

Date: January 25, 2025
To: Honorable Chairman Anthony Rodriguez
and Members, Board of County Commissioners
From: Daniella Levine Cava
Mayor 
Subject: Second Update on Directive No. 241676

Agenda Item No. 2(B)(5)
February 19, 2025

Executive Summary

This report is an update in response to Directive No. 241676, sponsored by Commissioner Oliver Gilbert and adopted by the Board of County Commissioners (Board) on September 13, 2024. This update follows the prior report issued to the Board on November 22, 2024, “Update on the Site Selection for the Sustainable Solid Waste Campus – Directive No. 241676.” This report provides the Board with a summary of the state of the solid waste system, including the challenges and options for a path forward.

Through the process, we have learned that there is no easy solution when it comes to waste management. As Mayor, my objective is to always deliver critical, quality services to our residents in a financially and environmentally responsible and efficient way. We recognize the urgent need to manage the loss of the Resource Recovery Facility (RRF) to ensure we can continue to meet our growing community’s waste disposal needs, as well as the need for a solution that integrates into a broader Zero Waste strategy as we seek to reduce our overall waste output. At the same time, it is critical that any option we pursue does not create an undue burden to our ratepayers. I take my role as the steward of the public’s tax dollars and of our natural resources very seriously, and at my direction, County staff has spent countless hours analyzing the financial and environmental costs and benefits to each of these options as reflected in Exhibit B^[1]. We have also engaged in extensive dialogue with community stakeholders, including numerous public meetings and continuing conversation with environmental organizations.

After careful consideration and much analysis, I am recommending that we continue to long haul waste via truck and rail using our contracted capacity, while we continue exploring options to build a landfill outside of Miami-Dade County. Our team extensively pursued potential sites to build a new, state-of-the-art waste-to-energy (WTE) facility to replace the old RRF, and we are confident that a new facility – built to meet stringent modern standards – would meet our disposal needs while protecting both human health and the environment. However, the costs of building and maintaining a new facility are extremely high, and any site selected would likely generate legal and other challenges that would significantly extend the project timeline. This decision also comes at a time of mounting pressure on our County’s overall budget as we transition

to five new constitutional offices, while demand for county services continues to grow. Ultimately, our top priority is to meet our disposal capacity needs while protecting our ratepayers, keeping overall taxes and fees low, and safeguarding our long-term fiscal health, and this option achieves those goals.

As has been previously provided and for your reference, please see the [2020 Solid Waste Master Plan update](#) and its [summary](#). This plan does not include the zero waste and other diversion initiatives that have been initiated since 2020 and have helped us divert waste and create operational efficiencies.

Timeline

Making a decision on the future of waste disposal is important to ensure access to potentially significant insurance proceeds. The County negotiated an extension with the RRF insurers, extending the two-year deadline to February 12, 2026, allowing the County additional time to secure a contract to replace the Facility. If the deadline is not met or if a RRF replacement is not built, the County will receive insurance proceeds based on the actual cash value of the property, which could be over 50 percent less than the replacement cost. Making a decision on waste disposal is critical due to County landfills reaching capacity within the next four to five years, based on the current waste disposal rates, see Exhibit A.^[2]

The North Dade Landfill (NDL) is expected to reach capacity in approximately five years and the South Dade Landfill (SDL) in approximately four years. The financial impact of closing the landfills represents a \$50 million loss in annual revenue, in addition to post-closure costs of \$48 million.

Path Forward: Options to Consider

Use of Contracted Capacity: The Department has contracted landfill capacity for 3.5 million tons with Waste Management (2.7 million) and Waste Connections (800,000). These agreements include the transport of waste by over-the-road long haul and waste by rail. Following the RRF fire, DSWM has utilized this capacity to meet our concurrency contingency requirements.

Build a Landfill Outside Miami-Dade County: DSWM staff has already begun exploring the option to build a landfill outside the County. Preliminary costs on a 1,000-acre property and 150-acre footprint are estimated at \$556 million for capital costs and operating costs at \$163 million per year, in 2034 costs. It is estimated to take approximately 10 years to permit and build a new landfill.

Build a Replacement WTE facility: In order to leave no stone unturned in this decision-making process, staff worked tirelessly to identify other alternatives to build a new, state-of-the art WTE.

The Department studied a total of six different locations with the help of Arcadis U.S., Inc. (Arcadis), our bond engineer: Doral, NW 58th Street, Airport West, Medley, Okeechobee, and Eiteljorge.

Each of the alternative sites generate significant additional capital and/or annual operating and maintenance costs compared to building the WTE facility at the original RRF location. Although we have done our due diligence and feel comfortable with the environmental footprint of the Airport West site, this site presents escalating costs. As mentioned, any site would likely face legal and other challenges. Below is a cost comparison summary (for additional information see Exhibit C):

Site	Capital Costs (Non-Recurring)	Annual O&M Costs	Time to Build
Doral RRF	\$1.5 billion	\$59.3 million	7 years and 9 months
NW 58 th Street	\$1.8 billion	\$62 million	10 years and 3 months
Airport West	\$1.8 billion	\$81 million	9 years and 3 months
Medley	\$1.9 billion	\$75 million	10 years and 6 months
Okeechobee	\$1.9 billion	\$77 million	10 years and 4 months
Eiteljorge	\$1.8 billion	\$87 million	9 years and 3 months

Funding Potential Capital Needs

Building any new major capital projects for our solid waste system will require additional investment. Funding alternatives will be necessary if the Board decides to finance capital projects such as a new Waste-to-Energy (WTE) facility, an out-of-county landfill, landfill expansions, or to maintain long-hauling operations via contract capacity beyond the current ten-year contractual price. New capital investment funding mechanisms could include:

1. Continuation of the current fee-based structure.
2. Restructuring the system to include a county-wide ad valorem tax.
3. Implementing a special assessment approach, similar to a special taxing district.
4. Establishing a public-private partnership (P3) to fund a new facility or landfill.

Each option would require a comprehensive communication and implementation strategy.

Conclusion

Miami-Dade County's solid waste management system is at a critical juncture, and we ask the Board to consider the options and recommendation above and provide further direction to the administration to ensure that the County continues to comply with solid waste concurrency requirements.

In accordance with Ordinance No. 14-65, this report will be placed on the February 19, 2025, Board meeting agenda. If additional information is needed, please contact Aneisha Daniel, Director, Department of Solid Waste Management, at Aneisha.Daniel@miamidade.gov.

Attachments

Exhibit A – Arcadis November 6, 2024, Landfill Capacity Analysis

Exhibit B – WTE vs. Landfilling (20 Years Out)

Exhibit C – WTE Site Comparison

- c:
- Geri Bonzon-Keenan, County Attorney
 - Gerald Sanchez, First Assistant County Attorney
 - Jess McCarty, Executive Assistant County Attorney
 - Office of the Mayor Senior Staff
 - Aneisha Daniel, PhD, Director, Department of Solid Waste Management
 - Yinka Majekodunmi, Commission Auditor
 - Basia Pruna, Director, Clerk of the Board
 - Eugene Love, Agenda Coordinator

[1] Exhibit B, WTE vs. Landfilling (20 Years Out)

[2] Exhibit A, Arcadis November 6, 2024, Landfill Capacity Analysis.



Miami-Dade County
Department of Solid Waste Management

**LANDFILL CAPACITY ANALYSIS FOR
DSWM ACTIVE LANDFILLS AS OF JULY 1, 2024**

Final Report

November 6, 2024

LANDFILL CAPACITY ANALYSIS FOR DSWM ACTIVE LANDFILLS AS OF JULY 1, 2024



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ACRONYMS AND ABBREVIATIONS

DSWM	Miami-Dade County Department of Solid Waste Management
DTM	Digital Terrain Models
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
MSL	Mean Sea Level
NDLF	North Dade Landfill
RRFAF	Resources Recovery Facility Ashfill
SDLF	South Dade Landfill

EXECUTIVE SUMMARY

Introduction

The Miami-Dade County Department of Solid Waste Management (DSWM) must evaluate the status of its landfills annually to determine the remaining capacity/volume of their existing active landfills and the land permitted for future landfills. Arcadis U.S., Inc. (Arcadis), in the capacity as Bond Engineer, has completed the 2024 landfill capacity analysis, which includes volume calculations for the three DSWM active landfills including North Dade Landfill (NDLF), South Dade Landfill (SDLF), and Resources Recovery Facility Ashfill (RRFAF). These calculations provide remaining volume estimates of the referenced facilities in accordance with the Florida Department of Environmental Protection (FDEP) Florida Administrative Code (F.A.C.) Chapter 62-701.500(13)(c). For its internal auditing purposes, DSWM has also included three months of tonnage information for July through September.

The capacity calculations were performed by comparing the latest topographic survey to the final permitted closure grades using AutoCAD Civil 3D software. Tonnage data for the analysis was provided by DSWM.

North Dade Landfill

As of July 1, 2024, the North Dade Landfill had an available waste capacity of approximately 880,554 tons, which is a decrease of 4.44% from the July 1, 2023 available waste capacity. The decrease in capacity is attributable to additional waste placement. The NDLF accepted 104,498 tons of waste between July 1, 2023 and June 30, 2024, which is a decrease of 31.27% from the previous reporting period. Based on the waste tonnage recorded from inception through June 30, 2024, there is approximately 13,627,578 tons of waste in the NDLF

South Dade Landfill

As of July 1, 2024, the South Dade Landfill had an available waste capacity of approximately 3,203,158 tons, which is a decrease of 8.89% from the July 1, 2023 available waste capacity. The decrease in capacity is attributable to additional waste placement. The SDLF accepted 748,313 tons of waste between July 1, 2023 and June 30, 2024, which is an increase of 15.43% from the previous reporting period. Based on the waste tonnage recorded from inception through June 30, 2024, there is approximately 21,683,964 tons of waste in the SDLF.

Resources Recovery Facility Ashfill

As of July 1, 2024, the Resources Recovery Facility Ashfill had an available waste capacity of approximately 1,121,485 tons, which is an increase of 0.15% from the July 1, 2023 available waste capacity. The increase in capacity is attributable to no additional waste placement and settlement of existing waste. The RRFAF accepted 0 tons of waste between July 1, 2023 and June 30, 2024, which is a decrease of 100% from the previous reporting period. The large decrease in placed tonnage is a result of the catastrophic fire at the RRF that occurred on February 12, 2023, rendering the facility inoperable. Based on the waste tonnage recorded from inception through June 30, 2024, there is approximately 6,662,704 tons of waste in the RRFAF.

1 INTRODUCTION

1.1 Background

The Miami-Dade County Department of Solid Waste Management (DSWM) currently maintains and operates three active solid waste landfills, which are:

- North Dade Landfill (NDLF),
- South Dade Landfill (SDLF), and
- Resources Recovery Facility Ashfill (RRFAF).

DSWM is required to estimate the remaining volume/capacity of the referenced facilities and land permitted for future landfills annually and submit the results to Florida Department of Environmental Protection (FDEP) in accordance with the Florida Administrative Code (F.A.C.) Chapter 62-701.500(13)(c) which states:

(c) Maintain an annual estimate of the remaining life and capacity in cubic yards of the existing constructed landfill and remaining capacity and site life of other permitted areas not yet constructed. The annual estimate shall be based on a summary of the heights, length, and widths of the solid waste disposal units. The estimate shall be made and reported annually to the Department.

1.2 Purpose

The purpose of this report is to document the results of the Landfill Capacity Analysis in order to provide data to satisfy the F.A.C. Chapter 62-701.500(13)(c) requirements for the North Dade Landfill, South Dade Landfill, and Resources Recovery Facility Ashfill. The remaining landfill waste capacity calculated for the annual analysis is also used internally by DSWM for forecasting, scheduling, and cost estimating efforts. Revenue projections are based on the capacity analysis looking at not only the remaining life of the active landfill but also the life of future landfill cells.

The methodology used to complete the analysis is described in Section 2 of this report. The results of the capacity analysis for DSWM's three active landfills, including NDLF, SDLF, and RRFAF, are presented respectively in Sections 3, 4, and 5. The Appendices at the end of this report contain data, tabulations, and comparison tables that support the 2024 Landfill Capacity Analysis.

2 PROJECT APPROACH

2.1 Methodology

The methodology used for the 2024 Landfill Capacity Analysis was divided into several key steps, which are described in detail below.

2.1.1 Gross Volume Remaining

Aerial surveys of each facility were conducted on July 22 at NDLF, August 13 at SDLF, and June 24 at RRFAF, 2024, by Stoner Surveyors and were provided electronically to Arcadis. The Gross Volume Remaining was calculated for NDLF, SDLF, and RRFAF based on the 2024 surveys and final closure grades. The 2024 Landfill Capacity Analysis was completed with AutoCAD Civil 3D software, by determining the volume, or the Gross Volume Remaining in the landfill, between the latest topographic aerial survey and the final permitted closure grades. Final closure grades for the three landfills were calculated previously by Arcadis based on assumed side slope and top grades provided by DSWM staff.

2.1.2 Cover Volumes

Volumes for the final cover, intermediate cover, and initial cover were calculated to approximate the Net Waste Capacity Remaining. The thickness of the final cover (24 inches) and intermediate cover (12 inches) were determined based upon current FDEP regulations. Volumes for these covers were calculated by multiplying the cover depth by the calculated area. The volume of initial cover was calculated using an assumed percentage of the Gross Volume Remaining. The assumed percentages were estimated to be 5%, 8% and 0% for NDLF, SDLF, and RRFAF, respectively. A weighted factor was used to determine the volume for the initial cover since multiple materials were used with different densities.

2.1.3 Net Waste Volume Remaining

The Net Waste Volume Remaining was calculated as follows:

$$N = G - F - M - I$$

Where:

- N = Net Waste Volume Remaining (as of date of survey)
- G = Gross Volume Remaining (as of date of survey)
- F = Final Cover Volume
- M = Intermediate Cover Volume
- I = Initial Cover Volume

2.1.4 Settlement

A weighted volume was used to determine the volume gained by settlement after placement and compaction. High rates of settlement are common in landfills but can vary greatly depending upon

numerous factors such as waste type, thickness, age, regional factors, etc. The settlement percentages varied for the three active landfills with assumed values of 10% for NDLF, 15% for SDLF, and 2% for RRFAF.

2.1.5 Net Waste Volume Remaining After Settlement

The resulting corrected Net Waste Volume Remaining value, N_s , represents the anticipated volume which will become available for waste disposal over the life of the landfill. This volume is calculated as shown below.

$$N_s = G - F - M - I + S$$

Where:

- N_s = Net Waste Volume Remaining after Settlement (as of date of survey)
- G = Gross Volume Remaining (as of date of survey)
- F = Final Cover Volume
- M = Intermediate Cover Volume
- I = Initial Cover Volume
- S = Settlement Volume Gained during Cell Life

2.1.6 Conversion to Tonnage

The Net Waste Volume Remaining and the Net Waste Volume Remaining after Settlement are calculated in terms of volume (cubic yards). These volumetric values are used to meet the FDEP regulatory requirements described in Section 1 of this report. However, the DSWM Waste In-Place Records are in terms of weight (tons). Therefore, the Net Waste Volume Remaining values as of the dates of the surveys were converted to tonnage by multiplying the calculated volumes by in-place waste densities. The following waste density values were used for the conversion:

- NDLF = 0.50 tons/cubic yard
- SDLF = 0.55 tons/cubic yard
- RRFAF = 1.35 tons/cubic yard

2.1.7 Waste Capacity Analysis

To determine the Waste Capacity Available as of July 1, 2024 for the DSWM audit requirements, the Waste Disposal Tonnage between June 30, 2024 and the survey dates shown in Table 2 of Appendix A was subtracted from the Waste Capacity Remaining value as of the survey dates. Table 2 included in Appendix A provides a summary of the capacity analysis calculations.

2.1.8 Built-Out Capacity

The built-out capacity was calculated for each of the three landfills as shown in Table 3 of Appendix A. This table sums the data from Tables 1 and 2 to determine the total waste life capacity of the landfills. These values provide DSWM with an outlook of past, current, and future status and capacities in terms of total tons of waste placed from inception to closure. The table identifies the landfill cells that are closed,

full, active, or planned for future use; allowing for planning and budgetary projections to be made for potential revenues, closure costs, long-term maintenance needs, and future capacity availability.

2.1.9 Permitted Available Capacity as of October 1, 2024

Table 4 of Appendix A shows the additional tonnages disposed at the landfills from July 1, 2024 through September 30, 2024 and as a result shows the permitted capacity available as of October 1, 2024.

2.2 Terminology Used

Terminology and definitions are provided below:

Final Cover	Final cover, per Chapter 62-701.200 (39), F.A.C., means “the material used to cover the top and sides of the landfill when fill operations cease.”
Gross Volume Remaining	The Gross Volume Remaining is the volumetric capacity calculated based on the survey dates by Longitude Surveyors, LLC and the theoretical profile of the landfill at closure based on the final grades established in the operating permit.
Initial Cover	Initial cover, per Chapter 62-701.200 (59), F.A.C., means “a minimum 6-inch layer of compacted earth used to cover an area of Solid Waste before placement of additional waste, intermediate cover, or final cover. The term also includes other material or thickness approved by the DSWM that minimizes disease vector breeding, animal attraction, and moisture infiltration; minimized fire potential; prevents blowing litter; controls odors; and improves landfill appearance.”
In-place Waste Density	The original in-place compacted densities of different categories of waste (e.g., Trash, Garbage, and Ash) were taken from established densities used during previous years’ capacity calculations.
Intermediate Cover	Intermediate cover, per Chapter 62-701.200 (61), F.A.C., means “a layer of compacted earth at least one foot in depth applied to a Solid Waste disposal unit. The term also includes other material or thickness approved by the DSWM that minimized disease vectors, odors, and fire, and is consistent with the leachate control design of the landfill.”
Net Waste Volume Remaining	The Net Waste Volume Remaining is defined as the volumetric capacity available for waste disposal after accounting for the volume taken up by initial, intermediate, and final cover material.

Settlement

Settlement is the result of consolidation of in-place waste. Consolidation occurs when initial void spaces in the refuse are replaced with surrounding waste and can be the result of additional waste placement and/or the decomposition of the existing waste. This process occurs over time but must be accounted for in the capacity analysis calculations.

Tonnage of In-place Waste

DSWM provided the tonnages of in-place waste in the landfills. These tonnages are the actual quantities that were physically deposited in the landfills and were prepared by using actual scale house data.

3 NORTH DADE LANDFILL

3.1 Landfill Description

The North Dade Landfill is one the three landfills operated by Miami-Dade County Department of Solid Waste Management (DSWM). The North Dade Landfill's mailing address and entrance to the landfill is located at 21500 NW 47th Avenue. The site is bounded by the Florida Turnpike Homestead Extension to the north, NW 47th Avenue to the east, and NW 57th Avenue to the west. The south side of the landfill is bounded by the Snake Creek Canal.

The facility encompasses a total area of 218 acres, of which about 180 acres are designated for waste disposal. The waste disposal area is composed of two cells, the West Cell and the East Cell. The West Cell has a waste disposal limit of approximately 96 acres and is not active. The East Cell has a waste disposal limit of approximately 84 acres and currently accepts waste. The existing topography, proposed final grades, and cross section of the NDLF are provided in Figures 1A through 1C in Appendix B.

The landfill is permitted to accept only Class III waste. By FDEP definition, Class III waste means "yard trash, construction and demolition debris, processed tires, asbestos, carpet, cardboard, paper, glass, plastic, furniture other than appliances, or other materials approved by the Department that are not expected to produce leachate which poses a threat to public health or the environment."

Aerial surveys of the North Dade Landfill were conducted on July 22, 2024 by Stoner Surveyors and reflect the existing grades at the time of the survey. This topography was used to calculate the Gross Volume Remaining as of July 22, 2024.

3.2 Assumptions

Arcadis made a number of assumptions to complete the capacity analysis for the DSWM Landfill Analysis. The assumptions used for NDLF are:

1. The East Cell final grades will be constructed in accordance with the original Brown and Caldwell 1988 Operation Plans and the FDEP existing operating permit, as shown in Figures 1B and 1C.
2. The intermediate cover will have a thickness of 12 inches over the entire waste disposal area. This material will not be reused as a final cover.
3. The final cover will have a thickness of 24 inches placed over top the intermediate cover. The top 6 inches will consist of topsoil and the bottom 18 inches will consist of general soil.
4. The initial cover consumes 5% of the Gross Volume Remaining.
5. Additional volume gained in the East Cell to the Net Waste Volume Remaining due to consolidation, settlement, and degradation is 10%.
6. The calculated in-place waste density is 0.50 tons per cubic yard.

3.3 Results

The results of the analysis are summarized in Table 3-1 with the details provided in Tables 1 through 4 of Appendix A.

Table 3--1.
Summary of Landfill Capacity Analysis for NDLF

Total Tonnage of In-place Waste as of 6/30/23 (tons)	Total Tonnage Placed Between 7/1/22 - 6/30/23 (tons)	Total Tonnage Placed Between 7/1/23 - 6/30/24 (tons)	Net Waste Volume Remaining as of 7/22/2024 (cy)	Additional Volume Gained from Settlement During Life of Cell (cy)	Total Tonnage of In-place Waste as of 6/30/24 (tons)	Waste Capacity Available as of 7/1/24 (tons)	Total Tonnage of In-place Waste from 7/1/24 to 9/30/24 (tons)	Waste Capacity Available as of 10/1/24 (tons)
13,523,080	152,051	104,498	1,612,719	161,272	13,627,578	880,554	30,913	849,641

As shown in Table 3-1, the Waste Capacity Available as of July 1, 2024 was calculated to be 880,554 tons, which is 4.44% less than the waste capacity of 921,501 tons that was available as of July 1, 2023 for the East Cell. NDLF received 104,498 tons of waste from July 1, 2023 through June 30, 2024, which is a decrease of 31.27% from the previous reporting period. Assuming no additional disposal capacity is constructed and future waste placement rates and in-place densities are as expected, the NDLF is estimated to reach capacity in approximately 5 years (2029).

4 SOUTH DADE LANDFILL

4.1 Landfill Description

The South Dade Landfill (SDLF) mailing address and entrance to the landfill is located at 23707 SW 97th Avenue in the southeast region of Miami-Dade County. The site is bordered by a county park and Black Point Marina on the east, the Black Creek Canal to the north, SW 97th Avenue to the west and the Goulds Canal and SW 248th Street to the south. Some additional landmarks to the site include the South District Wastewater Treatment Plant to the north of the Black Creek Canal, the Homestead Air Reserve base two miles to the south, the Biscayne Bay one mile to the east, and the Florida Turnpike one mile to the west of the SDLF.

SDLF consists of 200 acres of disposal area located on 300 acres of land. The 200 acres are divided into five cells. The status and capacity (tonnage) of the cells is presented in Table 3 of Appendix A along with a summary of the landfill cells below:

- Cells 1, 2 and 3 (~100 acres together) are closed,
- Cell 4 (~54 acres) is active and currently receiving waste,
- Cell 5 (~46 acres) is active and currently receiving waste.

The landfill is permitted to accept Class I waste, which by FDEP definition means “solid waste which is not hazardous waste, and which is not prohibited from disposal in a lined landfill under Rule 62-701.300, F.A.C.” Since Class I waste contains more odor producing material, the landfill applies initial cover more frequently than the NDLF and as a result the assumption for initial cover (8%) is higher.

The existing topography proposed final grades, and cross section of the SDLF are provided in Figures 2A through 2D in Appendix B. Aerial surveys of the South Dade Landfill were conducted on August 13, 2024 by Stoner Surveyors and reflect the existing grades at the time of the survey. This topography was used to calculate the Gross Volume Remaining as of August 13, 2024.

4.2 Assumptions

Arcadis made a number of assumptions to complete the capacity analysis for the DSWM Landfill Capacity Analysis. The assumptions used for SDLF are:

1. The final grades for Cell 4 will be constructed in accordance with the closure grades provided by Brown and Caldwell, as shown in Figures 2B and 2D.
2. This analysis assumes that the final grades for Cell 5 will be constructed in accordance with the closure grades developed by Arcadis, as shown in Figures 2B and 2D.
3. The intermediate cover will have a thickness of 12 inches over the entire waste disposal area. This material will not be reused as a final cover.
4. The final cover will have a thickness of 24 inches placed over top the intermediate cover. The top 6 inches will consist of topsoil and the bottom 18 inches will consist of general soil.
5. The initial cover consumes 8% of the Gross Volume Remaining.

6. Additional volume gained to the Net Waste Volume Remaining due to consolidation, settlement, and degradation is 15%.
7. The calculated in-place waste density is 0.55 tons per cubic yard.

4.3 Results

The results of the analysis are summarized in Table 4-1 with the details provided in Tables 1 through 4 of Appendix A.

Table 4--1.
Summary of Landfill Capacity Analysis for SDLF

Total Tonnage of In-place Waste as of 6/30/23 (tons)	Total Tonnage Placed Between 7/1/22 - 6/30/23 (tons)	Total Tonnage Placed Between 7/1/23 - 6/30/24 (tons)	Net Waste Volume Remaining as of 8/13/2024 (cy)	Additional Volume Gained from Settlement During Life of Cell (cy)	Total Tonnage of In-place Waste as of 6/30/24 (tons)	Waste Capacity Available as of 7/1/24 (tons)	Total Tonnage of In-place Waste from 7/1/24 to 9/30/24 (tons)	Waste Capacity Available as of 10/1/24 (tons)
20,935,652	648,270	748,313	5,199,203	779,880	21,683,965	3,203,158	151,067	3,052,091

As shown in Table 4-1, the Waste Capacity Available as of July 1, 2024 was calculated to be 3,203,158 tons, which is 8.89% less than the waste capacity of 3,515,713 tons that was available as of July 1, 2023 for SDLF. In addition, SDLF received 748,313 tons of waste from July 1, 2023 through June 30, 2024, which is an increase of 15.43% from the previous reporting period. Assuming no additional disposal capacity is constructed and future waste placement rates and in-place densities are as expected, the SDLF is estimated to reach capacity in approximately 4 years (2028).

5 RESOURCES RECOVERY FACILITY ASHFILL

5.1 Landfill Description

The Resources Recovery Facility Ashfill (RRFAF) is located adjacent to the Miami-Dade County Resources Recovery Facility at 6990 NW 97th Ave. Miami, FL 33178. The facility is bounded by NW 97th Avenue to the east, NW 66th Street to the south, NW 107th Avenue to the west, and NW 74th Street to the north. Other notable landmarks near the facility are the Miami International Airport, the Florida Turnpike, and the Palmetto Expressway.

This landfill is permitted under the Power Plant Siting Act to receive ash from the Miami-Dade County Resources Recovery Facility. The Miami-Dade County Resources Recovery Facility site consists of 160 acres, of which the western 80 acres is used for the RRFAF. The 80-acres are divided into 20 cells as follows:

- Cells 1-19: 61.5 acres, Status = Closed,
- Cell 20: 16 acres, Status = Active – Opened July 11, 2013.

Table 3 of Appendix A shows the current and future capacities for each of the landfill cells, along with the status of the cells. The capacity of Cell 20 was calculated previously by Arcadis based on assumed side slope and top grades provided by DSWM staff. The existing topography, proposed final grades, and cross section of the RRFAF are provided in Figures 3A through 3C in Appendix B.

Aerial surveys of the Resources Recovery Facility Ashfill were conducted on June 24, 2024 by Stoner Surveyors and reflect the existing grades at the time of the survey. This topography was used to calculate the Gross Volume Remaining as of June 24, 2024.

5.2 Assumptions

Arcadis made a number of assumptions to complete the capacity analysis for the DSWM Landfill Capacity Analysis. The assumptions used for RRFAF are:

2. The final grades for Cell 20 will be constructed in accordance with the closure grades developed previously by Arcadis, as shown in Figures 3B and 3C in Appendix B.
3. The intermediate cover will have a thickness of 12 inches over the entire waste disposal area, but this material will be reused as a final cover. Therefore, it is not included in the capacity analysis.
4. The final cover will have a thickness of 24 inches. The top 6 inches will consist of topsoil and the bottom 18 inches will consist of general soil.
5. There is no initial cover placement.
6. Additional volume gained to the Net Waste Volume Remaining due to consolidation, settlement, and degradation is 2%.
7. The calculated in-place waste density is 1.35 tons per cubic yard.

5.3 Results

The results of the analysis are summarized in Table 5-1 with the details provided in Tables 1 through 4 of Appendix A.

Table 5--1.
Summary of Landfill Capacity Analysis for RRFAF

Total Tonnage of In-place Waste as of 6/30/23 (tons)	Total Tonnage Placed Between 7/1/22 - 6/30/23 (tons)	Total Tonnage Placed Between 7/1/23 - 6/30/24 (tons)	Net Waste Volume Remaining as of 8/13/2024 (cy)	Additional Volume Gained from Settlement During Life of Cell (cy)	Total Tonnage of In-place Waste as of 6/30/24 (tons)	Waste Capacity Available as of 7/1/24 (tons)	Total Tonnage of In-place Waste from 7/1/24 to 9/30/24 (tons)	Waste Capacity Available as of 10/1/24 (tons)
6,662,704	72,114	0	814,440	16,289	6,662,704	1,121,485	0	1,121,485

As shown in Table 5-1, the Waste Capacity Available as of July 1, 2024 was calculated to be 1,121,485 tons, which is 0.15% more than the waste capacity of 1,119,847 tons that was available as of July 1, 2023, the small increase is due to settlement within the landfill. RRFAF received 0 tons of waste from July 1, 2023 through June 30, 2024, which is a decrease of 100% from the previous reporting period. The large decrease in placed tonnage is a result of the catastrophic fire at the RRF that occurred on February 12, 2023, rendering the facility inoperable.

APPENDIX A

Landfill Capacity Analysis Data and Calculations Tables

Table 1. Summary of Actual Waste Tonnage Disposed at DSWM Landfills as of July 1, 2024

Table 2. Capacity Analysis Calculations as of July 1, 2024

Table 3. Summary of Current and Future Capacities as of July 1, 2024

Table 4. Permitted Landfill Capacity Available for DSWM as of October 1, 2024



Table 1 – Actual Waste Tonnage Disposed at DSWM Landfills as of July 1, 2024^(b)

Facility	Total Tonnage of In-place Waste as of 6/30/23 (tons) ^(a)	7/1/23 7/31/23 (tons)	8/1/23 8/31/23 (tons)	9/1/23 9/30/23 (tons)	10/1/23 10/31/23 (tons)	11/1/23 11/30/23 (tons)	12/1/23 12/31/23 (tons)	1/1/24 1/31/24 (tons)	2/1/24 2/28/24 (tons)	3/1/24 3/31/24 (tons)	4/1/24 4/30/24 (tons)	5/1/24 5/31/24 (tons)	6/1/24 6/30/24 (tons)	Total Tonnage Placed Between 7/1/23 - 6/30/24	Total Tonnage of In-place Waste as of 6/30/24 (tons) ^(c)
North Dade Landfill (East Cell)	13,523,080	9,858	6,947	8,077	9,834	11,067	7,407	12,354	7,635	8,855	7,890	5,893	8,681	104,498	13,627,578
South Dade Landfill (Cell 4 and 5)	20,935,652	66,954	68,957	65,902	64,881	66,691	60,588	64,231	57,320	57,271	58,618	59,590	57,310	748,313	21,683,965
Recovery Facility Ashfill (Cell 20)	6,662,704	0	0	0	0	0	0	0	0	0	0	0	0	0	6,662,704

Notes:

- (a) Source: Landfill Capacity Analysis for DSWM Active Landfills as of July 1, 2023 – prepared by ARCADIS-U.S., Inc., October 30, 2024.
- (b) All tonnage data provided by DSWM on July 22, 2024.
- (c) Total tonnage in place as of June 30, 2024 = (Total tonnage in-place as of June 30, 2023) + (Total tonnage placed between July 1, 2023 and June 30, 2024).

Table 2 – Capacity Analysis Calculations as of July 1, 2024

Facility	Gross Volume Remaining as of Survey Date (cy) ^(a)	Estimated Volume of 24" Final Cover (cy) ^(b)	Assumed Volume of Intermediate Cover (cy) ^(c)	Assumed Volume of Initial Cover (cy) ^(d)	Net Waste Volume Remaining as of Survey Date (cy) ^(a)	Additional Volume Gained from Settlement During Life of Cell (cy) ^(e)	Calculated In-place Waste Density (ton/cy) ^(f)	Waste Capacity Remaining as of Survey Date (tons) ^(a)	Waste Disposal from 6/30/24 to Survey date (tons) ^(a)	Waste Capacity Available as of 7/1/24 (tons)	Waste Capacity Available as of 7/1/23 (tons) ^(h)	Difference (+/-)
North Dade Landfill (East Cell)	2,137,784	278,784	139,392	106,889	1,612,719	161,272	0.50	886,995	6,441	880,554	921,501	-4.44%
South Dade Landfill (Cell 4 and 5)	6,237,895	359,773	179,887	499,032	5,199,203	779,880	0.55	3,288,496	85,338	3,203,158	3,515,713	-8.89%
Resources Recovery Facility Ashfill (Cell 20)	914,467	100,027	0	0	814,440	16,289	1.35	1,121,485	0	1,121,485	1,119,847	0.15%

Notes:

- (a) Gross Volume Remaining for the NDLF, SDLF and RRF based on the existing grades as of July 22 at NDLF, August 13 at SDLF, and June 24 at RRF, 2024, by Stoner Surveyors. Final design grades for NDLF and SDLF (Cell 4) provided by Brown & Caldwell. Final design grades for SDLF (Cell 5) and RRF conceptualized by Arcadis.
- (b) Assumes 24 inches of final cover over calculated area as: NDLF 86.4 ac, SDLF (Cell 4) 65.5 ac, SDLF (Cell 5) 46 ac, RRF 31.0 ac.
- (c) Assumes 12 inches of intermediate cover over calculated area as: NDLF 86.4 ac, SDLF (Cell 4) 65.5 ac, SDLF (Cell 5) 46 ac
- (d) Initial cover assumed as: NDLF -5%, SDLF -8%, RRF -0%.
- (e) Settlement assumed as: NDLF +10%, SDLF +15%, RRF +2%.
- (f) In-place Waste Density based on Arcadis' experience.
- (h) Source: Landfill Capacity Analysis for DSWM Active Landfills as of July 1, 2024 – prepared by Arcadis-US, Inc., October 30, 2024.

Table 3. Summary of Current and Future Capacities as of July 1, 2024					
Landfill Cells	Status	Permitted Capacity Available on 7/1/24 (tons)(a)	Permitted Design Capacity of Future Cell (tons)	In-Place Waste Tonnage as of 6/30/24 (tons)(b)	Built-out Capacity (tons)(c)
North Dade (West Cell)	Closed	0	-----	-----	-----
North Dade (East Cell)	Active	880,554	-----	-----	-----
Total North Dade Landfill	Class III	880,554	0	13,627,578	14,508,132
South Dade Landfill (Cells 1, 2 & 3)	Closed	0	-----	-----	-----
South Dade Landfill (Cell 4)	Active	90,482	-----	-----	-----
South Dade Landfill (Cell 5)	Open	3,112,676	-----	-----	-----
Total South Dade Landfill	Class I	3,203,158	0	21,683,965	24,887,123
Resources Recovery Facility Ashfill (Cells 1 - 18)	Closed	0	-----	-----	-----
Resources Recovery Facility Ashfill (Cell 19) ^(d)	Full	0	-----	-----	-----
Resources Recovery Facility Ashfill (Cell 20) ^(e)	Active	1,121,485	-----	-----	-----
Total Resources Recovery Facility Ashfill	Ash	1,121,485	0	6,662,704	7,784,189
Notes:					
(a) Reference Table 2 - Volume Calculations as of July 1, 2024.					
(b) Reference Table 1 – Summary of Actual Waste Tonnage Disposed at DSWM Landfills as of July 1, 2024.					
(c) Total capacity of the existing and future cells.					
(d) Cell 19 closed on July 10, 2013.					
(e) Cell 20 opened on July 11, 2013.					

Table 4. Permitted Landfill Capacity Available for DSWM as of October 1, 2024						
Facility	Tonnage of In-Place Waste			Total In-Place Waste from 7/1/24 to 9/30/24 (tons)	Permitted Capacity Available on 7/1/24 (tons)	Permitted Capacity Available on 10/1/24 (tons)^(b)
	July ^(a) 2024	August^(a) 2024	September^(a) 2024			
North Dade Landfill (East Cell)	9,076	9,777	12,060	30,913	880,554	849,641
South Dade Landfill (Cell 4 and 5)	60,609	58,968	31,490	151,067	3,203,158	3,052,091
Resources Recovery Facility Ashfill (Cell 20)	0	0	0	0	1,121,485	1,121,485
Notes:						
(a) Data provided by DSWM on October 8, 2024.						
(b) Capacity as of October 1, 2024 is reported for DSWM auditing purposes. Report is dated July 1, 2024 to fulfill FDEP requirements.						

APPENDIX B

Landfill Capacity Analysis Figures

North Dade Landfill

Figure 1A. North Dade Landfill Site Plan

Figure 1B. North Dade Landfill Grading Plan

Figure 1C. North Dade Landfill Cross Sections

South Dade Landfill

Figure 2A. South Dade Landfill Site Plan

Figure 2B. South Dade Landfill Grading Plan

Figure 2C. South Dade Landfill Cross Sections

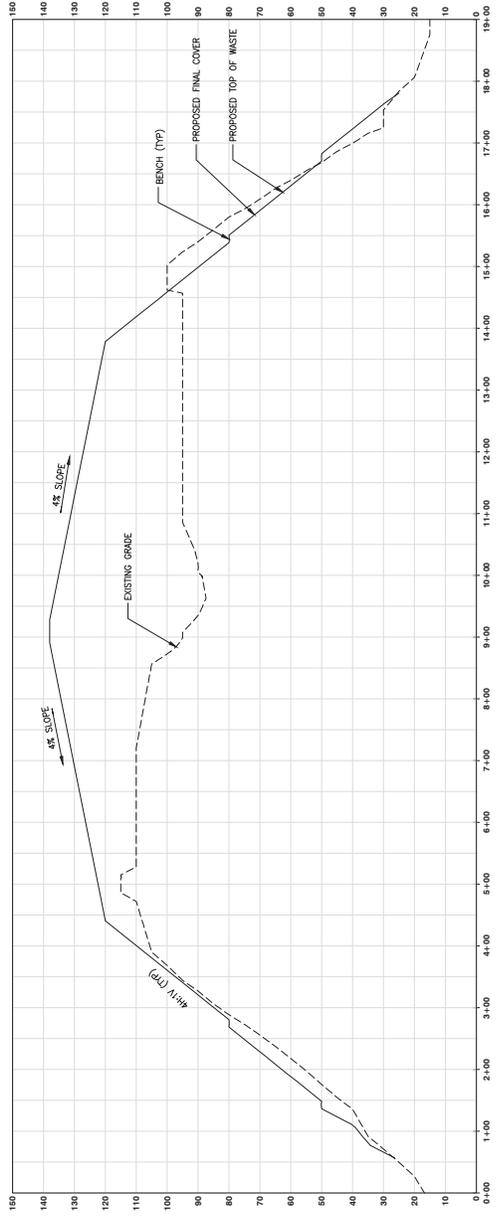
Resources Recovery Facility Ashfill

Figure 3A. Resources Recovery Facility Ashfill Site Plan

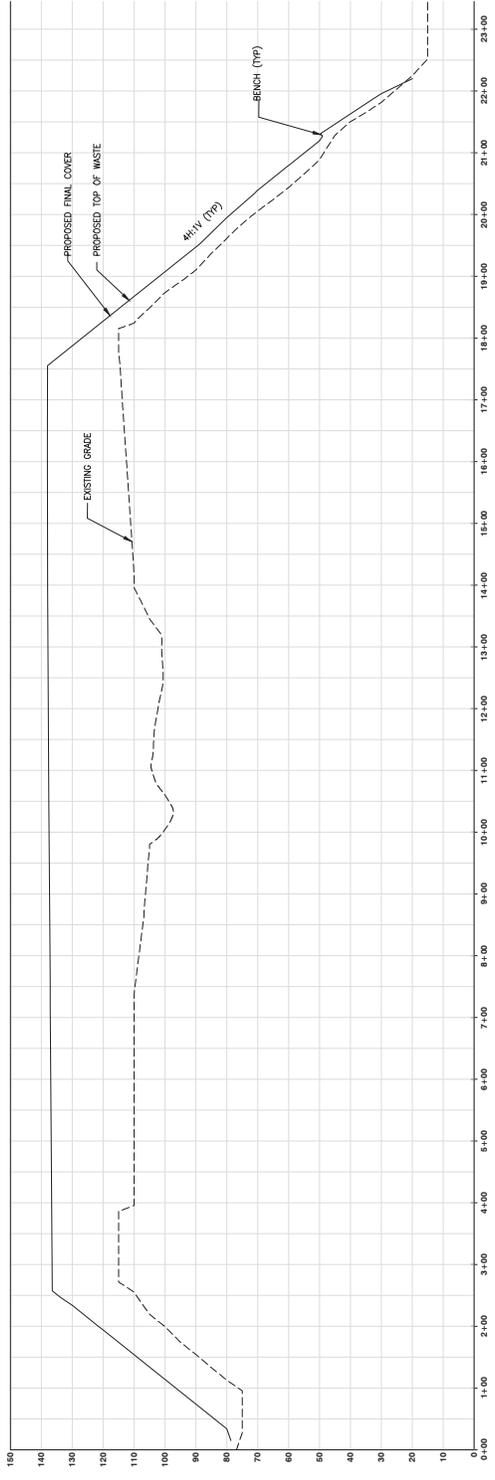
Figure 3B. Resources Recovery Facility Ashfill Grading Plan

Figure 3C. Resources Recovery Facility Ashfill Cross Sections

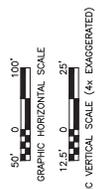
MDC029



SECTION A
FIG 1B



SECTION B
FIG 1B



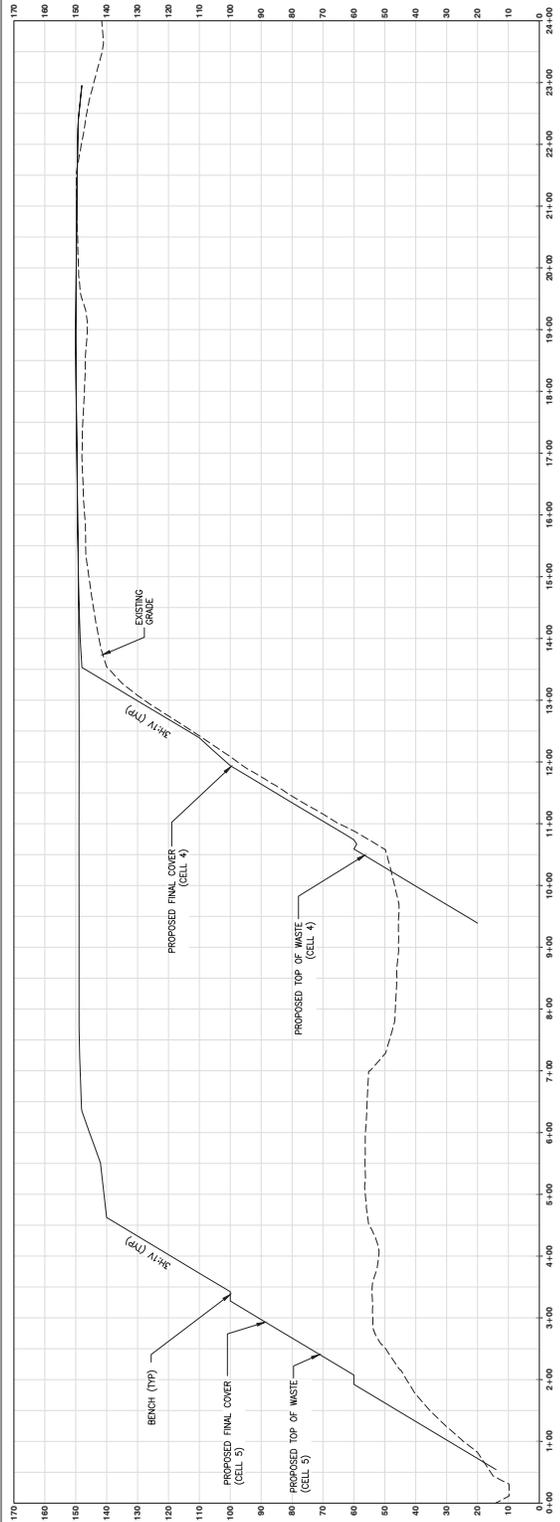
MIAMI-DADE COUNTY DEPARTMENT OF SOLID WASTE MANAGEMENT

DSWM ANNUAL CAPACITY REPORT
30229246

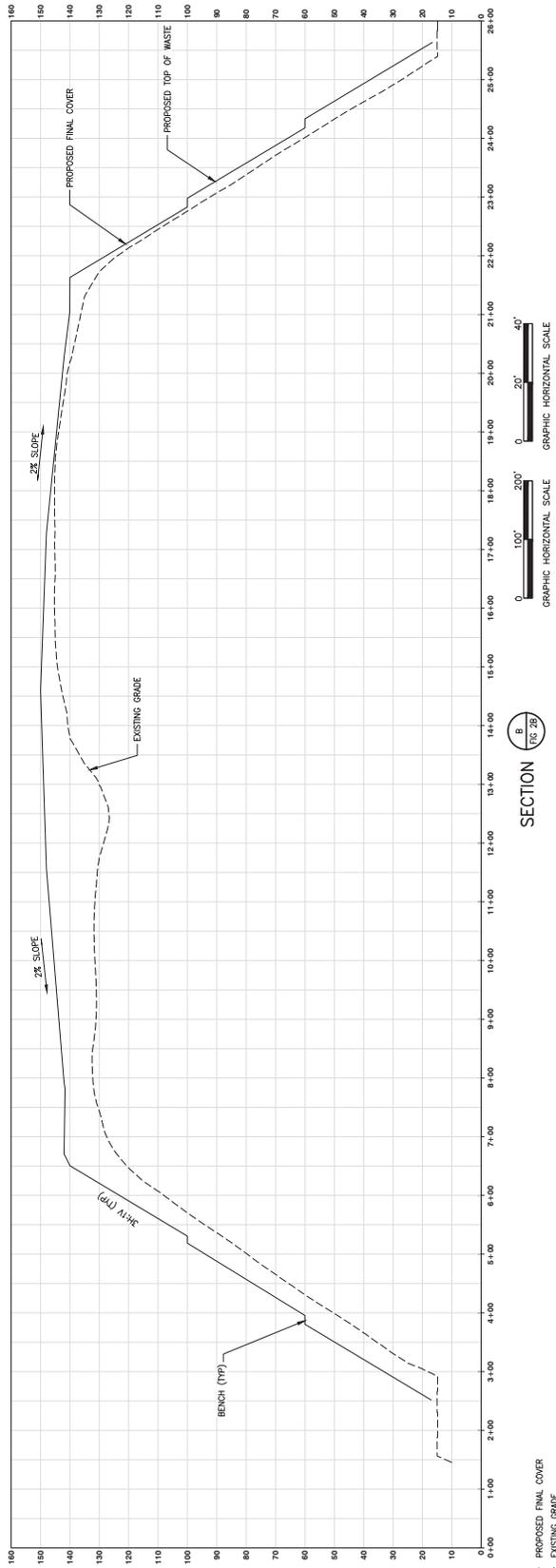
NORTH DADE LANDFILL SITE PLAN
FIGURE 1C

LEGEND
— PROPOSED FINAL COVER
- - - EXISTING GRADE





SECTION A
(REV 25)



SECTION B
(REV 26)

LEGEND
 ——— PROPOSED FINAL COVER
 - - - - - EXISTING GRADE

0 100' 200' GRAPHIC HORIZONTAL SCALE
 0 20' 40' GRAPHIC HORIZONTAL SCALE

MIAMI-DADE COUNTY DEPARTMENT OF SOLID WASTE MANAGEMENT

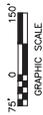
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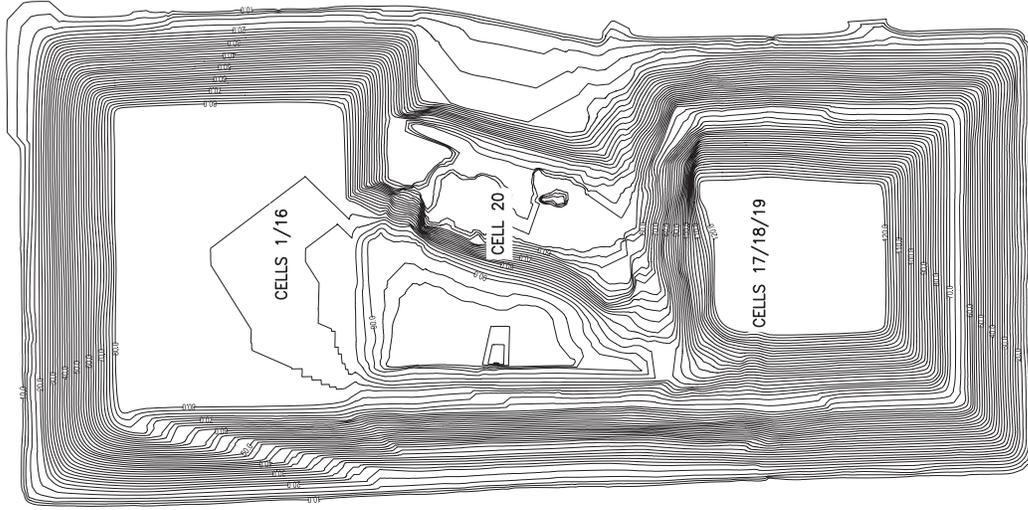
SOUTH DADE LANDFILL SITE PLAN
 FIGURE 2C



MDC032



NW 74th STREET



LEGEND
— 100' — EXISTING CONTOUR

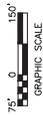
MDC033

MIAMI-DADE COUNTY DEPARTMENT OF SOLID WASTE MANAGEMENT

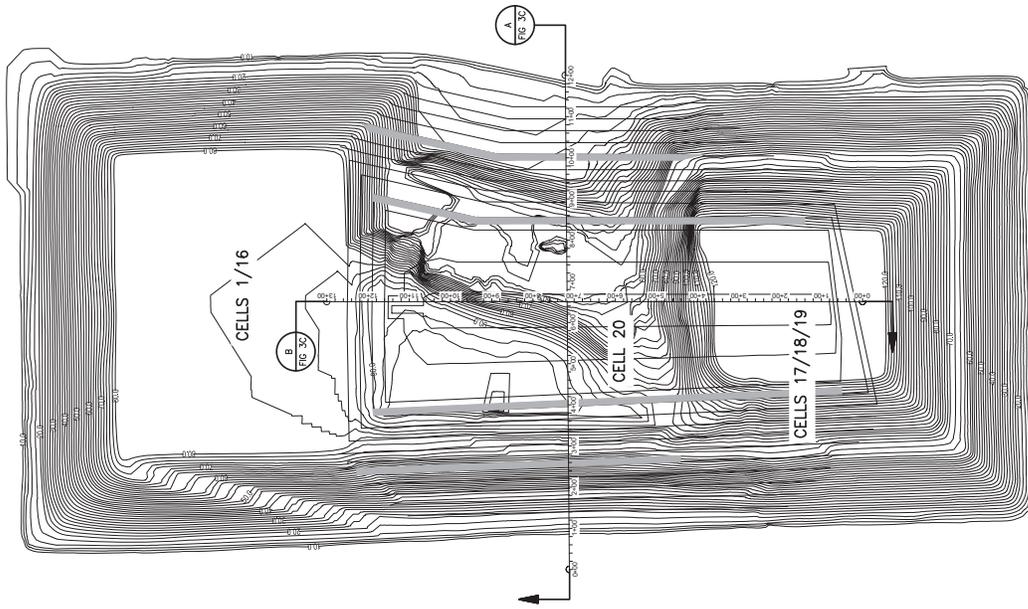
DSWM ANNUAL CAPACITY REPORT
30229246

RESOURCES RECOVERY FACILITY ASHFILL SITE PLAN
FIGURE 3A





NW 74th STREET



LEGEND
— EXISTING CONTOUR
— PROPOSED CONTOUR
— PROPOSED 1% INFL. BENCH



MIAMI-DADE COUNTY DEPARTMENT OF SOLID WASTE MANAGEMENT

DSWM ANNUAL CAPACITY REPORT

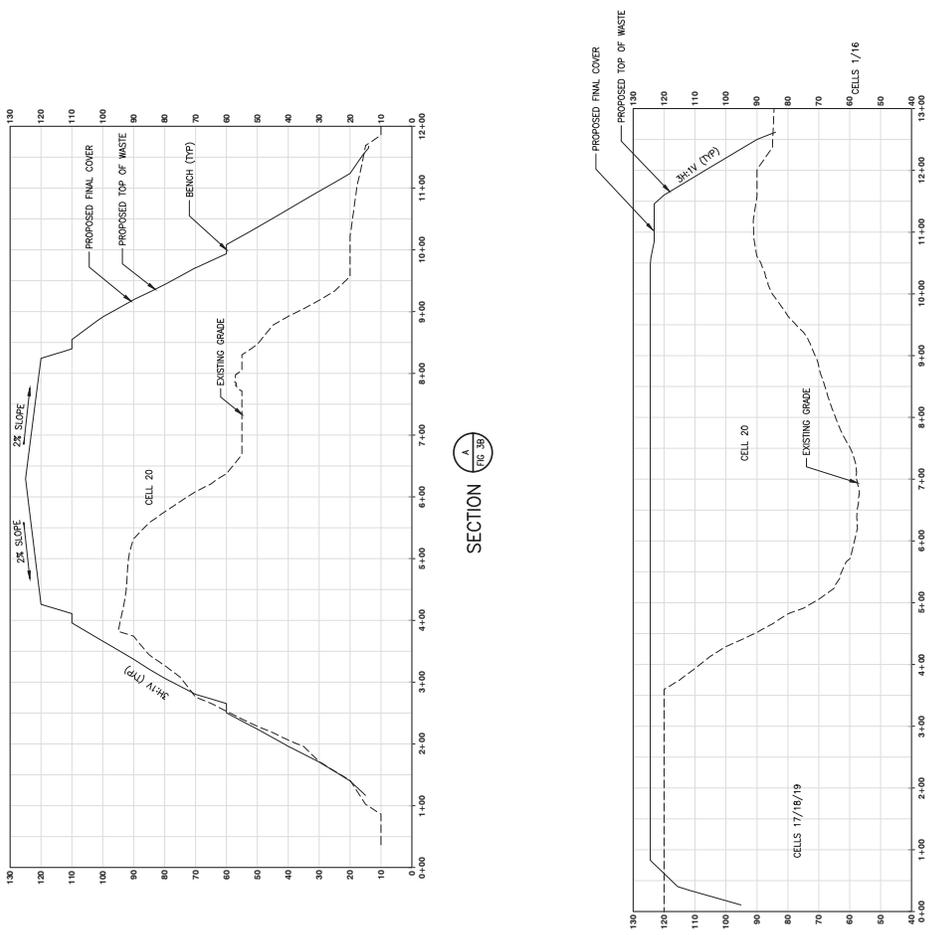
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RESOURCES RECOVERY FACILITY ASHFILL SITE PLAN
FIGURE 3B

MDC034

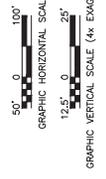


RESOURCES RECOVERY FACILITY ASH FILL SITE PLAN
 FIGURE 3C



LEGEND
 — PROPOSED FINAL COVER
 - - - - - EXISTING GRADE

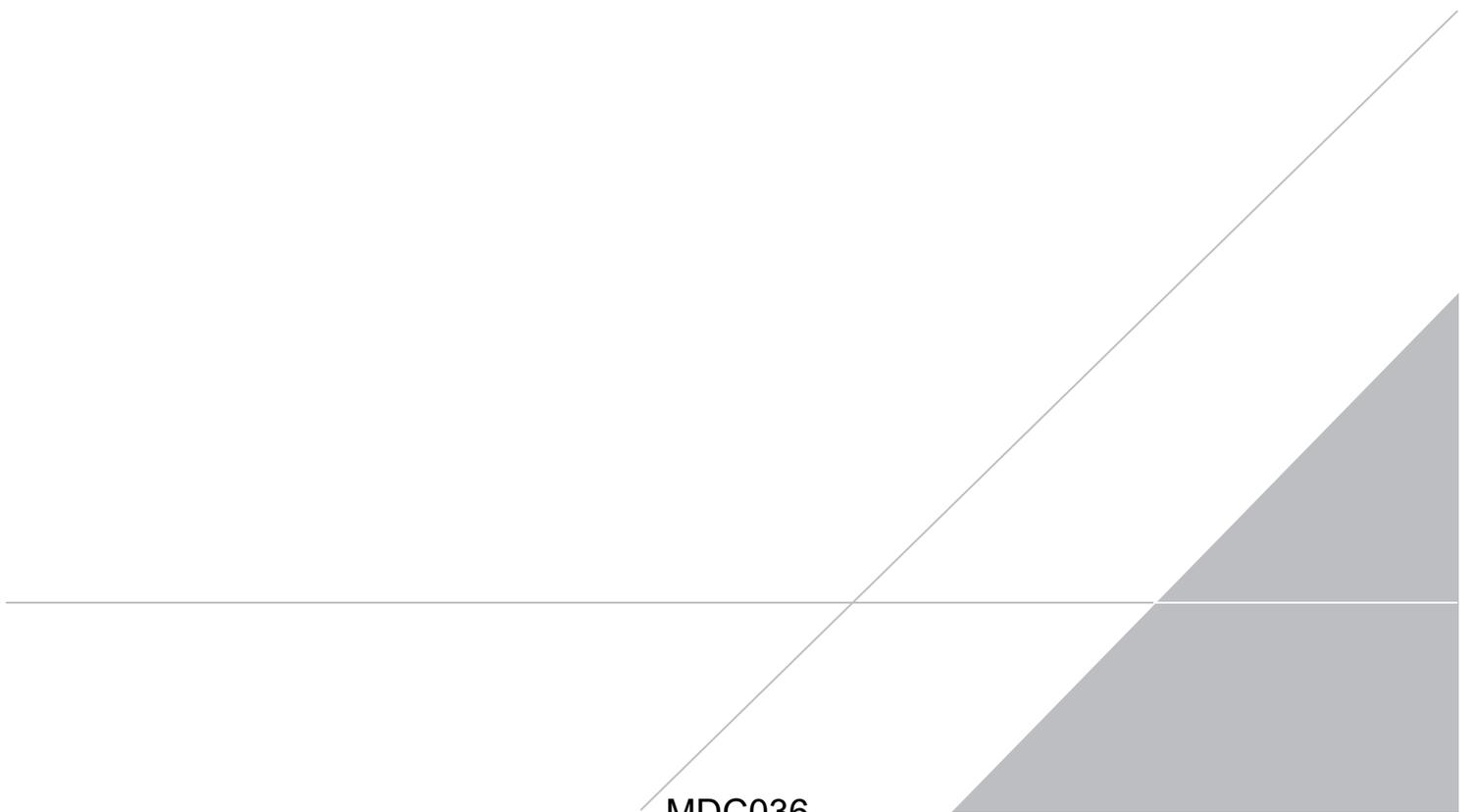
SECTION A
 (FIG. 3C)



MDC035

APPENDIX C

Correspondence



MDC036

- E-mail dated July 22, 2024 from Ravi Kadambala of DSWM with the October 2023 through June 2024 tonnage data for the three DSWM active landfills.

From: Kadambala, Ravi (DSWM) <Ravi.Kadambala@miamidade.gov>
Sent: Monday, July 22, 2024 10:47 AM
To: Tilman, Christopher <Christopher.Tilman@arcadis.com>; Anaxe, Geraldine (DSWM) <Geraldine.Anaxe@miamidade.gov>; Porcelli, Mario (DSWM) <Mario.Porcelli@miamidade.gov>
Subject: FW: LF Capacity Report

Arcadis Warning: Exercise caution with email messages from external sources such as this message. Always verify the sender and avoid clicking on links or scanning QR codes unless certain of their authenticity.

Good morning,
 Thanks Geraldine for the tonnage data. I agree that the tonnage data should exclude cover material.

Chris, attached is the tonnage data requested for the capacity report.

Mario, attached is the tonnage data for the compliance report.

Thanks,

Ravi Kadambala, Ph.D., P.E., BCEE
 Miami-Dade County Department of Solid Waste Management

(QUANTITY IN TONS)	ACTUAL OCT	ACTUAL NOV	ACTUAL DEC	ACTUAL JAN	ACTUAL FEB	ACTUAL MAR	ACTUAL APR	ACTUAL MAY	ACTUAL JUN	ACTUAL JUL	ACTUAL AUG	ACTUAL SEP	TOTAL
NET TONNAGE LANDFILLED AND BURNED													
S. DADE	64,880.64	66,690.89	60,587.97	64,231.15	57,320.19	57,270.64	58,618.36	59,589.64	57,309.56				546,499.04
N. DADE	9,833.99	11,066.50	7,407.26	12,353.84	7,635.25	8,855.17	7,889.70	5,892.95	8,680.74				79,615.40
R. RECOVERY ASHFILL	-	-	-	-	-	-	-	-	-				-

- E-mail dated October 8, 2024 from Ravi Kadambala of DSWM with the July 2024 through September 2024 tonnage data for the three DSWM active landfills.

From: Kadambala, Ravi (DSWM) <Ravi.Kadambala@miamidade.gov>
Sent: Tuesday, October 8, 2024 1:31:44 PM
To: Long, Allen <Allen.Long@arcadis.com>
Cc: Wong, John (DSWM) <John.Wong@miamidade.gov>
Subject: FW: Sept Tonnage report

Arcadis Warning: Exercise caution with email messages from external sources such as this message. Always verify the sender and avoid clicking on links or scanning QR codes unless certain of their authenticity.

Hi Allen,
 Tonnage data for NDLF and SDLF for September is attached.

Thanks,

Ravi Kadambala, Ph.D., P.E., BCEE
 Miami-Dade County Department of Solid Waste Management

(QUANTITY IN TONS)	ACTUAL OCT	ACTUAL NOV	ACTUAL DEC	ACTUAL JAN	ACTUAL FEB	ACTUAL MAR	ACTUAL APR	ACTUAL MAY	ACTUAL JUN	ACTUAL JUL	ACTUAL AUG	ACTUAL SEP	TOTAL
NET TONNAGE LANDFILLED AND BURNED													
S. DADE	65,157.55	67,225.77	60,720.78	64,325.36	57,313.99	57,271.14	58,618.36	59,589.64	57,309.56	60,609.31	58,967.73	31,489.71	698,598.90
N. DADE	9,833.99	11,066.50	7,407.26	12,353.84	7,635.25	8,855.17	7,889.70	5,892.95	8,680.74	9,076.09	9,776.59	12,060.18	110,528.26
R. RECOVERY ASHFILL	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX D

References

1. "Landfill Capacity Analysis for DSWM Active Landfills as of July 1, 2007." October 30, 2007 prepared by Brown and Caldwell, Inc.
2. "Landfill Capacity Analysis for DSWM Active Landfills as of July 1, 2023." October 30, 2023 prepared by Arcadis U.S., Inc.

Arcadis U.S., Inc.

701 Waterford Way

Suite 420

Miami

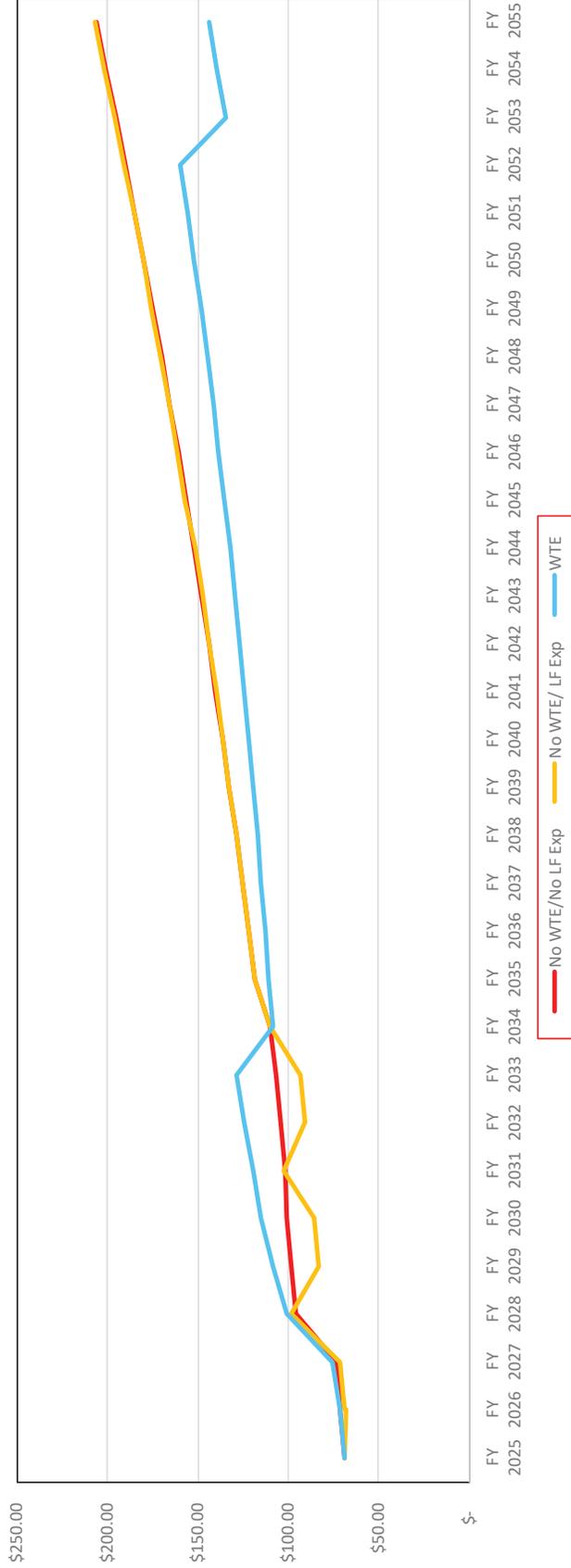
Florida 33126

Tel 305.262.6250

www.arcadis.com

WTE Versus Landfilling (20 Years Out)

Cost Per Ton-Doral RRF Site vs. No WTE vs. No WTE with LF Expansion



WTE Site Comparison Cost-Operating & Capital

	Doral RRF Site	58th St. Option (Move DSWM, ISD & MC to RRF, Soccer Complex to 58th St LF, DTPW Stays)	Airport West	Medley Site	Okeechobee	Eitlejorge
Capital Costs-Non Recurring Costs						
WTE Capital Cost	\$1,488,886,000	\$1,488,886,000	\$1,582,443,592	\$1,498,497,272	\$1,593,591,461	\$1,575,256,849
Revised Estimated Development Schedule	7 years, 9 months	10 years, 3 months	9 years, 3 months	10 years, 6 months	10 years, 4 months	9 years, 3 months
Total Non-Recurring	\$1,488,886,000	\$1,811,123,997	\$1,757,662,592	\$1,917,098,272	\$1,903,488,061	\$1,776,499,849
Variance btw Doral and Proposed Site		\$322,237,997	\$268,776,592	\$428,212,272	\$414,602,061	\$287,613,849
Annual Operating Costs- Recurring Costs (2033 costs)						
Total Annual O&M Costs	\$59,299,000	\$61,592,000	\$80,804,000	\$75,301,000	\$76,988,000	\$86,782,000
Variance btw Doral and Proposed Site		\$2,293,000	\$21,505,000	\$16,002,000	\$17,689,000	\$27,483,000
Total O&M Costs (20-yr)	\$1,593,386,334	\$1,655,000,102	\$2,171,233,737	\$2,023,366,066	\$2,068,696,388	\$2,331,864,836
Operating Cost Per Ton- Proposed WTE Sites	\$44.47	\$46.19	\$60.60	\$56.48	\$57.74	\$65.09

\$	1	4	2	6	5	3
⌚	1	4	2	6	5	3

(Number is ranked from lowest to highest non-recurring construction costs)

(Number represents from shortest to longest schedule)