



The City Of
PEMBROKE PINES

Florida

**Commission Workshop:
Recycling, Energy, and
Sustainable Organics Lifecycle
Value Enhancement
("RESOLVE") Project**

April 29, 2026



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Agenda

- 1) City Waste Disposal: History & Status
- 2) New Waste Management Recycling Facility in Pembroke Pines
- 3) Broward County Solid Waste Authority's Regional Efforts
- 4) The City's "RESOLVE" Project
 - A. What exactly is being proposed?
 - B. What will it take to implement this?
- 5) Conclusion - Recommended Actions

CITY WASTE DISPOSAL: HISTORY & STATUS

SECTION 1

History

Reuter Recycling of Florida, Inc.

- ▶ ~40 years ago, Broward County created the RRB
- ▶ Focused on incineration, RRB built two WTE
- ▶ Pembroke Pines opposed, pursued recycling alternatives
- ▶ Partnered with 3 cities & Reuter to build a recycling facility
 - ▶ Dania Beach, Hallandale Beach, and Pompano Beach
- ▶ Composting caused odors & facility was sold to WM

Reuter Recycling of Florida, Inc. Contract & Outcome

- ▶ By 2022, the costs at Reuter was **\$86.92/ton**.
- ▶ City was unable to negotiate a new agreement with WM
- ▶ Challenges included:
 - ▶ Rising contamination in recycling streams,
 - ▶ Increasing processing costs, and
 - ▶ Lack of market demand
- ▶ Led to suspending the Recycling program

Current Disposal Agreement Waste Connections of Florida, Inc.

- ▶ Agreement with Waste Connections through 2026
- ▶ One-year renewal options, mutual agreement
- ▶ Residential waste goes to Deerfield Beach Transfer Station
- ▶ Disposal cost **\$60.60 per ton**
- ▶ Transferred to JED Landfill, St. Cloud
- ▶ Methane is captured and converted into renewable energy to power up to 8,000 homes.

NEW WASTE MANAGEMENT RECYCLING FACILITY IN PEMBROKE PINES

SECTION 2

New Recycling Facility in Pembroke Pines Waste Management, Inc. - Overview

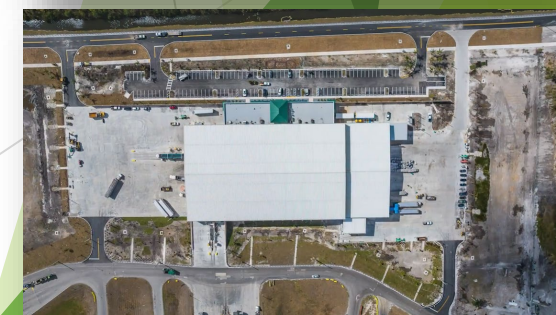


- ▶ \$90M, 127,000 sq. ft. expansion
- ▶ Located beside former Reuter facility
- ▶ Replaces previous recycling operation
- ▶ Serves Broward, Dade, Monroe & Collier counties
- ▶ Processes paper, plastics, metals, glass



New Recycling Facility in Pembroke Pines Waste Management, Inc. - Capabilities

- ▶ Capacity increased to 275,000 tons/year
- ▶ Processes about 60 tons per hour
- ▶ Recovery rate ~95% achieved
- ▶ Optical sorters: 600 picks/minute
- ▶ AI improves accuracy, reduces contamination
- ▶ Residuals: <20% landfilled



New Recycling Facility in Pembroke Pines

Limitations of Source Separated Recycling

- ▶ WM processes SS recyclables only
- ▶ Does not process mixed waste
- ▶ Performance depends on contamination
- ▶ Improvement over prior (~80-85% recovery rate), however:
 - ▶ Based on CY2021 with 8,841 TPY of SS Recyclables:
 - ▶ ~95% recovery rate = ~8,400 tons
 - ▶ This is only ~6.7% of the total waste stream, not including Wastewater Biosolids.

Description	CY2021
Garbage / Municipal Solid Waste	50,182
Single Stream Source Separated Recyclables	8,841
Bulk (Includes Yard Waste)	18,690
Commercial(*)	25,732
Construction and Demolition (C&D) / Roll Off(*)	23,397
Sub-Total	126,842
Wastewater Biosolids (Wet Tons - WT)	3,833
Dry Tons - Approximately 15% dry solids	(575)
Total Including Wastewater Biosolids (WT)	130,675

(*) The “Commercial” or “Roll-Off” category includes waste from apartment complexes and any condominium units serviced by Waste Pro; however, condominium units operating in the open market and serviced by other haulers are not included, as that data is not available to the City.

Microhabitat Planting Event

- ▶ Partnership with WM
- ▶ November 2025 hands-on Microhabitat planting event
- ▶ 40 Charter High School AP Environmental Students and
- ▶ EAB supported sustainability efforts
- ▶ Real-world ecological restoration experience
- ▶ Strengthened environmental awareness and stewardship



Waste Management, Inc.

Contract Structure - AMV Model

- ▶ Uses Average Market Value model
- ▶ Recycling value fluctuates monthly
- ▶ Based on markets and composition audits
- ▶ Blended value reflects material mix
- ▶ Processing fee **\$178.43 per ton**
- ▶ Annual CPI increases, capped 5%

Waste Management, Inc.

Contract Structure - How Costs Work

- ▶ WM recovers processing fee first
- ▶ Low Blended value could increase City costs over \$178.43
- ▶ High Blended value results in shared revenue up to 75%
- ▶ Glass has negative market value
 - ▶ Therefore, it increases the cost to the City
- ▶ Pricing not fixed or guaranteed

Waste Management, Inc.

Contract Structure - Key Risks

- ▶ Commodity prices are volatile
- ▶ Contamination increases disposal costs
 - ▶ Over 10% triggers T&D charges
- ▶ T&D costs variable, uncapped
- ▶ Materials may be rejected by WM
- ▶ No guarantee materials recycled

Disposal Cost Comparison & Collection Contract Structure

- ▶ Commingled system offers lowest cost today
- ▶ Recycling costs are higher and more volatile
- ▶ Residential rates include collection and disposal
- ▶ Market conditions increase pricing uncertainty
- ▶ Separate recycling requires negotiation with:
 - ▶ Waste Collection Contractors
 - ▶ Recycling Facilities

Provider	Method	Cost (\$/ton)	Rate ending
Reuter Recycling	Separated	\$86.92	1/1/22
Waste Connections	Mixed	\$60.60	9/30/26
Waste Management	Recycling Only	\$178.43*	9/30/26

**Rate fluctuates based on commodity values and contamination levels*

BROWARD COUNTY SOLID WASTE AUTHORITY'S REGIONAL EFFORTS

SECTION 3

Broward County Solid Waste Authority SWA Formation

- ▶ SWA formed by County and cities in 2022-2023
- ▶ 28 of 31 cities joined
- ▶ Represented about 83% population
- ▶ Three cities chose not to join:
 - ▶ Pembroke Pines, Hallandale Beach, Pompano Beach

Broward County Solid Waste Authority

Why Pembroke Pines Declined

- ▶ Uncertain costs and undefined system plan
- ▶ Governance structure raised concerns
- ▶ Potential use of **incineration** opposed
- ▶ Required upfront financial contributions
- ▶ Cities fund startup and planning costs
- ▶ Annual cost estimated up to \$232K

Broward County Solid Waste Authority City Policy Position

- ▶ City formally opposed incineration use
- ▶ Due to environmental and health concerns
- ▶ Concerns over facility siting
- ▶ Resolution adopted May 2024 urging SWA to:
 - ▶ prohibit expanding incineration and
 - ▶ prioritize non-combustion technologies
- ▶ Partnered with Miramar, providing financial support against Miami-Dade incinerator proposal

Broward County Solid Waste Authority Current Status & Decision Point

- ▶ SWA approved Master Plan & Facilities Amendment
- ▶ Cities must decide by August 14, 2026
- ▶ Requires ILA municipal members representing 80% population approval
- ▶ Failure to approve terminates SWA
- ▶ Approval commits to 40-year agreement through 2063
- ▶ Cities may rejoin under future terms
- ▶ Limits future flexibility and options

Broward County Solid Waste Authority Proposed Approach

- ▶ SWA evaluated **five** system scenarios
- ▶ **Scenario A** selected as preferred approach
- ▶ Targets 62% waste diversion rate
- ▶ 2.7 million tons projected to landfill by 2045
- ▶ Focus on recycling and waste reduction
- ▶ Relies on expanded programs and participation

Broward County Solid Waste Authority Proposed Programs

- ▶ Reduce trash collection to **once weekly**
- ▶ Restore countywide **curbside recycling**
- ▶ Add **curbside yard waste** collection
- ▶ Introduce **food waste drop-off events**
- ▶ Expand **hazardous, electronics drop-off sites**
- ▶ Increase **reuse and diversion programs**

Broward County Solid Waste Authority SWA Requirements

- ▶ **Must adopt ILA uniform rules**
- ▶ **Required to follow SWA flow control**
- ▶ **Waste directed to SWA-designated facilities**
- ▶ **Disposal pricing set by SWA**
- ▶ **Franchise agreements must meet SWA terms**
- ▶ **Commercial collection becomes non-exclusive**

Broward County Solid Waste Authority Potential Impacts to our City

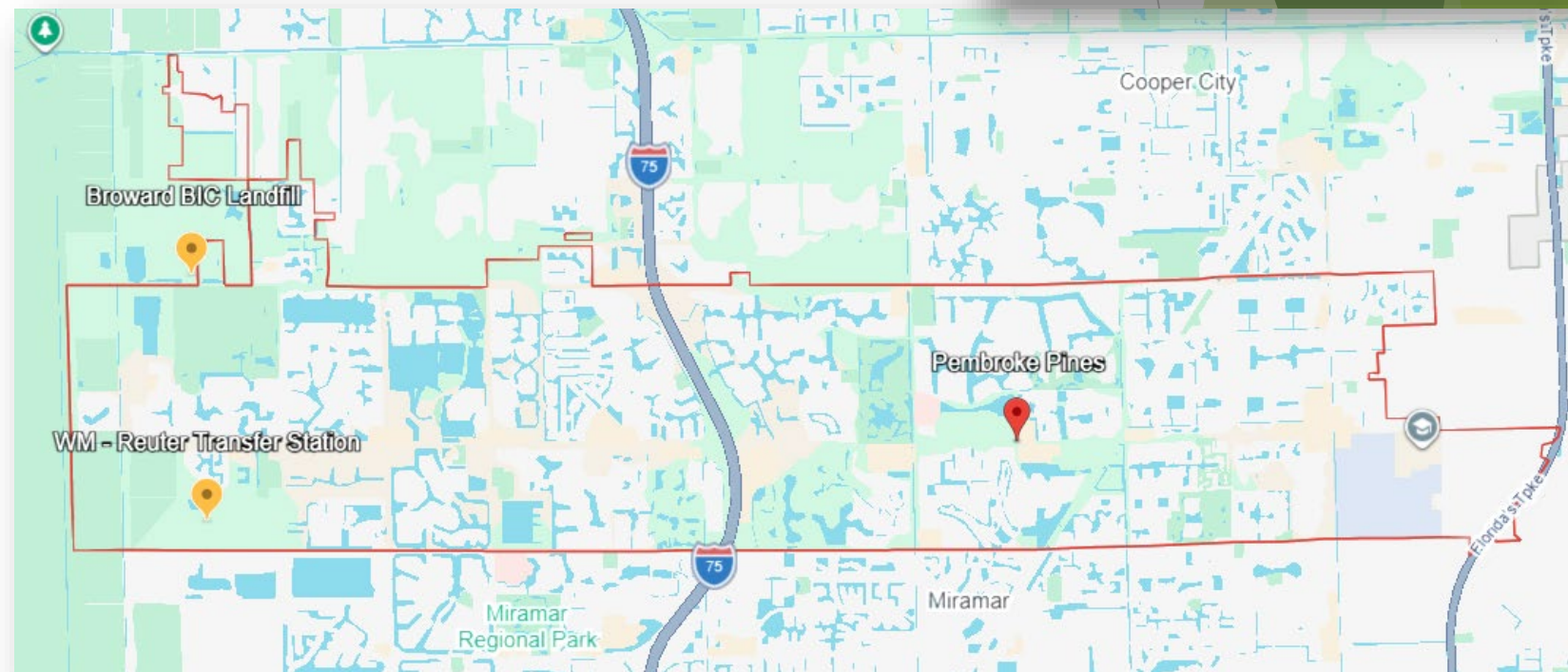
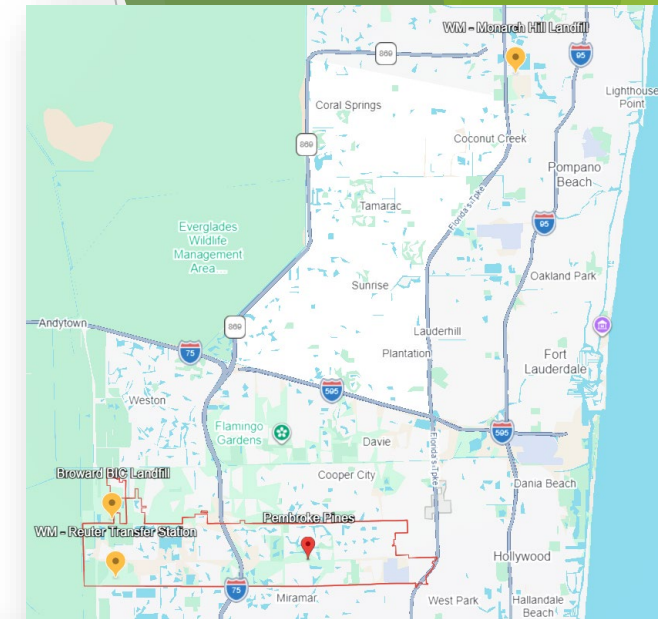
- ▶ May impact residential rate stability
- ▶ Loss of exclusive commercial collection rights
- ▶ Could affect franchise hauler economics
- ▶ Uncertainty for condominium classifications
- ▶ Condo service rules may change
- ▶ Disposal requirements may vary by type

Broward County Solid Waste Authority Proposed Infrastructure

Facility	Qty	TPY / Each	Notes
Landfill	1	3,000,000	640 Acres - No Site Identified
Transfer Station	3	890,000	North, Central & Broward County
Single-Stream MRF	2	250,000	
Mulch/Colorizing Op.	2	175,000	
Biochar Pyrolysis Op.	1	30,000	
Perm. Drop Off Ctr.	8	2,400	
C&D Recovery Facility	2	450,000	

Broward County Solid Waste Authority Landfill/Burn Disposal Strategy Unclear

- ▶ SWA indicates no new landfills or WTE planned in County
- ▶ However, all scenarios still require 640 Acre landfill capacity
- ▶ Long-term disposal strategy unclear
- ▶ Class I Waste capacity not defined
- ▶ Potential reliance on expansion of existing landfills or WTE.
 - ▶ Future availability for Class I waste **uncertain after 2026**, due to WM settlement agreement



Broward County Solid Waste Authority Funding Considerations & Purpose

▶ Funding Consideration:

- ▶ Establish flow control within ILA
- ▶ Build a capital reserve for expansion programs

▶ Funding Purpose:

- ▶ Expand education and outreach to help reduce waste less
- ▶ Set up 8 drop-off locations for recycling
- ▶ SWA Admin Services

Broward County Solid Waste Authority Funding Flow

Phase 1: FY 2027

Member Contribution

City pays contribution (based on your city's population)
Comparable to FY 2026

Phase 2: FY 2028 to 2030

Tipping Fee Surcharge

In FY 2028, the \$2.22 per ton surcharge is added to the collection rate paid by the hauler (i.e. pass through cost)

Recycling, yard waste, solid waste is collected

Truck gets to scale (i.e. 10 tons at \$2.22 per ton = \$22.20)

Receiving facility collects tipping fee plus \$22.20 surcharge from the hauler (i.e. pass through cost)

Receiving facility passes \$22.20 to the SWA

Phase 3: FY 2031

Non-Ad Valorem Assessment

Recycling, yard waste, solid waste is collected

SWA assessment on tax bill - estimated at \$2.72 per ton

Assessment goes straight to SWA

Broward County Solid Waste Authority

Tonnage Estimates

- ▶ SWA estimates 429,612 total tons for Pines in 2023
- ▶ City reports 128,444 collected tons in 2023
- ▶ Difference exceeds 300,000 tons total
- ▶ Includes private commercial and C&D waste
- ▶ Outside City control and visibility
- ▶ Assessments should reflect actual collected waste only

2023	Total	SSR	RMSW	CMSW	C&D	BW
SWA Estimate for Pines	429,612	21,889	76,992	153,394	177,338 (C&D/BW reported together on model)	
Pines Data	128,445	Commingled with RMSW	53,926	30,190	26,592	17,737
Delta	301,167	44,955		123,204	133,009	

Calculations

Based on Broward Mass Balance 2509 Model for the year 2023

ILA Cities	Data Year	Tons				
	2023	Est Total Tons	SSR	RMSW	CMSW	C&D/BW
Broward Municipal Services						
District		38,579	2,386	10,033	12,291	13,868
Coconut Creek		148,656	6,382	17,808	57,279	67,187
Cooper City		87,503	5,363	22,388	28,054	31,698
Coral Springs		333,224	17,024	60,062	118,815	137,323
Dania Beach		80,704	3,990	13,560	29,245	33,909
Davie		264,215	13,561	48,086	93,989	108,579
Deerfield Beach		229,256	9,773	26,949	88,580	103,955
Fort Lauderdale		464,195	21,610	68,059	172,938	201,589
Hillsboro Beach		5,404	166	160	2,314	2,764
Hollywood		377,566	18,097	59,211	138,831	161,427
Lauderdale Lakes		87,577	3,386	7,717	35,064	41,410
Lauderdale-by-the-Sea		16,200	597	1,207	6,591	7,806
Lauderhill		190,789	8,419	24,544	72,710	85,116
Lazy Lake		62	4	17	20	22
Lighthouse Point		26,319	1,377	4,984	9,270	10,688
Margate		145,700	7,036	23,242	53,387	62,034
Miramar		336,370	19,164	75,296	112,961	128,949
North Lauderdale		107,353	5,568	19,971	37,982	43,831
Oakland Park		112,953	5,579	18,936	40,951	47,486
Parkland		92,660	5,684	23,747	29,688	33,540
Pembroke Park		16,959	704	1,855	6,619	7,781
Plantation		243,338	12,250	42,509	87,408	101,172
Sea Ranch Lakes		966	59	246	310	351
Southwest Ranches		20,358	1,293	5,545	6,367	7,153
Sunrise		255,351	12,005	38,311	94,717	110,318
Tamarac		181,330	8,569	27,529	67,106	78,125
West Park		36,164	2,223	9,299	11,572	13,070
Weston		169,240	9,468	36,592	57,449	65,731
Wilton Manors		28,731	1,584	4,648	10,418	12,080
Hallandale Beach (Non-ILA)		107,178	3,680	6,011	44,544	52,942
Pompano Beach (Non-ILA)		298,281	12,602	34,219	115,650	135,809
Pembroke Pines (Non-ILA)		429,612	21,889	76,992	153,394	177,338
Tribal Lands (Non-ILA)		3,850	245	1,049	1,204	1,353
TOTALS		4,936,642	241,738	810,783	1,797,717	2,086,405

Source: SWA Presentation to the Executive Committee C&D and Commercial Recycling Meeting on 3/17/2026

Broward County Solid Waste Authority

Maximum Service Charges for Processing

- ▶ Rate increases require:
 - ▶ SWA Board and Executive Committee approval
 - ▶ 2/3 population approval by municipalities
- ▶ Cost increases may still be unavoidable
- ▶ Facility locations and design could increase collection costs
- ▶ **80% approval needed for new facilities for SWA to have disposal facilities**
- ▶ Residents ultimately bear increased costs

Maximum Service Charges for Materials Processing

Material Type	Est. Tipping Fee/Ton
Recyclable Materials	\$110.00
Yard Trash (for disposal)	\$52.56
Yard Trash (for beneficial use)	\$80.00
SWD (Class I Waste)	\$57.49
SWD (Class III Waste)	\$52.56

Maximum service charges as of October 1, 2025. These charges will escalate on an annual basis in accordance with the established annual revenue adjustment, at a maximum, that aligns with the Producer Price Index for Solid Waste Collection (PPI-SW), Series ID: PCU562111562111, which reflects industry-specific cost escalation for solid waste collection, reported on a non-seasonally adjusted basis.

- ▶ Source: SWA Presentation to BCCMA on 4/16/2026

Broward County Solid Waste Authority Facilities Amendment: Wind Down (ILA End)

Option A: County or Successor Entity Takeover	Option B: Transfer Solid Waste Services Back to Each Member
County or successor takes over system	County/municipality each responsible for its own system
<p>Requirements:</p> <ul style="list-style-type: none"> ✓ County approval ✓ Approval <ul style="list-style-type: none"> ✓ 51% population municipal parties ✓ 55% total tonnage of all waste in county 	<p>Asset Transfers:</p> <ul style="list-style-type: none"> • Regional assets offered to: <ul style="list-style-type: none"> → County → Host City → Other Parties • Non-regional assets offered to: <ul style="list-style-type: none"> → Host City → County → Other Parties • Any assets not accepted will be sold and proceeds distributed by population • Transferred assets must be used for solid waste (five years) • At end of five years (or if not used for solid waste): must either pay fair market value or sell <ul style="list-style-type: none"> • Proceeds distributed by population
<p>Outcome:</p> <ul style="list-style-type: none"> • All assets and liabilities transfer • Non-participants receive no asset value 	<p>Outcome:</p> <ul style="list-style-type: none"> • All assets are owned by parties or sold to third parties • Value of all assets eventually distributed by population

Broward County Solid Waste Authority

Key Risks

- ▶ **Flow Control:** Loss of local control over waste decisions
- ▶ Long-term commitment through **40-year** agreement
- ▶ Uncertain future disposal strategy and capacity
- ▶ Costs may increase despite approval structure
- ▶ Reliance on regional system and participation
- ▶ Potential future reliance on incineration
- ▶ Limited flexibility to pursue alternative solutions

THE CITY'S
Recycling, Energy, and
Sustainable Organics Lifecycle
Value Enhancement
("RESOLVE") Project

SECTION 4

The City's RESOLVE Project

Two Goals

They are: to explain...

1. What exactly is being proposed?
2. What will it take to implement this?

What exactly is being proposed?

SECTION 4A

The City's RESOLVE Project

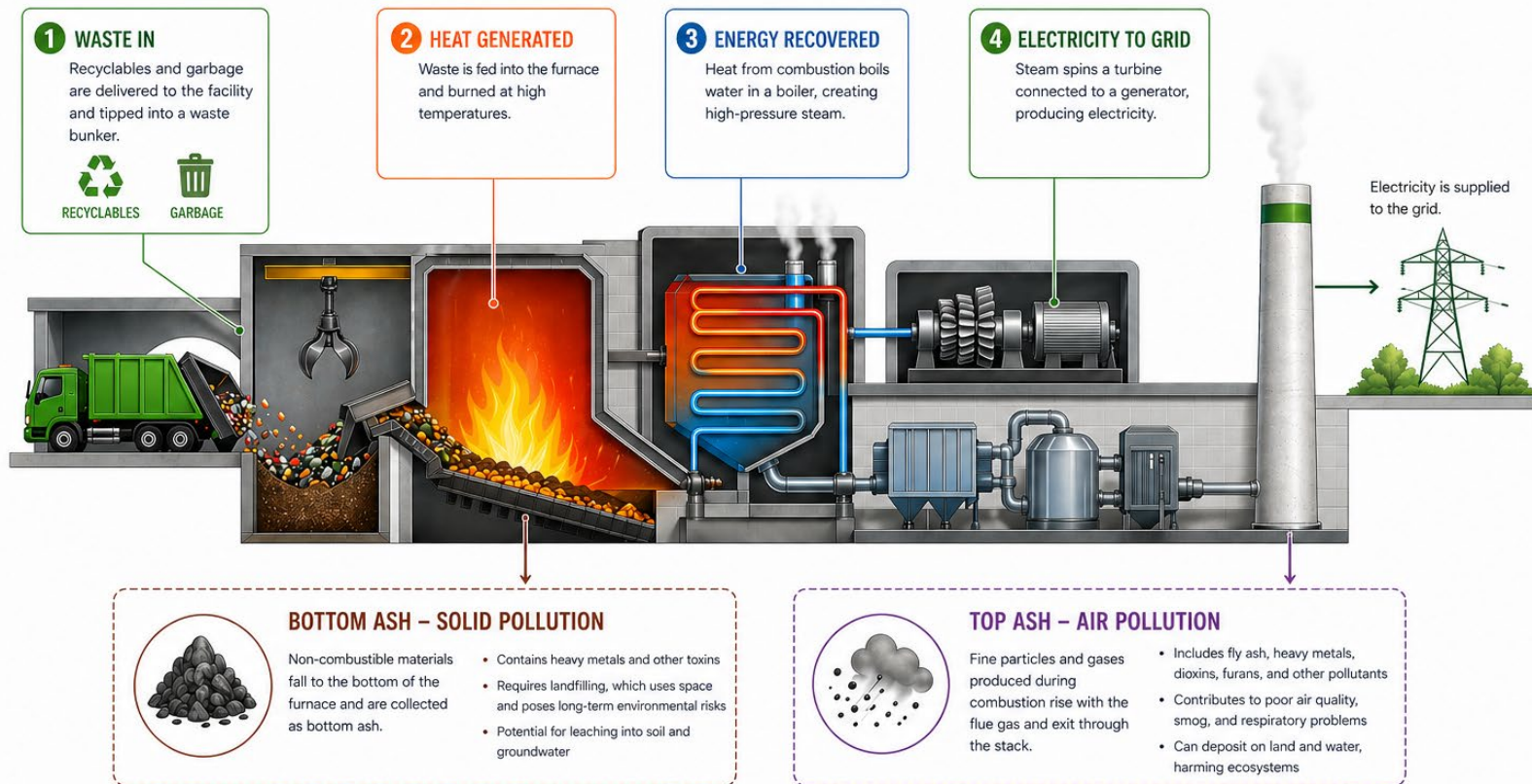
What exactly is being proposed?

- ▶ First, let's mention some terms. The EPA has a hierarchy of terms under the general heading of *Sustainable Materials Management*. Here is a summary:
 - ▶ Waste-to-Energy - For our purposes, a combustion process
 - ▶ Incineration
 - ▶ Gasification
 - ▶ Resource Recovery - For our purposes, a non-combustion process
 - ▶ Landfill Gas Recovery
 - ▶ Pyrolysis
 - ▶ Anaerobic Digestion

Let's talk about what it is not... ...it is not incineration:

WASTE-TO-ENERGY (WTE) PROCESS THROUGH INCINERATION

Waste is burned at high temperatures to reduce its volume and convert the energy in the waste into heat. That heat is used to produce steam, which drives a turbine to generate electricity.



The City's RESOLVE Project

So, what are we talking about?

- ▶ So, if Waste-to-Energy is incineration and gasification,
- ▶ What, then, is Resource Recovery?
 - ▶ Landfill Gas Recovery-Good but not efficient.
 - ▶ Pyrolysis - a type of steam treatment
 - ▶ Anaerobic Digestion
 - ▶ Added...emerging technologies not yet on the EPA list...
- ▶ Anaerobic Digestion is a form of ***Resource Recovery***.
- ▶ Please let me explain...

We all know what this is...

Monarch Hill Landfill:



(...final height 20 feet taller than the Statue of Liberty. Source: Florida Bulldog February 25, 2025)

MONARCH HILL LANDFILL SIZE COMPARISON COMPARED TO THE STATUE OF LIBERTY

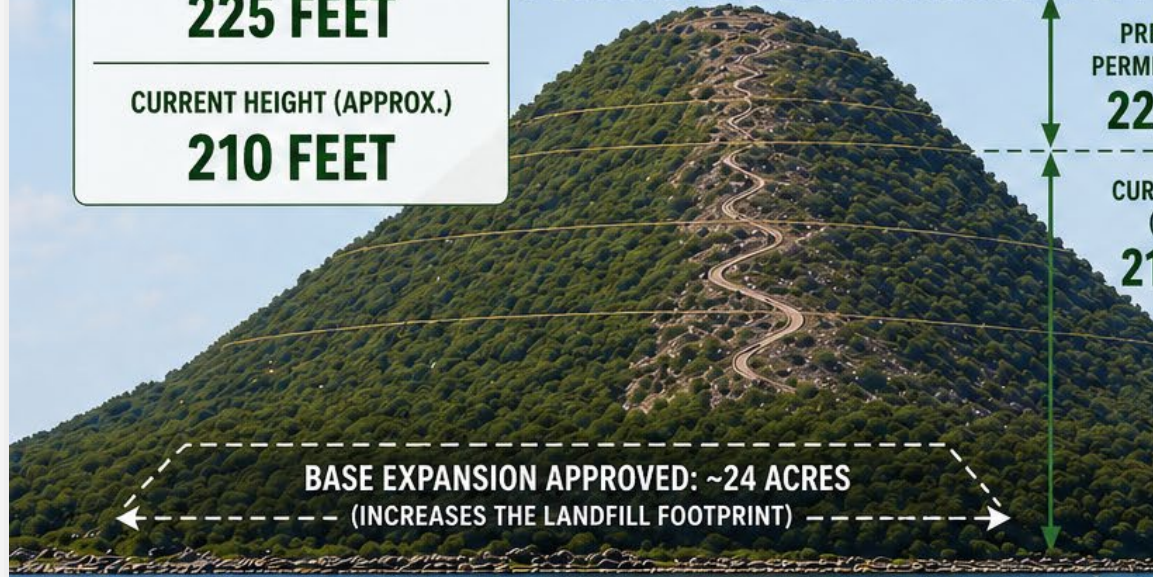
IMAGE NOT TO SCALE

MONARCH HILL LANDFILL

2025 APPROVED MAXIMUM HEIGHT
325 FEET
(225 FEET + 100 FEET INCREASE)

PREVIOUSLY PERMITTED HEIGHT
225 FEET

CURRENT HEIGHT (APPROX.)
210 FEET



2025 APPROVED
MAXIMUM HEIGHT
325 FEET
(225 FEET + 100 FEET INCREASE)

PREVIOUSLY
PERMITTED HEIGHT
225 FEET

CURRENT HEIGHT
(APPROX.)
210 FEET



STATUE
(HEEL TO
TORCH TIP)
151 FEET

PEDESTAL
89 FEET

FOUNDATION
(STRUCTURAL BASE)
65 FEET

TOTAL HEIGHT
(GROUND TO
TORCH TIP)
305 FEET

BASE EXPANSION APPROVED: ~24 ACRES
(INCREASES THE LANDFILL FOOTPRINT)



MONARCH HILL LANDFILL

CURRENT HEIGHT (APPROX.)
210 FEET

PREVIOUSLY PERMITTED HEIGHT
225 FEET

2025 APPROVED MAXIMUM HEIGHT
325 FEET
(225 FEET + 100 FEET INCREASE)

BASE EXPANSION APPROVED: ~24 ACRES
(INCREASES THE LANDFILL FOOTPRINT)

VS.



STATUE OF LIBERTY

TOTAL HEIGHT
(GROUND TO TORCH TIP)
305 FEET

AT ITS 2025 APPROVED
MAXIMUM HEIGHT,
MONARCH HILL LANDFILL
WOULD BE
20 FEET TALLER
THAN THE STATUE OF LIBERTY.

We all know what a landfill is...
but do you know what this is?



This is a landfill “flare”

So, why are there flames coming out of the landfill?

You may have seen these at burning at night...
24/7/365.

For the same reason our kitchen garbage pail smells!

Because of these little guys...
Micro-organisms.



Everything that Rots and smells
Is because of
Micro-organisms.

Basically,



— LANDFILL GAS* — METHANE GAS* — BIO GAS* — RENEWABLE NATURAL GAS (RNG)*

Actually, a mixture of gases where methane is the majority and can be concentrated

Natural Gas is VALUABLE!

Natural Gas, Bio Gas, and Methane are the same,

Natural Gas and Gas from Teco Peoples Gas, are the same,

So why waste it?



Methane is one of the Greenhouse Gases,
Why not reduce Greenhouse Emissions?

Why not capture it?

Why not Recover that Resource!

We can!

Enter...

Anaerobic Digestion.

So, what exactly is an Anaerobic Digester?



What might the facility look like?



Are Anaerobic Digesters common?

- ▶ According to the American Biogas Council:
 - ▶ 2,300 sites are producing biogas across all 50 states,
 - ▶ 332 anaerobic digesters are on farms, (ex: Des Moines, IA)
 - ▶ 66 stand-alone that process food waste,
 - ▶ 645 municipal solid waste sites that produce landfill gas,
 - ▶ 269 sites that use anaerobic digestion as part of their WWTP to recover water for reuse *and process biosolids (emphasis added)*.

Source: <https://www.fluencecorp.com/how-many-anaerobic-digesters-are-in-united-states/>

Are there any Anaerobic Digesters in Florida?

- ▶ According to the American Biogas Council:
 - ▶ 65 total in Florida
 - ▶ 36 at WWTP's
 - ▶ 22 at landfills
 - ▶ 8 in agriculture
 - ▶ 1 food waste.
- ▶ If all the potential for Anaerobic Digestion was utilized:
 - ▶ Enough electricity for 650,000 households.
 - ▶ The equivalent climate benefit of taking 70,000 cars off the road.
 - ▶ Divert 5,140,000 TONS of food waste out of landfills



Source: <https://americanbiogascouncil.org/resources/state-profiles/florida/>

Wait a minute, do Anaerobic Digesters smell bad? Yes and No...

▶ YES:

- ▶ Anaerobic Digesters used at WWTP's when the methane is burned (flared) *smell really bad!*
- ▶ *Landfill gases when burned smell bad too (but not quite as bad!)*

▶ NO:

- ▶ Anaerobic Digesters used for the production of biogas do not smell*.
 - ▶ *This is because the gases are captured, not burned, and “scrubbed” to RNG.*



Biogas is cleaned and upgraded to Renewable Natural Gas (RNG)



Technology

Why This Approach

- ▶ Combustion vs Non-Combustion
- ▶ Diversion rate as high as 70%
- ▶ Environmental benefits - Renewable, emissions.
- ▶ Recovers recyclables
- ▶ No Combustion by Products, Resource Recovery instead.
- ▶ Anaerobic digestion
 - ▶ Proven technology; Converts organic waste → biogas
 - ▶ Solves Bio Solids regulatory changes.
 - ▶ Generates Renewable energy
 - ▶ Renewable Natural Gas (RNG) production
 - ▶ Potential for Solid Fuel production
- ▶ Co-digestion of waste streams (Processes mixed waste, no separation required)
- ▶ Reduces landfill dependence
- ▶ Supports renewable energy goals / Strategic Plan and Green Plan

Broward County Solid Waste Authority

Anaerobic Digestion

- ▶ Below is an excerpt from the Broward County SWA's Master Plan's regarding Identifying Innovative and Future Technologies and Key Insights into advanced waste processing technologies:

2. Optimizing the Organic Fraction of Waste Streams

Proven methods such as composting, in-vessel aerobic systems, and Anaerobic Digestion (AD) offer the greatest potential for increasing diversion rates. These technologies are cost-effective, low-risk, and foundational to high-performance waste management strategies tailored to the Authority.

3. Advances in Sorting Technology

Emerging sorting technologies significantly enhance the recovery of recyclables in Mixed Waste Processing (MWP) facilities. These include advanced automation systems, self-regulating motor controls, and material preparation techniques such as shredding and

Broward County SWA
Task 4 White Paper: Future Needs Assessment

www.scsengineers.com

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- ▶ Source: SWA Master Plan, Appendix I - "Task 4 White Paper: Future Needs Assessment," Section 4.2(2)

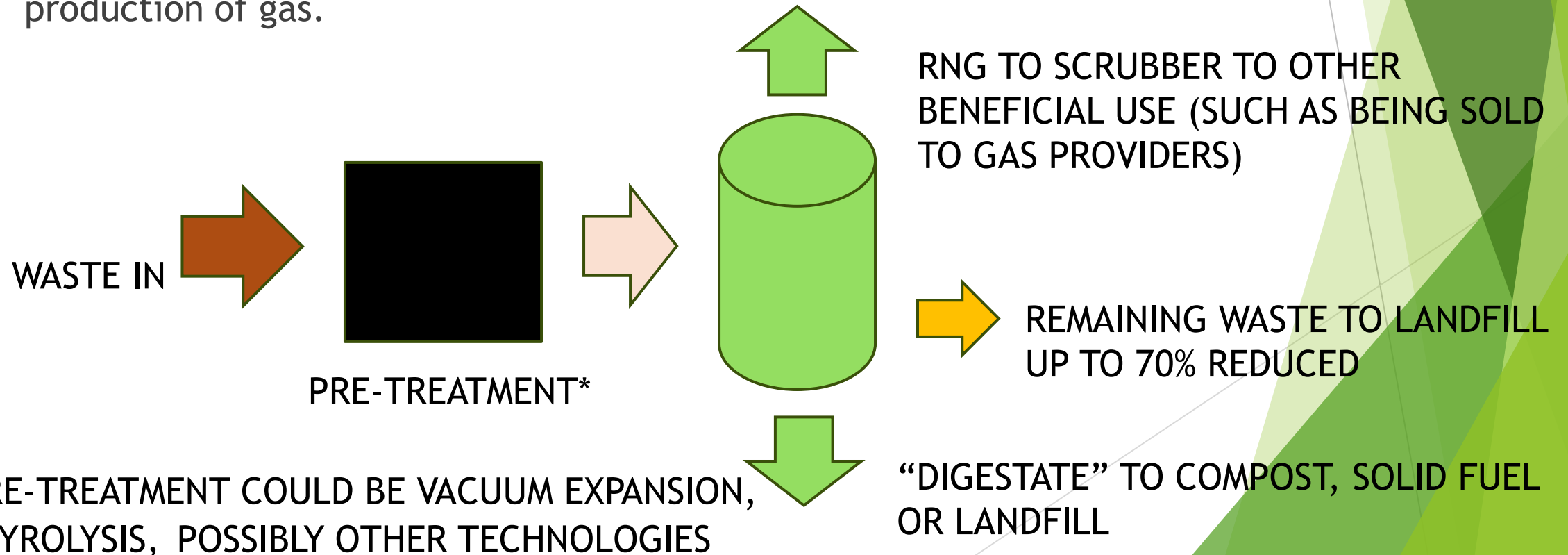
Examples of Anaerobic Digestion Facilities

LOCATION	INSTALL DATE	PROCESS	CAPACITY	SOLID (DIGESTATE) USE	GAS USE
Frankfort, Germany	2018	Separated MSW to AD	22,000 TPY	Compost/Fertilizer	RNG to grid
Aprilia, Italy	2021	Separated MSW to AD	87,000 TPY	Compost	RNG to electricity
Augsburg, Denmark	2016	Separated MSW to AD	90,000 TPY	Compost/Fertilizer	RNG to grid
Cordele, Crisp Co, GA, USA	2025	Separated MSW to Vacuum Expansion/AD*	100,000 TPY	Solid Fuel Contracts for Cement MFG	RNG to grid-Under Construction
Fulton, GA, USA	2027 Permitted	Separated MSW to Vacuum Expansion/AD	187,000 TPY planned	Solid Fuel contracts pending	RNG to grid-Under Construction
Ulster Co, NY, USA	2026 - Awarded Only	Separated MSW to Pyrolysis/AD	150,000 TPY	Digestate to landfill top cover	RNG to gas grid
Madrid, Spain	2020	Source Separated Pyrolysis / AD	70,000 TPY	Digestate to landfill	RNG to electricity

So why now?

Why aren't they more common?

- ▶ AD Technology improvements now increase the amount or yield of gas (so called “High Solids AD”).
- ▶ Modern anaerobic digesters include a “pre-treatment” process to optimize production of gas.



* PRE-TREATMENT COULD BE VACUUM EXPANSION, PYROLYSIS, POSSIBLY OTHER TECHNOLOGIES

Collaboration with FAU

- ▶ September 2025 began talks with FAU; Drs. Daniel Meeroff and Sumaiya Sharmin to collaborate on **Co-Digestion Study**
- ▶ FAU has already published studies on AD
 - ▶ Food Waste, aquatic weeds, seaweed.
 - ▶ Intending of studying Vacuum Assist AD pre-treatment material from Cordele, GA plant and wastewater biosolids for gas production in FAU's anaerobic digester.

P.S. - Sierra Club supports Anaerobic Digestion

THE PROJECT

Turning Today's Waste into Tomorrow's Resources

Single Cart Collection to Renewable Natural Gas (RNG) and Other Renewable Energy

1 COLLECTION

Single Cart Collection



Recyclables and Residential waste collected curbside in a single cart

ADDITIONAL INPUT: YARD WASTE

Collected separately through one of the two monthly bulk waste collections.



ADDITIONAL INPUT: WASTEWATER BIOSOLIDS

Biosolids are delivered from the wastewater treatment plant and go directly to anaerobic digestion.



NOT PART OF THIS PROCESS: Bulk Trash (besides Yard Waste) and C&D waste are not processed at this facility. The City could explore separate C&D recycling programs.

2 PRE-TREATMENT

Preparing Materials for Efficient Digestion

1

Separates and recovers marketable recyclables.



Metals Plastics Glass

2

Non-recyclable material moves onto pre-treatment process.



3

Pre-treatment process breaks down material and prepares for efficient digestion.



Biosolids skip pre-treatment and go directly to anaerobic digestion.

3 ANAEROBIC DIGESTION

Converts Organics to Biogas



Organics are optimized for anaerobic digestion to produce biogas



Biogas is cleaned and upgraded to Renewable Natural Gas (RNG)



Potential Option: Traditional solar or floating solar can provide renewable energy to power operations.

4 VALUABLE OUTPUTS

Clean Energy. Stronger Community.



RENEWABLE NATURAL GAS (RNG)

The same clean natural gas delivered to your home. Sold to gas companies.



Electric generation to power our grid



Industrial furnaces (e.g., concrete, manufacturing)



Piped to gas companies and delivered to your home



RNG-powered waste collection trucks



OTHER RENEWABLE ENERGY, SUCH AS SOLID FUEL



Used in industrial and commercial applications as a low-carbon fuel source.

ENVIRONMENTAL & COMMUNITY BENEFITS



Reduces landfill use and greenhouse gas emissions



Creates clean, renewable energy locally



Recovers resources and supports a circular economy

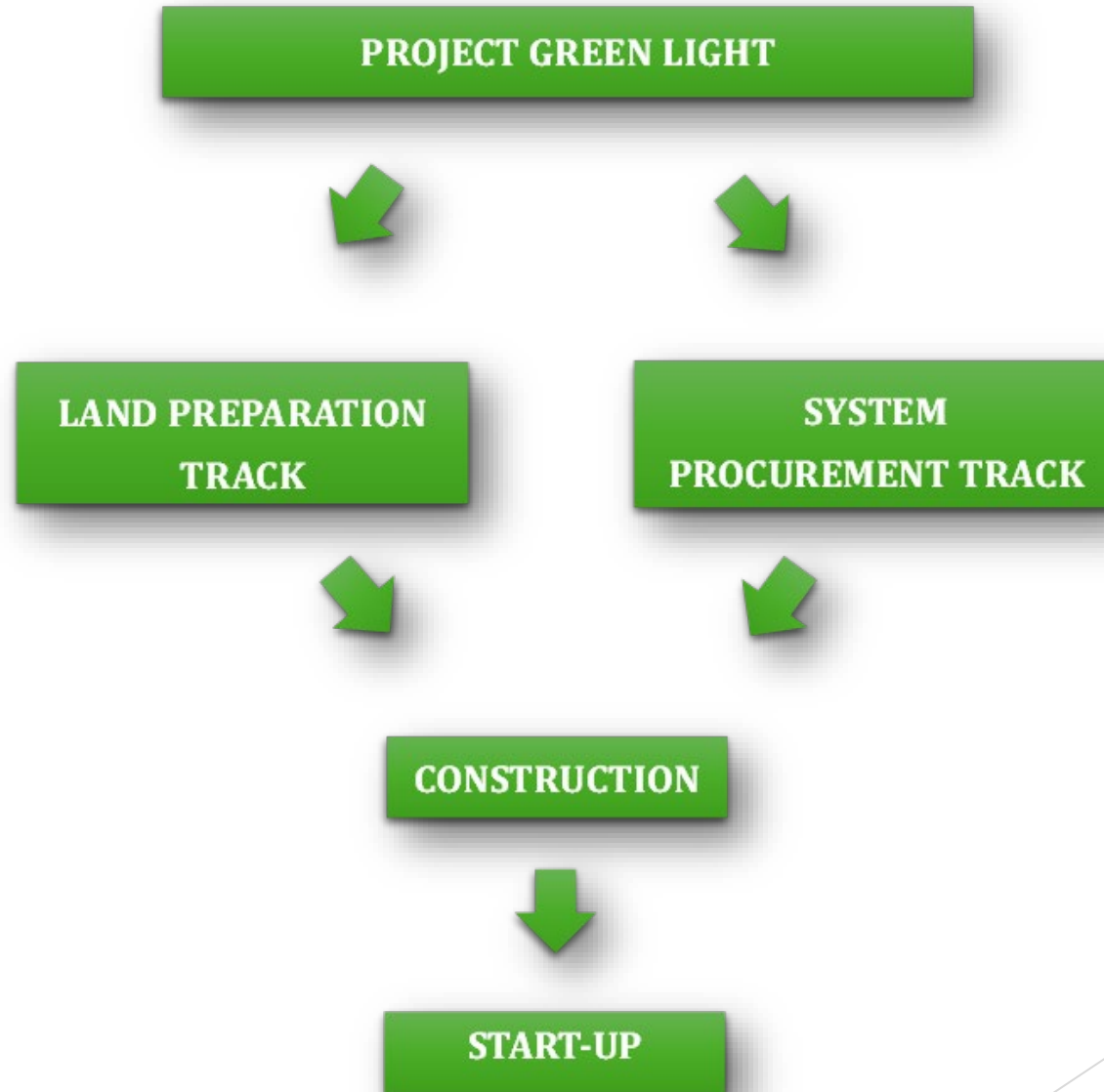


Supports a cleaner, stronger, more sustainable future

What will it take to
implement this?

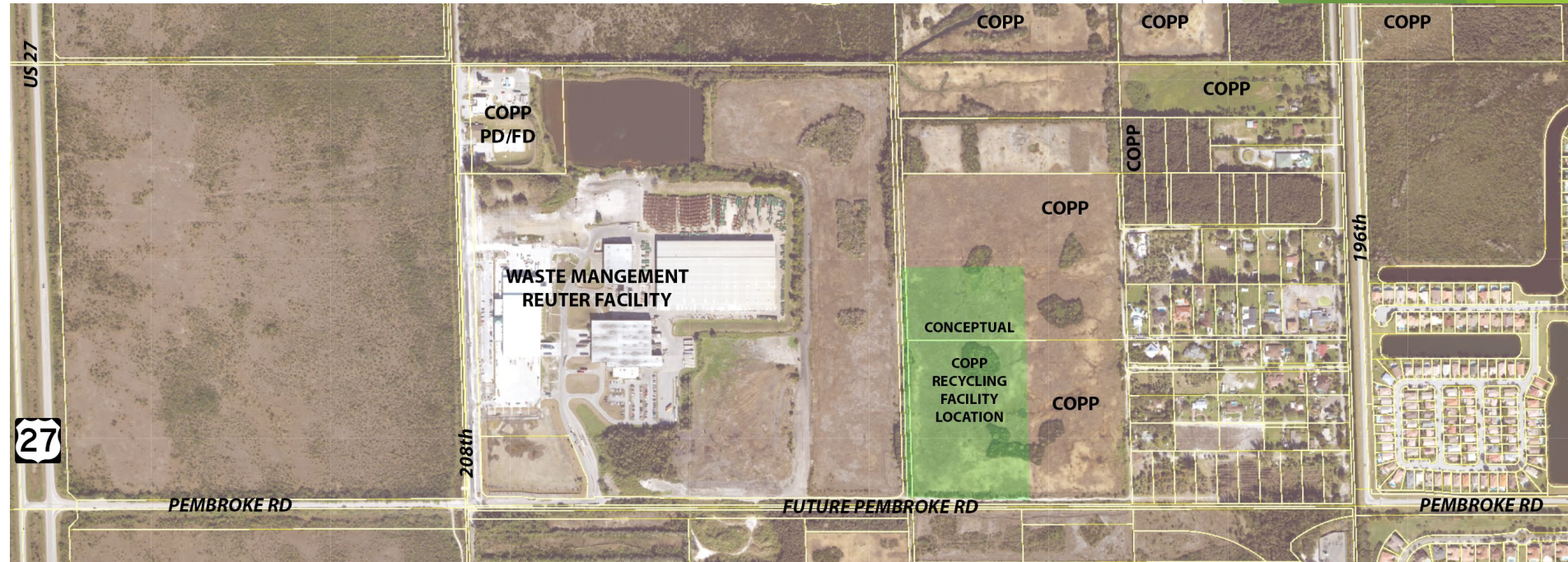
SECTION 4B

Project Roadmap

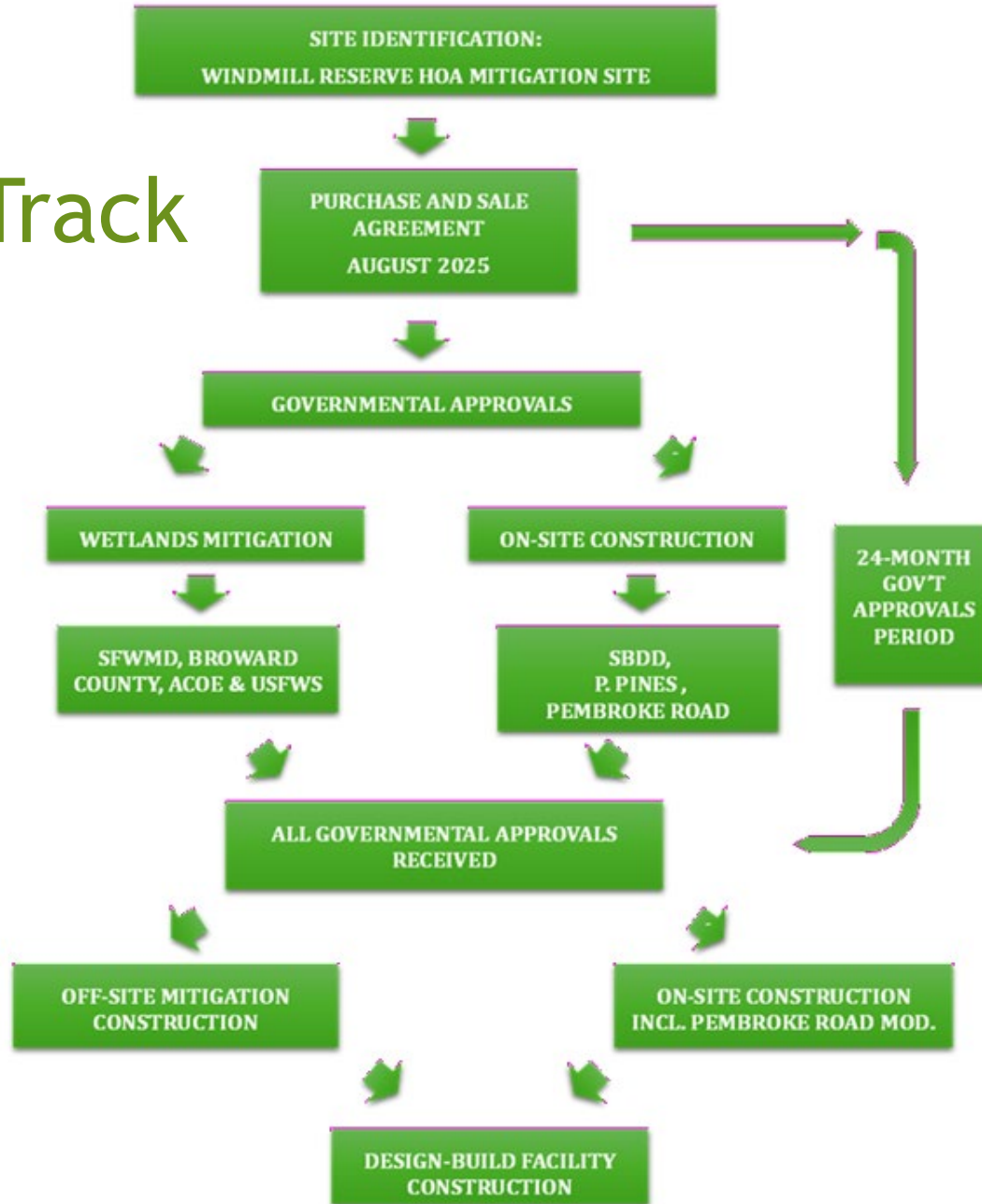


Roadmap: Land Preparation Track Site Location

- ▶ ~24/59 acre site
 - ▶ Pembroke Road
 - ▶ Near US 27
 - ▶ Between
 - ▶ SW 198th Ave
 - ▶ SW 200th Ave
- ▶ Adjacent to Waste Management Facility
- ▶ Creates “Sustainability Park” concept



Roadmap: Land Prep. Track



Roadmap: Procurement Track



Project Schedule

CITY PROJECT - LAND PREPARTION TRACK

Task	FY 2024-2025	FY 2025-2026	FY 2026-2027	FY 2027-2028	FY 2028-2029	FY 2030-2031
Land Purchase (24 mo App Period)						
Environmental Permitting						
Environmental Permitting Approvals						
Army Corp Permit						
Florida Fish and Wildlife Permit						
County Platting						
Southwest Ranches Site Plan Approval						
City Contractor Procurement						
Mitigation Construction						
On-Site Construction						

DESIGN-BUILD FIRM - SYSTEM PROCUREMENT TRACK

Task	FY 2024-2025	FY 2025-2026	FY 2026-2027	FY 2027-2028	FY 2028-2029	FY 2030-2031
RLI						
RFQ						
Selection						
CC Approval						
Design						
Permitting						
Construction						
Start-up						

CONCLUSION

SECTION 5

Conclusion

Recommended Actions

- 1) Authorize Advancement of the PROJECT
 - ▶ Direct staff to issue an RFP for the PROJECT, including development of a Design Criteria Package to evaluate technology, feasibility, and cost.
- 2) Continue SWA evaluation
 - ▶ Support continued evaluation of SWA participation, including financial, operational, governance, and policy impacts.
 - ▶ Support engagement with Broward County and the SWA to advocate for the City's priorities, including opposition to incineration and support for sustainable, non-combustion technologies.
- 3) Maintain flexibility
 - ▶ Support exploration of interim recycling at the Waste Management facility while preserving flexibility to pursue multiple long-term strategies without premature commitment.

Q&A



Project RESOLVE.
A Cleaner Solution.
A Stronger Community.
A Sustainable Future.

