Needs Assessment and Preliminary Strategies Identification

Solid Waste Master Plan

Task 5

Pinellas County, Florida
April 2019

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1 Introduction

The purpose of this Needs Assessment and Preliminary Strategies Report (Report) is to summarize assessments and analysis of gaps, needs, and opportunities identified in Phase 1 of the Pinellas County Solid Waste Master Plan project efforts (Project), and to identify potential strategies and next steps for consideration and further refinement in the remainder of the Project.

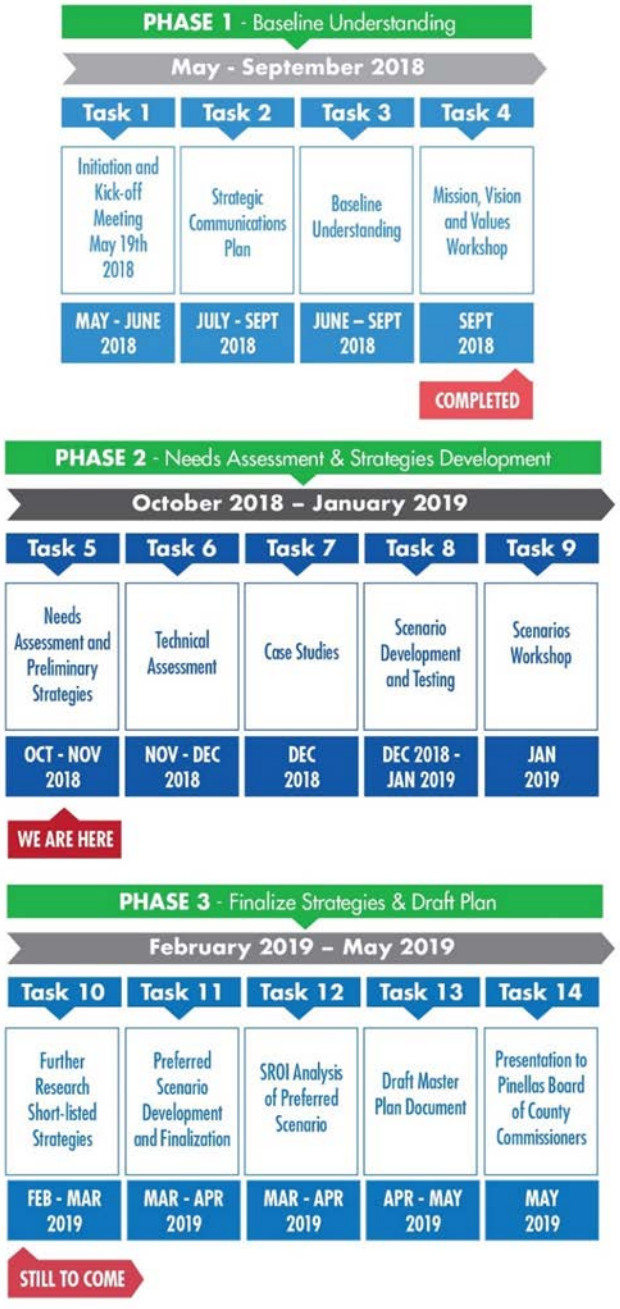

Figure 1-1 Breakdown of phases

Phase 1 of the Project included four main tasks, the first of which included extensive data sharing and review to understand the current solid waste management policies, programs and infrastructure in place in Pinellas County (County). The second task focused on development of a Strategic Communications Plan that will be implemented throughout the remainder of the Project to inform interested parties and to seek their input. The third task resulted in a Recyclables and Energy Market Assessment Report that identifies and clarifies the market conditions and potential opportunities for solid waste, recyclables and energy related investment, for further consideration in the Project; the third task also included a Baseline Report, describing the historical and current policies, programs, and infrastructure, as well as waste projections estimated if the County made no changes to its current solid waste management system. The fourth and final task of Phase 1 sought input from a regional sub-committee made up of representatives from municipalities within the County, as well as other community leaders, to understand current perceptions as well as ideas for the future of solid waste management in the County. To initiate Phase 2 of the Project, the HDR Project Team developed a matrix of needs and potential strategies identified throughout Phase 1 of the Project. The matrix was reviewed with County staff to guide the topics to be covered in this Task 5 Report, which will inform future tasks in the Project.

The remainder of this Report is organized in sections addressing each of the gaps, needs and/or opportunities categorized by material type (i.e., municipal solid waste, traditional recyclables, etc.) with subsections to address specific aspects within the solid waste management loop (i.e., waste prevention, collection and transfer, processing, disposal, and end use), as appropriate. Note that the Organics and Construction and Demolition Debris (C&D) material types are discussed in separate

summary reports, as each of these material types warranted analysis beyond what is currently included in the County's solid waste management system.

Picking up where Phase 1 concluded, each topic included in this Report provides a summary of the current condition, with available known and quantifiable data; a summary analysis of the gaps, needs, and/or opportunities identified; and a list of potential strategies that could be considered to address gaps, needs and/or opportunities. In some instances, "next steps" were also identified. Note that certain strategies delineated in the following sections will be the subject of additional review/assessment as part of Task 6 Technology Assessment – Assess Expanding/Modifying Existing County/ Regional Infrastructure, as appropriate.

The potential strategies identified in this Report will be reviewed with County staff and may assist in determining which technologies will be reviewed in Task 6 (Technology Assessment), which strategies have potential for regional cooperation, and which case studies will be conducted in Task 7 (Case Studies). The results of this Task 5, along with Tasks 6 and 7, will inform which strategies will be included in Task 8 (Scenario Development and Testing), which will include further research of the strategies deemed appropriate for further consideration.

2 General

Section 2 provides information relating to gaps, needs and opportunities that are either systemwide or otherwise general in nature, or cover multiple material types.

2.1 Flow of Waste

The flow of waste in the County is regulated per flow control provisions of the Pinellas County Code of Ordinances, Chapter 106 - Solid Waste, which contains several provisions that address the compulsory use of the County's Solid Waste Disposal System. Specific subsections of Chapter 106 relating to the County's regulatory flow control include the following.

- Section 106-53 – Powers of the County specifically states, in relevant part:
    - *"(3) Compel the inhabitants, persons, firms, corporations, municipalities, political subdivisions or agencies or bodies located within the territorial boundaries of the county to use such system for solid waste disposal.*
    - *(10) … To provide for the issuance of licenses or permits for the collection of solid waste in the unincorporated area of the county; to impose such conditions to such franchises as shall include but not be limited to standards of service, rate regulation, area of population and franchise fee for the privilege of operating under the franchise; … and to provide such other conditions of such franchise as shall be reasonable and necessary.*
    - *(11) Require all persons, lands (including municipalities and other political subdivisions), buildings and premises in the county to use the facilities and services of the solid waste disposal and resource recovery system in all cases deemed necessary or desirable by the board of county commissioners for the public health and safety for the county and the inhabitants thereof.*
    - *(12) Require that any existing solid waste disposal facility be restricted to disposal of specified types or amounts of solid waste when such restriction is deemed by the board to be necessary to guarantee the amount of solid waste to be processed by the solid waste and resource recovery system in the following instances*
        a. *To meet the design capacity of the system*
        b. To meet contractual obligations of the county entered into pursuant to Laws of Fla. Chap. 75-847 and this division."

- Section 106-93 – Findings specifically states, in relevant part:
    - *"(5) To assure that sufficient net operating reserves are generated as stated in this section, it is necessary that solid waste that is generated within the county is disposed of in the system, … and that all persons located within the county use the system for solid waste disposal.*
    - *(6) To assure that the system receives an adequate supply of solid waste generated within the county, it is necessary to require all persons within the county to use exclusively the system or a solid waste disposal system or facility operated or maintained by agreement with the county, or by license or permit with the county for disposal of all waste generated within the county …*
    - *(7) In addition to empowering the county to acquire, construct, maintain and operate the system, division 2 of this article grants to the county, among others, the following powers:*
        a. To compel persons located within the territorial boundaries of the county to use the system for solid waste disposal.
        d. To provide for the issuance of licenses or permits for the collection of solid waste in the unincorporated area of the county.

- *(9) The provisions of F.S. (Chap.) 403.713 authorize any local government that undertakes resource recovery of solid waste pursuant to general law or special act, to control the collection and disposal of solid waste which is generated within its boundaries and to institute a flow control ordinance for the purpose of ensuring that its resource recovery facility receives an adequate quantity of solid waste generated within its jurisdiction."*

- Section 106-94 - Purpose specifically states in relevant part:
  - *"The purpose of this division is to assure that the system receives an adequate quantity of solid waste generated within the county by requiring all persons within the county to use exclusively the system or a solid waste disposal system or facility operated or maintained by agreement with the county or by license or permit with the county for disposal of all solid waste generated within the county and to provide a surcharge for the use of the system's facilities and services to dispose of solid waste generated outside the county."*

- Sec. 106-97. – Use of system; operation of other disposal facilities prohibited, specifically states in relevant part:
  - *"(a) All solid waste generated within the territorial boundaries of the county shall be disposed of exclusively within the system, or a solid waste disposal system or facility operated or maintained by agreement with the county or by license or permit by the county. All persons located within the territorial boundaries of the county shall use exclusively the system for the disposal of solid waste generated within the territorial boundaries of the county, or a solid waste system or facility maintained by agreement with the county or by license or permit from the county …"*

2.1.1 Assessment of Modifying Flow Control Ordinance

To further the understanding of the County's ability to control or compel the flow of solid waste to the County's Solid Waste Disposal System, the definition of solid waste, as set forth in Division 3 – Operation and maintenance, Section 106 – 91. – Definitions "solid waste" is defined as follows:

"Solid waste includes nonhazardous materials but is not limited to garbage, refuse, yard trash, clean debris, trash, construction and demolition debris, international food refuse, dead animals, pharmaceutical drugs, controlled substances, asbestos, grit, grease, fish, beverage disposal, septic tank pumping, white goods, ashes or other discarded material, including solid or semisolid resulting from domestic, industrial, commercial, mining, agricultural, or other governmental operations. Such solid waste shall not include that portion separated at the point of generation or after collection and intended to be held for purposes of recycling pursuant to the requirements of state law; however, such solid waste shall be subject to applicable state and local public health and safety laws."

This definition of solid waste is broadly worded to be inclusive of Class I and Class III waste, as defined by state of Florida Department of Environmental Protection regulations Rule 262-701.200(13) and (14), F.A.C., and thus Chapter 106 appears to give the County the absolute right and ability to control the flow of solid waste into its system and facilities.

However, the existing Code 106 language may be considered too broad to serve as an implementable enforcement mechanism, and would require the drafting and adoption of additional, appropriate ordinance language applicable to the specific desired strategy or strategies for flow control. Competent and experienced legal advice should be obtained by the County in any effort to revise or amend Chapter 106.

Currently, flow control to the County's Solid Waste Disposal Complex is accomplished by a combination of (1) geographic and economic flow control, (2) Technical Management Committee membership and guidance (Pinellas County Code Section 106 – 54), and (3) Hauler licensing (Pinellas County Code, Article V). There is currently no enforcement of flow control for certain categories of Class I wastes (e.g., contaminated soil) and Class III waste (e.g., C&D), that leave the County for disposal.

POTENTIAL STRATEGIES

- **Expanded licensing or franchising** – Since collectors of residential MSW and recyclables are already licensed by the County for the unincorporated areas, the County could consider requiring licenses for other classes of waste haulers, such as those that handle and transport C&D, special wastes, vegetative and wood wastes, and possibly other classes of commercial and industrial waste.
- **Interlocal agreements with municipalities** – All Pinellas County municipalities dispose of their solid waste at the County's Disposal Complex as required by Code 106 and guided by the TMC provisions therein. At present, for Class I waste (MSW) there is also an "economic incentive" since there is no less expensive disposal option available primarily due to transportation costs. However, if a future less costly option were to present itself, as has happened in other communities, the municipality may choose to challenge the legal viability of County Code 106. Entering into long-term disposal agreements with municipalities could negate such risk.
- **Enact a new (or revised) flow control ordinance** -- New ordinance provisions, amending County Code 106, could be enacted to better define and "force" the classes of waste desired to be specifically regulated (e.g., Class I MSW, Class III waste, special wastes, etc.), and customers to be regulated (e.g., haulers, municipalities, etc.), to the Disposal Complex. Such action could be expected to invite legal challenge (as would also a strict enforcement of Code 106), especially since the County has historically allowed, and in fact, relied upon the open competitive marketplace and private providers to handle certain classes of solid wastes produced in Pinellas county.

NEXT STEPS

- Determine which material streams (i.e., Class I and Class III) would be beneficial for the County to regulate the flow to County facilities.
- County to engage legal advisors to determine how to modify Chapter 106, as needed.

2.1.2 Assessment of Controlling Out-of-County Waste

As with the issue of flow control, the Pinellas County Code of Ordinances (Section 106 – Solid Waste), contains substantial reference to this issue of "receipt of out-of-county waste" and "surcharges for out-of-county waste." First, in general, the County has the power and requirement to establish rates, fees and charges to the benefit of the solid waste system, which reads in relevant part:

- Section 106-55. – Rates, fees and charges.
  "The solid waste disposal and resource recovery system shall be operated on a self-supporting, cost recovery basis. The governing body shall prescribe and collect a schedule of rates, fees or other charges for the utilization of the services and facilities of such solid waste and resource recovery system and may, whenever necessary, revise such schedule. The schedule of rates, fees or other charges prescribed shall be sufficient to produce revenues that, when taken together with other revenue sources and pledged funds, will be adequate to provide for all expenses of land acquisition, construction, operation, maintenance and renewal, and necessary expansion of such solid waste disposal and resource recovery system…"

Specific reference to the issue of out-of-county waste is contained in Section 106-93, Findings, which reads in relevant part:

- Sec. 106-93. – Findings
  "(6) To assure that the system receives an adequate supply of solid waste generated within the county…, and to provide for a surcharge for use of the system's facilities and services to dispose of solid waste generated outside the county.

  (7) To establish and collect fees, rates or other charges for the use of the facilities and services of the system."

The County's ability to apply a surcharge to fees charged for receipt of out-of-county waste is also stated in Section 106-94, Purpose, which reads in relevant part:

- Sec. 106-94. Purpose.
  "The purpose of this division is to assure that the system receives an adequate quantity of solid waste generated within the county by requiring all persons within the county to use exclusively the system…and to provide for a surcharge for the use of the system's facilities and services to dispose of solid waste generated outside the county."

Further, in subsequent paragraphs in Chapter 106, various specifics related to surcharges are addressed:

- Sec. 106-97 – Use of the system; operation of other disposal facilities prohibited.
  "(a)…Any person delivering solid waste to the system shall, if any portion of the solid waste contained in the disposal vehicle was generated outside the county, pay to the county at the time the surcharge established for the disposal of all solid waste contained in the disposal vehicle, which shall be in addition to any other fee, rate or charge applicable for facilities or services provided by the system. Solid waste collected within or outside the territorial boundaries of the county will be presumed to have been generated within or outside the county, respectively, in the absence of a preponderance of evidence to the contrary. Such evidence shall include information discernable from vehicle inspection of the solid waste or obtained from any person having possession or control of the solid waste at any time."

- Sec. 106-98. – Fees, rates and charges
  "Fees, rates and charges for facilities and services of the system are determined by the board of county commissioners after it receives recommendations from the technical management committee, in accordance with section 106-54. In order to extend the useful life of the incineration system, and in order to cover the cost of such extension to make up for the results of acceptance of solid waste generated outside the county, a surcharge shall be collected for all solid waste generated outside the territorial boundaries of the county that is received and disposed of by the system. The amount of such surcharge shall be established in the same manner as fees, rates and charges for facilities and services of the system are established pursuant to section 106-54."

As shown, when the County established the solid waste system, the ordinance language contemplated the probable receipt of out-of-county waste and made provisions in the ordinance for the application of a disposal rate surcharge. Therefore, without ordinance revision, it appears the County cannot "prevent" the receipt of out-of-county waste but can charge an appropriate surcharge for its receipt and processing by way of its power to establish fees, rates and charges for all classes of solid waste, including out-of-county waste.

POTENTIAL STRATEGIES

- **Adopt disposal fee surcharges for out-of-county waste** – County Code 106 is clear on the County's right and ability to adopt disposal rate surcharges. The County could adopt such disposal rate surcharges for all classes and types of solid waste of concern, such as for example, tires, MSW, special wastes, C&D, etc.

2.1.3 Assessment of Storm Debris at the Disposal Complex

With regard to storm debris, which can increase tonnages being landfilled, the County's Disaster Debris Management Plan, administered by Pinellas County Public Works, addresses how storm debris should be managed. The Debris Clean-up Contractor agreement instructs the contractor for management of the materials. Each should be reviewed for potential enhancements to minimize impacts on the Bridgeway Acres Landfill capacity.

POTENTIAL STRATEGIES

- Evaluate ways to most efficiently process and utilize vegetative storm debris in order to minimize the impact on landfill life and incorporate alternative disposal capacity for storm debris in the County's next opportunity for FEMA related planning and pre-positioned contracts (e.g., Pinellas County Disaster Debris Management Plan and Debris Clean-up Contractor agreement).

NEXT STEPS

- Review and identify potential areas for revisions in the Pinellas County Hurricane Debris Management Plan and Debris Clean-up Contractor agreement.

2.1.4 Assessment of Purchasing Additional Property for County Solid Waste System

Pinellas County is the 6th largest county in Florida by population, and because of its relatively small geographic area, it is the most densely populated county in the state. Approximately 71 percent of the County's nearly one million permanent resident population resides within the incorporated areas of the County with 29 percent residing in the unincorporated areas. Further, the unincorporated areas are more or less scattered throughout the entire County. A large mostly undeveloped tract, located in the Eastlake/Tarpon area (northeast County), is the location of many potable water production wells and treatment facilities for Pinellas County and the Tampa Bay Water Authority. This area is specifically set aside for that use. Even proposals to locate additional water supply/treatment facilities on this land require public hearings and Pinellas Board of County Commissioners (BOCC) approval. Solid waste facilities, as well as other public use facilities such as water and wastewater plants, are allowed only in areas of the County designated as Transportation/Utility (TU), as set forth in the Pinellas County Comprehensive Plan, Future Land Use Map (FLUM) Category Descriptions and Rules (County Ordinance 16-55, as amended November 22, 2016). The population of the County and its impact on the solid waste system is more fully presented and discussed in Section 1 of the Baseline Report.

Based upon these factors, it has long been considered impossible to site any major future solid waste facilities or operations on property other than that currently owned and controlled by the County Solid Waste Department.

The Disposal Complex consists of 705 acres, of which the WTE resides on 15 acres; the Bridgeway Acres landfill and associated operations and facilities encompass 497 acres; and the future Sod Farm disposal area, located east of 28th Street N, consists of roughly 190 acres. The system also owns and maintains the old closed Toytown landfill property consisting of 235 acres located east of the Sod Farm property and across Interstate 275. The only active facilities/operations existing beyond these 705 acres are relatively very low impact facilities/operations such as recycling drop-off and beach recycling sites.

Since the inception of the County Solid Waste System in 1980, the City of St. Petersburg has owned over 200 acres of land located south of the Sod Farm property and east of 28th Street North (in fact, the Sod Farm was also owned by St. Petersburg but made part of the County Solid Waste System when it was established). Part of the land had been used by the City in the past for wastewater treatment plant sludge drying. In 2004, the Solid Waste Department became aware of the City's intentions to allow industrial/commercial development of this property and approached the City to ascertain if the City would be willing to sell the property to the County Solid Waste System in lieu of development. That offer was rejected as unacceptable, and the County chose to participate in the City's Request for Proposals process and made an offer to purchase the property and allow businesses to locate on the property until its future need for solid waste operations, estimated then to be in excess of 70 years (80+ years today). Because of the County's population density and lack of large suitably zoned tracts of land, this land was viewed as the only possible location for a new landfill or processing facility in Pinellas County. Ultimately, the City rejected the County's offer due to the potential for tax revenue, jobs and other economic development considerations, in favor of the offer by developer Grady Pridgen, Inc., for an industrial/ commercial mixed-use development, consisting of commercial/ manufacturing/ distribution businesses, hotel, retail shopping, and condominiums (Live/Work/Play concept). Today, three businesses occupy the northern portion of the property (Valpack, Halkey Roberts Health & Medical, and Great Bay Distributors). The hotel, retail, condo portion of the project has yet to be built.

Because of the County's land use and zoning restrictions, population density and lack of other suitably large tracts of land for future solid waste operations and facilities, it is extremely unlikely that the solid waste system could successfully pursue and utilize property other than what it currently owns. Citizen, and thus also political opposition, to any other in-county site, could be expected to be negative in the extreme.

Locating any solid waste operations (other than the most minor, such as recycling drop-off facilities), on the property of other county public works or utilities facilities, is also extremely unlikely. Lack of space, incapability, and neighborhood opposition are all negative factors. Use of the northeast wellfield property would not be possible.

POTENTIAL STRATEGIES

- Explore additional means to extend the useful life of the existing owned property (Bridgeway Acres and Sod Farm) should be vigorously considered and implemented throughout the solid waste master plan period. Extending the useful life of the Bridgeway Acres property could make the Sod Farm property available for varying solid waste recycling activities well into, and even beyond, the planning period (through 2048).
- Monitor and evaluate the potential availability of contiguous properties for purchase during latter portions of and beyond the planning period.
- Explore the possible utilization of the surface of the closed Toytown Landfill could be considered. Potential uses such as "low tech" composting or other processing technologies (no structures) may well be compatible with the site's regulatory closure requirements.

2.2 Waste Prevention, Reduction, Reuse

The concepts of waste prevention, reduction and reuse can apply to any material stream, and can include efforts to purchase products manufactured and packaged with less materials, less toxic materials, and/or easily reusable or recyclable materials. This Section 2.2 focuses on the purchasing practices of the County, and a general review of current practices and potential strategies relating to waste prevention. Specific analysis and potential strategies relating to bulky wastes are provided in Section 4; and household hazardous waste including electronics in Section 6. (Organics and C&D prevention, reduction and reuse are discussed in the respective separate material type reports.)

In the full lifecycle of any product, there are three main segments: up-stream, mid-stream and down-stream. The up-stream segment of a product's lifecycle involves the manufacturing process itself, where manufacturers determine which materials and how much material will be used to manufacture and package the product. The mid-stream segment of a product's lifecycle focuses on the longevity of the product, including reuse and repurposing of products. The down-stream segment of a product's lifecycle focuses on recovery, including recycling or energy recovery. By nature of the role of local government, the down-stream segment of a product's lifecycle is the point of greatest direct impact. However, local governments can, to some degree, influence the up-stream and mid-stream segments of a product's lifecycle, before the materials arrive at a local government facility, by promoting waste prevention, reduction, and reuse. A local government can also lead by example with its own purchasing policies.

The County's current education and outreach efforts related to waste prevention, reduction, and reuse primarily focus on informing customers of opportunities to reuse and recycle products, and how to correctly recycle. The County dedicates a lot of time and effort to describing what happens to waste after it is received at the Solid Waste Disposal Complex to help residents understand that the County receives more waste than can be incinerated for energy, stressing the importance of prevention, reduction and reuse. Through tours and presentations, County staff bring this message to an average of 8,000 residents annually.

The County contracts with Keep Pinellas Beautiful to drive various public outreach, litter prevention, and recycling promotion related efforts such as the School Recycling program in which Keep Pinellas Beautiful offers school recycling incentives and initiatives to encourage students to reduce, reuse and recycle through contests, community service activities, etc. The County also encourages its commercial customers to "recycle and reuse" through programs such as Cutting Waste at Work (CWW), where businesses contact Pinellas County staff for an initial phone evaluation. During the call, staff asks questions about their business' waste and recycling practices and a site visit is scheduled. During the site visit, staff will tour the facility and observe the business' waste stream and prepare a custom "Assessment Report". The report recommends how the business can create and launch a waste reduction and recycling program or improve their current waste reduction and recycling efforts.

2.2.1 Assessment of Opportunities to Expand Current Prevention, Reduction, Reuse Efforts

Because the primary role of local government is to focus on the down-stream segment of a product's lifecycle, the County is limited on how directly involved it can be on up-stream and mid-stream segments of a product's lifecycle. Generally, the County's involvement should focus on expanding the promotion of such opportunities. (Additional prevention, reduction, reuse opportunities are described in Sections 4.1 – Bulky Waste and 6.2 - HHW)

POTENTIAL STRATEGIES

- Increase promotion of prevention and reuse opportunities, which may include providing links to additional information on the County website.
- Standardize recycling centers in all County buildings with consistent labeling and containers to combat recycling confusion. (Coordinate with the City of Clearwater, City of Largo, and Pinellas County's Real Estate Management Department to implement.)
- Incorporate emphasis and assessment of prevention and reuse opportunities in the CWW program and resulting assessment reports.

NEXT STEPS

- Determine which reuse opportunities could be promoted along with County existing education (e.g., take back programs at home improvement stores).

- Determine what specific strategies for prevention and reuse in the CWW program and resulting assessment reports should be added.

2.2.2 Assessment of Modifying County Purchasing Guidelines

The County's purchasing code can be found in PART II of the Pinellas County Code of Ordinances, Chapter 2 – Administration, Article V – Finance, Division 2 – Purchasing. The purpose of the Purchasing section reads in relevant part:

> *"The purpose of this division is to provide for the fair and equitable treatment of all persons involved in public purchasing by the county, to maximize the purchasing value of public funds in procurement, and to provide safeguards for maintaining a procurement system of quality and integrity."*

The ordinance language focuses primarily, as it should, on the process of procuring goods and services for the County and does not explicitly focus on environmental stewardship. Each agency within the County that may procure goods and services would, however, have the ability to add environmental requirements to specific procurement opportunities.

The County also has a "Purchasing Manual" with a stated purpose of providing "a standard outline of the principles, policies, and practices to be used in performing all purchasing procedures as agents of the County". The Purchasing Manual lists ten objectives of the manual, with the tenth item being "To comply with the County's policy relevant to the procurement of recycled products." However, there is no other mention of recycled content in the remainder of the Purchasing Manual. Similar to the purchasing ordinance language, while explicit intent on environmental stewardship is not expressed, each agency within the County that may procure goods and services would, however, have the ability to add environmental requirements to specific procurement opportunities.

The primary role of any purchasing department is to ensure that purchases are made in compliance with current federal, state, and local laws and policies, as is the case with the County's purchasing department. However, environmentally sustainable purchasing practices have become more commonplace. The University of Florida has a "Sustainable Purchasing Policy" in place to support campus sustainability and to provide guidelines, information, and resources in procuring products that will minimize negative impacts on society and the environment to the greatest extent practicable. In Miami-Dade County, the Internal Services Department's Procurement Management Division has created guidelines for County departments to reduce waste and increase environmental efficiency when making purchases, referred to as the "Buy Green Purchasing Guide".

In Mecklenburg County, North Carolina, the Mecklenburg County Green Purchasing Team is a volunteer group of County employees representing County Departments and their varying purchasing interests. This team has provided input and oversight for development of an Environmentally Preferable Purchasing Guide (EPPG). This EPPG targets inclusion of environmental considerations in purchasing decisions for goods and services. Its purpose is to support markets for recycled and other environmentally preferable products by encouraging County agencies and contractors to buy such products wherever practicable and to outline operating standards for waste reduction and recycling.

POTENTIAL STRATEGIES

- Create county-wide guidelines regarding use of recycled content paper.
- Create a sustainability purchasing team to develop an "Environmentally Preferable Purchasing Guide" to serve as encouragement (not mandates) for environmental stewardship across all County agencies to enhance the County's existing purchasing guidelines.

- Enforce implementation of guidelines County-wide as a strategy for implementing 3.4 of County's Strategic Plan of reduce/reuse/recycle resources including energy, water, and solid waste which could include efforts related to waste reduction initiatives at County facilities such as hand dryers and refillable soap dispensers in restrooms.

2.2.3 Assessment of Opportunity to Support Extended Producer Responsibility

CalRecycle, which is the State of California's environmental protection agency, defines Extended Producer Responsibility as:

> *"Extended Producer Responsibility (EPR), also known as Product Stewardship, is a strategy to place a shared responsibility for end-of-life product management on the producers, and all entities involved in the product chain, instead of the general public; while encouraging product design changes that minimize a negative impact on human health and the environment at every stage of the product's lifecycle. This allows the costs of treatment and disposal to be incorporated into the total cost of a product. It places primary responsibility on the producer, or brand owner, who makes design and marketing decisions. It also creates a setting for markets to emerge that truly reflect the environmental impacts of a product, and to which producers and consumers respond."*

Supporting state and national level initiatives focused on the product stewardship is possible for local governments. Product stewardship regulations and/or incentives can impact up-stream, mid-stream and down-stream segments of a product's lifecycle. However, for a local government to impose regulations, restrictions or bans on products presents challenges for retailers that have locations across multiple local government jurisdictions to abide by local jurisdiction regulations for one retail location but not for other locations. In Florida, the State went as far as disallowing local governments to implement regulations on disposable plastic bags, in order to avoid confusion and unfairness across local jurisdictions.

The Energy, Climate Change, and Economic Security Act of 2008 created Section 403.7033, Florida Statutes. Florida Department of Environmental Protection (FDEP) performed an analysis and submitted a report in February of 2010 to the state legislature regarding the necessity and efficacy of both statewide and local regulation of bags used by consumers to carry products from retail establishments. To date, Senate Bill 830 relating to carryout bags was introduced in 2014 but failed to pass; House Bill 661 relating to regulating or banning plastic bags was introduced in 2015, but also failed to pass. According to FDEP website, "until such time that the Legislature adopts the recommendations of the department, no local government, local governmental agency or state government agency may enact any rule, regulation or ordinance regarding use, disposition, sale, prohibition, restriction or tax of such auxiliary containers, wrappings or disposable plastic bags."

Some other states have made more progress on the issue of single use plastic bags.

- California, Aug 2014: California became the first state to enact legislation imposing a statewide ban on single-use plastic bags at large retail stores. There is a 10¢ minimum charge for recycled paper bags, reusable plastic bags, and compostable bags.
- Delaware, 2009: Delaware enacted legislation that encourages the use of reusable bags by consumers and retailers, requires a store to establish an at-store recycling program that provides an opportunity for a customer to return clean plastic bags.
- Washington DC, 2009: the District of Columbia enacted legislation that protects its aquatic and environmental assets, to ban the use of disposable non-recyclable plastic carryout bags, to establish a fee on all other disposable carryout bags provided by grocery stores, drug stores, liquor stores, restaurants, and food vendors, to give the Mayor the authority to

implement rules and procedures to collect the fee, to establish a non-lapsing recurring Anacostia River Cleanup and Protection Fund.

The Product Stewardship Institute (PSI) is a national nonprofit organization "committed to reducing the health, safety, and environmental impacts of consumer products across their lifecycle with a strong focus on sustainable end-of-life management". According to the PSI website (https://www.productstewardship.us/default.aspx) PSI has 47 state environmental agency members, hundreds of local government members from coast to coast, and 100 corporate, business, academic, non-U.S. government, and organizational partners, working to promote product stewardship across North America. The Florida Chapter of the North American Hazardous Materials Management Association has worked with PSI on the Florida Paint Stewardship Project described in more detail in Section 7.1.

In Florida, it appears that no other state level product stewardship initiatives are currently being considered in the state legislature. At the national level, organizations such as PSI are working on a variety of initiatives, but the federal government does not appear to be considering legislation related to product stewardship.

Within the County, efforts are underway in Clearwater and St. Petersburg for incentives, fees or bans on items such as plastic bags, plastic straws, and polystyrene packaging (Styrofoam). In Clearwater, between June 1, 2018 and August 31, 2018, the solid waste department issued a voluntary "Strawless Summer Challenge" to reduce the use of plastic straws in the City. For the three-month period, businesses could participate by abstaining from giving plastic straws out unless requested by a customer. The forty businesses that successfully completed the Strawless Summer Challenge received a certificate of achievement and a photo spotlight on the department's website for one year.

The City of St. Petersburg is working toward being a Zero Waste City. St. Petersburg is currently seeking input from local businesses in shaping potential programs which would help businesses reduce or eliminate plastic bags. According to the language in their proposed ordinance, the bag plan would require retailers to charge 5 cents at checkout for every single-use bag given to the customer. One cent would go to the retailer, and the City would collect 4 cents for a water cleanup fund. St. Petersburg has also issued a ban on single-use plastic straws and polystyrene. For the first year, from January 1 to December 31, 2019, restaurants and other places can only give plastic straws to customers who ask for them. After the first year, businesses will be prohibited from offering plastic straws at all. The ban enforcement starts January 1, 2020; the first violation is a warning, the second will result in a $40 fine, and all subsequent violations within a year of the first violation will result in an $80 fine. St. Petersburg's Styrofoam ban will work in a similar manner to the straws, except there's no by-request-only grace period. Instead, the ban began on January 1, 2019. Like straws, there will be no penalties in the first year; beginning in the second year, the $40 and $80 fines will come into play.

POTENTIAL STRATEGIES

- Monitor FDEP and other state level efforts for product stewardship opportunities to support.
- Pilot glass bottle buyback programs (i.e., cash for clean source separated glass).
- Monitor national level efforts for product stewardship opportunities to support.
- Coordinate with municipalities within the County to implement incentives, fees, or bans Countywide that are currently working within certain municipalities for items such as plastic straws, plastic bags, and polystyrene packaging.

2.2.4 Assessment of Opportunity to Promote Zero Waste to Landfill or Low Waste Public Events

Organizations such as Seven Generations Ahead (https://sevengenerationsahead.org/) and GreenBiz (https://www.greenbiz.com/) provide guidance on promoting zero waste events.

Seven Generations Ahead provides a zero waste event planning guide, downloadable at https://sevengenerationsahead.org/images/work/zerowaste/SGA_ZW_Event_Planning_Guide_FINAL.pdf. The guide covers pre-event planning steps; event set up and tear down; and after event evaluations.

GreenBiz provides a step by step guide (https://www.greenbiz.com/article/step-step-guide-zero-waste-events) that describes how to collaborate with the venue, training "back of house" staff, and setting higher standards for vendors.

Generally, pre-event planning steps can include:

- Selecting the venue
- Minimizing waste up-stream (e.g., caterer requirements)
    - Develop and provide list of acceptable items and food guidelines and serving ware
- Potentially develop and have vendors sign a zero waste contract
- Pre-event publicity efforts
- Volunteer training

Event set up and tear down can include:

- During event publicity (e.g., signage, mobile apps to reduce paper)
    - Venue map and resource recovery stations
- Volunteer arrival – review responsibilities
- Set up resource recovery stations with proper signage and trained volunteers
- Monitor stations
- Take measurements, as appropriate (e.g., weigh and record bags of compostables, recyclables, garbage)
- Clean up

After event evaluations can include:

- Collect feedback from volunteers
- Collect feedback from attendees
- Create a report to include measurements and whether goals were achieved
- Share the experience

POTENTIAL STRATEGIES

- Develop and provide a guide for zero waste / reduction of waste for other County departments for public events.
- Develop and adopt a policy requiring zero or low waste events on County property.
- Establish or promote zero waste to landfill certification program and train County Solid Waste staff to issue "zero waste" certifications for businesses in the County (Appropriate programs would need to be available for reduction, reuse, and recycling efforts associated with zero waste for this strategy to be viable.)

2.3 Collection and Transfer

Collection services for municipal solid waste (MSW) throughout the County are provided in a variety of ways. Each of the 24 municipalities within the County has organized collection for at least

residential curbside service, either through municipal collection crews or through exclusive franchise agreements/service contracts. In the unincorporated areas of the County, there is currently one Municipal Services Benefit Unit (MSBU), the Lealman MSBU, that has organized collection services through an exclusive franchise agreement. The remaining unincorporated area has collection services offered by eight different licensed haulers, where the resident selects which, if any, hauler to subscribe for curbside collection services. Residents in the remaining unincorporated area may elect to use one of the County's citizen drop-off centers in lieu of contracting with a hauler for curbside service. Collection services for multifamily and commercial units vary by jurisdiction. Table 2-1 summarizes the mechanism for collection of municipal solid waste by customer type (e.g., single family, multifamily, commercial) across the County.

Table 2-1 Mechanism for collection of municipal solid waste by customer type

	Single family	Multifamily[1]	Commercial[2]
Municipal crew	10 municipalities	10 municipalities	10 municipalities
Exclusive franchise/ service contract	14 municipalities and Lealman MSBU	13 municipalities and Lealman MSBU	11 municipalities
Licensed hauler by subscription	Remaining unincorporated	Remaining unincorporated	None
Open market	None	None	Town of Redington Beach, Lealman and remaining unincorporated area

[1] The Town of Belleair Shore has no multifamily units in its jurisdiction.
[2] The Towns of Belleair Beach and Belleair Shore have no commercial units in their jurisdictions.

As shown in Table 2-1, a majority of jurisdictions within the County use a private hauler via an exclusive franchise agreement or service contract to provide collection services. The only open market collection of municipal solid waste occurs in the commercial sector for one town with very few commercial units and the unincorporated areas of the County.

Nine of the municipalities provide a separate yard waste collection service for single family units. The rest of the jurisdictions within the County, including the Lealman MSBU and the remaining unincorporated areas, provide yard waste commingled with MSW, rather than as a separate collection. Only four jurisdictions within the County offer a separate yard waste collection service for multifamily units and commercial units.

Recyclables collection for single family units is offered by subscription in the Lealman MSBU and the remaining unincorporated areas of the County, while each of the municipalities provides recyclables collection as part of standard service. Fourteen municipalities provide recyclables collection using bins, and ten municipalities use carts for recyclables collection. Seven jurisdictions within the County, including Lealman MSBU and remaining unincorporated areas, leave recyclables collection for multifamily units to the open market. Commercial recyclables cannot be exclusively franchised or municipally controlled, per State Statute, and therefore is an open market for the entire County; however, seven municipalities compete in the open market to provide the service with municipal crews in their respective jurisdictions. Note that in 2018, the City of Treasure Island voted to repeal and replace its solid waste ordinance in order to better promote recycling. One of the new clauses included in the revised ordinance requires commercial establishments to conduct waste audits at least once every five years in an effort to help businesses identify items that could be recycled and implement appropriate recycling programs.

Bulky waste collection is provided on an as requested or special appointment basis in seventeen jurisdictions while nine jurisdictions offer bulky waste on a pre-scheduled basis (i.e., 1 x week, or 4 x year).

The County currently encourages commercial units to "recycle and reuse" through its Cutting Waste at Work (CWW) program, which evaluates collection and disposal of trash, recycling, yard waste, and disposal of chemicals and electronics (including things like grease waste and motor oil). In 2017, the CWW program resulted in 10 assessments, out of which 5 recycling programs were implemented. Assessments in 2018 have surpassed those in 2017, with 16 assessments out of which 2 recycling programs have been confirmed at the time of this writing.

Only four municipalities within the County exclusively control the collection of Construction and Demolition Debris; all other jurisdictions in the County leave C&D collection to the open market.

The County owns and operates 25 Beach & Park Recycling Locations (BPRL) and 14 Collection Centers (CC) where residents can drop off recyclable materials. The CC at the Disposal Complex is called the "Recycling Drop Off Center" and is located near the HEC_3 where residents can drop off cardboard, paper, plastic and glass containers and aluminum and steel cans. Beach and Park Recycling Locations are also in parks and beaches owned and operated by municipalities. Over 500 collection containers with 32-gallon capacity each are part of the program. With the exception of two locations, the CC locations are owned by the County. These locations, spread throughout the County, provide Pinellas County residents with multiple additional options to recycle. The CC locations are serviced by a contracted private entity (Waste Management, Inc.). Waste Management is responsible for processing and marketing collected recyclables at their privately-owned materials recycling facility (MRF) located in Tampa. In addition to the 39 drop off facilities owned and operated by the County (25 BPRL and 14 CC), 13 other drop off facilities are available through municipalities within the County, for a total of 52 drop off locations.

2.3.1 Assessment of Organizing Collection in Unincorporated Area of County

The unincorporated area of the County (not including the Lealman MSBU) is the only portion of the County that does not currently have organized collection with one service provider for single family and multifamily units, and one of only three jurisdictions in the County without one service provider for commercial units. This portion of the unincorporated area of the County, excluding Lealman MSBU, is estimated to have roughly 100,000 single family units, 50,000 multifamily units, and 100,000 commercial units, which is the largest potential service area compared to any of the other jurisdictions (i.e., the 24 municipalities and Lealman MSBU) within the County.

With the current licensing procedure in place, there is potential for multiple collection vehicles to be operating on the same streets on any given day, which can mean additional traffic congestion and "wear and tear" on roads. It can also impact aesthetics on the street with collection containers at the curb on any day of the week. Multiple collection vehicles serving the same area can also limit operational efficiencies, especially for single family units, as it is more efficient to collect from each single family unit on the street rather than only certain homes. Public safety is also improved with fewer collection vehicles operating on each street.

The economies of scale are improved with a single service provider in a given area, which typically means lower operating costs and therefore lower rates to customers for the same level of service. The average rate charged by the licensed residential haulers currently providing subscription curbside service in the unincorporated area of the County is not known, as the County does not currently regulate rates among these haulers; how many homes currently subscribing for curbside service is also unknown, and not regulated by the County.

The Lealman MSBU service rates are currently $16.00 per household per month for curbside garbage and bulky waste collection, and an additional $3.00 per household per month for optional recyclables collection. The monthly per household rates in the municipalities within the County range from approximately $11 to slightly over $30, with an average of roughly $19 per household per month; some of the variability in these rates is likely in part attributable to varying degrees of

level of service, and in part due to varying size of service area. The rates for customers in the remaining unincorporated area are unknown, but it is believed the rates can vary even with the same hauler offering services to different customers.

A legal aspect to consider for organizing collection services with one service provider is commonly referred to as the "Displacement Law", specifically Florida Statute 403.70605 (3) - DISPLACEMENT OF PRIVATE WASTE COMPANIES. The section reads in relevant parts:

> *(a) As used in this subsection, the term "displacement" means a local government's provision of a collection service which prohibits a private company from continuing to provide the same service that it was providing when the decision to displace was made.*
>
> *(b) A local government or combination of local governments may not displace a private company that provides garbage, trash, or refuse collection service without first:*
>
> *1. Holding at least one public hearing seeking comment on the advisability of the local government or combination of local governments providing the service.*
>
> *2. Providing at least 45 days' written notice of the hearing, delivered by first-class mail to all private companies that provide the service within the jurisdiction.*
>
> *3. Providing public notice of the hearing.*
>
> *(c) Following the final public hearing held under paragraph (b), but not later than 1 year after the hearing, the local government may proceed to take those measures necessary to provide the service.* ***A local government shall provide 3 years' notice to a private company before it engages in the actual provision of the service that displaces the company. As an alternative to delaying displacement 3 years, a local government may pay a displaced company an amount equal to the company's preceding 15 months' gross receipts for the displaced service in the displacement area.*** *The 3-year notice period shall lapse as to any private company being displaced when the company ceases to provide service within the displacement area. Nothing in this paragraph prohibits the local government and the company from voluntarily negotiating a different notice period or amount of compensation.*

As stated in F.S. 403.70605 (3), the implementation of organized collection with one service provider could require three years' notice or paying displaced haulers 15 months' gross receipts in lieu of the three year waiting period.

Table 2-2 summarizes advantages and disadvantages of organizing collection with one service provider.

Table 2-2 Summary of advantages and disadvantages

Organized collection with one service provider	
Advantages	**Disadvantages**
• Provides the County with the most control over collection services (frequency, style, material types including recyclable materials, customer service; and increased control and coordination abilities after a disaster)	• Customers do not get a choice in service provider
• Less large vehicle traffic on streets (increased public safety, fewer emissions, less wear and tear on roads)	• Implementation could displace some haulers, which may require additional implementation steps, per F.S. 403.40605 (3)

Organized collection with one service provider	
Advantages	**Disadvantages**
• Better potential aesthetics with collection containers only at the curb on specified collection day(s) for each street	• Cost per household, though typically lower for same services, could be higher if level of service is higher than what the customer previously received in subscription service
• Economies of scale with one service provider could mean more efficient and therefore less expensive collection costs (depending on services included)	

Organizing collection with one service provider in a given area can be accomplished through municipal collection where the County provides collection services with its own personnel and equipment, or it can be accomplished through an exclusive franchise agreement/service contract. There are a variety of approaches for an exclusive franchise agreement, as well as advantages and disadvantages for each summarized in Table 2-3.

Table 2-3 Approaches for an exclusive franchise agreement

Name	Description	Advantages	Disadvantages
Exclusive franchise, subscription	One hauler per service area; residents subscribe for garbage, recyclables, yard waste and/or bulk waste service	• One hauler/agreement to administer • Less large vehicle traffic on streets • More County control over hauler performance	• No guarantee of customer base for hauler (difficult for pricing) • No choice of hauler for residents • Implementation could displace haulers
Exclusive franchise, universal	One hauler per service area; residents required to pay for garbage (and perhaps recycling service, as a policy decision)	• One hauler/ agreement to administer • Guaranteed customer base and economies of scale • Recycling participation may increase if residents are required to pay for the service • Less large vehicle traffic on streets • More County control over hauler performance and customer service	• No choice of hauler for residents • Residents have to pay for service • Implementation could displace haulers
Exclusive franchise, hybrid	One hauler per service area; could require garbage collection (universal), require the hauler to offer additional services such as separate yard waste or recycling collection, but let the additional collection services be subscription based (resident subscribes)	• One hauler/ agreement to administer • Guaranteed customer base for garbage collection • Residents could choose to subscribe for recycling (or not) • Less large vehicle traffic on streets • More County control over hauler performance and customer service	• No choice of hauler for residents • Residents have to pay for garbage collection • May discourage recycling participation • Implementation could displace haulers

Because of the size of the service area, dividing the unincorporated area into more than one zone is possible. If the County elected to conduct the services with County personnel and equipment, multiple zones would not be necessary unless a policy decision was made to create different zones to accommodate more difficult to serve areas separately from standard curbside service, which could mean different rates (more closely aligned to cost of service) depending on the zone. It is worth noting that if the County were to perform the collection services with County personnel and equipment, it would be a major administrative and operational undertaking for the County, since this service has historically been provided by the private sector. Some administrative and operational tasks would include specifying and purchasing the appropriate number of collection vehicles; hiring and training appropriate new personnel; providing for collection vehicle maintenance; providing for overnight vehicle storage and fueling; providing for driver and administrative staff office and training facilities; and many other operational and administrative efforts.

Multiple zones could be considered if an exclusive franchise approach is preferred in order to allow more than one hauler to continue to provide service and would not necessarily be limited to creating zones based on difficulty to serve. Size of the service area(s) can impact competition during a procurement process, and should be considered when determining if, and how many, zones to designate in the unincorporated area of the County.

POTENTIAL STRATEGIES

- Organize collection services with County as the service provider (i.e., using County personnel and equipment)
    - One zone, unless difficult to serve areas are handled separately (policy decision)
    - Could include single family, multifamily, and commercial
    - Could include only residential curbside service, leaving commercial service to open market
    - Could be subscription based, universal for all service covered, or hybrid of universal for some services, and subscription for other services
- Organize collection services using exclusive franchise/ service contract
    - One zone or multiple zones
    - Could include single family, multifamily, and commercial
    - Could include only curbside service, leaving dumpster service to open market
    - Could be subscription based, universal for all service covered, or hybrid of universal for some services, and subscription for other services
- If commercial units are not included in organized collection, the County could expand the CWW program assessments to include ensuring minimum standards of solid waste and recycling collection services are adequately provided, which may require ordinance revisions to regulate flow of waste and minimum standards of solid waste management for commercial units.

NEXT STEPS

- Survey current licensed haulers to obtain opinions regarding one service provider, and opinion on whether and how many multiple zones within the service area.
- Begin process required in the “Displacement Law”.
- Survey customers to obtain information on current rates paid, opinions regarding one service provider, and whether preference for subscription based or universal basic service, and which services should be included.
- Determine whether to use County personnel and equipment, or to use exclusive franchise approach.
- Determine how many zones are appropriate, which may require an operational and economic review of the service area, including taking into consideration the many

unincorporated out-parcels throughout the County, some of which are serviced by municipalities.

- Determine which services, for which customer classes, are to be included and whether and which services are subscription, universal, or hybrid.
- If commercial units are not included in organized collection, determine appropriate standards to be added, via ordinance, to better regulate and assess commercial solid waste services.
- Develop interlocal agreements with municipalities in enclave areas

2.3.2 Assessment of Need for Additional Citizen Drop-off Center

From discussions with the County and reviewing waste collection data from 25 Beach & Park Recycling Locations (BPRL) and 14 Collection Centers (CC) previously provided by the County (see Baseline Report), and the additional 13 municipality provided drop off facilities, the 52 locations appear to adequately serve the unincorporated and incorporated areas of the County. Although there are differences in solid waste systems across different counties, Table 2-4 provides a comparison of the land area and their respective number of drop off locations. As shown, Pinellas County provides the greatest number of drop offs, and the fewest square miles of land area.

Table 2-4 Comparison of land area and drop off locations

County	Land area (sq. miles)	Drop off locations
Pinellas County	274	52
Broward County	1,210	4
Hillsborough County	1,020	7
Pasco County	747	6

In the future, should capacity at a certain County-owned drop off location become an issue, the County may consider adding additional bins to those locations as space allows, which would require a site assessment to determine whether site modifications would be needed to accommodate additional bins. If the County opts for organizing collection in the unincorporated area of the County, the need for drop off locations may decline.

POTENTIAL STRATEGIES

- Monitor capacity needs at existing drop off locations.
- If the County does not organize collection in the unincorporated area, determine the need for an additional CC in the north part unincorporated area, for convenience purposes (capacity does not appear to be an issue).

NEXT STEPS

- As part of surveying customers described in Section 2.3. Next Steps above (Organize Collection), seek opinion on need for CC in the area.

2.3.3 Assessment of the Need for Transfer Station

In 2007, HDR prepared a report titled the “North Pinellas County Transfer Station Conceptual Feasibility Report”. This report analyzed the feasibility of siting and operating a transfer station in the north end of the County. The report was developed at the request of the City of Dunedin through the Technical Management Committee. Transfer Station development is governed under County Code 106-61 which states in relevant part:

Where economically feasible or advantageous, the governing body may, with the recommendation of the technical management committee, construct a transfer station in a designated district within

the county for the purpose of receiving solid waste collected municipally or privately so that it may be transported from the transfer station to the disposal site more efficiently. Such special districts shall be on a self-supporting, cost recovery basis in the same manner as is provided for in section 106-55.

The report evaluated two primary options:

- Option 1 – A transfer station located near Dunedin serving the County areas north of the City of Clearwater
- Option 2 – A new larger transfer station located at the site of the existing Clearwater transfer station serving all of the north County area.

The conclusion of this study determined that the operation of a transfer station increased system operating costs. It should be noted that the study was based solely on economic and cost factors and additional considerations such as public convenience benefits, increased maintenance and replacement schedules for equipment and increased congestion were not factored into the analysis and could be defined as advantageous under § 106-61. The study acknowledged that policy issues would need to be evaluated if the County chose to take the analysis further including:

- Analysis of variable tipping fees
- Facility Utilization
- Other Services
- Financial Assumptions
- Public/Private Operation
- Transportation Impacts
- Environmental Impact Statement

In the purest of connotation, transfer stations are just that, a mechanism to mobilize materials from one form of transportation to another - in this case, residential collection trucks to 100 cubic yard transfer trailers. As populations increase and development areas in-fill, the increasing impact of traffic needs to be considered. Along with this impact which is mostly a function of time, the impacts to collection route efficiency need to be considered. Collection trucks that spend more time traveling between the route and disposal take away from the time spent servicing their routes resulting in a cost impact that goes beyond the County's system costs. It is difficult to justify the expenditures of County funds for a transfer station if cost savings are not captured. The impact on fees and the need for fee increases or development of a tiered rate structure would need to be considered.

POTENTIAL STRATEGIES

- If it is determined to go forward for policy reasons in support of County Code § 106-61, it is recommended to establish Interlocal agreements centered on providing flow to the Transfer Station to ensure financial viability.
- Consider additional services to compliment the transfer station operations including yard waste collection and processing, household chemical collection and consolidation, and bulky waste drop off and management.
- Develop capacity for management and/or preprocessing of recyclables for delivery to processors. Provide an opportunity for contract consolidation between the municipalities and the County for processing contract solicitation.
- Develop system pricing impacts and variable rate structure or service/tax beneficial units needed to support increased costs.

NEXT STEPS

- Confirm that non-economic factors are sufficient to drive the need for an additional transfer station.

2.4 Processing

For the last six years, the WTE has been operating at between 80 to 90 percent of its guaranteed minimum processing capacity of 930,000 tons. Actual processing capacity can exceed the guaranteed minimum processing capacity depending on actual operating experience. Potential available capacity could be as high as 1,060,000 tons per year (3,150 tons per day at 92% availability). In the past, the County has temporarily landfilled processable waste during WTE downtimes and then recovered that waste when the WTE came back on-line. Although this practice is not standard procedure or required, the availability of this practice could ensure continuous tonnage to the WTE, during periods when waste flow is below the WTE processing capacity.

The annual waste (processable and non-processable combined) delivered to the Disposal Complex is in excess of the WTE guaranteed minimum processing capacity of 930,000 tons (annually). This excess waste is either landfilled, recycled/beneficially, re-used, or mulched at the Disposal Complex. In 2017, the WTE combusted 0.79 million tons out of 1.20 million tons delivered at the Disposal Complex.

2.4.1 Assessment of the Traffic Flow at the Disposal Complex

With commercial operation started in 1983, the Pinellas County Disposal Complex has successfully serviced the community for over 35 years. Over the course of this service, the waste industry and demands on the solid waste system in the County have evolved. Originally developed as a landfill for ash residue and some overflow waste as well as the Waste-to-Energy facility itself, the majority of traffic and its management was placed with these services in mind. Over the years, additional services, administrative offices, the Citizens Hand Unloading Area, the Household Electronics and Chemical Collection Center (HEC_3) have all been additions to enhance the operation of the Disposal Complex. Further, waste streams have been increased such that certain materials that were typically co-mingled with MSW have outgrown their ability to be incorporated in the waste stream at the WTE facility. These include unprocessed yard waste, tires, bulky waste and the aforementioned hand unloaded materials. While traffic flow generally functions well, the facility experiences issues on high traffic days and seasons, during periods of material diversions during facility outages and as a result of ever increasing waste deliveries.

Photo 2-1 Disposal complex

POTENTIAL STRATEGIES

- Develop a master traffic plan to examine realigning traffic patterns and/or relocating services including scale location
- Develop alternative access points to the facility to diversify site travel and eliminate concentration on front end of the facility.
- Expand the WTE tipping floor to manage additional traffic, control litter and odors, and assist with management of bulky materials.

NEXT STEPS

- Develop cost estimate for covered tip floor expansion and evaluate impacts to the facility service agreement.
- Analyze traffic counts by materials to determine site traffic conflicts and growth of traffic over the plan period.

2.4.2 Assessment of Management of Excess Waste Deliveries to the Disposal Complex

Historic tonnage data delivered to the Disposal Complex was analyzed in the Baseline Report. It showed that since the 2012-2014 timeframe, landfilled quantities have increased slightly; whereas incinerated waste quantities have decreased slightly in the 2015-2017 timeframe. The recent decrease in incinerated waste quantities was due to increased downtime at the WTE facility related to implementation of equipment upgrades and improvements per the Technical Recovery Plan (TRP). The TRP is a $240 million plus multiyear capital improvement program initiated as part of the Service Agreement the County executed with Covanta who took over operation of the Facility in 2014. Under the TRP, Covanta is implementing various projects at the WTE facility to improve performance levels, including availability, throughput, energy generation, and utility and reagent utilization.

Historically, as much as 200,000 tons per year of MSW have been disposed in the Bridgeway Acres Landfill. As a result of the improvement in availability due to the TRP, this is expected to decrease. However, over time, the amount of MSW potentially deliverable to the Disposal Complex is expected to increase to over 1.2 million tons during the planning period.

The WTE is designed to process up to 3,150 tons per day although recent operational history indicates values between 2,800 and 3,000 are more typical and practical based on other operational constraints. Because of scheduled and unscheduled outages, guaranteed processing capacity for the WTE is 930,000 tons per year. Additionally, the County has agreed to make 810,000 tons of base delivery amount per year (minimum) available to Covanta. On an annual basis, the actual capacity utilized (defined in this report as a ratio of waste incinerated at the WTE to guaranteed processing capacity) fluctuates between 80 and 90 percent.

Waste available to the WTE is projected using historical tonnages of processable waste and Countywide generated waste. Based on 2016 and 2017 tonnage data analysis, approximately 37.5 percent of total County-wide generated waste is processed at the WTE, and 11.5 percent of total County-wide generated waste is disposed at the Bridgeway Acres Landfill. Assuming a maximum of 49 percent of the County-wide generated waste will be available to the WTE as potentially processable waste, projections for processable waste available to the WTE were calculated and shown in the Baseline Report. Waste available to the WTE currently exceeds the guaranteed processing capacity of 930,000 tons per year; this excess waste, above guaranteed processing capacity, increases from approximately 101,000 tons in 2018 to approximately 275,000 tons in 2048, based on the projections. Potential available capacity in some years could be as high as 1,090,000 tons per year. Were the Facility to actually operate at these levels on a ‘year in year out’ basis in the near term, it would delay the need to dispose or find alternative diversion programs for such excess waste into the next decade.

As indicated, depending on the actual waste quantities received, which will be affected in part by changes in the County’s diversion/recycling programs, reducing the amount of excess waste will contribute to extending the life of the Bridgeway Acres Landfill. This will require the addition of processing capacity at the Disposal Complex or arranging alternate off-site processing/disposal options.

Waste-to-Energy facilities are capable of processing a steady stream influx of fuel, in this case MSW, over the course of their near 24/7 operations. Waste deliveries, as is current practice, function on a working day and working hours schedule. Hours at the Solid Waste Disposal Facility are 6 AM to 6 PM, Mon–Fri and 7 AM to 5 PM Saturday. On a typical six day delivery week, the facility must collect over seven (7) days of processing capacity. At a throughput of 2800-3000 tons per day, the Pinellas facility must receive approximately 19,600 – 21,000 tons per week when running at full demonstrated capacity. On a six (6) day delivery schedule this results in over 3300-3500 tons per day or approximately 275-292 tons per hour which is equivalent to 20 route trucks serviced per hour.

Waste receipts at the Disposal Complex are fairly consistent with little seasonality as reflected in Figure 2-1. Although the period between October and February trends slightly lower than the remainder of the year, the difference is only about 8 percent or approximately 7,000 tons per month. With a peak monthly through put of just over 85,000 tons per month, the available monthly waste is currently less than capacity in some months. During scheduled and unscheduled outages, the processing capacity decreases resulting in a net positive available waste quantity. It is not uncommon that this overage of materials needs to be diverted directly to landfill disposal during these periods due to lack of pit space due to the increased load. Conversely, during the late fall into

winter months, the operational load at the facility needs to be reduced due to the unavailability of MSW deliveries.

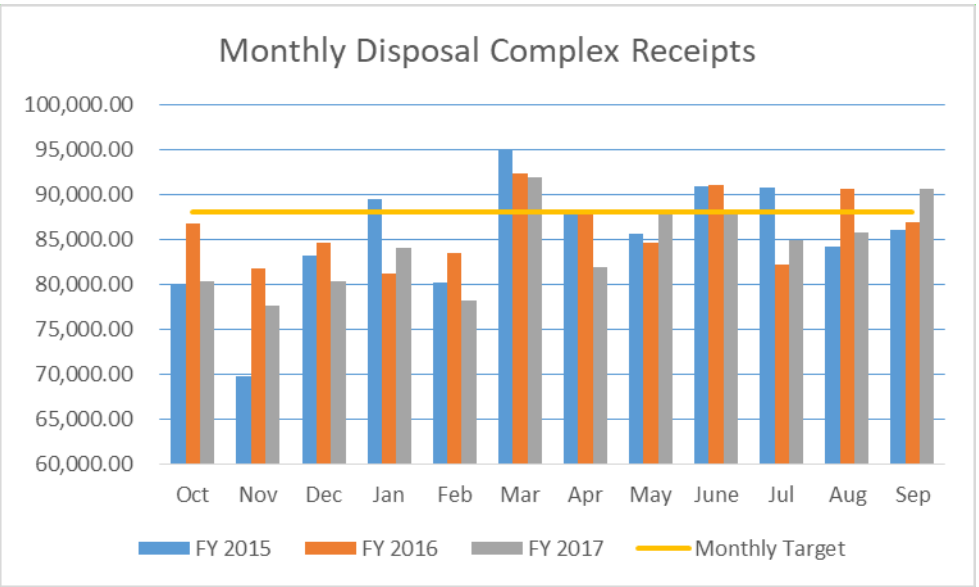

Figure 2-1 Monthly disposal complex receipts

One approach to leveling throughput is to stockpile waste during peak periods/outages and deliver that waste during periods with available capacity. Ecomaine in Portland, ME has utilized a system of encapsulation to support low volume periods in the winter. Waste is collected, “bagged” and stored on the surface of their landfill. During low volume periods, these pods are delivered on demand for introduction into the waste pit. While this particular approach of encapsulation in plastic bales may not be directly applicable to Pinellas County, this example shows a balance between facility operations and fluctuating delivery differences.

POTENTIAL STRATEGIES

- Increase pit storage volume to stretch out high volume delivery periods during outages or seasonal fluctuations.
- Continue to landfill excess waste deliveries for excavation/mining during low periods.
- Evaluate storage systems for economical waste storage and retrieval including technologies to stabilize waste and reduce impacts from Florida’s warm and wet environment.
- Expand processing capacity.

NEXT STEPS

- Evaluate inventory modelling to support up to 4,000 tpd deliveries.
- Evaluate engineering and financial impacts of pit expansion.
- Evaluate engineering, environmental and financial impacts of facility expansion.
- Further review industry technologies for waste encapsulation.

2.4.3 Assessment of upgrading WTE to most modern technology and best capacity

The WTE facility is well operated and is in compliance with permit conditions as established by FDEP and the EPA. Each combustor is equipped with state-of-the-art air pollution control equipment that consists of a spray dryer absorber (SDA) to capture acid gases, a fabric filter (FF) to capture particulates, a selective non-catalytic reduction (SNCR) system for nitrogen oxides (NOx) control, and a powdered activated carbon injection system (PACIS) to aid in capturing mercury and dioxins. Portions of the TRP included investment in air pollution control and emission monitoring equipment improvements.

Over the planning period, additional changes in regulatory emission limits are possible. Covanta is the largest operator of WTE facilities in the US and closely monitors developments/improvements in technology. Any potential future change in regulation would be subject to an assessment of the changes needed, if any, to comply with the new requirements and implemented in accordance with the provisions of the Service Agreement.

The design of the facility is centered on certain assumptions, such as fuel heating value and heat transfer efficiency. If the average heating value of the fuel, the solid waste, increases, throughput decreases and conversely when the heating value decreases, throughput increases. The best example of this is demonstrated by the average throughput during wet and dry seasons. During wet periods, even with lidded residential garbage carts, the moisture content of the waste increases. The resultant increase in throughput is offset by increased water vapor and treatment in the flue gas stream. Supplementation with low heating value wastes can help to increase throughput for the same resultant Btu value needed for steam production. A recent example that has been permitted at several facilities is biosolids which are under continuing scrutiny for land application and other disposal methods.

A second assumption is the heat transfer to convert boiler water to super-heated steam. Most of the metal alloys used in water walls, economizers, superheaters and evaporators are chosen for the combination of effective heat transfer, structural integrity and corrosion resistance. Although not available currently, future advancements in available alloys that maximize these properties may have the ability to provide more efficient heating transfer and thus greater steam flow which yields greater electrical generation. Lastly, the operation of the facility draws a parasitic load typically around 10 to 15 percent of the gross generation of electricity. Steps to offset this parasitic load would help to increase the available power to export.

Unlike the examples above using efficiencies in facility operations to yield more gross power, additional onsite power generation can take advantage of favorable energy values in the current PPA to justify capital expense prior to the PPA expiration in 2024. Some of these technologies include solar energy generation on areas such as facility and solid waste division roofing or on southern facing intermediate or final closed landfill surfaces. This may include Toytown but analysis of connecting to the internal transmission services would need to be examined. The County has had recent conversations with Duke Energy regarding the implementation of solar power at the facility. To date these conversations have not produced interest in development of solar at the facility as the projects have not met Duke's economic criteria. Another power generating strategy is landfill gas to energy. Both solar and landfill gas to energy are well understood technologies and costs are well established to determine financial viability. Prior to evaluating this feasibility, the ability to generate power on site needs to be evaluated against Public Service Commission regulations and current approvals as well as the ability to yield up to gross power output under the PPA.

POTENTIAL STRATEGIES

- Continue staff's active participation in industry associations.
- Continue to monitor regulatory activity on an ongoing basis.
- Investigate and develop alternative power-producing opportunities at the Disposal Complex.

NEXT STEPS

- Continue monitoring ongoing developments in WTE technology.
- Evaluate allowances under PSC approvals for power generation.
- Analyze PPA for restrictions on net power output.
- Analyze feasibility of power transmission from Toytown to Disposal Complex.

2.5 Disposal

As shown in Table 2-5, historically over 200,000 tons per year of MSW has been landfilled at the Bridgeway Acres Landfill (not including ash).

Table 2-5 MSW processed/disposed FY 2015-2018

	Landfill				WTE			
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2015	FY 2016	FY 2017	FY 2018
Oct	5,805.39	29,883.30	25,163.79	25,163.79	74,154.43	56,828.88	55,139.51	76,440.29
Nov	5,914.81	47,244.56	56,190.19	56,190.19	63,810.59	34,481.19	21,347.53	74,832.42
Dec	56,959.09	15,407.27	26,031.21	26,007.01	26,277.27	69,158.05	54,262.86	75,547.93
Jan	19,364.14	5,677.77	7,745.67	7,745.67	70,101.98	75,427.28	76,266.90	79,278.95
Feb	8,230.90	16,759.89	4,825.52	4,804.04	71,998.11	66,701.18	73,381.94	73,381.94
Mar	34,598.43	46,285.67	28,950.95	28,950.95	60,434.87	46,036.28	62,957.96	86,932.73
Apr	31,068.66	24,058.71	38,085.43	38,085.43	56,956.17	63,692.09	43,842.17	77,842.12
May	24,472.26	19,234.18	13,495.36	13,501.32	61,165.52	65,328.29	74,831.62	83,547.60
June	13,970.49	4,375.96	5,776.44	5,781.19	76,962.80	86,625.13	82,055.39	82,915.62
Jul	11,821.47	4,835.87	5,348.72	5,352.89	78,861.89	77,338.83	79,479.52	80,063.73
Aug	10,032.01	3,889.14	5,041.88	4,911.71	74,072.57	86,736.81	80,765.55	81,498.70
Sep	9,029.65	16,264.35	19,341.08	19,266.83	76,979.65	70,616.72	71,199.27	86,955.62
Total	231,267.30	233,916.67	235,996.24	235,761.02	791,775.85	798,970.73	775,530.22	959,237.65
Data: Monthly Destination Summary Scale Report Total landfilled waste. Does not include ash.					1,023,043.15	1,032,887.40	1,011,526.46	1,194,998.67

The Bridgeway Acres Landfill is a critical component of the County's system. Preservation of the air space and extension of the landfill life is critical to the continued viability of the County's program. The following sections address potential approaches to extending the landfill life.

2.5.1 Assessment of Amending Permit for Vertical and Horizontal Expansion

One approach to extend the landfill life is to reduce the amount of material being placed in the landfill. The other option is to expand the capacity. Horizontal and vertical expansions of landfills represent commonplace actions toward achieving additional airspace. As such, they are subject to the permitting requirements of Chapter 62-701, F.A.C. Often, the first hurdle for landfill expansion lies with local zoning and siting codes. Horizontal expansions must be evaluated based on land use if the land use designation needs modification, proper zoning and analysis of any siting criteria that would prevent landfill development. These include:

- Geologic conditions that wouldn't provide foundation support
- Distance to potable water sources
- Distance to jurisdictional wetlands
- Distance to airplane runways
- Historical or cultural artifacts
- Endangered species or other wildlife prohibitions
- Floodplain location and impacts

As vertical expansions are located on areas that already contain waste and have met typical siting requirements, they are governed by additional criteria in Rule 62-701.430, F.A.C. as shown below. In some cases, local zoning regulations need to be consulted as there may be criteria related to limited heights due to local aesthetics or runway flight paths or other limiting criteria.

62-701.430 Vertical Expansion of Landfills.

(1) Applicability. Construction of a solid waste disposal unit on top of or against the side slopes of a previously filled landfill, whether active, closed, or inactive is considered vertical expansion of that landfill. Vertical expansion shall require either a modification of the landfill permit, or a new permit if the landfill has been

closed. If a landfill has not been closed at the time of the vertical expansion, then the closure requirements of that landfill will apply at the time of closure of the vertical expansion, unless the closure requirements for the vertical expansion are more stringent. The following requirements shall apply:

(a) The vertical expansion shall not cause or contribute to any violations of water quality standards or criteria, shall not cause objectionable odors, and shall not adversely affect the closure design of the existing landfill.

(b) For vertical expansion over lined landfills, no interface liner is required between the old and new landfill slopes.

(c) For vertical expansion over landfills that were not constructed with a liner system or were not constructed in accordance with permit requirements, the vertical expansion shall comply with all the requirements of rule 62-701.400, F.A.C., with the following exceptions:

1. Side slopes of six feet horizontal to one foot vertical rise or steeper require the installation of a single geomembrane slope liner overlain by a leachate collection and removal system.

2. The slope liner shall consist of a 60-mil or thicker HDPE geomembrane.

3. The liner shall be protected from physical damage by a 24-inch thick protective layer above the liner and a bedding layer below the liner at least 24 inches thick to protect against the calculated differential settlement.

4. In all vertical expansion construction, grades shall slope toward the new expansion area.

5. If the vertical expansion consists exclusively of construction and demolition debris, the expansion must comply with the requirements of rule 62-701.730, F.A.C., as well as paragraph (a) of this subsection. If the vertical expansion consists exclusively of land clearing debris, the expansion must comply with the requirements of rule 62-701.803, F.A.C., as well as paragraph (a) of this subsection.

6. If the vertical expansion consists of a composting operation, it must meet the requirements of chapter 62-709, F.A.C., as well as paragraph (a), of this subsection.

7. If the vertical expansion consists of a Class III landfill, the provisions of paragraph 62-701.340(3)(c), F.A.C., apply.

(d) The provisions of subsection 62-701.610(1), F.A.C., are applicable to all operations, including recycling operations, conducted on top of closed landfills.

Vertical Expansion of Landfills and Airport Safety

62-701.320 Solid Waste Management Facility Permit Requirements specifically addresses airport safety requirements and the proximity to landfills.

(13) Solid waste management facilities where waste is stored, disposed, or processed outdoors, shall not be located within 10,000 feet of any licensed and operating airport runway used by turbine powered aircraft, or within 5,000 feet of any licensed and operating airport runway used only by piston engine aircraft, unless the applicant demonstrates that the facility is designed and will be operated so that it does not pose a bird hazard to aircraft.

Operators at the County's Bridgeway Acres Class I Landfill do not place putresible waste within 10,000 feet of the St. Pete-Clearwater International Airport runway and thereby does not pose a bird hazard. A vertical expansion of the landfill would not pose a bird hazard as long as the 10,000 foot non-puterescible limit is maintained following the expansion.

The Federal Aviation Administration (FAA) also has requirements for proposed construction or alteration of facilities within 20,000 feet, 10,000 feet, and 5,000 feet of airport runways under "Notification of Proposed

Construction or Alteration on Airport Part 77". If requested by the FAA, an applicant must apply and be approved for the following:

77.9 (a) Any construction or alteration that is more than 200 ft. AGL (above ground level) at its site.

77.9 (b) Any construction or alteration that exceeds an imaginary surface extending outward and upward at any of the following slopes:

(1) 100 to 1 for a horizontal distance of 20,000 ft. from the nearest point of the nearest runway…

(2) 50 to 1 for a horizontal distance of 10,000 ft. from the nearest point of the nearest runway…

(3) 25 to 1 for a horizontal distance of 5,000 ft. from the nearest point of the nearest runway…

The St. Pete-Clearwater International Airport's nearest runway is approximately 7,414 feet from the limits of waste of the landfill. The current permitted height of the landfill is 90 feet above sea level. A desktop study as shown below indicates that at that distance between the airport runway and the closest point of the landfill, a vertical expansion at the toe of slope could be at approximately 151 feet elevation before intercepting the FAA glide path rules for alterations within 10,000 feet but further than 5,000 feet away from the edge of the airport's runway. Economic feasibility studies of MS berms constructed at landfills indicate a general berm height limit of approximately 60-feet.

2.5.2 Assessment of Vertical Expansion of Landfills using Mechanically-Stabilized Berms

WTE ash disposed is oftentimes placed using traditional filling techniques, sometimes in combination with raw MSW, in lined landfills with side slopes typically of 3 horizontal to 1 vertical similar to that of lined municipal solid waste (MSW) landfills. However, by integrating a portion of the ash that is produced at the WTE facility into an alternative use, the landfill can realize significant additional airspace by re-designing and re-developing the sideslopes as a vertical expansion utilizing a mechanically stabilized berm design along sections of, or around the entire, perimeter of the lined landfill.

In MSW landfills, most mechanically-stabilized berms are made of compacted soils and high-density polyethylene (HDPE) geogrid. They are typically used in designs developed to increase landfill capacity as a vertical expansion without having to expand the footprint of the landfill. At Class I landfills that accept WTE ash such as the Pinellas County's Bridgeway Acres Class I Landfill, some of the ash generated at the facility can be diverted and processed for use as a replacement for soil within the lined area for building the berm. The HDPE geogrid is compatible with the WTE ash, and the processed ash has properties that can be suitable for mechanically stabilized (MS) berm construction and long-term performance.

The traditional filling operations at Class I landfills that accept WTE ash generally place the ash/MSW in lifts of 8 feet or use the ash as a cover material over putrescible waste. However, when constructing an MS berm utilizing the ash at the landfill, a third type of application can be identified in which a portion of the WTE ash produced is diverted for additional screening and processing for use in the berm construction. Under this scenario the berm is constructed as an additional waste placement operation in which additional airspace is created by developing the berm. In this sense, using the WTE ash as a building material within the landfill boundary gives the material a secondary beneficial use as berm construction material and improving the geometry of the landfill by increasing air-space, optimizing the permitted footprint, and extending the site-life of the landfill. By incorporating the construction of the mechanically stabilized berms as part of operations within the lined area, the Pinellas County landfill can achieve airspace increases for each ton of ash used in the berm construction.

The physical properties of the processed ash can be utilized as structural fill in both the reinforced as well as the retained fill areas within the mechanically stabilized berm – thereby creating

significant airspace by constructing a stable and nearly vertical face with the processed ash product as it is generated at the WTE facility that also can meet the current regulatory WTE ash disposal facility requirements.

Figure 2-2 illustrates how an MS Berm provides an increase in the airspace of a landfill by raising the final grades from the toe of the lined disposal area. Figure 2-3 illustrates the impact an MS berm positioned around the perimeter of the lined disposal area as a vertical expansion can affect the overall airspace of a given footprint.

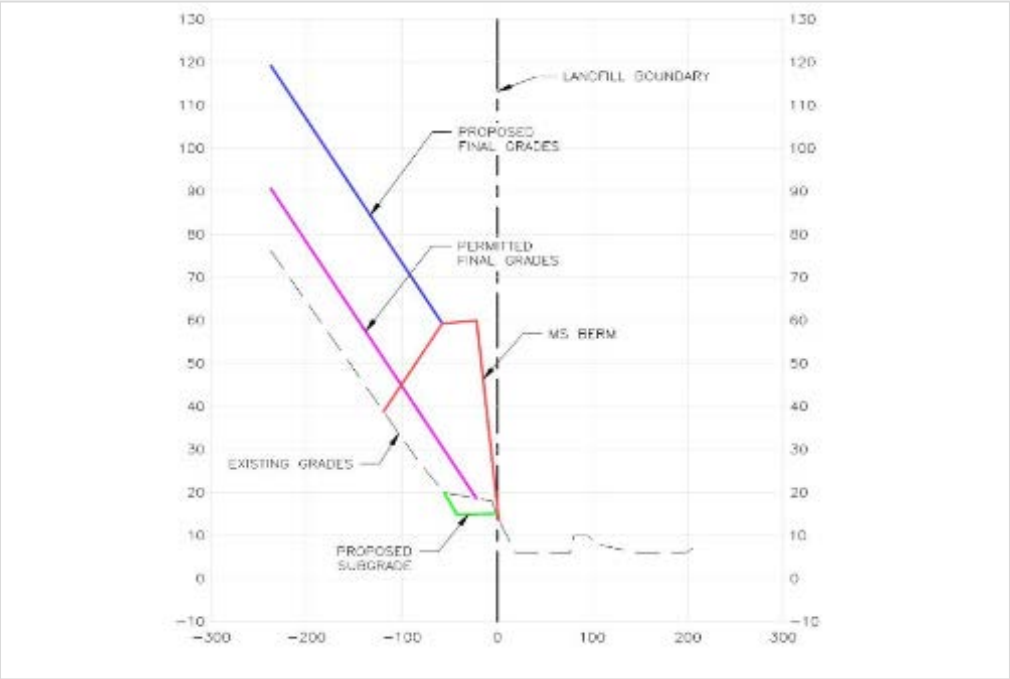

Figure 2-2 Section showing MS berm at toe of slope

There are four options the County can review to utilize the MS berm as strictly a vertical expansion as illustrated in Figure 2-2 and avoiding a horizontal expansion permitting process. This means designing the MS berm so that no ash is used outside the current limits of waste and therefore not requiring an expansion of the current footprint of the landfill.

1. Locate part of the berm outside of the current waste limits and design it with the area outside the current waste limit made up of earth. This will avoid placing waste in the berm outside of the landfill footprint.

2. Design a vertical wall portion along the toe of the landfill to develop sufficient horizontal embedment depth for the geogrid in the MS ash berm.

3. Cut into the previously placed waste at the toe of the slope to create horizontal embedment depth for the geogrid in the MS ash berm and design the berm inside the currently permitted footprint.

4. Design the berm on top of currently placed waste within currently permitted footprint.

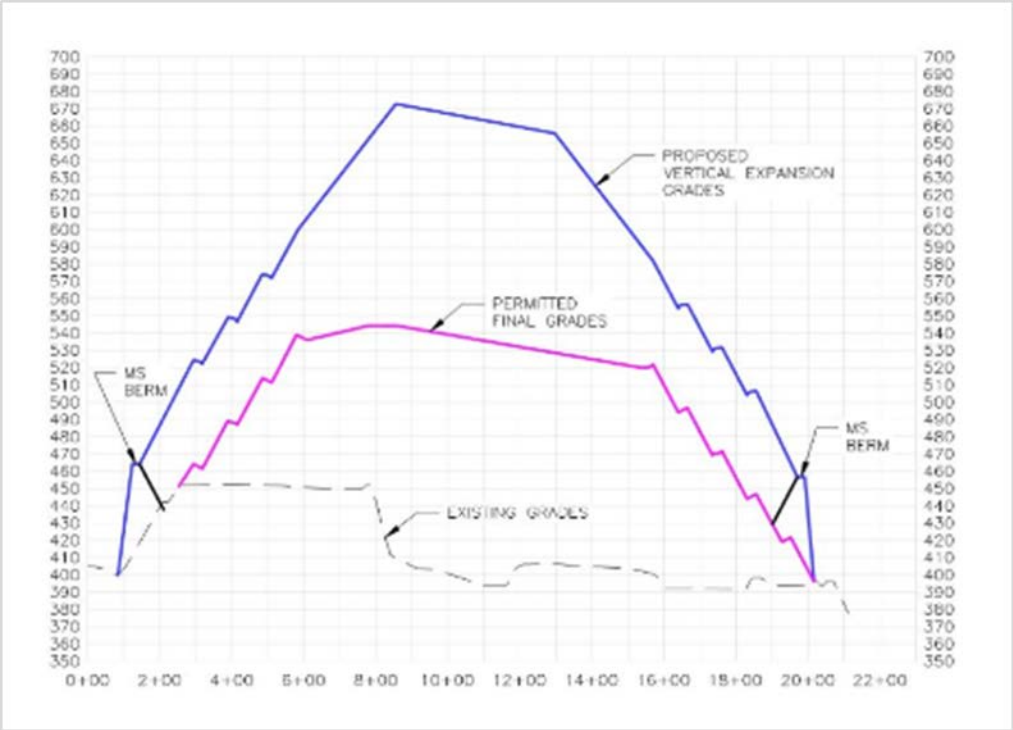

Figure 2-3 Section showing airspace impact of MS berm along perimeter

Working to optimize the footprints of currently permitted Landfills reduces the need of siting new disposal sites or horizontally expanding existing sites. With this innovative engineering solution, post combustion residuals such as WTE ash can be utilized as construction materials to build reinforced berms/walls within the permitted waste footprint of existing landfills. For WTE disposal facilities this innovation identifies a reuse option for using some of the ash generated and reusing it in such a way as to increase the value of those facilities by significantly increasing airspace over a given permitted footprint without the expense of importing soils to construct mechanically stabilized earthen berms.

Figure 2-4 MS berm footprint on ash monofill

To properly assess the feasibility of a mechanically stabilized berm, a site specific preliminary design and cost estimate should be performed to weigh the additional costs of permitting and construction versus the value of the airspace gained and the site life extension that the mechanically stabilized berm would provide. For an example, HDR designed a MS berm around the perimeter of a coal ash monofill to extend the life of the facility. An aerial view of the facility is shown in Figure 2-4 below which also illustrates the proposed berm footprint around the existing monofill. The airspace gained as a result of the MS berm based on the permitted grades is an additional 15 million cubic yards of fill that also includes the ash material in and behind the MS berm. With a length of approximately 9,000 linear feet, and an MS berm height of 65 linear feet. For this project, the contracted ash management company on site estimated a cost of $40 per square foot of face to

construct the MS Berm. Under this unit price, the total cost is $14,400,000 or approximately $0.96 per cubic yard of additional airspace.

Assessing mechanically stabilized walls to increase site life addresses the following Pinellas County's Values/Guiding Principles:

- Inspiring conscious decision making and thoughtful consumption
- Anticipating future needs
- Balancing environmental, economic, and social sustainability
- Increasing operational capacity of the Solid Waste Disposal Complex

POTENTIAL STRATEGIES

- Develop plans for implementation, both vertically and horizontally for additional airspace for Class I disposal, including appropriate review of geotechnical data.
- Use technologies such as mechanically stabilized embankments (MSE) to create additional airspace from vertical expansion within existing disposal cells.

NEXT STEPS

- Evaluate the feasibility of vertical expansion on established disposal areas.
- Evaluate financial feasibility of MSE walls within the current landfill footprint with either increased disposal area height and/or within current height restrictions.
- Identify additional lands for disposal area development.
- Evaluate feasibility of redevelopment of Toytown for disposal.

2.5.3 Assessment of Regional Disposal Cooperation Opportunities

Another option potentially available to divert MSW from landfill disposal at the County's complex is to dispose of the MSW at other locations. At current forecasted waste generation rates, the Bridgeway Acres Landfill is anticipated to have 84 years of available airspace. In an effort to preserve landfill disposal capacity, the County is looking toward various diversion and processing options to reduce the need for disposal capacity. In addition to greater processing efficiency and waste reduction through the WTE facility, diversion through external agreements can alleviate long and short term disposal needs. There are two primary providers of offsite disposal capacity: 1) public facilities and 2) private facilities. Although public facilities typically take the approach of conservation of their assets for the betterment of their ratepayers, should a facility have significant disposal capacity available, short term agreements might be attained. Often these agreements represent a short term revenue boost for the receiving facility as part of long term financial planning. Figure 2-5 below shows available Class I disposal areas within a reasonable distance from Pinellas County. The two sites circled in red are privately operated, the remainder are owned by the counties in which they reside.

Of these publicly owned facilities, Hillsborough County is the primary operator that has capacity and land for future development such that they may entertain disposal discussions. The two privately operated facilities, Cedar Trail operated by Republic Services and JED operated by Waste Connections, offer an alternative to formal disposal agreements. Generally, private facilities are open to all Class I disposal receipts. In some cases, a negotiated rate may be attained for guarantees of delivery quantities.

In addition to the landfill capacity, there are WTE facilities in Pasco and Hillsborough County and the City of Tampa. These facilities are currently sized to meet the internal needs of their respective jurisdictions. Were expansion options to be considered, one potential opportunity would be to develop access agreements to the expanded capacity.

With any off site disposal options, Pinellas County has to arrange to transport the waste. Given the County's location, the use of a transfer station would be needed to facilitate waste exports from the Disposal Complex.Transfer station operating costs are estimated to be on the order of $7-$10 per ton depending on the faciltiy size and throughput. Transportation costs vary, but using Cedar Trail as a representative example as the closest private facility, the haul distance from the Disposal Complex is 63 miles. As Tampa traffic can be challenging, haul times of 90 to 120 minutes each way could be expected. Tractor trailer operating costs, given the current fuel market are approximately $90 per hour for municipal operations. With a 3 hour travel time and approximately 30 minutes on each end for loading and/or dumping the resultant transportation cost is approximately $18 per ton. Combined with transfer station operating costs yields an additional disposal cost of $25 -$28 per ton. With a current disposal rate of $37.50 per ton, and recently approved to rise, the County would ideally need to pursue alternative disposal options at a rate of $12.50 per ton or less, which is well below current published disposal rates at available private facilities, unless the decision to subsidize disposal was considered in the interest of conserving in house disposal airspace. While there are no known tip fees at that level, private sector facilities may consider negotiating a lower rate for other considerations such as long term disposal commitments.

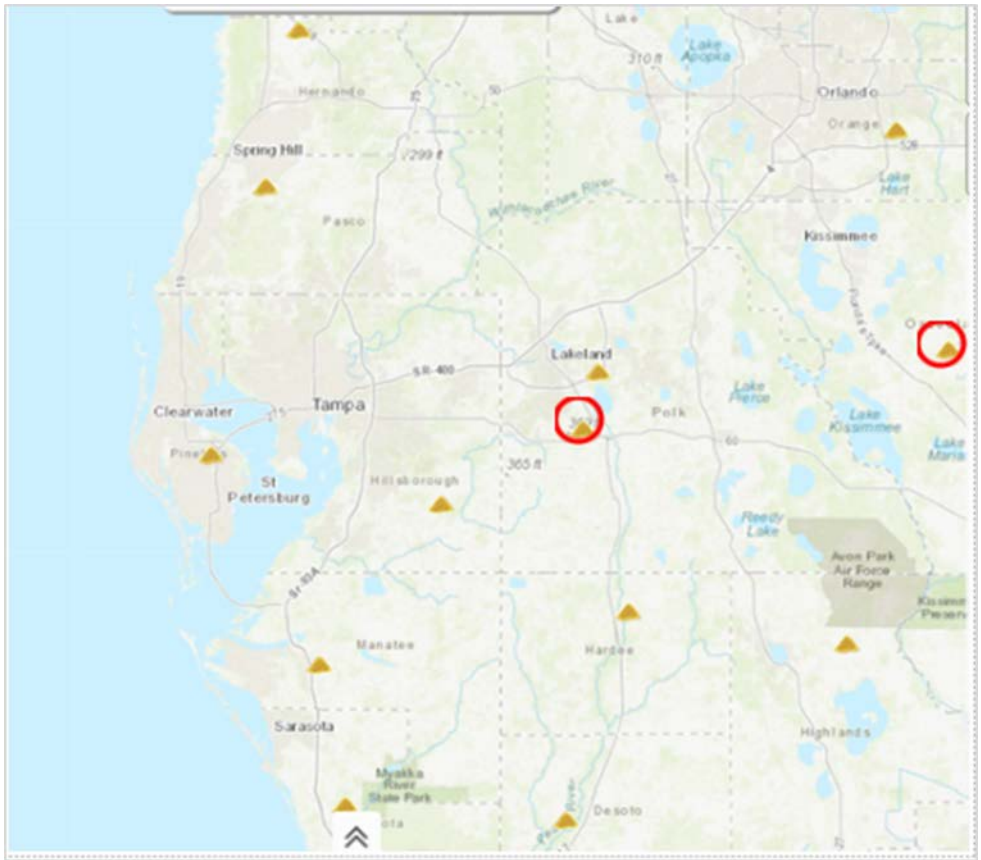

Figure 2-5 Active Class I disposal sites

POTENTIAL STRATEGIES

- Develop a transfer station at the Disposal Complex for off-site movement of MSW if justified by the amount of tonnage requiring disposal. Could also facilitate handling of recyclables, yard waste, bulky or tire waste as necessary.
- Establish a transfer fleet for off-site movement of materials.
- Solicit pricing for processing/disposal capacity and transport out of county.

NEXT STEPS

- As may be appropriate, engage in discussions with surrounding counties as to availability of out of county disposal and future processing capacity and potential rate structure.

- Engage discussions with Republic and Waste Connections for short or long term processing/ disposal options

2.6 Residuals Reuse and End Markets

2.6.1 Assessment of Enhanced Metals Recovery from WTE Ash

The County is evaluating potential options to improve the recovery of metals from the ash generated at the WTE. The goal is to maximize metals recovery, increase project revenue, and to potentially reduce the future amount of ash being disposed in the County's landfill, thus extending its life by diverting additional resources to reuse applications. Ash is the number one material being disposed currently and the County's goal is to reduce/minimize such disposal.

Vendors of alternative metal recovery/ash processing systems have approached the County with possible options to improve metals recovery. Increased recovery and removal of metals from the ash is understood to be a necessary step in the development of ash reuse and one with the advantage of generating revenue.

At the County's WTE, bottom ash (from each ash extractor) is combined with fly ash which has been processed through a pug mill and the combined stream is then transported into the Ash Processing Building. In the Ash Processing Building, the combined ash passes over a screen to separate the > 5" material. The < 5" inch material is conveyed to a rare earth magnet for ferrous recovery. This ferrous material is collected in a bunker. After the magnet, the "ferrous free" residue passes over a 3/8" screen. The <3/8" material passing through screen is residue for disposal. The >3/8" material passes over the Eddy Current Separator (ECS). The non-ferrous material from the ECS is collected in a bunker and the >3/8" residue material from the ECS is collected in a bunker as residue for disposal.

The recovered ferrous metal fraction is currently being shipped offsite to a facility operated by American Steel where additional processing occurs. American Steel conducts similar ferrous metal processing services for several other WTE facilities in the area. Processed residuals from Pinellas County's ferrous metal are returned to the County for disposal at the landfill.

From the Ash system there are three residue streams that still contain some ferrous and non-ferrous materials. The combined material from these sources is referred to as Process Residuals.

- The <3/8" stream that still contains non-ferrous and may contain small ferrous. The small ferrous will have a reduced value but may need to be collected to improve the non-ferrous product.
- The >3/8" stream that still contains ferrous and non-ferrous, and
- Processed residuals returned from American Steel if this stream remains.

Processing of scrap ferrous and non-ferrous metals involves several steps to get materials suitable for the marketplace. Often metals from WTE facilities are comingled with cleaner streams to dilute the negative effects from the quality of this material. In the case of most of the metals managed in the Tampa Bay area, the materials are delivered to American Steel. The system utilized by companies such as American Steel is commonplace and could be self-performed by the County. At American Steel's facility, the materials are shaken using vibratory screens and ferrous materials are pulled from the discharge belt via belt magnet. This presents two problems. The first is that the belt magnet is less powerful than the rare earth magnet that the WTE facility uses to pull these materials. The second is that the residual material represents processing costs to the County as well as additional transportation costs to return the material. The shaker removes ash residue that is attached to the metals often due to the moisture in the quenching process at the WTE facility. The

screen may be anywhere from 2” to 6” to encourage large ferrous to remain on the belt. The fines cross under the belt magnet to liberate smaller ferrous that travels with the fines.

An alternative but more costly process is rough shredding of materials. The shredding process liberates the adhered ash residue during the shredding process. Further, the scrap metals dealers prefer a material that is 4” or less. By shredding materials, the County has the potential to deal directly with the end market scrap brokers and eliminate the costs of American Steel and similar preprocessing companies. Typical equipment costs can range anywhere from $800,000 to $1.5 million from manufacturers such as Shred-Tech and Linder. These units can be mobile, diesel driven or fixed electrical or diesel driven. Covanta, under contract with Miami Dade County processes metal for sale to scrap dealers using a fixed electrical unit. Use of onsite produced electricity can reduce overall operating costs for metal and ash processing facilities at WTE facility sites as the electrical energy is provided at a rate less than the typical retail rate.

Lastly, a low cost practice that has been used at WTE facilities is magnet loading of trucks prior to delivery to intermediate processors. Magnet loading is an aggressive loading technique that assists in removing ash from the ferrous metals. Using a boom mounted magnet, materials are picked up and dropped repeatedly to liberate ash. Fugitive dust may be generated and would need to be controlled and the ash removed from the metal will require proper disposal. After several cycles, the materials are either stored in a “clean” stockpile or loaded for delivery to the preprocessing contractor. Lee County, facing a similar dilemma as Pinellas County, worked with their operator, Covanta and their metal vendor Allied Steel to magnet load materials on Lee County’s site. The Lee County facility was not designed for this activity and is space limited. The potential reduction in weight represents ash residue and resulted in a reduction in processing costs for the associated weight of this residue. This may be an option provided there is adequate space in the current metal bunkers at the Pinellas Disposal Complex. A separate processing area may be required.

The County and Covanta are in discussions regarding potential changes to the ash handling operation to improve metals recovery. This is consistent with Covanta’s corporate-wide initiative to improve revenues being generated by recovery of metals.

The combined bottom and fly ash are currently being processed to recover ferrous and non-ferrous materials at the Pinellas Facility. One potential approach would be to modify the current metals recovery operations and replace with an enhanced metals recovery system. A second approach is to add a separate enhanced metals recovery system to process residuals from the current system, recovering additional metals.

The current facility ash management configuration is not readily modified to permit the separate treatment of bottom and fly-ash. Other facilities have modified their systems to permit them to process fly and bottom ash separately. In Pasco County, for example, only a portion of the bottom ash is combined with the fly ash to satisfy managing the resulting combined ash as non-hazardous with the balance of bottom ash (the portion not commingled with the fly ash) being available for further processing/reuse applications. Previously, the County looked at the feasibility of keeping the two streams at the Pinellas Facility separate but given the location of the ash processing building and the length of multiple conveyors that would be required, the proposal was determined at that time to be cost prohibitive.

HDR recently evaluated potential enhanced metals recovery opportunities at the Complex looking at installation of enhanced metals processing capacity outside the Ash Residue Building. The study results supported continued pursuit of the opportunity, depending on the site and processing option selected.

POTENTIAL STRATEGIES

- Develop a metals cleaning facility at the Disposal Complex.
- Develop an enhanced metals processing facility at the Disposal Complex.
- Develop a regional metals processing facility at the Disposal Complex.
- Negotiate a metals processing facility agreement with Covanta to bring technology similar to Fairless, PA to the Tampa Bay area.

NEXT STEPS

- Monitor implementation of pilot program underway with Covanta.
- Review latest equipment options and costs for metals processing.
- Discuss metals processing with Covanta and opportunities for regional use.
- Identify low cost options at the Disposal Complex including magnet loading of materials and evaluate metal bunker and ash house for modification or expansion for metal cleaning practices.

2.6.2 Assessment of Regional Beneficial Reuse of WTE Ash Opportunities

Waste-to-Energy is the keystone process in Pinellas County's solid waste management system. Although this technology reduces waste by almost 90 percent by volume and 75 percent by weight, the residual still requires management. Current practice is to use as an alternative cover at the landfill or dispose of the residual with MSW. Possible uses for the ash residual include beneficial use as an aggregate in road construction or other cementitious products (wall block, pavers, and asphaltic cement), mineral and enhanced metals extraction, or other structural fill applications. One potential outlet is the use as fill for mechanically stabilized walls for airspace enhancement at landfills (as described in Section 2.5.2).

After processing to remove some ferrous and non-ferrous metals, the combined bottom ash and fly ash stream of approximately 200,000 to 250,000 tons per year is primarily beneficially used as daily cover (~65-70%), with the balance being directly landfilled.

WTE ash has not been historically beneficially reused in Florida or the US. WTE bottom ash is, however, commonly reused in some parts of the world, most notably in several European Countries (e.g., the United Kingdom, the Netherlands, and Denmark) and Asian Nations (e.g., Japan, China). Recently, interest in WTE ash recycling in the US has been renewed, and many facilities have initiated the process of exploring this opportunity. Most of the progress towards WTE recycling has been made in Florida, and while most work is still at the developmental scale, WTE ash has been successfully recycled in several construction projects. In the following section, potential avenues for recycling WTE ash from the Pinellas County WTE facility, including development and feasibility considerations, are discussed.

OPPORTUNITIES FOR WTE ASH RECYCLING

Processing Considerations

The Pinellas County WTE facility current combines bottom and fly ash within the facility prior to disposal. Most WTE facilities in the US produce a combined ash stream, an outcome of the objective of producing a material that passes federal and state requirements for hazardous waste determination. WTE facility operators have determined that when WTE bottom ash and fly ash are mixed together, in some cases with amended amounts of lime in the process, this material does not exceed the toxicity characteristic (TC) hazardous waste threshold as measured using the toxicity characteristic leaching procedure (TCLP).

As noted above, standard international practice is to recycle WTE bottom ash, but to manage the fly ash as a hazardous or special waste and dispose of this material in a landfill (often after treatment). Prior to pursuing WTE ash recycling, Pinellas County will need to determine whether separation of

bottom ash is appropriate and feasible (recent evaluations have concluded that the existing facility is space limited with respect to ash handling reconfiguration). WTE ash recycling efforts by Pasco County, Palm Beach County and Miami-Dade County have all focused on bottom ash. As will be discussed below, through additional processing (as might be coupled with an advanced metals recovery operation) it might be possible to produce a reusable product from WTE combined ash, and this approach is currently being evaluated by Hillsborough County. Regardless of the approach taken, Pinellas County will have to consider the implications of ash separation through testing (whether separating within the facility or as part of an external processing system) on the hazardous waste status of whatever remaining ash must be disposed of in the landfill.

All reuse options are going to require the ash to be processed prior to reuse. Since WTE ash is often wet when it leaves the facility, common practice is to age the material for several weeks to provide a physical form that is easier to work with. Larger pieces in the ash will need to be screened out, as will most unburned materials. For non-encapsulated reuse options (e.g., structure base) the ash will need to be aged so that the pH drops (which reduces the leachability of some heavy metals). And depending on the aggregate product desired, the aged ash will need to be screened to very specific size requirements. As stated above, such screening could be integrated into an advanced metals recovery system.

Summary of Existing Markets and Current State of Practice

Table 2-6 summarizes the major markets currently considered for WTE ash recycling. Again, the vast majority of existing experience is based on bottom ash. Combined ash could potentially be processed to produce an aggregate product. The remaining discussion will thus refer to markets for WTE ash in general. Regardless of the approach taken, Pinellas County's ash stream (in its ultimate processed form) would require testing to determine whether (a) it meets necessary environmental characteristics for the desired use options and (b) it meets necessary performance characteristic for the desired use option. The objective here is to provide an overview of the potential use options available for the County to explore in more detail.

Table 2-6 Summary of major markets for WTE ash

Ash recycling market	Description
Structural base	Processed WTE ash is used as a replacement of construction stone for structural base under roads or other structures. In Florida the primary construction stone is lime rock. In this manner, the processed WTE ash would function similar to recycled concrete aggregate (RCA).
Partial aggregate replacement in Portland cement concrete (and concrete products)	Processed WTE ash, particularly a coarser fraction, is used to replace some fraction of the natural aggregate in Portland cement concrete. This could be part of poured concrete or used in concrete products (e.g., Jersey barriers, pavers). Most feasible market in the near term is for non-structural applications.
Partial aggregate replacement in hot mix asphalt pavement	Processed WTE ash is used to replace some fraction of the natural aggregate in hot mix asphalt pavement.
Cement kiln feed	WTE ash is used as a cement kiln feed. Cement production requires calcium, silica, iron and aluminum, and waste products such as coal ash are often used as one of the kiln feeds (the major components of kiln feed would be natural materials such as limestone, clay and sand). WTE ash can provide a source of all needed minerals and is of value because of the iron and aluminum content.

WTE ash recycling is currently practiced throughout Western Europe and in parts of Asia. The requirements and restrictions vary among nations. The literature indicates that all four of the above

recycling markets are utilized to some extent. Most of the recycling efforts in Europe are accompanied by an advanced metals recovery system to first recover ferrous and non-ferrous metals not recovered within the WTE facility. These are separate operations usually located nearby the WTE facility, but often operated by independent contractors (many of these same companies are now marketing their services in the US). The process of advanced metals recovery involves screening the ash to different size fractions, thus creating the opportunity to achieve screening requirements also necessary in preparing aggregate products.

While discussed and attempted on a pilot scale in the US for decades, WTE ash recycling has not evolved to a full-scale production level in the US. There are several efforts underway, most notably in Florida, to explore and implement WTE ash recycling. All of these efforts have required substantial testing of the ash both for environmental and performance properties. WTE ash cannot be recycled without the permission of the FDEP, and the efforts of the Florida local government facilities has involved a testing program submitted to FDEP. Pasco County (Pasco) was the first to receive permission for their WTE bottom ash to be used within Pasco (following specified restrictions). Permitted use options include road base, partial aggregate replacement in Portland cement concrete (PCC), and partial aggregate replacement in hot mix asphalt (HMA) pavement. Pasco has constructed a test road at the landfill site with all three use options and their new biosolids facility incorporated WTE bottom ash as structural base. They are currently planning other road construction projects.

The Solid Waste Authority of Palm Beach County (SWA) has been testing WTE bottom ash for structural base, PCC aggregate, and HMA aggregate; their request is currently undergoing approval by the FDEP. Miami-Dade County recently worked with a local cement kiln to test their bottom ash as kiln feed. Hillsborough County is currently planning a construction project at one of their old landfill sites (currently a transfer station) that will utilize aggregate derived from combined ash for road base and paving aggregate.

The following sections provide additional information on each of these markets. Unlike other potential waste recycling alternatives, the County may be exploring, examples of other US recycling operations for WTE ash are limited. Thus, most of the following examples are limited to recent experiences in Florida or observations from international operations.

Recycling WTE Ash as Structural Base

Stone aggregate is commonly required to provide a base layer of sufficient structural support under roads, parking lots and other structures including buildings. In Florida, lime rock is the most commonly used construction stone. Other materials used in Florida include cemented coquina and recycled concrete aggregate. Properly graded construction WTE ash has been demonstrated to meet properties that make it suitable for base material. In some cases, blending with other aggregates might be required. The Florida Department of Transportation is aware of WTE ash as a potential aggregate source and is currently considering approaches for developing construction specifications for this material.

Photo 2-2 documents the use of WTE bottom ash at a project in Pasco County. This project involved the construction of a biosolids facility and processed WTE bottom ash was used as a structural base. The contractor provided positive feedback on the performance of this material. Use of WTE bottom ash as structural base is common in some other countries. Photo 2-3 illustrates the use of WTE bottom ash in the Netherlands at a construction site.

While the use of processed WTE ash as a structural base offers the potential to use a large volume of material, because it is not encapsulated in the same manner as PCC and HMA pavement, it requires the additional scrutiny from an environmental perspective. The local governments in Florida examining this material have been able to demonstrate that it does meet normal risk thresholds, but

that certain controls need to be in place as would be reflected in FDEP approvals. Such controls include making sure that the material remains under a paved surface; keeping the material a suitable distance away from groundwater, surface water, or potable water sources; and that the material must be returned to a landfill or a similar construction project if it is ever removed. Alternative controls are to blend the material with other aggregates. Approaches in Europe vary by nation, with some locations allowing widespread use of the material with limited control (as long as it issued in the appropriate geologic setting) to requiring encapsulation by geomembrane even when used under roads. If Pinellas County were to pursue this option, an extensive environmental and performance characterization, and of course regulatory approval, would be required

Photo 2-2 Processed WTE bottom ash placed as structural base under a concrete structure in Pasco County Florida (Photo: T Townsend)

Photo 2-3 Processed WTE bottom ash used as structural base at a construction site in the Netherlands (Photo T Townsend)

Recycling WTE Ash as Concrete and Asphalt Aggregate

When properly screened to create an aggregate of the appropriate gradation, WTE ash can provide an alternative to some of the natural aggregates in poured PCC and PCC products. The material works bests when sufficient metals removal has been achieved, since the presence of aluminum can cause hydrogen gas formation in the concrete which in turn reduces concrete strength. Previous experience has found that PCC made using WTE ash as a partial aggregate replacement can meet typical performance requirements (e.g., compressive strength), especially for non-structural applications. Research is still needed to better understand long-term performance and how to mitigate any concerns that might exist, thus most proposed uses in the near term are for non-structural applications.

Photo 2-4 illustrates the construction of a PCC road in Pasco County, Florida. The road has performed well even after exposure to high levels of heavy truck traffic. The most common use in Europe for PCC application has been to incorporate WTE ash aggregate into pavers or bricks. Photo 2-5 show a load of pavers manufactured in the Netherlands using processed aggregate from WTE bottom ash.

Aggregate from WTE ash has been used as a partial aggregate replacement in HMA pavement. HMA pavement consists of approximately 5 to 6 percent asphalt cement (bitumen) along with different aggregate products. Several mix designs have been developed using WTE ash as a partial aggregate replacement as part of projects in Florida. Photo 2-6 shows HMA pavement being placed in Pasco County, Florida that incorporates WTE ash aggregate in the mix. Challenges with using WTE ash in asphalt pavement include the additional binder content that might be required because the ash tends to be more absorptive and the difficulty in meeting all of the parameters required for a superpave mix design.

Photo 2-4 Portland cement concrete pavement incorporating processed WTE bottom ash as a partial aggregate replacement in Pasco County (Photo: T Townsend)

Photo 2-5 Concrete paver products in the Netherlands using WTE bottom ash as a partial aggregate replacement (Photo: T Townsend)

Photo 2-6 Hot mix asphalt pavement incorporating processed WTE bottom ash as a partial aggregate replacement in Pasco County (Photo: T Townsend)

Environmental issues associated with using WTE as a partial aggregate replacement in PCC or HMA pavement are less than those associated with unencapsulated structural base. Potentially problematic elements resulting from the WTE ash tend to be bound up in the encapsulated matrix, and because the ash only represents a fraction of the raw material, leaching risk is less than if the ash were used as 100 percent of construction material.

Recycling WTE Ash as Cement Kiln Feed

Florida is home to several cement kilns, and these large industrial operations utilize large amounts of raw materials to produce a variety of cement products. The four primary elements needed for cement manufacture are calcium, silica, iron and aluminum. Raw materials such as lime rock, sand, and clay provide for the bulk of cement kiln feed, but waste materials are commonly utilized as sources of iron and aluminum. Common waste sources include mill scale and coal ash. WTE ash is

used in some parts of the world as a cement kiln feed. Typical replacement ranges in the literature are in the 5 to 10 percent of total kiln feed. Most of this work has been conducted using bottom ash.

A major challenge with using WTE ash as cement kiln feed is chloride content. If the chloride concentration is too high, this can pose a problem to the cement product and air emissions in the manufacturing process. Photo 2-7 shows a cement kiln in Japan that routinely uses WTE bottom ash as a cement kiln feed; this facility, however, incorporates a washing system to remove the chlorides and other salts. An alternative to washing the ash is to use less in the process. The amount that can be used depends on the quality of the ash, the characteristic of the other feed minerals, the operating conditions of the kiln, and the cement product being produced.

Photo 2-7 Cement kiln in Southern Japan using WTE bottom as a cement kiln feed; this facility washes the ash first to remove salts (Photo: T Townsend)

Use of WTE ash as cement kiln feed has not been reported as practiced in the US. Recently Miami-Dade County began exploring this option for their WTE bottom ash. They worked with a local cement kiln and performed a full-scale test for several hours using WTE ash as kiln feed. The amount of ash added was kept to an amount low enough to off-set the potential problems with chloride. Integration of WTE ash into cement kilns represents the use options with potentially the least environmental concerns as any problematic chemical will largely be integrated into the cement and thus will be integrated into the final concrete product.

Photo 2-8 Cement kiln in South Florida where WTE bottom ash was tested as kiln feed (Photo: T Townsend)

Considerations for Developments of a WTE Ash Recycling Program

The previous discussion illustrates that WTE ash has a successful track record for being recycled in other countries but can only be considered an emerging practice in the US. Florida is home to most of the few WTE ash use demonstration projects currently underway in North America. Recycling of WTE ash from Pinellas County would likely be technically feasible with certain limitations. Additional work would be needed to determine the potential economic implications. The following considerations should be part of future discussions about exploring the beneficial use of the County's WTE ash:

- The development of a WTE bottom ash recycling program would be easier than a similar program for combined ash. An aggregate product from bottom ash would have lower concentrations of chemicals of concern compared to one produced from fly ash. Separation of ash would require modifications to the current ash handling equipment. A combined ash aggregate product may still be realistic, but the effort to achieve regulatory approval would be greater.
- All decisions regarding WTE ash recycling should be considered in conjunction with decisions about advanced metals recovery. The advanced metals recovery process would be similar to that needed for most ash reuse options, and thus it would only make sense to remove the metals at the same time as producing the aggregate. The aggregate product would in many cases be superior for reuse with the metals removed.
- The County would need to conduct extensive testing to determine the environmental and performance characteristics of their WTE ash products. While some groundwork has been laid through the investigation of ash from other facilities, presently FDEP is still making decisions on a facility-by-facility basis.
- Before determining the types of WTE ash markets to pursue, the County should investigate local markets and opportunities. This would include discussion with Florida Department of Transportation, the County's Public Works department as well as local contractors, batch plants, and cement kilns.

A hindrance to beneficial use in construction applications is the generation of sufficient quantities to support economies of scale as it relates to construction materials. Pinellas County is generating ~

200,000-250,000 tons per year of ash residue, with about 65,000 tons per year available after use for landfill cover. A regional approach to material supply may offset some of the supply shortfalls. With four facilities (Pinellas, Hillsborough, Tampa, and Pasco) in the Greater Tampa Bay area, the ability to generate greater quantities over a shorter term could attract construction material investment. All four facilities have unique ash management systems, making consistency of product difficult at this time without modifications to these facilities.

POTENTIAL STRATEGIES

- Determine best ash recycling system option (i.e., within the Ash Building, separate facility, combined versus separate).
- Develop quality specifications for ash residue for use in construction materials.
- Develop cooperative agreements with Bay area plants for ash residue material supply for onsite uses such as MSE walls.
- Identify out of County disposal options.

NEXT STEPS

- Determine preferred approach
- Convene regional group to discuss ash potential
- Discuss ash use with FDOT

3 Municipal Solid Waste (MSW)

By 2048, it is estimated that nearly 160,000 combined tons of newspaper, cardboard and office paper, and approximately 35,000 tons of PET and HDPE bottles, would be delivered to the Disposal Complex with municipal solid waste. Municipal solid waste collection throughout the County is summarized in Section 2.3, which also describes specific material types. This section focuses on the MSW portion specifically.

3.1 Collection and Transfer

3.1.1 Assessment of Traditional Recyclables Currently Not Source Separated from MSW

There are a number of traditional recyclables that make up significant portions of the waste stream (50,000 tons or more annually) delivered to the Solid Waste Disposal Complex, where there is significant potential for increased recovery. As part of the Baseline Report efforts, waste projections by major material type were developed. The projections assume that waste composition will remain unchanged during the projection period.

By 2048, if waste composition remains the same and no new policies, programs or infrastructure are implemented, the projections show the following (for more details, refer to Baseline Report, Appendix A, Sheet 13):

- Newspaper: 32,250 tons
- Corrugated containers: 113,575 tons
- Office paper: 14,022 tons
- Other recyclable paper: 151,433 tons
- PET bottles: 22,435 tons
- HDPE bottles: 12,619 tons
- Tin/Steel cans: 15,424 tons
- Aluminum cans: 11,217 tons
- Glass containers: 56,086 tons

Over time, it is reasonable to expect changes in the amounts and types of materials due to changes in consumption habits and changes in manufacturing/ packaging materials. As reported in the U.S. EPA Advancing Sustainable Materials Management 2015 Fact Sheet, published in July of 2018, the composition of waste in the U.S. has changed over time. As shown in Table 3-1, which summarizes data from the EPA composition data for products generated in the municipal waste stream from 1960 to 2015, newspaper has declined over the last twenty years, as would be expected with the advent and popularity of online news. Corrugated boxes have remained relatively constant over the last fifteen years, though the popularity of online shopping and shipping may mean increases in corrugated boxes in the future. Glass packaging has slightly declined over the last fifteen years.

Table 3-1 Composition of MSW stream over time (Source: EPA)

Material	2000	2005	2010	2014	2015
Newspaper[1]	6.1%	5.0%	3.9%	2.9%	2.6%
Corrugated Boxes	12.4%	12.2%	11.6%	11.8%	11.9%
PET Bottles and Jars	0.7%	1.0%	1.1%	1.1%	1.1%
Steel Packaging	1.2%	0.9%	1.1%	0.9%	0.9%
Aluminum Cans	0.6%	0.6%	0.53%	0.55%	0.55%
Glass Packaging	4.5%	4.1%	3.7%	3.6%	3.5%

[1] Newspapers/Mechanical Papers. Starting in 2010, newsprint and ground wood inserts expanded to include directories and other mechanical papers previously counted as Other Commercial Printing.

POTENTIAL STRATEGIES

- Increase education and outreach (specific approach depends on other strategies):
    - If collection services are organized in the unincorporated area of the County, and curbside recycling is included as a basic service, additional opportunities for education and promotion could be included in the outreach for the new collection services (relates to Section 2.3).
    - Also see potential strategies covered in Section 5 (Traditional Recyclables).

3.1.2 Assessment of Pay-as-You-Throw Collection Services

In pay-as-you-throw (PAYT) programs, also known as unit pricing or variable-rate pricing, residents are charged for the collection of municipal solid waste based on the amount they throw away. This creates a direct economic incentive to recycle more and to generate less waste. Traditionally, in systems with organized collection, residents pay for waste collection through property taxes or a fixed fee, regardless of how much, or how little, trash they generate. PAYT breaks with tradition by treating trash services just like electricity, gas, and other utilities. Households pay a variable rate depending on the amount of service they use.

According to Pay-as-you-throw Now (http://paytnow.org/), an organization that promotes PAYT, PAYT is available in over 9,000 communities throughout the US and has been statistically found to be one of the most cost effective methods to reduce trash disposal and encourage recycling. According to Skumatz Economic Research Associates, Inc., PAYT programs are more common on the west coast and in the northeast of the U.S. based on a survey conducted in 2006 and updated in 2010 (see Figure 3-1). It was noted in the Pay-as-You-Throw/ Variable Rates for Trash Collection 2014 Update to the Region 9 Grant Report, available on the paytnow.org website, between 2006 and 2010, the count of communities increased to more than 9,000 (about a 25% increase from 7,100 in 2006). The states of Washington, Oregon, Minnesota and Vermont have passed legislation requiring some form of PAYT. Florida is among a list of 15 states with the lowest share of population having access to some form of PAYT program.

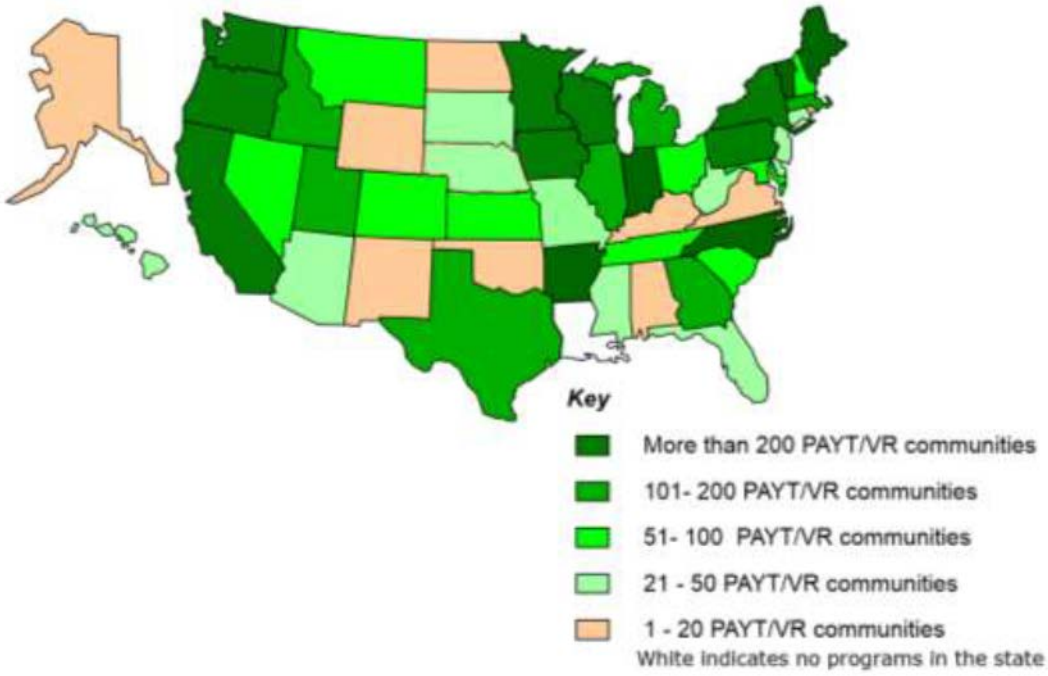

Figure 3-1 Number of communities with PAYT

There are different approaches to PAYT, including:

- **Variable Rate Carts:** residents choose from different sized carts, paying more for larger carts
- **Overflow:** residents pay a flat fee that covers everything they can fit into a certain size cart, and then pay extra (usually by the bag) to dispose of anything that does not fit into that cart
- **Sticker/Tags:** residents pay by the bag by affixing a pre-paid tag or sticker to each bag of trash
- **Bags:** residents dispose of their waste in specialized bags approved by the municipality and clearly marked with the municipal seal or other unique instructions or information
- **Future Potential: Weight-based at the Curb:** While there isn't currently any known progress on Automated Side Loader collection vehicle scale systems at this point, there may be progress in the future that would allow for actual weight-based billing. The engineering challenge is considerable to capture weights as low as 20 or 30 pounds, which is more feasible with a static position. Weighing in motion, which will be required for efficiency, is very difficult to achieve with accuracy, and would be expensive to accomplish, currently keeping weight based PAYT out of reach with automated cart systems.

The City of Gainesville, Florida utilizes PAYT. The City provides once a week collection of refuse, recyclables, yard waste and bulk waste. In the first two years following PAYT program implementation, the City reported that:

- Solid waste disposal decreased 14 percent
- Recyclables recovered increased 25 percent
- Yard waste tonnage set out for disposal decreased 20 percent

Photo 3-1 City of Gainesville carts and specially marked yellow bags

The City offers variable cart sizes and has specially marked yellow bags for excess waste that residents can purchase at Publix grocery stores.

As shown in Table 3-2, the variable rates in Gainesville range from $17.50 per household per month for curbside collection of the mini cart to $35.25 per household per month for curbside collection of a 95 gallon cart. A majority of customers elect to use the 65 gallon cart size, with the fewest number of customers selecting the mini cart size. Recyclables are collected using a two-bin system.

Table 3-2 City of Gainesville variable rates

Cart size	Approximate capacity	Curbside rate	Backyard rate
Mini cart	1 bag	$17.50	$29.75
35 gallon	2 bags	$22.75	$34.50
65 gallon	5 bags	$28.25	$42.00
95 gallon	7 bags	$35.25	$51.50

The City of Plantation, Florida, has a PAYT program using bags – the only PAYT bag program in Florida. Garbage collection using specially marked and colored bags that residents purchase at Publix, Walmart and Winn Dixie stores was introduced 40 years ago. The City's recycling program, using clear bags, was introduced several years later. Residents pay for collection services through the purchase of bags as well as a flat fee charged on the utility bill.

Detractors of PAYT programs suggest that PAYT encourages illegal dumping, and for programs that use carts for garbage and recycling, it can encourage contamination in recycling carts. However, there is no published data to demonstrate these claims. (Note that Gainesville uses a two-bin system for recycling, which mitigates risk of increased contamination.)

When setting rates for a PAYT program, the bag or sticker/tag approaches require pricing that covers the cost of collection and disposal in addition to the cost of the bag or sticker/tag. For variable rate cart sizes, setting rates for different cart sizes is in part based on the cost of collection and disposal and in part determined by the community's desire to incentivize/disincentivize behavior.

POTENTIAL STRATEGIES

- PAYT could be implemented with organized collection in the unincorporated area.
- PAYT could be implemented in Lealman MSBU during the next procurement process.
- If not organizing in the unincorporated area, PAYT would be difficult to implement since the County does not control pricing; and would require the County begin to monitor pricing in the licensing procedure.
- Monitor progress of weight-based PAYT with automated cart systems.

NEXT STEPS

- Include questions in residential surveys described in Section 2.3 related to opinions on PAYT, and different approaches to PAYT (e.g. variable rate carts, specially marked bags, etc.).

4 Bulky Waste

As described in Section 2.3, bulky waste collection is provided on an as requested or special appointment basis in seventeen jurisdictions within the County, while nine jurisdictions offer bulky waste on a pre-scheduled basis (i.e., 1 x week, or 4 x year). In sixteen municipalities, bulky wastes are collected by appointment. Ten municipalities provide collection; the remainder are handled through private haulers or self-delivered. While each jurisdiction may define bulky waste slightly differently, for the purpose of this section, bulky waste focuses on furniture, appliances and mattresses.

4.1 Waste Prevention, Reduction, Reuse

4.1.1 Assessment of Reuse, Repair, Refurbish Opportunities for Furniture, Appliances, Mattresses

The County's "A to Z Recycling and Disposal Guide" is an interactive, online tool available on the County's Solid Waste webpage, www.pinellascounty.org/solidwaste/getridofit/default.htm. Recycling and disposal guidance was previously available on the County's website through a series of individual PDF files. In 2017, the County contracted with a vendor, ReCollect, to transfer the information to a cloud-based information storage system accessible to users via desktop computers and mobile devices. Currently, the database includes 400+ items. The program provides real-time data on usage, material searches, and suggested items from users. The online tool is available to County partners for placement on their individual websites using just a few lines of code. Using the tool is simple: users type in the name of an item, and a list of options for recycling or disposal are displayed. The user has the option to enter an address; the tool will find drop-off locations nearest the user.

Specific to bulky items, if a user types in "mattress", the opportunities listed include checking with the delivery company of a new mattress for picking up the old mattress, checking with collection provider for curbside pickup availability and provides the Disposal Complex and the Waste Management facility as options for drop off including associated fees. If a user types in "furniture", the opportunities listed include checking with collection provider for curbside pickup availability, and Habitat for Humanity for drop off. If a user types in "appliances", the opportunities listed include checking with collection provider for curbside pickup availability and includes the potential for drop off at scrap metal dealers (though none currently listed) and Habitat for Humanity.

Habitat for Humanity ReStore is a nonprofit retail center where new and gently used building materials and home furnishings are sold at discounted prices. The ReStore currently accepts dishwashers or water heaters in working condition, new or less than 15 years old, cabinets with no water damage, and furniture in good condition. There are ReStore locations in Clearwater and Palm Harbor. Mattresses are not accepted.

Mattresses pose a difficultly in reuse due to the health risk associated with the potential for vectors. While there are some successful mattress reuse and recycling programs in Florida, none appear to currently be available in Pinellas County. In Central Florida, the Mustard Seed of Central Florida accepts mattresses, and will provide them for reuse based on an assessment of the mattress. Dismantling and recycling the components of the mattresses is another way the Mustard Seed diverts mattresses from landfills. There are some successful mattress recycling programs operating in California, Connecticut and Rhode Island through "Bye Mattress".

Another approach to increase diversion of bulky waste is to encourage the repair of appliances and refurbishing furniture. The City of Eugene, Oregon regularly hosts Fix-It Fairs, inviting the community to get items repaired at no cost. Volunteers and professionals provide free repairs and

are available to coach attendees interested in learning how to make their own repairs. Repair services are made available for a variety of products, including small appliances (like lamps and toasters), tools, clothing and textiles, small electronics, home and garden tools, furniture, and toys. To cut down on unnecessary waiting times during busy periods, a maximum of one broken item per person will be examined. Each event typically lasts 3 hours and is free to residents. In 2017, the City hosted three Fix-It-Fairs, and estimates in total for 2017, over 400 community members were assisted with about 70 percent of the items being repaired.

POTENTIAL STRATEGIES

- Continue to promote Habitat for Humanity ReStore for furniture and working appliances.
- Identify and encourage opportunities to repair appliances and refurbish furniture.

NEXT STEPS

- Further investigate repair and refurbish opportunities in the County.

4.1.2 Assessment of Viability of a Grant Program set up by the County to Promote Reuse of Bulky Waste

The County currently maintains the Municipal Recycling Grant program that provides $500,000 in grants to municipalities to support recycling efforts each year. With buy-in from TMC members, the County may be able to propose revisions to Resolution 05-59 (the Resolution that created the Recycling Grant program) to include reuse and repair support in the private sector, and use a portion of these grant funds to encourage bulky waste reuse efforts, or potentially increase the total grant amount with the increase dedicated to these reuse efforts.

In October 2017, the Oregon Department of Environmental Quality selected recipients for 5 micro grant projects aimed at workforce development in the reuse and repair industries. Each grantee is receiving up to $10,000 that can be used to purchase equipment and train employees to support long-term business expansion. The purpose of this funding is to reduce the environmental impacts of material production and disposal through growing reuse and repair enterprises. The selected projects focus on making reuse and repair options more accessible, as well as normalizing the concept of repairing goods, as opposed to disposing of them. Both small businesses and non-profits were eligible for funding under the micro grants. The five grant recipients will use the funds in the following manner:

- The Renewal Workshop in Cascade Locks will train two sewing technicians and purchase new equipment to expand their unique model of repairing small defects in returned clothing that would have otherwise been discarded. This process brings these items back into the economy for use.
- Garten Services in Salem will recruit and train two new employees to sort electronics for reuse. This will range from harvesting, testing and packaging small parts for resale, to testing computers, printers and monitors, to assessing the cost/benefit ratio of refurbishment of unique items. These new employees will be adults with intellectual and/or cognitive disabilities.
- JD's Shoe Repair in Portland will train one cobbler, for employment in the business or to start their own small business. This new worker will be trained in repair of shoes, bags, sports equipment and other items. This company has steady demand and is looking to grow, and grant funding will assist to cover in-house training costs.
- The Toolbox Project in Eugene will hire an operations manager and purchase equipment to facilitate member growth, further outreach, and increase the financial stability of the

organization. This will allow more people to use this community library of tools, avoiding unnecessary new purchases.

- Salvage Works in North Portland will train a new full-time employee to assist customers with purchasing reclaimed wood. This wood is sourced from barns, warehouses, granaries and deconstructed homes across the Pacific Northwest, and is given another useful life.

The Manhattan Solid Waste Advisory Board (SWAB) is partnering with the Citizens Committee for New York City and Manhattan Borough President Gale Brewer on a new grant initiative called NYC Reuse and Repair. The goal of the grant is to support New York City in reusing, repairing, and refurbishing 100 percent of all discarded products that can be reused in some capacity, with the balance being recycled. The initiative will provide grants of up to $2,000 to be awarded to start new reuse or repair projects, undertake related research projects, or initiate other activities which will help lead to replicable reuse or repair models in all five boroughs of New York City. A total of $25,000 was awarded in the 2017 Grant Cycle.

POTENTIAL STRATEGIES

- Expand the current Municipal Recycling Grant program by proposing revisions to Resolution 05-59 to include reuse and repair support in the private sector.

NEXT STEPS

- Discuss with the TMC to determine buy-in for expanding the potential recipients and uses for grant funds.

4.2 Processing

For most jurisdictions in the County, the disposal location for bulky waste (e.g. furniture, appliances and mattresses) is the Disposal Complex. The exceptions include the City of Clearwater, which delivers it to either the Disposal Complex, Waste Management or Sarnago & Sons facilities, and the City of Largo, which delivers it to Angelo's. Based on scale records, approximately 1,800 tons of Bulky Waste was delivered to the Disposal Complex in 2017.

4.2.1 Assessment of Processing Bulky Waste for WTE

Currently, bulky waste that is too large to process at the Waste to energy facility is landfilled. The County is considering installing a bulky waste processing unit to shred/size oversized bulky materials to be processed at the waste to energy facility. The equipment would include a shredder sized to handle the bulky waste and suitable conveyors.

Some loads of waste delivered to the Disposal Complex are sent to the landfill because of one or more oversize objects whereas the rest of the load is acceptable for the WTE facility. Often these loads have materials that could also be recovered for recycling including metals, yard debris, soil, and other components. A full scale bulky waste processing facility could provide the ability to sort recoverable materials and process the bulky materials to minimize the need to landfill these materials.

The Pinellas County Disposal Complex currently owns and operates mobile equipment to process bulky wastes. However, this operation is currently dedicated to processing waste tires due to the high volume of tires received. A complete bulky waste processing system could incorporate the existing operating equipment as the waste tire component of the overall bulky waste facility.

POTENTIAL STRATEGIES

- Put in place a full scale bulky waste processing capability at the Disposal Complex, either through a public/ private partnership or through design and acquisition of the appropriate equipment and operating facility.

NEXT STEPS

- Confirm the economic feasibility of a bulky waste management program including building/pad requirements, processing and separation equipment, pre-processing/triage, and recyclables recovery.
- Determine whether to work with a private operator in a public/private partnership or use County owned and operated equipment.

5 Traditional Recyclables

Across the U.S., per capita waste generation has been declining since 2000, affecting recycling, landfilling, and waste-to-energy operations.[1] In terms of the recycling industry, plastic increasingly dominates the waste stream as paper materials continue to decline. Consumer product packaging currently comprises thirty percent of the municipal solid waste stream, although the composition of packaging continues to shift towards lighter, rigid plastics.[2] Consumer packaged goods companies continue to introduce innovative packaging at an accelerated pace with the intention of minimizing food loss and waste and reducing the carbon footprint over the life cycle of the package. Another impactful trend for curbside recycling has been the decline of paper, particularly newsprint, as consumers favor a news media facilitated by technology.

As described in Section 2.3, in the County, recyclables collection for single family units is offered by subscription in the Lealman MSBU and the remaining unincorporated areas of the County, while each of the municipalities provides recyclables collection as part of standard service. Seven jurisdictions within the County, including Lealman MSBU and remaining unincorporated areas, leave recyclables collection for multifamily units to the open market. Commercial recyclables cannot be exclusively franchised or municipally controlled, per State Statute, and therefore is an open market for the entire County. Recyclables collected in the County are delivered to one of five private sector processors depending on the contractual arrangement. The service providers are Recycling Services of FL, Republic, Waste Connections, Waste Management and Waste Pro.

According to the FDEP 2017 annual report, 45 percent of single family, 37 percent of multifamily, and 67 percent if commercial waste generated in Pinellas County was recycled, for an overall traditional recycling rate of 55 percent. Thus, there is opportunity for increasing the level of recycling.

5.1 Collection and Transfer

5.1.1 Examine Regional Standardizing of Recycling Collection

As shown in Appendix A (Recycling Programs), each of the 24 municipalities, the Lealman MSBU and the remaining unincorporated areas of the County have access to curbside collection of the following materials:

- Metal Cans
- Paper and Cardboard
- Cartons
- Glass Bottles and Jars
- Newspaper
- Mixed Paper
- Plastics Bottles and Jugs

However, the City of Gulfport does not accept glass bottles and jars in their curbside recycling programs. However, drop off centers for glass recycling are available.

Every jurisdiction, except for the City of Gulfport, indicates curbside recyclables are collected single stream, where paper and containers are mixed in the same collection container. However, 14

[1] https://www.waste360.com/landfill-operations/landfills-adapt-changing-waste-stream
[2] https://plastics.americanchemistry.com/Education-Resources/Publications/Making-Sense-of-the-Mix.pdf

jurisdictions indicate the use of bins (and manual collection) rather than carts. While using carts typically yields higher tonnages of recyclables, it also typically yields higher contamination rates.

Also shown in Appendix A, among the drop off locations throughout the County, the number of drop off locations in the following jurisdictions accept metal cans, cardboard, cartons, glass bottles and jars, mixed paper, newspaper, and plastic bottles and jugs:

- Unincorporated area (3 locations)
- Town of Belleair (1 location)
- City of Clearwater (4 locations)
- City of Dunedin (2 locations)
- City of Gulfport (1 location)
- City of Indian Rocks Beach (1 out of 5 locations)
- City of Indian Shores (1 location)
- Town of Kenneth City (1 location)
- City of Largo (5 locations)
- Town of Redington Shores (1 location)
- City of Safety Harbor (2 locations)
- City of Seminole (1 location)
- City of South Pasadena (1 location)
- City of St Petersburg (12 of 19 locations)
- City of Tarpon Springs (4 locations)
- Tierra Verde (1 location)

The number of drop off locations in the following jurisdictions in the County do not accept one or more of the items included in the locations above; the most common item not included in these drop off locations are cardboard, cartons, and glass bottles and jars:

- City of Indian Rocks Beach (4 out of 5 locations)
- City of Madeira Beach (1 location)
- City of St Petersburg (7 of 19 locations)

The City of Treasure Island does not currently offer drop off locations.

Standardizing recyclable materials accepted in curbside and drop off recycling programs Countywide would require that processors receiving the materials are able to process and market the same materials. With the different jurisdictions across the County relying on five different processors, standardizing materials accepted in curbside programs would be contingent upon the processors accepting all of the same materials.

POTENTIAL STRATEGIES

- Encourage each jurisdiction to include the same materials in curbside recycling programs and drop off recycling programs (contingent upon processor).
-
- Streamline outreach materials for items accepted in curbside and drop off recycling programs Countywide, to include the same materials, if possible.

NEXT STEPS

- Identify which materials are *not* accepted by which processor(s).

5.1.2 Assessment of Recycling Ordinance for Residential and Commercial Sectors

For the residential sector, mandating recycling is common in cities and counties, and is typically accomplished through organized collection where recycling collection is part of base service. In

those instances, enforcement is fairly simple and mainly relies on outreach to homes that do not regularly participate by setting out recyclables for curbside collection. The hauler can assist the local government in enforcement by tracking neighborhoods (or routes) with lower participation rates and can also assist in distributing outreach materials. In communities that do not have organized collection, mandating recycling through ordinance alone can be done, but poses enforcement challenges. Without organized collection, a local government could "ban" materials from being placed in garbage containers, but enforcement is limited, so taking the "ban" materials approach may encourage some additional recycling but is not as effective as mandating recycling through organized collection. Section 5.1.3 describes mandating recycling as part of organizing collection and is the preferred approach to gaining recycling participation in the residential sector.

For the commercial sector, due to State law, commercial recyclables cannot be made a part of an exclusive franchise. The County can require businesses to recycle and can require licensed or franchised haulers to offer recyclables collection but cannot require businesses to contract with a specific hauler. Mandating recycling for businesses has been done in several cities and counties in Florida.

One example is Lee County, which implemented universal commercial recycling in 2008, via County Code of Ordinance, Chapter 17, Section 283, "Business Recycling Requirements". The ordinance requires all businesses in unincorporated Lee County to participate in recycling. The program allows for businesses on minimum service (i.e., can/bag service, 70 gallons or less) to be exempt. The ordinance also requires that new businesses comply within 14 days of starting waste service. This program affects about 7,500 businesses. The businesses are required to recycle at least one material type from a list of materials included in the ordinance. Lee County has achieved near 100 percent compliance through education by recycling staff, field inspectors, and customer service staff. Two County representatives visited nearly every business in unincorporated Lee County over the initial 18 month implementation period. The County originally anticipated a grace period of a calendar quarter but extended it to allow for added outreach. The County also held several workshops leading into implementation and individual franchise areas were targeted with a postcard mailer which prompted customer service calls and helped identify non-compliant businesses. Ongoing enforcement is necessary to maintain compliance.

For both residential and commercial customers, if the County elected to implement a universal recycling ordinance, it would only apply in the unincorporated areas of the County. However, the County could lead by example for the other jurisdictions within the County.

POTENTIAL STRATEGIES

- Implement universal recycling ordinance for residential and commercial sectors.

NEXT STEPS

- For the residential sector, mandating recycling may be accomplished if the County adds recycling collection to curbside services in Lealman and implements organized collection in the remaining unincorporated area, as described in 5.1.3
- Survey businesses, perhaps through Chambers of Commerce, to gage opinions on mandating recycling for the commercial sector.
- For the commercial sector, new ordinance language would need to be developed, and likely a minimum of two public hearings would need to be held before adoption.

5.1.3 Assessment of implementation of universal curbside recycling for residential customers in the Lealman MSBU and remaining unincorporated areas in the County

In the Lealman MSBU, where collection services are provided through an exclusive franchise agreement, recyclables collection is offered on a subscription basis, but not included in the base services. Residents who subscribe for the service pay an additional fee of $3.00 per month directly

to the franchisee. It is believed that approximately 200 homes in the service area currently subscribe for curbside collection of recyclables. If every customer was required to pay for service and receive a recycling collection container, the monthly rate customers pay for recycling collection would likely be less than $3 since the franchisee would have more customers to spread the operational costs. However, it would mean a higher total monthly rates to cover base services with the addition of recycling collection to base services.

To implement universal curbside recycling for residential customers, it would require a revision in the services included in the franchise agreement to make recycling part of the base service, which may best be accomplished through the next procurement process, though it may be possible to negotiate an amendment to the existing franchise agreement. The current franchise agreement expires in December of 2021, with an option to renew for five years; negotiating an amendment to the existing franchise agreement could occur as part of the renewal process.

Implementing universal curbside recycling for residential customers would also require a modification in the ordinance relating to the Lealman MSBU. Specifically, Sec. 114-358. - Description of Services, states in relevant part: *"All residential properties in the MSBU containing residential units shall be subject to universal residential waste collection and disposal services".* Additional language in the ordinance currently refers to waste and does not include recyclables. These ordinance revisions would likely require at least two public hearings on the revisions prior to adoption.

For the remaining unincorporated areas of the County, the efforts would be similar to what is described for the Lealman MSBU, assuming the County elects to organize collection in the area (see Section 2.3.1).

POTENTIAL STRATEGIES

- Implement universal curbside recycling in the Lealman MSBU, requiring ordinance revisions and franchise agreement revisions.
- Include universal curbside recycling as part of organized collection in the remaining unincorporated area, if the County elects organized collection (see Section 2.3.1).

NEXT STEPS

- Determine opinions of Lealman MSBU and remaining unincorporated area residents for acceptance of universal curbside recycling.
- Determine whether an amendment to the existing Lealman franchise agreement is feasible, whether prior to or at the time of possible renewal by December of 2021.
- If it is not feasible to amend the existing Lealman franchise agreement, incorporate universal curbside recycling collection in the next procurement process.
- Revise appropriate sections in the ordinance for the Lealman District.
- Determine whether ordinance revisions would be necessary to address universal curbside recycling in the remaining unincorporated area, and if so, make appropriate revisions.

5.2 Processing and End Markets

The County and municipalities rely upon the private sector to provide processing capacity and marketing of recyclables collected in the County. Each municipality has entered into agreements with varying terms and conditions. The options available to the County as efforts are implemented to increase recyclables diversion include continued reliance on the private sector vendors or developing additional publicly owned processing capacity.

As described in the Baseline Report and the Market Assessment Report, there has been significant volatility in the traditional recyclables' commodity markets. Much of this is due to the impact of

China's policies and bans on the importation of recyclables. The reduction of contamination is a critical issue facing the industry. Reliance on foreign markets can be problematic. There are a number of initiatives underway involving industry, trade associations and the municipal sector to develop long term strategies to address the issue. In the near term, the disruptions in the market have caused processing costs to increase and some jurisdictions have modified their collection practices and/or changed the mix of materials. The needs and opportunities for the marketing of traditional recyclables depends on the commodities in particular. Provided below is an assessment of these needs and opportunities, by commodity.

5.2.1 Assessment by Material Type

PAPER

Paper collected in the County includes cardboard (OCC), cartons (milk cartons), and mixed paper including newspaper and paperboard (cereal boxes). OCC provides a significant opportunity for increased recycling. Comprising eight percent (aggregate) of the County's disposed waste stream, there remains a significant quantity of OCC to be captured. While OCC market pricing has dropped over the past year, it is anticipated that OCC will continue to have reasonable market access and value.

Paper cartons represent a smaller portion of the waste stream and have also seen a dramatic market price reduction over the past year. Organizations such as the Carton Council (http://www.cartonopportunities.org) continue to support the collection and recycling of cartons at paper mills and manufacturing facilities. It is anticipated that cartons will continue to have reasonable market access and value.

Mixed paper, including newspaper, also comprises a significant portion of the disposed waste stream (over 13 percent aggregate) providing an opportunity for continued capture for recycling. The recycling markets for mixed paper, however, will continue to have significant challenges for the foreseeable future. FDEP recently commissioned a study, the "Florida Residential Mixed Paper (RMP) Feasibility Study"[3] , for which a report was issued September 26, 2018. The report evaluated the potential markets for residential mixed paper and concluded that there are "real, but limited opportunities for increasing use of RMP at existing paper mills in Florida." Some of the recommendations in the study included improving the quality of collected RMP, encouraging greater mill consumption of RMP, and purchasing initiatives (green procurement) to support the market development for mixed paper.

CONTAINER GLASS

Glass containers represent four percent (aggregate) of the County's disposed waste stream. Markets for glass recycling in Florida continue to be limited with only one glass processing facility in Southwest Florida - Strategic Materials, located in Sarasota. As was mentioned in the Market Assessment Technical Memorandum, the market for glass is very dependent on the amount of contamination. MRF glass remains a low (negative) value commodity due to the high level of contamination and breakage. Further, because some communities are considering dropping glass from curbside collection, there is an additional threat to material supply, which impacts the economic viability for the processor.

[3] Southern Waste Information eXchange, Inc. and Moore & Associates, "Florida Residential Mixed Paper (RMP) Feasibility Study", prepared for Florida Department of Environmental Protection (FDEP), September 26, 2018.

One opportunity to possibly improve the value of recycled glass is to separate glass from single-stream recycling collection and to collect glass at drop-off centers. While capture rates will likely decrease with drop-off collection versus single-stream curbside collection, the commodity value will likely increase, and the resulting quality of the remaining single-stream recyclables will improve.

Opportunities for recycled glass will continue to also be found as a substitute for various construction materials. Lee County and Hendry County have used recycled glass cullet as the top one foot of the leachate collection system in their ash monofill. This use was approved by FDEP pursuant to Rule 62-701.400(3)(d)3, subject to the restriction that the glass cullet must be less than 3/8 of an inch in size.

Florida Department of Transportation (FDOT) provides opportunities for the use of recycled crushed glass in asphalt mixture (as described in FDOT Specification 902) and glass beads for highway striping (as described in FDOT Specification 971-2).

Crushed glass can also be used as an aggregate in concrete mixtures. FDEP and Calhoun County Board of County Commissioners studied the use of recycled glass in pre-cast concrete as part of a Green Carbon-Offset Procurement Initiative for Calhoun County. The study concluded that waste glass could be used as a substitute for virgin limestone aggregate at 10 percent by weight in pre-cast concrete.

PLASTICS

Pinellas County currently collects all seven resin types of plastics containers, jugs and hard plastic materials. Film plastic bags and Styrofoam are not collected and not recycled in Pinellas County. The 2014 Waste Composition Study prepared for the County by Kessler Consulting, Inc. reports that over 50% percent of the commercial waste sent for disposal in 2014 could have been recycled/composted. According to the study, plastics represent 13.8 percent of this amount, consisting of:

- Plastic containers 4.1 percent
- Bulky rigid plastics 1.6 percent
- Non-rigid plastic film 6.2 percent
- Other plastics 1.7 percent

The County does not accept plastic bags, film plastics, plastic wrap, Styrofoam, foam containers or Styrofoam packaging.

As described in the Market Assessment Report, the seven categories of plastic resins commonly recycled are:

- #1 - PET (Polyethylene terephthalate)
- #2 - HDPE
- #3 – PVC (Polyvinyl chloride)
- #4 – LDPE (Low-density polyethylene)
- #5 – PP (Polypropylene)
- #6 – PS (Polystyrene)
- #7 – Other (acrylic, nylon, polycarbonate, fiberglass)

Recycling higher value plastics (#’s 1 and 2) requires separation of plastics into their individual resins. Optical sorters or manual sorting can be used to separate these two resin types from the remainder of the waste stream. The relatively weak markets of the remainder of the plastic resins generally do not warrant the effort to isolate the plastics by resin type so they are typically sorted as ‘mixed plastics’. If mixed, the effort required to manually or optically sort plastics into their individual

resin category exceeds their market value. However, mixed plastics can be used as low grade plastics or they can be separated by molecular structure because they tend to phase-separate into different layers according to the resin category.

China's National Sword/Blue Sky stringent requirements for recyclable materials have resulted in a dramatic downturn in the demand and end markets for essentially all of the recyclables collected in Pinellas County[4]. That said, end markets remain relatively strong for plastics #'s 1 and 2 as these materials can be returned to produce products in the same resin value. Mixed plastics #3 through #7 have fewer end markets and are typically used to produce molded plastics products, mixing with wood fibers or as filler to produce plastic lumber, or encapsulated as a filler in higher value plastic products. Some have reported mixed plastics are being landfilled in China[5] . Similar to glass, the percentage of plastic that can be fully recycled is affected by the presence of contamination and the mix of resin categories. Similar to paper, plastics that are recovered from the County's recycling programs via the MRFs discussed above are marketed by the operators of the facilities.

In addition to these byproducts, the use of plastics in refuse derived fuel to boost energy value is an option.

In addition to the production of materials, some have sought to extract the energy value of plastics. A variety of companies claim to have demonstrated this process and assert by-products include a low grade oil, off-road diesel fuel, low sulfur diesel fuel, or other petroleum by-products. Renewlogy operates a waste plastics to oil facility in Salt Lake City, Utah using lower grade plastics #3 through #7. The facility reportedly uses a pyrolysis processes for the conversion process.

Photo 5-1 Renewlogy plastics to fuel facility in Salt Lake Utah

[4] https://www.mnn.com/lifestyle/recycling/blogs/soon-cant-ship-recycling-china-thats-problem
[5] http://www.whqr.org/post/coastline-recycling-market-struggles-mean-plastics-3-7-go-landfill#stream/0

Other companies have also claimed to achieve similar results. Agilyx in Tigard, Oregon also claims a similar result. Their history demonstrates a decade long development process that includes evolution of products through a batch processing system producing synthetic oil, fuels and olefin.

As in any emerging technology, a thorough investigation of the technology will be needed to vet the relevance of the technology to the unique needs of the County.

METALS

Metals collected by the County's residential and commercial recycling program include aluminum, tin and steel cans. Based on waste characterization data, metal cans represent a reasonably small portion of the disposed waste stream (aluminum cans at 0.8 percent and tin/steel cans at 1.1 percent).

Unlike other traditional recyclable commodities, metals market pricing has remained relatively stable over the past year. Future pricing for metal cans will depend in part on several factors:

- the overall economy;
- export and import tariffs to and from China and other nations; and,
- changes in material packaging.

China imposed tariffs on U.S. scrap steel and aluminum imports, and the U.S. has imposed tariffs on imported steel and aluminum. The impact of these tariffs on recyclable metal commodity pricing is currently unclear as markets and U.S. mills are adjusting to the changing economics.

Advances in plastic and composite packaging may also impact metal recycling in the future. Some materials typically packaged in metal cans, e.g., tuna fish, are now being packaged in plastic or composite packaging. This may result in lower quantities of recyclable metal cans collected, and lower demand for the commodity from mills.

5.2.2 Need for Additional Regional Capacity

Materials available for recycling are expected to grow. In Pinellas County, recyclables processing/marketing is currently handled by the private sector under a variety of contracts. Future negotiations will likely include revisions to pricing and contamination standards. It may be advantageous for the municipalities within the County to work together to establish common "best management" practices terms and conditions.

According to the FDEP 2017 annual report, 45 percent of single family, 37 percent of multifamily, and 67 percent of commercial waste generated in Pinellas County was recycled, for an overall traditional recycling rate of 55 percent. Thus, there is opportunity for increasing the level of recycling, particularly in the multifamily sector. As the County and municipalities increase the quantities recycled, how that additional capacity is provided will depend upon the ability of the private operators to increase their processing capacity and/or the implementation of additional processing capacity within the County, either by the public sector or in conjunction with the private sector.

Currently there are six Recycled Material Processing Facilities in the "MRF-shed" consisting of Pinellas, Pasco, Hillsborough and Manatee Counties each with varying levels of processing capability. Ongoing contamination concerns have negatively affected potential capacity by requiring processors to slow down processing lines or reprocess materials to reduce contamination for outbound materials. Processing capacity or MRF throughput for private MRF operations is not published nor is it publicly available information through FDEP reporting and other regulatory agencies as these metrics can be considered proprietary related to business operations of

recovered material facilities. Materials processed for Counties is available, but this does not address available processing capacity.

POTENTIAL STRATEGIES

- Continue working with the public and private sectors to ensure adequate future processing capacity.

NEXT STEPS

- Examine potential need/implementation in County for a Materials Recovery Facility.

5.2.3 Available technologies / processing equipment to reduce contamination

Whatever options are pursued, reduction of contamination will continue to be a critical part of the recyclables conversation for the near future. Reducing contamination begins at the source. Minimizing non-recyclables that are placed in the bin is key. Expanded focus on reducing contamination is an ongoing necessity. The Recycling Workshop Committee has formed a working group to look at standardizing best management practices. This will help as contracts are renewed.

There are a number of options for MRF operators to reduce contamination and improve the quality of recyclables coming out of a MRF. These include:

- Reducing processing speeds;
- Focusing on positive sorting; and,
- Investing in new technology.
- Investment in equipment

In general, MRF processing speeds have an inverse relationship with material sorting efficiency. The faster the processing speeds are in a MRF, the less efficient the MRF will be in separating materials. A study conducted by the Environment and Plastics Institute of Canada (EPIC) showed that reducing belt speeds 32 percent at a MRF can improve sorting efficiency by 17 percent.

Positive sorting involves targeting specific commodities, such as paper, and sorting that material early in the process. Positive sorting provides the highest quality recovered recyclables with the lowest contamination.

Regarding technology investments, key types of technology that are used to improve quality and reduce contamination include optical sorters, robotics, and ballistic separators. Optical sorting includes color, near infrared (NIR) and metal detection. With optical sorting technology, it is possible to positively sort a variety of materials, including PET and HDPE plastics, film plastics, and various grades of paper. Robotics work in conjunction with optical sensors and 3D laser cameras to positively sort targeted materials off conveyor belts using suction or grippers. Ballistics separators utilize moving air and screens to separate materials. The ballistic separators improve sorting as they are not subject to film wrapping which occurs with many current screens.

POTENTIAL STRATEGIES

- Work with the private sector on ongoing implementation of contamination reduction initiatives.

NEXT STEPS

- Continue to monitor local, regional and national contamination reduction initiatives.
- Monitor the development of standardized best management practice terms and conditions for contract renewals underway by the Recycling Workshop Committee.

6 Household Hazardous Waste (including Electronics)

The County's Solid Waste System provides programs to assist County residents in properly managing the collection, handling, and disposal of Household Hazardous Waste (HHW). These services are provided at no additional cost to County residents through the operation of the HEC_3 facility for specific HHW items at the Disposal Complex. Moreover, Mobile Collection Events and the Haz-to-Go program are mobile programs that expand collection beyond the HEC_3 facility. Pinellas County residents are encouraged to bring their unwanted electronics and chemicals to the HEC_3 (at no charge).

Some municipalities in the County offer curbside collection for electronics on an on-call basis for a fee, including the cities of Dunedin, Gulfport, and Treasure Island. The City of St. Petersburg offers free curbside pickup of TVs for recycling. The City of Clearwater offers an Electronics Collection Day for free drop off once per month.

The County also operates a Swap Shop (located at HEC_3) that offers reusable household products such as paint, cleaners, fertilizers, pesticides and automotive fluids, free of charge to Pinellas County residents. Electronics are not included in the Swap Shop Program.

Pinellas County offers a chemical disposal option for businesses that are Very Small Quantity Generators (VSQG) of hazardous waste; and used oil, universal waste, and electronics disposal option for all businesses during monthly Business Days. Private vendors, contracted by the County, accept, package, document, and provide disposal/recycling manifest and collect fees from the businesses. The transaction is between the contractor and the business. The Business Days occur on the second Wednesday of every month at the rear of the HEC_3 facility in the loading dock area.

Private vendors are contracted by the County to dispose of the collected business and household hazardous waste and electronics in accordance with Subtitle C of RCRA.

In addition to the existing HEC_3 facility, the County is developing a permanent North County HEC_3 satellite facility. The addition of this facility will provide more convenient access to the residents living in northern areas of the County.

The municipalities in the County primarily rely on Pinellas County's HHW program for residents to drop off HHW (See Table 6-1) except for City of Clearwater. The City of Clearwater collects HHW at its Hercules Avenue location, but piggy backs on the County's contractor for disposal.

6.1 Changes in HHW Material Stream

According to the EPA, E-Waste is the fastest growing municipal waste stream in the world, though it currently only represents approximately 2 percent of total landfilled waste in America.[6] In 2016, an estimated 6.9 million tons of E-Waste was generated in the United States and a significant portion of that was exported, mostly to Asia, which is no longer allowed. The electronics landscape has advanced quickly in recent years, outpacing the ability to manage these products and ensure that electronic devices at the end of their useful life are properly managed. Oftentimes, these devices have an artificially reduced lifespan due to a planned obsolescence, which raises serious

[6] https://www.nytimes.com/2018/07/05/magazine/e-waste-offers-an-economic-opportunity-as-well-as-toxicity.html

consequences in areas of air pollution, soil pollution, water pollution, information security, and human exploitation.[7]

New waste streams are expected to emerge as technologies improve and expand. One example of this relates to solar panel recycling in the United States. In 2017, the United States installed 10.6 gigawatts of new solar energy, which equates to approximately 35.3 million new solar panels installed just last year.[8] Although solar panel recycling does not present itself as a major issue today, it will represent a growing waste stream 10-15 years from now, especially as the solar panel industry continues to expand. Recently, the "Recycle PV" program (PV is an acronym for photovoltaics, which is the conversion of light into energy), based in the United States, has started implementing a new recycling initiative, modeled after a successful European program. It is worth mentioning, however, that the Electric Power Research Institute (EPRI) found that most recycling in Europe relates to glass recycling; solar panels are crushed or shredded, and then glass and metals are separated. Solar panels are largely comprised of glass, which represents anywhere from 76 percent to 97 percent of its entire composition. European regulations, however, are the primary drivers in the solar panel recycling market, as there is not a large market value present in any of the salvageable parts of a solar panel.

The availability of processors of electronic waste has been problematic in Florida with numerous businesses going into and out of commercial operations. Further, the end market processors for items such as tube style monitors which contain leaded glass continues to diminish. Lastly, the industry has been plagued with processors and end markets that cannot be traced or circumvent environmental regulations in their home nations. The net result of this uncertainty is a concern for long term management of electronics as part of solid waste management systems. Several counties in Florida have opted to use WTE facilities as a disposal option and rely on the air pollution control systems to offset potential negative effects of combustion of these materials. Where WTE is not available, landfilling is the alternative management option but arguably not the most preferred.

6.2 Waste Prevention, Reduction, Reuse

6.2.1 Assessment of Opportunities to Promote HHW Prevention

According to the waste composition study performed by KCI in 2014 for waste delivered to the Disposal Complex, an estimated 1.7%, or approximately 20,000 tons in 2018, of the waste stream was electronics. The best way to handle HHW is to prevent it in the first place. Informing residents more about which types of products are hazardous, ways to use less, use it up and use nonhazardous alternatives, and the challenges associated with handling HHW could encourage the reduction of the generation of this type of waste at the source. The U.S. EPA provides publications and reports on the subject of HHW prevention.

Some Extended Producer Responsibility (EPR) laws for HHW require that manufacturers offer "convenient" collection programs or otherwise engage in managing hazardous materials such as rechargeable batteries, mercury thermostats, and other mercury containing items. Some examples of states with such laws include:

- Rechargeable batteries (Minnesota and New Jersey)

[7] https://www.theatlantic.com/technology/archive/2016/09/the-global-cost-of-electronic-waste/502019/
[8] https://www.solarpowerworldonline.com/2018/04/its-time-to-plan-for-solar-panel-recycling-in-the-united-states/

    - Both states' laws ban consumers from disposing rechargeable batteries in household trash and require that manufacturers only market products with rechargeable batteries that are easily removed and appropriately labeled.
- Mercury Thermostats (Minnesota)
    - The state enacted a law prohibiting disposal of thermostats containing mercury in the solid waste stream and placing responsibility for compliance on heating and cooling contractors who typically remove thermostats when they repair or replace a furnace or air conditioner in the home.
- Auto Switches, light switches that contain mercury found in car hoods, trunks (Maine, New Jersey)
    - Maine enacted the nation's first auto switch EPR law in 2002 requiring producers to pay auto recyclers and scrap recycling facilities at least $1 for every switch removed as compensation for labor and other costs.
    - New Jersey's law, enacted in 2004, requires auto producers to submit to the state environmental agency an EPR plan and pay the state $0.25 per switch as compensation for administering the program.
    - The National Vehicle Mercury Switch Recovery Program (NVMSRP) extended recovery programs to all states.

In Massachusetts, proposed legislation amendments may amend wastes subject to conditional exemptions to include used, broken cathode ray tubes (CRTs) and processed CRT glass destined for ***recycling*** (see 310 CMR 30.000: Proposed Hazardous Waste Amendments, specifically, 310 CMR 30.104(3) proposed item (h)). The same pending legislation proposes revisions to include used intact CRTs as materials that "are not hazardous wastes within Massachusetts if speculative accumulation is deemed not to be occurring pursuant to the speculative accumulation definition described at 310 CMR 30.010, ***and they are not disposed***". If the pending legislation is adopted, the revised regulations would promote the recycling or diversion of these materials, potentially having a positive impact on markets for these materials and encouraging other states to take similar actions.

In Oregon, proposed legislation amendments aim to address product stewardship for HHW through EPR that would provide more convenient collection services in order to address health and environmental impacts and establish sustainable financing to ensure that collection can be provided. State-mandated EPR regulations can impact manufacturer behavior in more than the state where it is mandated, potentially enhancing product stewardship beyond the mandated state.

For paint, specifically, the Florida Paint Stewardship Project, an initiative of PSI (PSI is described in Section 2.2.3) in conjunction with the Florida Chapter of the North American Hazardous Materials Management Association, aimed to lay the groundwork for industry-sponsored paint stewardship legislation in Florida. Florida is one of nine states slated for paint stewardship legislation to be introduced with support from the paint industry, and passage of this legislation could provide Florida local governments with financial benefits of up to $35 million if all leftover paint were to be collected and managed properly. The following 10 counties participated in PSI's initial benefits assessment:

- Alachua County
- Brevard County
- Broward County
- Citrus County
- Hillsborough County
- Leon County
- Martin County
- Okaloosa County
- Orange County
- Sarasota County

In Florida, 10 percent of all paint purchased becomes leftover – around 4.6 million gallons annually. Leftover paint is the largest component of local household hazardous waste collection programs and is costly to manage. Paint can be captured for reuse, recycling,

energy recovery, or safe disposal, but doing so requires public awareness and a convenient and effective infrastructure at the local level that currently exceeds local government budgets and capacity.

Regarding electronics, the Habitat ReStore previously described in Section 4.1.1 accepts televisions and electronics that are new or less than five years old, which is not currently included in the County's A to Z Recycling and Disposal Guide previously described in Section 4.1.1. The A to Z Recycling and Disposal Guide already informs users of the ability to drop off certain televisions and electronics at the local Office Depot and Best Buy. The County performs a careful vetting process for businesses before adding them to the A to Z Recycling and Disposal Guide in order to ensure the materials are properly managed.

POTENTIAL STRATEGIES

- .
- Continue to monitor legislative actions related to paint and the PSI / Florida Chapter of the North American Hazardous Materials Management Association initiative.
- Continue to monitor the state legislature for other EPR initiatives related to HHW.

6.3 Collection and Transfer

The County's A to Z Recycling and Disposal Guide previously described in Section 4.1.1 provides users with information on collection and drop off opportunities for certain HHW materials. The City of St. Petersburg offers free curbside pickup of TVs for recycling. The City of Clearwater offers an Electronics Collection Day for free drop off on the last Wednesday of each month for city residents at the Hercules Ave. recycling center where residents can bring up to six electronics along with a utility bill for proof of residency. The Cities of Dunedin, Gulfport, and Treasure Island offer curbside pickup of electronics for a fee. The A to Z Guide also instructs users that electronic items with screens, CPUs, and rechargeable batteries can be dropped off at Pinellas County's HEC_3, and that all other electronic items should be placed in the garbage or taken to an electronics store that accepts items for recycling.

6.3.1 Assessment of Viability of Curbside Collection of Electronics

If the County organizes collection in the unincorporated areas of the County as described in Section 2.3.1, electronics could be included in the material streams to collect separately for recycling or combined with garbage and bulky waste collection service. For combined collection, electronics that can fit into standard garbage containers could be collected with garbage, and items too large for standard garbage containers could be collected with bulky waste. In communities that offer curbside collection of electronics, it is common for the service provider to collect electronic items with a separate non-compaction box truck. However, in some communities, electronics are collected along with garbage for smaller items or other bulky items. The cost for the collection of electronics curbside will vary depending on the frequency and amounts allowed, and whether the intent is to keep electronics separate from other materials for processing rather than disposal. If separate electronics collection is included as the base service, it can drive up collection costs for a service only seldom used by customers, and as such may best be incorporated as a call ahead service for an additional fee per item, as is the case in Dunedin, Gulfport and Treasure Island. For the Lealman MSBU, the current franchise agreement does not specifically mention electronics. The City of St. Petersburg offers free curbside collection and

recycling of TVs for residents that call ahead. The current Lealman franchise agreement does not expire until December of 2021, with an option to renew for five years. A similar approach of a call ahead service for an additional per item fee could be added in the next franchise agreement, or the County could negotiate a fee for the service to be added to the current agreement.

The City of Clearwater offers an Electronics Collection Day free drop off on the last Wednesday of each month from 7am-3pm for city residents (not businesses) at the recycling center at 1701 N. Hercules Avenue. Residents can bring up to six electronics and a utility bill for proof of residency.

Including electronics in garbage and bulky waste collection service, rather than a separate collection service, provides several benefits. More efficient collection mitigates cost impacts. Collecting electronics with garbage and bulky waste maintains HHW exemption status. Further, considering the uncertainty experienced around Florida related to availability of processors, as described in Section 6.1, WTE is a reliable and safe option for disposal.

POTENTIAL STRATEGIES

- If the County elects to organize collection in the unincorporated area (see 2.3.1), include electronics collection curbside, either as a separate collection or as part of bulky waste collection, depending on processing or disposal determinations (see Section 6.4, Processing).
- In the Lealman MSBU, add electronics collection either as a separate collection or as part of bulky waste collection, depending processing/disposal determinations (see Section 6.4, Processing).
- Collect electronics along with MSW, and if unable to fit in container, collect as bulky waste. Collection in this manner, maintains the exemption as HHW exemption criteria.

6.4 Processing

6.4.1 Assessment of Need for Additional HHW Management Capacity

The County is developing a permanent satellite HHW location in the North County; the Disposal Complex HEC_3 can serve mid to South County and the County's Capital Improvement Plan (CIP) includes the development of a potential South County satellite HHW location (refer to Section 8 of the Baseline Report). Although the South County satellite HHW location is in the CIP, actual development of such facility is contingent upon the County's current needs and associated decision making. During the planning period, if additional regional access is warranted, (beyond the South County satellite location), the County may consider evaluating strategic locations for either developing a new satellite HHW or co-locating a HHW facility with a municipal partner. If needed, a new HHW satellite location with basic infrastructure and without land acquisition expense can cost approximately $3 million or more, depending on various logistics.

With a dedicated satellite HHW location in the North County, potential satellite HHW location in the South County (if this project materializes), and the Disposal Complex for HHW collections, the County may be able to scale back on the mobile HHW collection events in

the County. Currently, the County holds twenty mobile events at various locations in the County each year.

Table 6-1 HHW program information for incorporated Pinellas County

Jurisdiction	Hazardous waste (electronics, chemicals etc.) Current practice
Town of Belleair	County's HHW program.
City of Belleair Beach	County's HHW program
City of Belleair Bluffs	County's HHW program
Town of Belleair Shore	Assumed County program
City of Clearwater	Clearwater residents with proof of residency may drop electronics at the Solid Waste Complex 1701 N Hercules Ave the last Wednesday of each month from 7 AM - 3 PM. Chemicals and other items follow County's program. The City also offers curbside collection of certain electronics on an on-call basis.
City of Dunedin	Two free disposal options for residents: Hazardous Waste Mobile Collection at 29582 US Highway 19 N South of Curlew on the West side of US 19. Take your electronics & chemicals to the North County local satellite site now open once a month on Saturdays from 9 AM - 2 PM. Other location is Pinellas County Hazardous Waste Collection Center. The City also offers curbside collection of certain electronics on an on-call basis.
City of Gulfport	TVs and computers can be special pick up for $31 each. Car batteries can be special pick up for $10.50 each. For chemicals and electronics considered hazardous, use County's program. Household chemicals such as fertilizers, pesticides, paint, paint thinners and similar materials, and other electronics may also be taken to the Pinellas County Household Chemical Collection Center located at 2855 109th Avenue North.
City of Indian Rocks Beach	Assumed County program
City of Indian Shores	Assumed County program
Town of Kenneth City	Residents are responsible for all hazardous waste. Call Pinellas County Solid Waste for information and site locations.
City of Largo	County's HHW program
City of Madeira Beach	Assumed County program
Town of North Redington Beach	Assumed County program
City of Oldsmar	County's HHW program
City of Pinellas Park	County's HHW program
Town of Redington Beach	County's HHW program
Town of Redington Shores	Assumed County program
City of Safety Harbor	County's HHW program. City holds a hazardous household chemical collection day once a year, in the fall.
City of Seminole	County's HHW program
City of South Pasadena	Assumed County program
City of St. Petersburg	County's HHW program. City also provides curbside collection of computers and TV's on an on-call basis.
City of St. Pete Beach	County's HHW Program
City of Tarpon Springs	County's HHW Program
City of Treasure Island	Electronic items shall be collected for a fee of $15 for the first item and $5 for each additional item on that pick up. The City won't pick up hazardous materials. Call Pinellas County Solid Waste

6.4.2 Electronics

The County is currently paying a contactor $250,000 a year to process segregated electronics delivered to the HEC_3. There are also issues related to the difficulties with

verification of material end use/disposition. One potential option to mitigate the cost and related issues would be to process the electronics in the WTE Facility as MSW. That would permit recovery of the energy value and recoverable metals while eliminating the cost and concerns related to remanufacture/dismantling and residue disposal. It is noted however, that once such waste is aggregated, it is no longer afforded the "household hazardous waste exemption". Once aggregated at a HHW Collection Center, any material destined for "disposal" (aka, a "waste") is treated just like any other industrial or commercial waste. The onus is on the generator (which would be the County under such a scenario) to demonstrate that the waste is not a Subtitle C waste, as Subtitle C wastes are prohibited in the WTE Facility. Implementation of this approach to the extent that it requires a change in the collection practices (i.e., eliminating separate drop off of electronics) will require modification of the current messaging on this topic.

POTENTIAL STRATEGIES

- Increase access to HHW management capacity.

NEXT STEPS

- Determine whether and which types of electronics could be collected with bulky waste or as a separate collection in order to comply with applicable regulations.
- Consider moving forward with implementing an additional permanent satellite HHW location (South County). However, if electronics can be treated as processable waste or part of MSW, adding an additional permanent satellite HHW location may not be a viable strategy. Therefore, implementing additional permanent satellite HHW location is contingent upon treating electronics as a HHW component.

7 Special Waste

Special Waste and wastes requiring special handling (such as asbestos, CCA-treated lumber, sludge, industrial/processed waste, over-sized items, or contaminated soil) are accepted at the Disposal Complex by appointment. Depending on the specific material, it may require additional tests. Special Waste and wastes requiring special handling accepted at the Disposal Complex do not include hazardous waste, gasoline or fuel oil, radioactive waste, biological waste, infectious waste, liquid waste or explosives.

Depending on the material, it is either combusted at the WTE or disposed in the Landfill, either the Class I portion or the Class III portion depending on the material. Combustible portions of Special Waste and wastes requiring special handling are processed at the WTE Facility. Special Waste and wastes requiring special handling is estimated to comprise approximately 0.2 percent of the waste delivered to the Disposal Complex based on the 2014 composition study. That translates into ~ 2,500 tons per year.

Note that in 2017, 19,018 tons of Class I waste were disposed in facilities outside of the County. It was determined that 12,421 of those Class I tons were contaminated soil. Thus, the amount of Class I waste potentially processable/recyclable (~7,000 tons) leaving the County does not appear to be significant at this time.

7.1 Processing

7.1.1 Assessment of Adding Special Waste and Wastes Requiring Special Handling for Processing

Depending on the specific nature of the waste material, Special Waste and wastes requiring special handling can be a potential source of additional revenue. Combustible waste streams, such as treated biomedical waste, certain sludges, non-hazardous drugs, contraband, and expired consumer products and non-hazardous pharmaceuticals can be properly and effectively managed in a waste-to-energy facility. The Title V permit for the WTE Facility contains a detailed list of materials which can be combusted in the WTE Facility, which includes some of the items identified as special waste. Covanta has implemented similar programs targeting special wastes at other facilities in their fleet. Permit modifications in certain instances may be required but have been obtained at other facilities. In terms of impacts on operation, acceptance protocols can be set up including application forms detailing the type of waste, receiving/inspection procedures and special fees. Some facilities have implemented separate receiving areas for certain special waste categories.

POTENTIAL STRATEGIES

- Increase processing of Special Waste and wastes requiring special handling.

NEXT STEPS

- Evaluate additional special waste streams that could be processed at the WTE Facility.

7.1.2 Assessment of out-of-county Tires Coming into County

The County receives nearly 13,000 tons of tires per year. The majority of tires are processed through the WTE facility. Under the facility's Title V Air Permit, tires and other specific segregated waste streams are limited to 3% of the daily load limit. At 3,150 tons per day, this amounts to a maximum of 94.5 tons per day. As the facility is not processing at peak

capacity, based on the recent operating year (2017) where approximately 800,000 tons of MSW were processed (2,191 tons per day), the tire allowance would be 65 tons per day or 23,725 tons annually.

The tire tonnage is excessive compared to what other Counties receive as part of their solid waste programs. A primary cause of such tire quantities is the County's low tipping fee for tires. The County charges $50.50 per ton of tires. This tip fee is considerably low compared to the neighboring Counties (see Table 7-1 for tire tip fee benchmarking). Generally, the counties are charging $86 to $200 per ton of tires. Such a low tip fee attracts out of County tires and is a prime reason for the high tire tonnage received by the County. Note that Sumter County only charges by tire, converting those by tire to by tons (based on average weight of tires), their tire disposal tip fee comes to over $100 per ton.

Table 7-1 Tire tip fee, benchmark counties

County	Tire fee	Notes
Lake	No charge for residents for up to four tires per year - additional $95 per ton (40" or less). 41" or more for residents, $95 per ton. Farm tractors, semi or industrial equipment tires $350 per ton (commercial or residential). Commercial purposes 40" or less $95 per ton. Tires larger than 40" are not accepted at the Convenience Centers. Commercial purposes 41" or more $95 per ton.	Lake County Solid Waste allows residents to dispose of five per day, free of charge, at six drop-off locations listed. Any Lake County resident may dispose of items at the landfill or convenience centers with proof of residency. Household items dropped off for recycling are accepted at no charge. For questions regarding acceptable items, disposal fees or hours, call 352-343-3776. The Solid Waste administration hours are 8 a.m.-5 p.m., Monday through Friday, except holidays.
Sumter	Car tire $3.50 each Car tire with rim $5.00 each Pickup truck tire $6.00 each Pickup truck tire with rim $8.50 each Tire (tractor, heavy equipment, etc.) $36.00 each	Sumter County Solid Waste does provide a citizens drop off area at 819 CR 529 Lake Panasoffkee FL 33538 for residents to drop off waste tires.
Citrus	Residential passenger car tires (Max 5 times per visit - 2 times per year) no charge. Residential car or small truck tires over 5 $95.00 per ton Residential oversize tires any number $90 per man hour	
Pasco	EAST Pasco County: Car/pickup $2.00 per tire - 10 per da EAST Pasco County: Truck/semi $10.00 per tire - 2 per day WEST Pasco County: All tires are chargeable at $100 per ton prorated (commercial and residential). Car/pickup $2.00 per tire - 10 per day. Truck/semi $10.00 per tire - 2 per day. Off-the-road equipment tires $200.00 per ton.	
Polk	Standard passenger vehicle tires: no more than 24 tires accepted per visit $2/tire off rim $5 tire with rim. Equipment/semi tires over 17" $175/ton.	

County	Tire fee	Notes
Hillsborough	Residents may dispose up to 12 tires per year as part of their annual assessment at those 4 locations. Tires in excess of 12 are required to be delivered to the Southeast County Landfill where residents will pay the tipping fee for tire processing. Passenger tire without rim $110/ton or $5/each. Tire with rim $175/ton or $7 each. Semi-truck and oversized tires $115/ton or $10 each.	Alderman's Ford Solid Waste Hillsborough Heights Solid Waste Facility South County Solid Waste Facility Northwest County Solid Waste Facility
Manatee	Tires $86/ton (minimum fee of $43) at Lena Road Landfill	Two tires may be placed at the curb with your garbage. More than two tires require a special pickup, which may be requested by calling Manatee County Utilities Customer Service.
Sarasota	$156/ton or $2/each for individual passenger vehicle tires (up to 5)	Tires can be collected curbside by 6:00 AM on collection day. Automotive tires up to 25" either on or off rims can be placed next to your garbage. Limit of 4 tires per week. Tires can be dropped off at the Central County Solid Waste Disposal Complex.
De Soto	IN COUNTY: 10 or more tires $200/ton. Individual car tires: $2.00, truck tires $4.00, semi and/or agricultural use tires $8.00. OUT OF COUNTY: 10 or more $400/ton. Car tire $4.00, truck tire $8.00, semi and/or agricultural tire $16.00.	All tire prices are without rims. Any individual priced tire disposal with a rim will be charged double the fee.

POTENTIAL STRATEGIES

The County may consider raising its tire tip fee based on one of the following strategies:

- If the County wishes to retain the same tonnage for incoming tires, the County may raise the tire tip fee, but still keep it competitive to attract majority of the tonnage it currently receives.
- If the County wishes to discourage out of County tires flowing to the Disposal complex, the County may consider:
    - Adopting a higher out of County tire tip fee: This option will discourage influx of out of County tires. (If the County wishes to attract this tonnage at a later date, the County can reduce the tip fee again.)
    - Amending Pinellas County’s solid waste ordinance to ban out of County tires.

NEXT STEPS

- Determine if change in tire fees is warranted.

8 Summary of Preliminary Strategies Identified

A total of 78 preliminary strategies have been identified in this Task 5 Report (not including strategies identified or Organics and C&D and Class III described in separate reports). Appendix B (Summary of Preliminary Strategies Identified) provides a list of each strategy identified, by material type, and includes indications for whether the strategy is considered a good candidate for inclusion in Task 6 – Technology Review, inclusion in discussions with potential regional partners, and/or consideration for Task 7 – Case Studies.

As shown in Table 8-1 below, a total of 17 strategies appear to be candidates for Task 6, Technology Review, a total of 31 strategies appear to be candidates for potential regional cooperation, and a total of 16 strategies appear to be candidates to consider for Task 7, Case Studies.

Table 8-1 Summary of Preliminary Strategies Identified

Material Category	Potential strategies identified	Candidate for Task 6 technology review (yes or no)	Candidate for regional cooperation (yes or no)	Candidate for Task 7 case studies (yes or no)
General	Total of 53 identified	16 Yes	22 Yes	7 Yes
MSW	Total of 5 identified	0 Yes	1 Yes	3 Yes
Bulky waste	Total of 4 identified	0 Yes	1 Yes	0 Yes
Traditional recyclables	Total of 7 identified	1 Yes	2 Yes	3 Yes
Household hazardous waste	Total of 6 identified	0 Yes	3 Yes	2 Yes
Special waste	Total of 3 identified	0 Yes	2 Yes	1 Yes

Building upon the Task 5 efforts, discussions with County staff will determine which technologies will be further examined in Task 6 (Technology Review). It is anticipated that items identified as having potential for regional cooperation will be a part of continuing discussions with surrounding counties, as the County deems warranted.

A

Appendix A – Recycling Programs

Residential Recycling Program[1]											
Jurisdiction	Bins or Carts	Collection Provider	Metal Cans	Paper & Cardboard[2]	Cartons	Glass Bottles & Jars	Mixed Paper	Newspaper	Plastics-Bottles and Jugs	Steel Cans	Yard Waste[3]	Other
Unincorporated Area – Lealman MSBU	Manual w/ bins	Subscription with County Recycling Inc.	X	X	X	X	X	X	X	X		
Unincorporated Area – General	Up to licensed hauler	8 licensed private haulers (subscription) or residents can self haul	X	X	X	X	X	X	X	X		
Town of Belleair	Automated w/ carts	City of Clearwater	X	X	X	X	X	X	X	X		
City of Belleair Beach	Manual w/ bins	Waste Management	X	X	X	X	X	X	X	X		
City of Belleair Bluffs	Manual w/ bins	Waste Management	X	X	X	X	X	X	X	X		
Town of Belleair Shore	Manual w/ bins	Waste Connections	X	X	X	X	X	X	X	X		
City of Clearwater	Automated w/ carts	City	X	X	X	X	X	X	X	X	X	Electronics can be dropped off once a month.
City of Dunedin	Automated w/ carts	Waste Pro	X	X	X	X	X	X	X	X		
City of Gulfport	Manual w/ bins	City	X	X	X		X	X	X	X	X	Electronics can be collected for a fee.
City of Indian Rocks Beach	Manual w/ bins	Waste Connections	X	X	X	X	X	X	X	X	X	
City of Indian Shores	Bins and Carts	Waste Connections	X	X	X	X	X	X	X	X		
Town of Kenneth City	Manual w/ bins	Waste Connections	X	X	X	X	X	X	X	X	X	
City of Largo	Automated w/ carts	City	X	X	X	X	X	X	X	X	X	
City of Madeira Beach	Manual w/ bins	Waste Connections	X	X	X	X	X	X	X	X	X	
Town of North Redington Beach[4]	Manual w/ bins	Waste Connections	X	X	X	X	X	X	X	X		
City of Oldsmar	Automated w/ carts	Republic	X	X	X	X	X	X	X	X	X	
City of Pinellas Park	Manual w/ bins	Waste Management	X	X	X	X	X	X	X	X		
Town of Redington Beach	Manual w/ bins	Waste Connections	X	X	X	X	X	X	X	X		
Town of Redington Shores	Manual w/ bins	Waste Connections	X	X	X	X	X	X	X	X		
City of Safety Harbor	Automated w/ carts	City	X	X	X	X	X	X	X	X	X	
City of Seminole	Automated w/ carts	Waste Management	X	X	X	X	X	X	X	X		
City of South Pasadena	Manual w/ bins	Waste Connections	X	X	X	X	X	X	X	X		
City of St. Petersburg	Automated w/ carts	City	X	X	X	X	X	X	X	X		Electronics are collected curbside (must call ahead).
City of St. Pete Beach	Manual w/ bins	Waste Connections	X	X	X	X	X	X	X	X		
City of Tarpon Springs	Manual w/ bins	Waste Management	X	X	X	X	X	X	X	X	X	
City of Treasure Island	Automated w/ carts	Conex	X	X	X	X	X	X	X	X	X	Electronics can be collected for a fee.

Notes:
1. For items accepted, please use 2019 Recycle Guide (be sure to check Extra Information and Exceptions column), provided under separate cover.
2. Cardboard, mixed paper, and Newspaper now classified together as "Paper and Cardboard."
3. Picked up separately.
4. North Redington Beach provides "back door" recycling service.

Jurisdiction / Facility	Location	Materials							
		Metal Cans	Cardboard	Cartons	Glass Bottles & Jars	Mixed Paper	Newspaper	Plastics Bottles and Jugs	Other
Unincorporated Area – General									
Palm Harbor									
Curlew Retention Pond	1825 Curlew Rd.	X	X	X	X	X	X	X	
John Chesnut Sr. Park	SW corner of Sandy Point Road & East Lake Rd.	X	X	X	X	X	X	X	
William E. Dunn Water Reclamation Facility	4111 Dunn Dr. off Alt U.S. 19 N.	X	X	X	X	X	X	X	
Town of Belleair									
John J. Osborne Public Works Building	1075 Ponce de Leon Blvd.	X	X	X	X	X	X	X	
City of Clearwater									
Clearwater Solid Waste Facility	1701 N. Hercules Ave.	X	X	X	X	X	X	X	**Cooking oil collection available; Electronics accepted the last Wednesday of each month.**
North County Service Center	29582 U.S. 19 N. West side, South of Curlew Rd.	X	X	X	X	X	X	X	
Sand Key Park	1060 Gulf Blvd.	X	X	X	X	X	X	X	
Walmart	23106 U.S. 19 N. I SE corner of parking lot	X	X	X	X	X	X	X	
City of Dunedin									
Highlander Park Recycling Site	Ed Eckert Dr.	X	X	X	X	X	X	X	
Lake Haven Recycling Site	817 Lake Have Rd.	X	X	X	X	X	X	X	**Cooking oil collection available**
City of Gulfport									
Gulfport Neighborhood Center	1617 49th St. S.	X	X	X	X	X	X	X	
City of Indian Rocks Beach									
Brown Park	Bay Blvd. & 2nd Street	X		X	X	X	X	X	
10th Ave. Park	Corner of 10th Ave. and Bay Pine Blvd.	X				X	X	X	
Nature Preserve	903 Gulf Blvd.	X				X	X	X	
Historical Museum	203 Fourth Ave.	X				X	X	X	
Kolb Park	1507 Bay Palm Blvd.	X	X	X	X	X	X	X	
City of Indian Shores									
Behind Town Hall	19305 Gulf Blvd.	X	X	X	X	X	X	X	
Town of Kenneth City									
Public Works Bldg.	4600 58th St. N.	X	X	X	X	X	X	X	
City of Largo									
Bank of America	10900 Seminole Blvd.	X	X	X	X	X	X	X	
Hamlin Blvd.4-H	14644 113th Ave. N.	X	X	X	X	X	X	X	
Pinellas County Extension	12520 Ulmerton Rd.	X	X	X	X	X	X	X	
Tri-City Plaza	U.S. 19 N. & East Bay Dr.	X	X	X	X	X	X	X	
Starkey Road Recycling	1551 Starkey Rd.	X	X	X	X	X	X	X	
City of Madeira Beach									
Madeira Beach Municipal Marina	503 150th Ave.	X	X	X	X	X	X	X	
Town of Redington Shores									
Redington Shores Town Hall	17425 Gulf Blvd.	X	X	X	X	X	X	X	
City of Safety Harbor									
Safety Harbor Fire Station 53	3095 McMullen Booth Rd.	X	X	X	X	X	X	X	
Safety Harbor Public Works	1200 Railroad Ave.	X	X	X	X	X	X	X	
City of Seminole									
Lake Seminole Park	10015 Park Blvd.	X	X	X	X	X	X	X	
City of South Pasadena									
Winn Dixie	6851 Gulfport Blvd. at Pasadena Ave.	X	X	X	X	X	X	X	
City of St. Petersburg									
Recycling/Brush Site	1000 62nd Ave. N.E.	X	X	X	X	X	X	X	**Yard waste also accepted**
Recycling/Brush Site	7750 26th Ave. N.	X	X	X	X	X	X	X	**Yard waste also accepted**
Recycling/Brush Site	2453 20th Ave. N.	X	X	X	X	X	X	X	**Yard waste also accepted**
Recycling/Brush Site	2500 26th Ave. S.	X	X	X	X	X	X	X	**Yard waste also accepted**
Recycling/Brush Site	4015 Dr. MLK Jr. St. S.	X	X	X	X	X	X	X	**Yard waste also accepted**
Crescent Lake	1320 Fifth St. N.	X	X	X	X	X	X	X	
Old Sweetbay	6095 Ninth Ave. N.	X	X	X	X	X	X	X	
Clearview United Methodist Church	4515 38th Ave. N.	X	X	X	X	X	X	X	
Grace Lutheran Thrift Store	4300 Haines Rd	X	X	X	X	X	X	X	
Municipal Marina	300 Second Ave. S.E.	X	X	X	X	X	X	X	
Enoch Davis Center	1111 18th Ave. S.	X							**Only accepts aluminum cans**
Kiwanis Park	38th Ave. N. & 18th St. N.		X		X		X		
Main Library	3745 Ninth Ave. N.	X	X	X	X	X	X	X	
Bay Vista Park	7000 Fourth St. S.		X		X		X		
Childs Park Sports Complex	601 45th St. S.		X			X	X		
Fossil Park	6635 Dr. MLK Jr. St. N.		X		X		X		
Lakewood Youth Association	4801 31st St. S	X	X			X	X		**Accepts aluminum cans**
Northwest Park	2331 60th St. N.	X	X			X	X		**Accepts aluminum cans**
Pinellas County Solid Waste	2855 109th Ave. N.	X	X	X	X	X	X	X	
City of Tarpon Springs									
Tarpon Springs Fire Rescue Station 70	1023 Gulf Rd.	X	X	X	X	X	X	X	
Yard Waste Facility	898 S. Levis Ave.	X	X	X	X	X	X	X	**Yard waste also accepted**
A.L. Anderson Park	39699 U.S. 19 N.	X	X	X	X	X	X	X	
Brooker Creek Education Center	3940 Keystone Rd.	X	X	X	X	X	X	X	
Tierra Verde									
Ft. De Soto Park	3222 Pinellas Bayway S.	X	X	X	X	X	X	X	

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Appendix B – Summary of Preliminary Strategies Identified

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Material Category	SW Management Loop Category	Potential Strategies Identified	Task 5 Report Section Reference	Candidate for Task 6 Technology Review (Yes or No)	Candidate for Regional Cooperation (yes or no)	Candidate for Task 7 Case Studies (yes or no)
General *(covers more than one material type, or otherwise general in nature)*		**Total of 53 Identified**	**Section 2**			
	Flow of Waste	Expand Licensing or franchising	2.1.1	No	No	No
	Flow of Waste	Interlocal agreements with municipalities	2.1.1	No	No	No
	Flow of Waste	Enact a new (or revised) flow control ordinance	2.1.1	No	No	No
	Flow of Waste	Adopt disposal fee surcharges for out-of-county waste	2.1.2	No	No	No
	Flow of Waste	Identify diversion options for storm debris	2.1.3	No	Yes	No
	Flow of Waste	Explore additional means to extend the useful life of the existing owned property	2.1.4	Yes	No	Yes
	Flow of Waste	Monitor and evaluate the potential availability of contiguous properties for purchase during latter portions of and beyond the planning period.	2.1.4	No	No	No
	Flow of Waste	Explore the possible utilization of the surface of the closed Toytown Landfill	2.1.4	Yes	Yes	No
	Waste Prevention, Reduction, Reuse	Increase promotion of prevention and reuse opportunities, which may include providing links on the County website	2.2.1	No	Yes	No
	Waste Prevention, Reduction, Reuse	DSW standardize recycling centers in all County buildings with consistent labeling and containers to combat recycling confusion. (Coordinate with City of Clearwater, City of Largo, and Pinellas County's Real Estate Development Department to implement.)	2.2.1	No	No	
	Waste Prevention, Reduction, Reuse	Incorporate emphasis and assessment of prevention and reuse opportunities in the CWW program and resulting assessment reports	2.2.1	No	No	No
	Waste Prevention, Reduction, Reuse	DSW create county-wide guidelines regarding use of recycled content paper.	2.2.2	No	No	
	Waste Prevention, Reduction, Reuse	Create a sustainability purchasing team to develop an “Environmentally Preferable Purchasing Guide” to serve as encouragement (not mandates) for environmental stewardship across all County agencies to enhance the County’s existing purchasing guidelines	2.2.2	No	Yes	No
	Waste Prevention, Reduction, Reuse	Enforce implementation of guidelines County-wide as a strategy for implementing 3.4 of County's Strategic Plan of reduce/reuse/recycle resources including energy, water, and solid waste which could include efforts related to waste reduction initiatives at County facilities such as hand dryers and refillable soap dispensers in restrooms	2.2.2	No	No	No
	Waste Prevention, Reduction, Reuse	Monitor FDEP and other state level efforts for product stewardship opportunities to support	2.2.3	No	Yes	No
	Waste Prevention, Reduction, Reuse	Pilot glass bottle buyback programs (i.e., cash for clean source separated glass)	2.2.3	No		
	Waste Prevention, Reduction, Reuse	Monitor national level efforts for product stewardship opportunities to support	2.2.3	No	Yes	No
	Waste Prevention, Reduction, Reuse	Coordinate with municipalities within the County to implement incentives, fees, or bans Countywide that are currently working within certain municipalities for items such as plastic straws, plastic bags, and polystyrene packaging	2.2.3	No	Yes	No
	Waste Prevention, Reduction, Reuse	Develop and provide a guide for zero waste / reduction of waste for other departments for public events	2.2.4	No	Yes	No
	Waste Prevention, Reduction, Reuse	Develop and adopt a policy encouraging (or requiring) zero or low waste events on County property	2.2.4	No	No	No
	Waste Prevention, Reduction, Reuse	Establish or promote zero waste to landfill certification program and train DSW staff to issue “zero waste” certifications. (Composting programs would need to be available for this strategy to be viable.)	2.2.4	No		
	Collection and Transfer	Organize collection services in unincorporated area with County as the service provider	2.3.1	No	No	No
	Collection and Transfer	Organize collection services in unincorporated area using exclusive franchise/ service contract	2.3.1	No	No	Yes

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	Collection and Transfer	If commercial units are not included in organized collection, expand the CWW program assessments to include ensuring minimum standards of solid waste and recycling collection	2.3.1	No	No	Yes
	Collection and Transfer	Monitor capacity needs at existing drop off locations	2.3.2	No	No	No
	Collection and Transfer	If the County does not organize collection in the unincorporated area, determine the need for an additional CC in the north part unincorporated area, for convenience purposes (capacity does not appear to be an issue)	2.3.2	No	No	No
	Collection and Transfer	If it is determined to go forward for policy reasons in support of County Code § 106-61, recommend establishing Interlocal agreements centered on providing flow to the Transfer Station to ensure financial viability.	2.3.3	No	Yes	No
	Collection and Transfer	Consider additional services to compliment the transfer station operations including yard waste collection and processing, household chemical collection and consolidation, and bulky waste drop off and management.	2.3.3	No	Yes	No
	Collection and Transfer	Develop capacity for management and/or preprocessing of recyclables for delivery to processors. Provide an opportunity for contract consolidation between the municipalities and the County for processing contract solicitation.	2.3.3	No	Yes	Yes
	Collection and Transfer	Develop system pricing impacts and variable rate structure or service/tax beneficial units needed to support increased costs	2.3.3	No	Yes	Yes
	Processing	Develop a master traffic plan to realign traffic patterns and/or relocate services.	2.4.1	Yes	No	No
	Processing	Develop alternative access points to the facility to diversify site travel and eliminate concentration on front end of the facility	2.4.1	Yes	No	No
	Processing	Expand the WTE tipping floor to manage additional traffic, control litter and odors, and assist with management of bulky materials	2.4.1	Yes	No	No
	Processing	Increase pit storage volume to stretch out high volume delivery periods during outages or seasonal fluctuations	2.4.2	Yes	No	No
	Processing	Continue to landfill excess waste deliveries for excavation/mining during low periods	2.4.2	No	No	No
	Processing	Evaluate storage systems for economical waste storage and retrieval including technologies to stabilize waste and reduce impacts from Florida's warm and wet environment.	2.4.2	Yes	No	No
	Processing	Expand processing capacity	2.4.2	Yes	No	No
	Processing	Continue staff's active participation in industry associations	2.4.3	No	No	No
	Processing	Continue to monitor regulatory activity on an ongoing basis.	2.4.3	No	No	No
	Processing	Develop alternative power producing opportunities at the Disposal Complex.	2.4.3	Yes	No	No
	Disposal	Develop plans for development, vertically and horizontally for additional airspace for Class I disposal, including appropriate review of geotechnical data	2.5.2	Yes	No	No
	Disposal	Use technologies such as mechanically stabilized embankments (MSE) to create additional airspace from vertical expansion within existing disposal cells	2.5.2	Yes	No	Yes
	Disposal	Develop a transfer station at the Disposal Complex for off-site movement of MSW. Could also facilitate recyclables, yard waste, bulky or tire waste as necessary.	2.5.3	Yes	Yes	No
	Disposal	Establish a transfer fleet for off-site movement of materials.	2.5.3	No	No	No
	Disposal	Solicit pricing for processing/disposal capacity and transport out of county	2.5.3	No	Yes	No
	Residual Reuse and End Markets	Develop a metals cleaning facility at the Disposal Complex	2.6.1	Yes	Yes	No
	Residual Reuse and End Markets	Develop an enhanced metals processing facility at the Disposal Complex	2.6.1	Yes	Yes	No
	Residual Reuse and End Markets	Develop a regional metals processing facility at the Disposal Complex	2.6.1	Yes	Yes	No
	Residual Reuse and End Markets	Negotiate a metals processing facility agreement with Covanta to bring technology similar to Fairless, PA to the Tampa Bay area.	2.6.1	No	Yes	No

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	Residual Reuse and End Markets	Determine best ash recycling system option (i.e. within the Ash Building, separate facility, combined versus separate	2.6.2	Yes	Yes	Yes
	Residual Reuse and End Markets	Develop quality specifications for ash residue for use in construction materials	2.6.2	No	Yes	No
	Residual Reuse and End Markets	Develop cooperative agreements with Bay area plants for ash residue material supply for onsite uses such as MSE walls	2.6.2	No	Yes	No
	Residual Reuse and End Markets	Identify out of County disposal options	2.6.2	No	Yes	No
MSW *(municipal solid waste (Class I) generated by residential and commercial units)*		**Total of 5 Identified**	**Section 3**			
	Collection and Transfer	Increase education and outreach to divert more traditional recyclables from MSW (specific approach depends on other strategies)	3.1.1	No	Yes	Yes
	Collection and Transfer	PAYT could be implemented with organized collection in unincorporated area	3.1.2	No	No	Yes
	Collection and Transfer	PAYT could be implemented in Lealman MSBU during the next procurement process.	3.1.2	No	No	Yes
	Collection and Transfer	If not organizing in the unincorporated area, PAYT would be difficult to implement since the County does not control pricing; and would require the County begin to monitor pricing in the licensing procedure.	3.1.2	No	No	No
	Collection and Transfer	Monitor progress of weight-based PAYT with automated cart systems	3.1.2	No	No	No
Bulky Waste *(municipal solid waste generated by residential and commercial units that, due to size, cannot be placed in a garbage can or cart, and cannot be processed at WTE without pre-processing)*		**Total of 4 Identified**	**Section 4**			
	Waste Prevention, Reduction, Reuse	Continue to promote Habitat for Humanity ReStore for furniture and working appliance	4.1.1	No	No	No
	Waste Prevention, Reduction, Reuse	Identify and encourage opportunities to repair appliances and refurbish furniture	4.1.1	No	Yes	No
	Waste Prevention, Reduction, Reuse	Expand the current Municipal Recycling Grant program by proposing revisions to Resolution 05-59 to include reuse and repair support in the private sector	4.1.2	No	No	No
	Processing	Put in place a full scale bulky waste processing capability at the Disposal Complex, either through a public/ private partnership or through design and acquisition of the appropriate equipment and operating facility	4.2.1	No	No	No
Traditional Recyclables *(recyclables commonly accepted in curbside recycling programs such as paper, plastics, aluminum, steel and tin cans, glass)*		**Total of 7 Identified**	**Section 5**			
	Collection and Transfer	Encourage each jurisdiction to include the same materials in curbside recycling programs and drop off recycling programs (contingent upon processor)	5.1.1	No	No	No
	Collection and Transfer	Streamline outreach materials for items accepted in curbside and drop off recycling programs Countywide, to include the same materials, if possible	5.1.1	No	No	No
	Collection and Transfer	Implement universal recycling ordinance for residential and commercial sectors	5.1.2	No	No	Yes
	Collection and Transfer	Implement universal curbside recycling in the Lealman MSBU, requiring ordinance revisions and franchise agreement revisions (seek public input first)	5.1.3	No	No	Yes
	Collection and Transfer	Include universal curbside recycling as part of organized collection in the remaining unincorporated area, if the County elects organize collection (see Section 2.3.1)	5.1.3	No	No	Yes
	Processing and End Markets	Continue working with the public and private sectors to ensure adequate future processing capacity	5.2.2	Yes	Yes	No
	Processing and End Markets	Work with the private sector on ongoing implementation of contamination reduction initiatives	5.2.3	No	Yes	No

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Household Hazardous Waste *(waste with properties that make it dangerous to, or capable of having a harmful effect on human health or the environment, generated in normal household activities such as electronics, household cleaning chemicals, pesticides, batteries, fluorescent bulbs, used oil, paint, mercury containing items)*	**Including Electronics**	**Total of 6 Identified**	**Section 6**			
	Waste Prevention, Reduction, Reuse	Continue to Monitor legislative actions related to paint and the PSI / Florida Chapter of the North American Hazardous Materials Management Association initiative	6.2.1	No	Yes	No
	Waste Prevention, Reduction, Reuse	Continue to monitor the state legislature for other EPR initiatives related to HHW	6.2.1	No	Yes	No
	Collection and Transfer	If the County elects to organize collection in the unincorporated area (see 2.3.1), include electronics collection curbside, either as a separate collection or as part of bulky waste collection, depending on processing or disposal determinations	6.3.1	No	No	Yes
	Collection and Transfer	In the Lealman MSBU, add electronics collection either as a separate collection or as part of bulky waste collection, depending on processing or disposal determinations	6.3.1	No	No	Yes
	Collection and Transfer	Collect electronics along with MSW, if unable to fit in container, collect as bulky waste. Collection in this manner, maintains the exemption as HHW exemption criteria	6.3.1	No	No	
	Processing	Increase access to HHW management capacity	6.4.2	No	Yes	No
Special Waste *(includes items that require special handling such as asbestos, sludge, industrial/processed waste, soil, or waste tires, not covered in other categories herein)*		**Total of 3 Identified**	**Section 7**			
	Processing	Increase processing of Special Waste and wastes requiring special handling	7.1.1	No	No	Yes
	Processing	If the County wishes to retain same tonnage for incoming tires , the County may raise tire tip fee, but still keep it competitive to attract majority of the tonnage it currently receives.	7.1.2	No	Yes	No
	Processing	If the County wishes to discourage out of County tires flowing to the Disposal complex, the County may consider: (1) Adopting higher out of County tire tip fee: This option will discourage influx of out of County tires. If the County wishes to attract this tonnage at a later stage, the County can reduce the tip fee; (2) Amending Pinellas County's solid waste ordinance to ban out of County tires	7.1.2	No	Yes	No