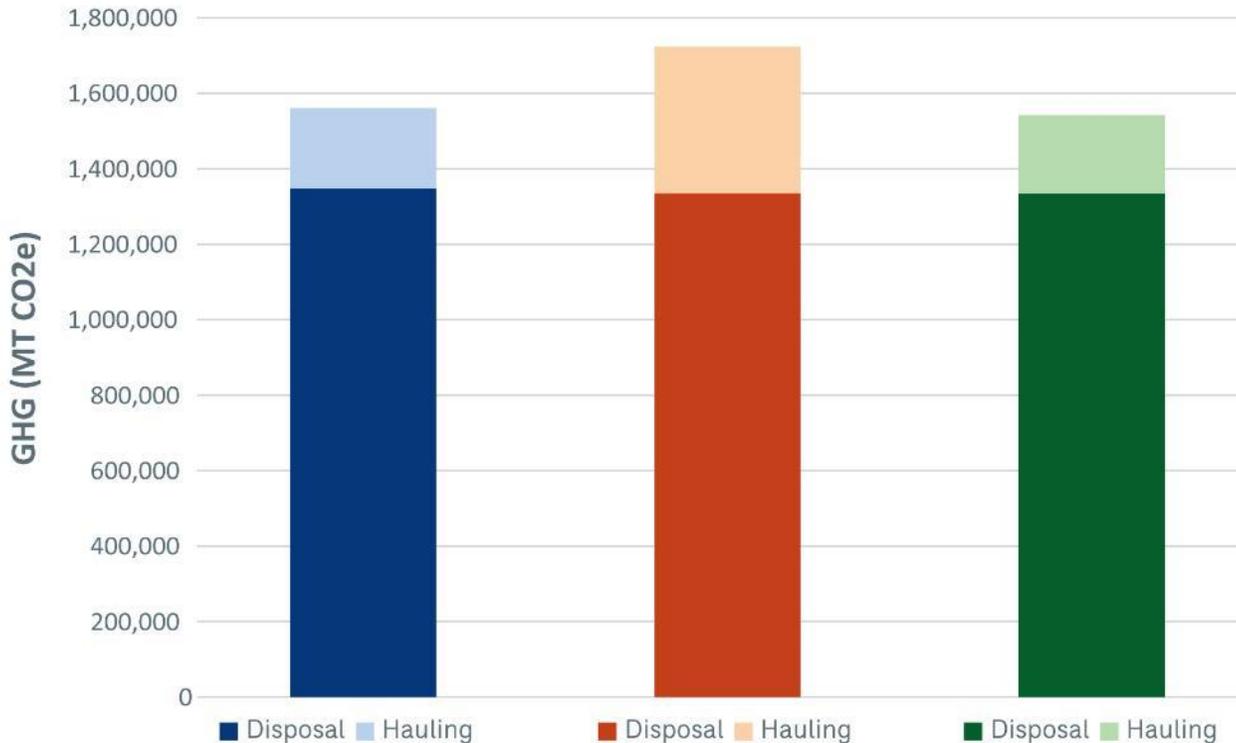
- ✓ A WTE facility at the SWLF
- ✓ Ash disposal in the SWLF
- ✓ Continued use of the East Wake Transfer Station
- ✓ Hauling distance of 10,000 miles per day



Environmental Performance

Greenhouse Gases (MTCO2e over 30 Years)

Scenario 1: New Landfill Scenario 2: Regional Landfill Scenario 3: WTE



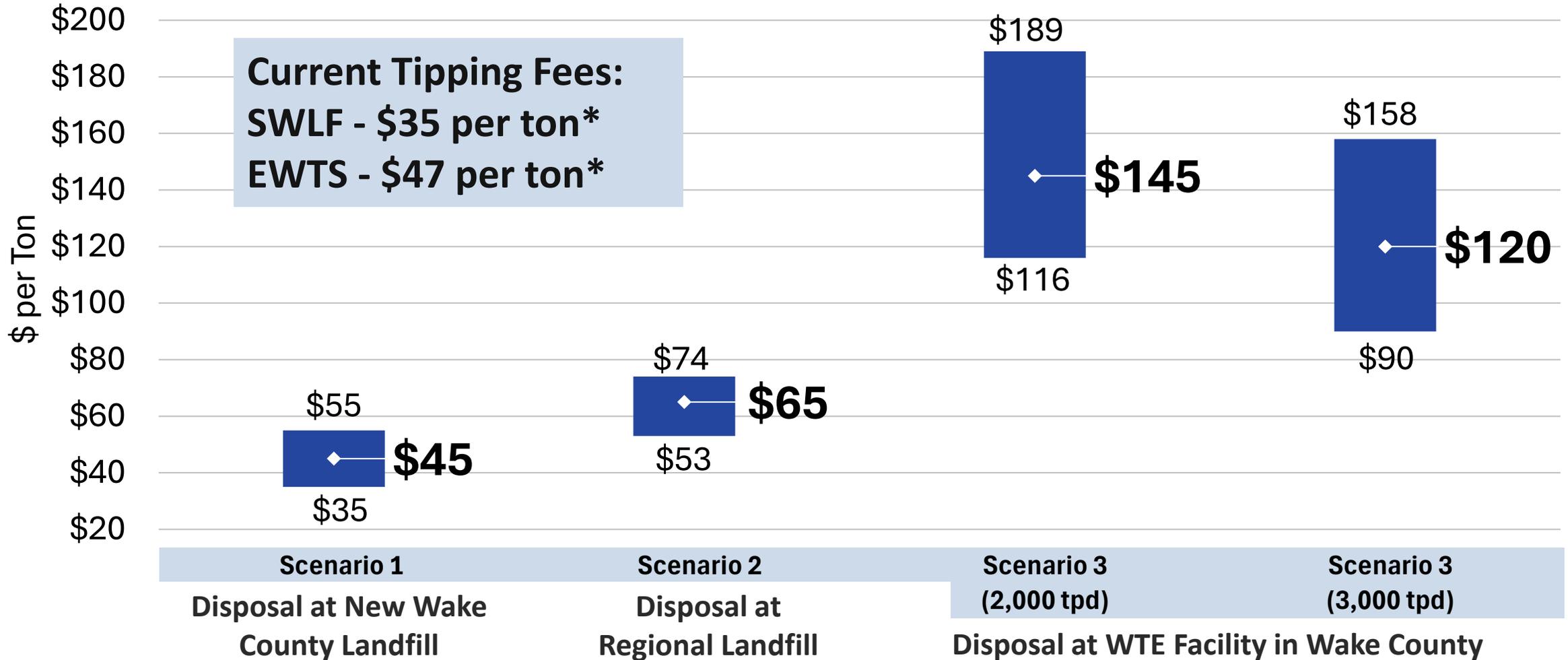
= Most favorable
 = Less favorable
 = Least favorable

Criteria Air Pollutants as a Percentage of the National Ambient Air Quality Standards

Pollutant	Scenario 1 New Landfill	Scenario 2 Regional Landfill	Scenario 3 WTE
CO	0.98%	3.6%	0.007%
NO ₂	42.0%	67.6%	1.4%
SO ₂	4.9%	15.2%	0.36%
PM ₁₀	25.9%	19.3%	0.02%
PM _{2.5}	110.9%	82.9%	0.09%

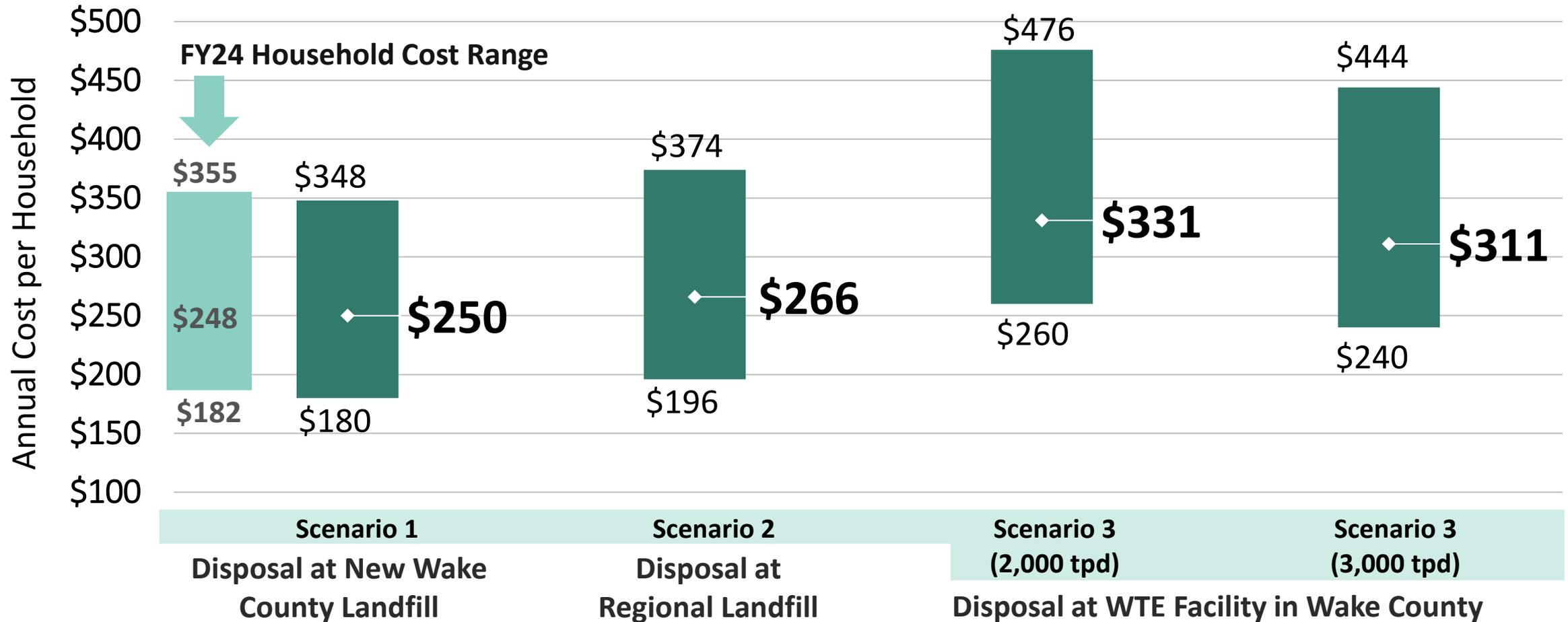
CO, NO₂, and SO₂ use 1-hr averaging periods
 Particulate Matter 2.5 and 10 use 24-hr averaging periods

Financial Performance – Cost per Ton* Range



Financial Performance – Cost per Municipal Household

Estimated MSW, Recycling, and Yard Waste Costs per Household



Social Performance - Vehicle Collisions



Scenario 1
Disposal at New Wake
County Landfill
(11,000 miles/day)



Scenario 2
Disposal at
Regional Landfill
(19,200 miles/day)



Scenario 3
Disposal at a WTE
Facility in Wake County
(10,200 miles/day)



I-40, November 13, 2025



Phase 1 Disposal Options Evaluation Summary

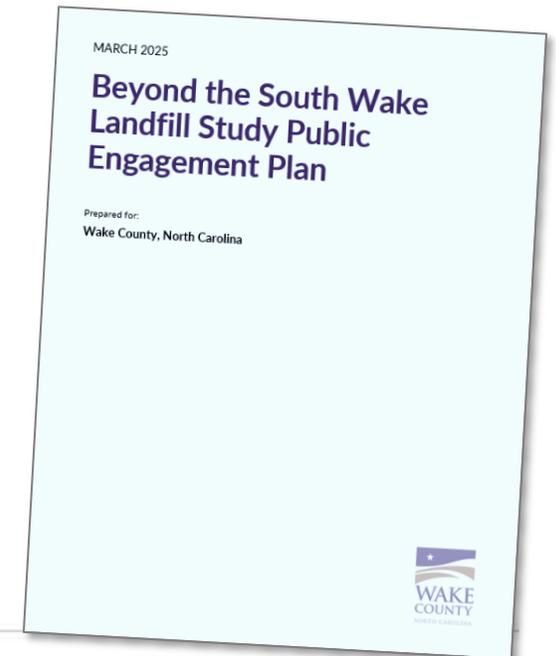
- There is limited land remaining in Wake County that meets regulatory and other criteria and is of sufficient size to site a **new landfill**. Further evaluation is needed.
- Expansions of existing **regional landfills** and/or new regional landfills are needed if out-of-county disposal is pursued.
- Estimated **greenhouse gas** emissions are similar for each scenario.
- Estimated **criteria air pollutants** are higher for the landfilling options, accounting for dispersion.
- **WTE** is a viable option, but the economics are challenging and there is uncertainty in the regulatory landscape.



Next Steps (Phase 2) Stakeholder Feedback

Next Steps - Phase 2 Focuses on:

- **Engaging with Stakeholders**
 - ✓ Wake Energy Advisory Commission
 - ✓ Wake County Solid Waste Technical Advisory Committee
 - ✓ Triangle Solid Waste Consortium (Central Pines Regional Council)
 - ✓ County/City/Towns Managers
 - Environmental Advisory Boards, Committees, and Groups
 - Chamber of Commerce and other business interests
 - Community groups and residents
- **Launching a project webpage**
- **Increasing Awareness through Social Media**
- **Further Exploring the Waste-to-Energy Option**
- **Further Assessing in-County Landfill Opportunities**



What criteria are most important when selecting the next MSW disposal option?

Economic factors

- ★ Minimizing cost
- ★ Cost stability
- Recovering metals and/or other resources

Environmental and Human Health factors

- ★ Minimizing greenhouse gas emissions
- ★ Minimizing human health risks from pollutants
- ★ Minimizing ecological impacts

★ *These generally represent the highest ranked criteria in the ~30 surveys completed to date*

★ *These were also commonly ranked in the top half*

Social and Community Factors

- Community impacts and environmental justice
- Minimizing truck traffic and vehicle collisions
- Minimizing odors
- Job creation

Other factors

- ★ Maintaining local control of waste disposal
- ★ Maintaining flexibility to adapt to changing conditions
- Producing energy
- Finding a regional solution

Next steps

- **Encourage community input**
- **We will share results when Phase 2 is complete**



Questions?

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