



Public Works Department

**SOLID WASTE AND RECYCLING SERVICES**

1 N. University Drive, Suite 400 • Plantation, Florida 33324 • 954-765-4999 • FAX 954-577-2391

**MEMORANDUM**

DATE: January 27, 2023

TO: Mary Lou Tighe, Executive Director, Broward League of Cities

FROM: Beam Furr, Broward County Commissioner District Six,  
Vice Chair of Solid Waste and Recycling Working Group

RE: Solid Waste and Recycling Scenarios Proposed in Arcadis Study

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**BACKGROUND**

The Solid Waste and Recycling Working Group (“SWWG”) is exploring scenarios for a comprehensive regional system for the recycling and disposal of solid waste. In 2017, the County and several municipalities agreed to engage a consultant, Arcadis, to study regional management for solid waste disposal to reach Florida’s 75% recycling goal. On December 13, 2018, Arcadis issued the Final Report on Broward County Solid Waste and Recycling Issues Study (“Arcadis Study”), which included proposed scenarios for various facilities (both existing and new) to process and recycle Broward County’s municipal solid waste (“MSW”). The scenarios presented by Arcadis provide helpful information as the SWWG contemplates what a comprehensive regional system might include and identifies next steps.

This memorandum summarizes the three scenarios detailed in the Arcadis Study (referred to as Scenarios A, B, C) and the estimated construction costs for each. In addition to the Arcadis scenarios, a fourth option (Scenario D) was prepared by County staff, along with its estimated construction costs, for consideration.

Each scenario proposes a slightly different combination of facilities to effectively process, recycle, and dispose of unprocessed MSW<sup>1</sup> (from commercial and residential sources) by year 2025.

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<sup>1</sup> Depending on the source document, “unprocessed MSW” may also be referred to as “mixed waste.”

### I. ARCADIS SCENARIOS COMPARISON

The table below compares the three scenarios analyzed in the Arcadis Study. Note that all costs listed utilize 2020 dollars.

| Proposed Facilities   | Scenario A                       | Scenario B  | Scenario C |
|---|----------------------------------|---|------------|
| 5 MSW Processing Facilities   | ✓                                | ✓   | ✗          |
| 5 Bulky Waste / Yard Trash / C&D Debris Facilities                                  | ✓                                | ✓   | ✓          |
| 3 Materials Recycling Facilities  | ✓                                | ✓   | ✓          |
| 2 Organics Processing Facilities  | ✓                                | ✗   | ✗          |
| 1 Yard Trash Facility   | ✓                                | ✓   | ✓          |
| Waste to Energy ("WTE") Incineration  | ✓                                | ✓   | ✓          |
| Landfill Disposal <sup>2</sup>  | ✓                                | ✓   | ✓          |
| <b>Option 1: Estimated Cumulative Construction Costs (without New WTE Facility)</b> |                                  |   |            |
|   | No WTE Expansion at WSB Required | Includes WTE Expansion of 4 <sup>th</sup> Boiler at WSB |            |
|   | \$329M <sup>3</sup>              | \$457M  | \$285M     |
| <b>Option 2: Estimated Cumulative Construction Costs (with New WTE Facility)</b>    |                                  |   |            |
|   | \$1B                             | \$1.2B  | \$1.05B    |

<sup>2</sup> Existing landfills to be utilized; construction costs not included.

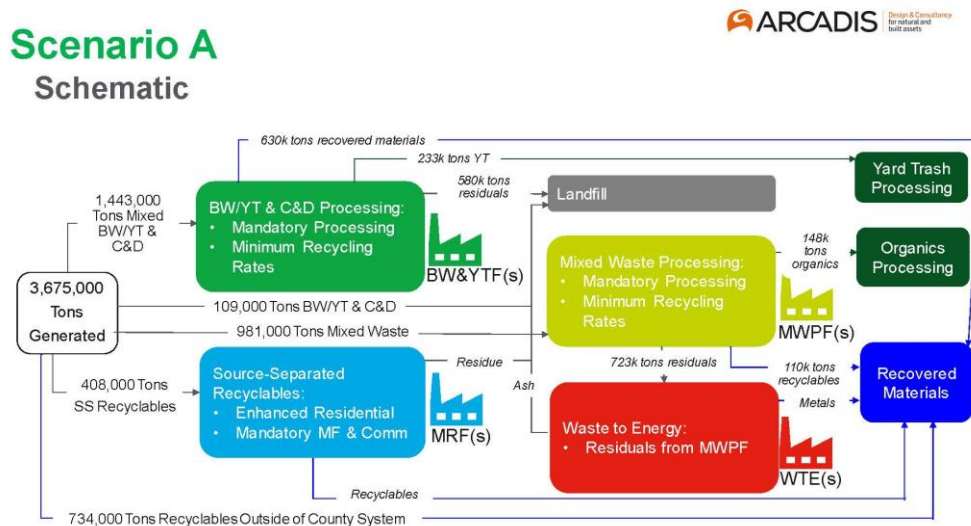
<sup>3</sup> In Scenario A, costs for an additional boiler at the WIN-Waste/Wheelabrator South Broward WTE is not included because adequate disposal capacity is available with the three existing boilers under this scenario.

## II. SCENARIO A

MSW and source separated recyclables would be directed to the facilities below for processing, including unprocessed MSW, Bulk/Yard waste, and Construction and Demolition Debris (“C&D”).

| Facilities                                 | Purpose  |
|--|--|
| 5 MSW Processing Facilities                | To turn unprocessed MSW into recovered materials and wet organics (food waste, compostable paper, etc.) and to sell those to end markets. Organics, excluding yard trash, would be sent to an Organics Processing Facility |
| 2 Organics Processing Facilities           | To process the organics into compost   |
| 5 Mixed Bulk/Yard Trash and C&D Facilities | To segregate larger bulky waste, yard trash, and C&D into recovered materials for end markets  |
| 1 Yard Trash Processing Facility           | To reduce yard trash into usable material or compost   |
| 3 Materials Recycling Facilities           | To process curbside recyclables from residential, multifamily, and commercial establishments   |
| WTE  | To process various residuals and recover remaining metals  |
| Landfill                                   | To dispose of remaining residuals  |

The schematic below illustrates the relationship between these facilities:

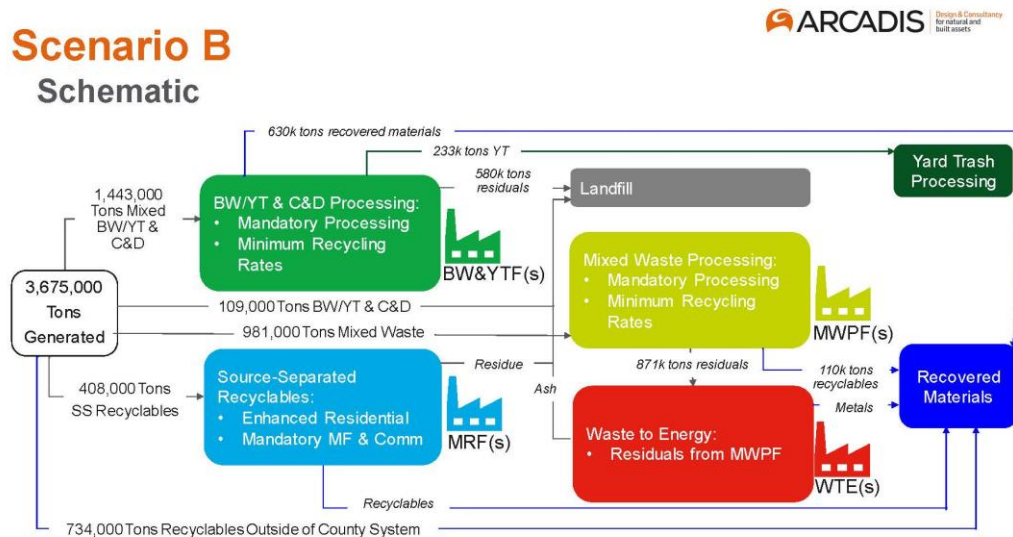


### III. SCENARIO B

This scenario is the same as Scenario A, but without an Organics Processing Facility.

In Scenario B, **organics would be sent to the WTE and a fourth boiler will need to be constructed** at the WIN Waste/Wheelabrator South Broward WTE.

The schematic below illustrates the relationship between these facilities:

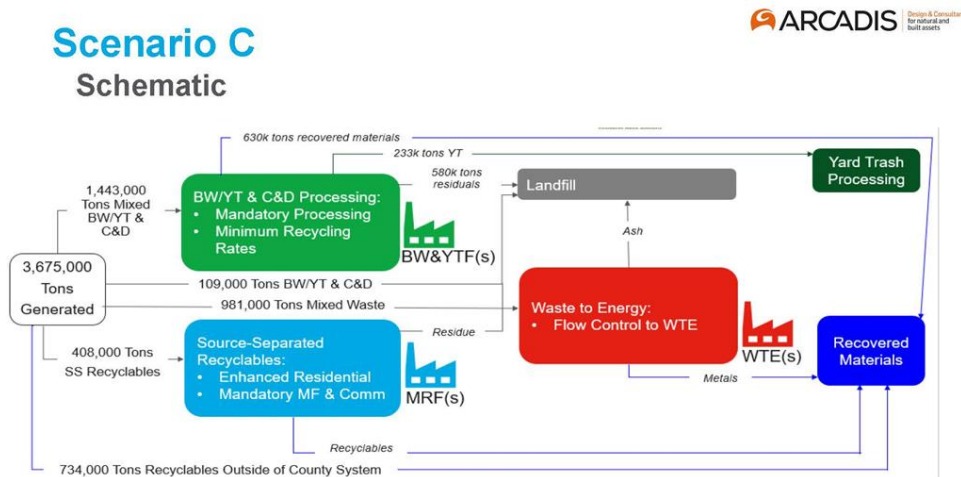


#### IV. SCENARIO C

This scenario is the same as Scenario A, but without an Organics Processing Facility or MSW Processing Facilities.

Consequently, **organics and unprocessed MSW would be sent directly to the WTE and a fourth boiler will need to be constructed** at the WIN Waste/Wheelabrator South Broward WTE.

The schematic below illustrates the relationship between these facilities:



### V. SCENARIO D

County staff has also prepared this alternative scenario using updated cost estimates. It provides for an initial set of facilities to process, recycle, and dispose of mixed residential and commercial waste. The scenario serves as a starting point that can be refined based on future needs and overall goals set forth by the SWWG.

| Facilities                                   | Purpose   |
|--|---|
| 1 Materials Recycling Facility               | To process curbside recyclables from residential, multifamily, and commercial establishments  |
| 2 Recyclables Transfer Stations <sup>4</sup> | To receive source separated recyclables for transfer to the Materials Recycling Facility      |
| 1 WTE <sup>5</sup>                           | To process various residuals and recover remaining metals                                     |
| 2 MSW Transfer Stations                      | To receive MSW for transfer to the WTE  |
| 1 Organics Processing Facility               | To process the organics into compost  |
| 1 Mixed Bulk/Yard Trash and C&D Facility     | To segregate larger bulky waste, yard trash, and C&D into recovered materials for end markets |
| Landfill <sup>6</sup>                        | To dispose of remaining residuals   |

#### Estimated Cumulative Construction Costs for Proposed Facilities: \$1.35B

Note that, unlike the three scenarios from the Arcadis Study, the facility costs for Scenario D are estimates based on 2022 dollars, except for the Organics Processing Facility, which is based on 2020 dollars. Scenario D also contemplates contracting for services at privately-owned facilities, including private Materials Recovery Facilities that are expected to be constructed within Broward County.

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<sup>4</sup> Various transfer stations may be collocated for efficiency.

<sup>5</sup> Scenario D contemplates the construction of a new WTE rather than the expansion of existing facilities.

<sup>6</sup> Existing landfills to be utilized; construction costs not included.

## VI. SUMMARY

Scenarios A, B, and C were developed by Arcadis to assist Broward County in achieving the State of Florida's 75% recycling goal. Note that, in the near term, the State may modify the methodology by which recycling rates are calculated.

The first three scenarios present slight differences in how unprocessed residential and commercial waste would be managed. In **Scenario A**, unprocessed waste would be sent to MSW Processing Facilities where recyclables would be recovered and marketed and wet organics would be recovered and processed. Remaining residuals would go to WTE. Under **Scenario B**, unprocessed waste would be sent to MSW Processing Facilities, where recyclables would be recovered and sent to end markets but organics would not be processed. Remaining residuals including wet organics would be sent to a WTE instead. Under **Scenario C**, unprocessed waste and organics would be sent to a WTE. Under Florida's current methodology for calculating recycling rates, whether or not unprocessed waste or organics are sent to a WTE matters. Currently, partial recycling credits are realized when these wastes are sent to a WTE rather than MSW Processing Facilities.

Based on preliminary feedback from County staff, **Scenario D** is presented as an alternative option. This scenario contemplates using a mix of facilities, including privately and publicly owned Materials Recovery Facilities and Mixed Bulk/Yard Trash and C&D Facilities, to effectively process, recycle, and dispose of solid waste generated across Broward County as well as additional transfer stations to reduce transportation costs. The SWWG is encouraged to continue constructive discussions on the viability of Scenarios A, B, C, and D in an effort to establish a countywide solid waste and recycling system.

## ATTACHMENT

**Exhibit 1:** Arcadis Summary of Estimated Solid Waste Facility Construction Cost Projections.

C: Monica Cepero, County Administrator  
Kimm Campbell, Deputy County Administrator  
Kevin B. Kelleher, Assistant County Administrator  
Michael Ruiz, Assistant County Administrator  
Trevor M.A. Fisher, P.E., MBA, Director, Public Works Department  
Andrew J. Meyers, County Attorney





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**Exhibit 1:**  
Arcadis Summary of Estimated Solid Waste Facility Construction Cost Projections

Table 25: Summary of Estimated Solid Waste Facility Construction Cost Projections

| Facility   | 2025                      |                                  |                                   | 2040                      |                                  |                                   | 2060                      |                                  |                                   |
|--|---------------------------|----------------------------------|-----------------------------------|---------------------------|----------------------------------|-----------------------------------|---------------------------|----------------------------------|-----------------------------------|
|  | Processing Lines Required | Facilities Required <sup>1</sup> | Est. Facility Cost (2020 dollars) | Processing Lines Required | Facilities Required <sup>1</sup> | Est. Facility Cost (2020 dollars) | Processing Lines Required | Facilities Required <sup>1</sup> | Est. Facility Cost (2020 dollars) |
| <b>Common Elements</b>                             |                           |                                  |                                   |                           |                                  |                                   |                           |                                  |                                   |
| Materials Recycling Facility                       | 5                         | 3                                | \$ 63,000,000                     | 5                         | 3                                | \$ 63,000,000                     | 6                         | 3                                | \$ 76,000,000                     |
| Combined Bulky Waste/Yard Trash/C&D Facility       | 10                        | 5                                | \$ 39,000,000                     | 11                        | 6                                | \$ 42,000,000                     | 12                        | 6                                | \$ 46,000,000                     |
| Yard Trash Facility                                | 1                         | 1                                | \$ 3,000,000                      | 1                         | 1                                | \$ 3,000,000                      | 2                         | 1                                | \$ 6,000,000                      |
| <b>Constants Subtotal</b>                          |                           |                                  | \$ 105,000,000                    |                           |                                  | \$ 108,000,000                    |                           |                                  | \$ 128,000,000                    |
| <b>Scenario A</b>                                  |                           |                                  |                                   |                           |                                  |                                   |                           |                                  |                                   |
| Mixed Waste Processing Facility                    | 10                        | 5                                | \$ 172,000,000                    | 10                        | 5                                | \$ 172,000,000                    | 11                        | 6                                | \$ 189,000,000                    |
| Organics Processing Facility (excludes Yard Trash) | 4                         | 2                                | \$ 52,000,000                     | 4                         | 2                                | \$ 52,000,000                     | 4                         | 2                                | \$ 52,000,000                     |
| <b>Waste-to-Energy (WTE)</b>                       |                           |                                  |                                   |                           |                                  |                                   |                           |                                  |                                   |
| WSB Expansion (Add 4th 750 tpd Boiler Unit)        | 0                         | 0                                | \$ -                              | 0                         | 0                                | \$ -                              | 1                         | 0                                | \$ 180,000,000                    |
| <b>OR</b>  |                           |                                  |                                   |                           |                                  |                                   |                           |                                  |                                   |
| New WTE Facility (750 tpd Boiler Units)            | 3                         | 1                                | \$ 675,000,000                    | 3                         | 1                                | \$ 675,000,000                    | 4                         | 1                                | \$ 900,000,000                    |
| <b>Scenario A (4th WTE Unit at WSB) TOTAL</b>      |                           | <b>16</b>                        | <b>\$ 329,000,000</b>             |                           | <b>17</b>                        | <b>\$ 332,000,000</b>             |                           | <b>18</b>                        | <b>\$ 549,000,000</b>             |
| <b>Scenario A (New WTE Facility) TOTAL</b>         |                           | <b>17</b>                        | <b>\$ 1,004,000,000</b>           |                           | <b>18</b>                        | <b>\$ 1,007,000,000</b>           |                           | <b>19</b>                        | <b>\$ 1,269,000,000</b>           |
| <b>Scenario B</b>                                  |                           |                                  |                                   |                           |                                  |                                   |                           |                                  |                                   |
| Mixed Waste Processing Facility                    | 10                        | 5                                | \$ 172,000,000                    | 10                        | 5                                | \$ 172,000,000                    | 11                        | 6                                | \$ 189,000,000                    |
| <b>Waste-to-Energy (WTE)</b>                       |                           |                                  |                                   |                           |                                  |                                   |                           |                                  |                                   |
| WSB Expansion (Add 4th 750 tpd Boiler Unit)        | 1                         | 0                                | \$ 180,000,000                    | 1                         | 0                                | \$ 180,000,000                    | 1                         | 0                                | \$ 180,000,000                    |
| <b>OR</b>  |                           |                                  |                                   |                           |                                  |                                   |                           |                                  |                                   |
| New WTE Facility (1,050 tpd Boiler Units)          | 3                         | 1                                | \$ 945,000,000                    | 3                         | 1                                | \$ 945,000,000                    | 3                         | 1                                | \$ 945,000,000                    |
| <b>Scenario B (4th WTE Unit at WSB) TOTAL</b>      |                           | <b>14</b>                        | <b>\$ 457,000,000</b>             |                           | <b>15</b>                        | <b>\$ 460,000,000</b>             |                           | <b>16</b>                        | <b>\$ 497,000,000</b>             |
| <b>Scenario B (New WTE Facility) TOTAL</b>         |                           | <b>15</b>                        | <b>\$ 1,222,000,000</b>           |                           | <b>16</b>                        | <b>\$ 1,225,000,000</b>           |                           | <b>17</b>                        | <b>\$ 1,262,000,000</b>           |
| <b>Scenario C<sup>2</sup></b>                      |                           |                                  |                                   |                           |                                  |                                   |                           |                                  |                                   |
| <b>Waste-to-Energy (WTE)</b>                       |                           |                                  |                                   |                           |                                  |                                   |                           |                                  |                                   |
| WSB Expansion (Add 4th 750 tpd Boiler Unit)        | 1                         | 0                                | \$ 180,000,000                    | 1                         | 0                                | \$ 180,000,000                    | 1                         | 0                                | \$ 180,000,000                    |
| <b>OR</b>  |                           |                                  |                                   |                           |                                  |                                   |                           |                                  |                                   |
| New WTE Facility (1,050 tpd Boiler Units)          | 3                         | 1                                | \$ 945,000,000                    | 3                         | 1                                | \$ 945,000,000                    | 4                         | 1                                | \$ 1,260,000,000                  |
| <b>Scenario C (4th WTE Unit at WSB) TOTAL</b>      |                           | <b>9</b>                         | <b>\$ 285,000,000</b>             |                           | <b>10</b>                        | <b>\$ 288,000,000</b>             |                           | <b>10</b>                        | <b>\$ 308,000,000</b>             |
| <b>Scenario C (New WTE Facility) TOTAL</b>         |                           | <b>10</b>                        | <b>\$ 1,050,000,000</b>           |                           | <b>11</b>                        | <b>\$ 1,053,000,000</b>           |                           | <b>11</b>                        | <b>\$ 1,388,000,000</b>           |

Note 1: Number of required facilities assumes that each facility operates for one shift-per-day and has a maximum of two processing lines. The number of facilities, and estimated construction cost may be reduced if operating at two shifts-per-day.

Note 2: For the mid and long-term planning period of 2040 and 2060 for Scenario C, a 2nd 750 tpd processing line is required but is not possible due to the existing design of WSB. Therefore one processing line is noted due to this limitation. Additional disposal capacity will be required for any waste exceeding the capacity of WSB.