Solid Waste Management Implementation Plan

Final Report

St. Tammany Parish, Louisiana

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Section 1
Executive Summary

St Tammany Parish is a growing Parish with a population approaching the 2010 Census estimate of 241,914 people. The population has grown by 20 percent between 2000 and 2006 with expected growth of 35% over the next 20 years. With this population growth comes an increase in waste volume of Municipal Solid Waste (MSW) and Construction and Demolition Waste (C&D) including yard waste and potential recyclables. Waste volumes within the Parish are expected to reach 726 tons per day for MSW and 121 tons per day of C&D waste by 2010. This increase in population and waste volume requires planning and a more controlled and organized approach to the Parish's solid waste management program.

Currently there are no MSW landfills and only one C&D landfill in the Parish. This lack of solid waste disposal facilities requires that MSW waste be collected and transferred out-of-Parish thereby resulting in additional costs for disposal. The permit for the C&D landfill located in the Parish expires on January 31, 2010 which will result in the C&D waste also being transferred out-of-Parish at a higher cost.

CDM has reviewed the existing Parish solid waste management system and has provided recommendations for the improvements and implementation measures. Improvements to the solid waste management system for St. Tammany Parish were focused on the development of a multi-purpose solid waste management facility and to provide for an organized waste and recyclable collection system. CDM, in working closely with the Parish, has developed the concept of an Eco Park Solid Waste Management Facility.

1.1 Eco Park Solid Waste Management Facility

The Eco Park is a solid waste management facility that establishes an emphasis on recycling and waste minimization utilizing governmental controls, public participation and private sector involvement. Integrating as many solid waste processes, recycling, and conversion technologies as possible will develop a robust, flexible, and cost-effective approach to resource recovery. This will allow options to be exercised depending upon local conditions, quantity surges in materials due to storm events, fluctuations in market conditions, and periodic maintenance outages for various systems. The intent is for the facility to be economically viable and to provide for commercial participation in the management of the waste materials. A significant portion of the parcel will be devoted to buffer areas which shield the Eco Park from the surroundings. The time has come for proactive and progressive management of solid waste and the Eco Park concept can provide an innovative and sustainable solution for St. Tammany Parish.

The Eco Park concept is totally flexible. The facility can be developed in phases to allow for available funding and Parish priorities. Components can be added in the future to meet public needs and markets for materials. Private sector participation is crucial for

the build out of recycling and processing components and commercial partners should be sought out as part of the development process.

A carefully coordinated solid waste processing and disposal facility design will minimize environmental impacts, provide maximize benefits, and keep operation and maintenance costs as low as possible. The site can be developed to manage four major solid waste categories: Concrete and Demolition (C&D), Municipal Solid Waste (MSW), Recyclables and excluded wastes such as yard wastes, white goods, batteries, tires, electronics and household hazardous waste. The choice of which materials will be accepted is up to the Parish based on compatibility, citizens needs, and market conditions. The list of potential components include:

- C&D material recycling (concrete, wood, dirt, etc.)
- Recycling household garbage
- Composting (green waste)
- C&D disposal
- MSW disposal
- Electronic waste recycling
- Tire recycling
- Household hazardous waste
- Used oil drop off
- Battery recycling
- Biosolids processing and recycling

Other important functions that can be integrated in the Eco Park are:

- Waste fuel processing (pelletizing)
- Waste to energy
- Recycled materials manufacturing
- Biofuel processing
- Landfill gas production

One of the largest components of a waste disposal facility is C&D waste. This waste consists of debris such as concrete, asphalt, wood, metals, bricks, and plastics to name a few. This is generally bulky, heavy material. The principal need for St. Tammany Parish's solid waste management plan is the development of a C&D disposal facility. When the Slidell Landfill closes in 2010 the Parish will need to transport C&D waste out of the Parish. With fluctuating costs in fuel, transporting this waste out of the Parish may not be economical. This component must be first priority for St. Tammany Parish.

The facility can be developed and permitted in phases. The initial phase is expected to include the C&D landfill, green waste processing, recycling drop off center, and areas for tire, used oil and battery drop off. The design and permitting is expected to take up to 3 years for regulatory approval from LDEQ.

These facilities usually pay for themselves in a span of 10 to 20 years. Afterwards the revenue generated can be used for new development and O&M of the disposal facility. The benefits to the Parish include a long term option for disposal of waste, cost competitive waste disposal without shipping to out-of-Parish facilities, an effective recycling program and a more environmentally friendly solid waste management system.

1.2 Collection System

LDEQ records show that there are 24 haulers operating in St. Tammany Parish for waste collection. This many haulers cause an inefficient and potentially harmful collection system. This situation produces several negative consequences:

- Safety issues due to increased truck traffic in neighborhoods and on the roads;
- Environmental impacts due to pollution of additional truck traffic;
- Deterioration of Parish roads due to unnecessary heavy traffic;
- Traffic impacts on some rural roads, which are not wide enough to have trucks collecting waste and traffic on both lanes;
- Difficulty to enforce Parish minimum standards for garbage trucks ;
- Deterioration of the curb appeal of the neighborhoods due to having garbage containers and/or garbage bags out on the curb different days a week on different houses;
- Lack of control over implementation of new waste collection strategies, such as recycling;

Therefore, an organized and controlled approach to solid waste collection must be implemented.

A regional approach to solid waste collection is an important concept for a municipality with a varied population density and land use. An approach that is appropriate for an urban or suburban region may not be appropriate for rural or less populated areas. That is why a flexible regional approach is important for the parish to consider in dealing

with solid waste collection. Curbside collection, automated curbside collection, dual stream collection, pay as you throw (PAYT) for weight and volume based collection, and regional convenience drop off centers are successful approaches that would be effective in St. Tammany parish. Each approach has it's advantages and disadvantages and depend on the service area, distance to the disposal site or transfer station and the population density.

Recycling

The keys to a successful recycling program with a high participation level are to make the program convenient, enact mandates and institute a PAYT program. Some programs have enacted mandates requiring residents to source separate or their waste will not be collected. When developing a recycling system the market for the materials must also be considered.

The first step in the process is collecting recyclables via curbside, conveniently located drop-off centers, buy-back centers, and deposit/refund programs. The collected recyclables are usually sent to a materials recovery facility (MRF) to be sorted and prepared into marketable commodities for manufacturing. Recyclables are bought and sold just like any other commodity, and prices for the materials change and fluctuate with the market.

The next step is getting the materials manufactured into a new product. Common household items that contain recycled materials include newspapers and paper towels; aluminum, plastic, and glass soft drink containers; steel cans; and plastic laundry detergent bottles.

Then the purchasing of recycled products completes the recycling loop. By "buying recycled," governments, as well as businesses and individual consumers, each play an important role in making the recycling process a success. As consumers demand more environmentally sound products, manufacturers will continue to meet that demand by producing high-quality recycled products.

Garbage Districts

St. Tammany Parish currently has two functional management units for residential solid waste collection and management; Garbage District No. 1 and No. 2. These districts are both located west of Slidell within unincorporated St. Tammany Parish. District No. 1 is centered on the Crossgates Subdivision while District No. 2 is located to the south encompassing Oak Harbor and Lakeshore Estates Subdivisions among others.

Garbage District No. 1 has an existing municipal billing system with Crossgates Utilities (water and sewer system). Overlaying a garbage system with Crossgates would be relatively simple and in fact has been targeted by St. Tammany Parish as the pilot for Parish garbage service. After implementation of the initial service, it is recommended that adjacent and surrounding subdivisions who have billing mechanisms be encouraged to piggyback onto the Crossgates contract.

Once the program has become a success then the garbage districts can be expanded for growth and creation of new districts.

Funding

There are several mechanisms used for the funding of solid waste collection and disposal systems. As previously discussed tax based systems, flat fee systems, variable rate systems and hybrid funding methods are the most popular means of governmental funding systems.

As a public entity St. Tammany Parish may be eligible for grants and low interest loans or municipal bonds which may also be an option for additional funding to keep the resident fees lower. The project becomes more attractive to government funding especially if the project can show "green" aspects or LEED certification with a renewable energy component.

By operating it's own facility, St. Tammany Parish would avoid the cost of sending materials to out-of-parish landfills for disposal and could potentially save between $500,000 to $1,000,000 per year.

For a tax based system, raising the millage rate in St. Tammany Parish by 1 mil could generate about $863,000 per year. Local option sales tax could also provide funding for the system. Other revenues from tipping fees and public private partnerships would allow for operational funding and future improvements.

Most funding systems for collection are based on the flat fee system. This system allows for ease of revenue projections and calculation of bills. In general waste collection can cost each household about $25 per month for 86,400 households yielding monthly revenue of about $2.16 million. This equates to annual revenues of $25.92 million.

1.3 Next Step

In order for St. Tammany Parish to develop a solid waste management program the developmental steps must be taken to plan and develop an organized and efficient program.

- Perform an analysis of the waste stream to identify potential recyclable materials and quantity, develop a correlation between urban and rural waste types and quantities, and develop an expected waste stream for landfilling.
- Solicit input from the community regarding their opinions on recycling, collection and disposal from meetings and questionnaires;
- Define the goals of the community using public input, local and state governments, and waste coalitions and associations(Recycling, SWANA, NSWMA);
- Analyze the service area;

- Determine public and private collection and transfer options and determine what facilities the Parish may need;
- Determine and develop the system funding structure;
- Determine the location for the Eco Park Solid Waste Management Facility and commence design, permitting and construction;
- Identify waste preparation and collection procedures and prepare an RFP for privatization on a pilot program for a district;
- Provide education brochures and news advertisements for upcoming pilot program.
- Develop collection routes and districts for pilot program and for future;
- Review proposals and determine best provider;
- Contract for collection on a pilot study and develop infrastructure as needed for support;
- Monitor system performance and make adjustments prior to selection on future districts.
- Provide education brochures and news advertisements for upcoming wider scale program.

Development and implementation of a solid waste management system must be designed to meet the needs of the community and the Parish. This process takes extensive planning and solicitation of input from the community to provide the expected services for an efficient and cost effective solution as possible.

Section 2
Introduction

The backbone of an effective municipal solid waste management program is an effective and efficient collection system that provides residential garbage collection for a set fee. This combined with the potential for recycling and environmentally sound disposal are the main components of a successful program. Since residential collection accounts for more than 50 percent of the cost for solid waste handling and disposal, development of an efficient collection system is of great importance.

As indicated in the 2006 population estimate from the U.S. Census Bureau, the population of St. Tammany Parish has grown to 230,605 which represents a 20 percent increase over the year 2000 census (191,268). This number may be even higher due to relocation of large number Hurricane Katrina evacuees many of whom permanently relocated to the Parish (U.S. Census Bureau, 2008). Most of this growth has occurred in unincorporated St. Tammany Parish. As the demographics and environment of St. Tammany has evolved rapidly, the solid waste collection systems have continued to rely on private sector service providers and local market conditions. It should be noted that the incorporated towns and cities within St. Tammany Parish provide residential garbage collection as a public utility funded largely by user fees and in some cases supplemented by taxes.

Historically, within the unincorporated areas a privately operated, market driven approach to residential garbage collection has been the primary methodology. Under this approach individual waste hauler would offer their services to individual homeowners or to private subdivisions on a contract basis or subscription-based program. This type of service offers several advantages and disadvantages. For the Parish, not having the need to establish administration (and a billing mechanism), which will be costly and will require additional staff to run, is definitely an advantage. For the homeowner, the freedom to choose from different providers (and therefore rates) can be appealing. This mechanism also addresses collection in remote rural areas and it is currently used in rural areas of several parishes surrounding St. Tammany including Tangipahoa, Washington and St. John the Baptist.

As the residential solid waste market continues to grow, the needs of the Parish are continually evolving. Although the private sector is servicing the demand for residential and commercial solid waste collection, the system is inefficient and lacks sufficient controls. The Parish has reached "critical mass" with regard to residential garbage collection and the need for an organized and controlled system has become apparent. Implementing a Parish-wide solution cannot be accomplished overnight however. There are many existing private sector haulers (with existing service contracts) to contend with and limited mechanisms for consolidation and customer billing. In fact, there are too many haulers competing for the residential business at this time leading to inefficient collection service, overlapping routes, as well as potential safety and environmental impacts. On any given day, it is possible to see multiple garbage trucks from different companies picking up waste on the same street. LDEQ records show 24 permitted private haulers currently operating on St. Tammany Parish. This situation produces several negative consequences:

- Safety issues due to increased truck traffic in neighborhoods and on the roads;
- Environmental impacts due to pollution of additional truck traffic;
- Deterioration of Parish roads due to unnecessary heavy traffic;
- Traffic impacts on some rural roads, which are not wide enough to have trucks collecting waste and traffic on both lanes;
- Difficulty to enforce Parish minimum standards for garbage trucks ;
- Deterioration of the curb appeal of the neighborhoods due to having garbage containers and/or garbage bags out on the curb different days a week on different houses;
- Lack of control over implementation of new waste collection strategies, such as recycling;

This report analyzes the Parish's existing solid waste management system, discusses trends in solid waste generation, and provides for collection and disposal alternatives for solid waste and recyclables. The report discusses alternatives for funding of collection and disposal systems and provides recommendations on the direction for a long term solid waste management solution.

Section 3
Current Solid Waste Practices

3.1 Current Collection Practices

3.1.1 Residential Collection Practices

Curbside garbage collection is offered to the residents in St. Tammany Parish through a variety of sources with the primary distinction being whether or not you are in an incorporated municipality or within unicorporated St. Tammany Parish. The approach to managing garbage collection in incorporated and unincorporated areas are quite different. The existence of a system for customer billing in the towns and cities allows for a blanket contract for garbage collection for all residents provided by the municipality.

3.1.1.1 Incorporated Areas

The local governments of Slidell, Mandeville, Covington, and Abita Springs are currently franchising out their solid waste collection to individual private haulers (see **Table 3.1**). These communities have created ordinances for collection, hauling and disposal of solid waste and bid out the garbage collection service to a single service provider. Haulers wishing to do business within these communities must be able to conform to the ordinance and compete for the contract to provide the service on a city-wide basis. In each case, a single service provider is retained for a contract period of typically 5 years.

Table 3.1
Contracted Haulers

Community	Hauler
Covington	Waste Management (WM)
Mandeville	Coastal Waste Services (CWS)
Slidell	Coastal Waste Services (CWS)
Abita Springs	BFI (Allied Waste)

The town/city ordinances for solid waste collection typically define a Garbage District or service boundaries with are usually the corporate limits. Private haulers are notified through public advertisement that the community is seeking to franchise (bid) their solid waste collection and provide the standards they expect. Bids are accepted and reviewed by the governmental entity of the incorporated community to determine which hauler to franchise out the collection. The bids are reviewed and evaluated based on the price per household per month, level of service, operating equipment, and experience. Award can be based on low bid price or a combination of criteria including price.

This franchising process has created an effective and efficient solid waste collection system for both the incorporated communities and private haulers. The result is low

cost for individual residents and businesses located in incorporated areas. As an example, Coastal Waste Services (CWS) is charging Mandeville $15.05 per household per month. In unincorporated areas, private service monthly fees maybe $25.00 per household or greater for a subscription-based service. It should be noted that the cost of rural waste collection is typically higher due to the distances and lack of density.

Billing for residential waste collection within incorporated areas is typically handled directly by the Cities that send out the bills coupled with other provided utilities. The existence of a customer billing mechanism is the key to consolidated garbage collection. Since the Parish lacks a common customer billing mechanism on a parish-wide basis, it becomes difficult to implement a comprehensive franchise or contract based service without resorting to tax based funding.

The benefit of incorporated communities franchising their waste collection goes beyond price. With the haulers having the right (and obligation) to the entire community, they are able to establish collection schedules and routes that are not fragmented or intrusive to the community. Overlapping garbage truck routes are no longer an issue. As a result, solid waste collection is effective and efficient. Residential collection service can be contracted on a weekly or semi-weekly schedule depending on the level of service required. Other services, such as curbside recycling can be readily provided if desired. In addition to this, ninety-five gallons (wheeled and covered) containers may be provided by the service provider if desired. Providing the large containers standardizes the aesthetics of the community on waste collection days and is typically more efficient for the haulers. The waste hauler may also provide the option for curbside recyclable pickup for a small fee.

Many communities including Mandeville, Covington and Slidell have gone to once per week pickup utilizing the "semi-automated" collection system. Because residents are provided with 96 gallon containers (3 times larger than the typical homeowner garbage can), one collection per week is normally sufficient for the waste generated by a typical family, see **Figure 3.1**. An additional can may be requested by homeowners if they need the capacity. The 96 gallon containers are wheeled and have a hinged cover. They are easy to roll and the cover keeps out rain and keeps in odors (and never gets lost). The system is referred to as "semi-automated" based on the collection truck system which uses a hydraulic cart tipper on the back since the 96 gallon containers are too heavy for lifting by hand.

Figure 3.1
Typical 96 Gallon Residential Garbage Cart

The incorporated communities typically mandate that contracted haulers obtain the permits needed by the Department of the Transportation Department (DOTD) and the Louisiana Department of Environmental Quality (LDEQ) for their waste collection trucks. These permits help to ensure that the haulers are using the proper equipment in good condition for waste collection in the community. From an administrative view, it is much easier to monitor the contract and compliance of a single service provider as it typical of municipal garbage collection.

Based on discussions with the towns and cities within St. Tammany, the administration and the residents are pleased with the services that their franchised haulers are providing. In general the feedback from municipalities with single source garbage collection is very positive. In most cases, the garbage service provider becomes an important arm of the government providing service and partnering with the municipality to anticipate and solve problems related to residential and commercial garbage management as well as providing community service.

3.1.1.2 Unincorporated Areas

The unincorporated area of St. Tammany Parish is where the population growth is experiencing the fastest increases and the need for consolidated garbage collection is greatest. In 2005, the Solid Waste Management Report for St. Tammany Parish stated that the majority of growth is occurring in the unincorporated areas south of Interstate -12.

The garbage collection ordinance for St. Tammany Parish has not been changed significantly since 1979, so the Parish is now looking into necessary updates to this ordinance. Two new Consolidated Garbage Districts have been established east of Slidell. Garbage District No. 1 will provide residential collection in the Crossgates subdivision and adjacent communities served by the Crossgates Utilities (water and wastewater service). Residential garbage fees will be bundled with the Crossgates monthly billing. Garbage District No. 2 is located to the south of Slidell. Similar billing arrangements with local utility companies are envisioned in the future for this district as well. Outside of these two Garbage Districts, garbage collection in unincorporated St. Tammany Parish is based on the commercial market as described above with all of the associated problems, inefficiencies and costs.

How residential waste is collected in unincorporated areas varies between the individual haulers. Some haulers provide containers, others have the residents purchase containers, and some do not require containers for collection. How the containers are left after collection also varies. Some haulers place empty containers how they found them. Others are thrown back into the driveway, leaving them scattered at the end of the household's driveway. The different types and scattering of containers has led to diminishing aesthetics and safety concerns in the unincorporated communities.

The equipment that is used also varies among haulers. In general, the larger haulers are using proper equipment and procedures. Many of the smaller service providers are also doing a good job and following all the rules. Some small private haulers, who may be only services a few homes in the Parish, are not meeting the required equipment standards and the disposal practices may be substandard as well. . There are haulers who use pick-up trucks for operations, containing the solid waste using only nets or building up walls on the bed of their truck. These methods lead to waste liquids leaking and litter falling out of the trucks while servicing communities. This is not only unsightly, but may also create a health and safety hazard to the public.

The overall opinion of the solid waste collection in the unincorporated areas varies. St. Tammany Parish would like to have more control and consistency for waste collection for the unincorporated areas of the Parish. A large portion of the public also would like collection practices to improve. There are those that oppose change and like the idea of a free market for collection (even though they are paying more). Others would welcome standardized garbage collection provided by Parish Government, in particular those who moved from the south shore.

Some of the better organized neighborhood and homeowner associations have franchised out waste collection services to one hauler. They manage these contracts just like the incorporated areas. This gives these neighborhoods the control needed to make garbage collection efficient and more environmentally friendly.

3.1.2 Commercial Collection Practices

Commercial solid waste is generated from small businesses, restaurants, stores, malls, offices and the like. Collection of commercial solid waste is managed similar to the current collection practices of residential waste within unincorporated areas. Unincorporated areas allow individual businesses to personally subscribe out the collection of solid waste they generate. It should be noted that commercial service differs from residential service in several ways. Typically commercial solid waste is collected in dumpsters which are serviced by automated front loaders. For larger commercial or industrial generators, roll-off containers are used. Contracts are established between the generator and the waste hauler. Unlike residential service, this arrangement is typically outside of the direct control of the municipality, although municipalities should dictate collection standards and even control of disposal. Commercial garbage collection within unincorporated areas should follow this model whereby the Parish's ordinance should apply but the service providers are allowed to continue to solicit business independently. The Parish may elect to control disposal of waste from commercial haulers at a point in time where control is beneficial from a health and safety perspective.

3.1.3 Recycling Collection Practices

Recycling opportunities for residents of unincorporated area are very limited at this time for a variety of reasons. Curbside recycling is expensive when evaluated in terms of volume of materials recovered. Materials markets are extremely volatile and can quickly turn from a profitable endeavor to a financial burden as has happened during the latter part of 2008.

Coastal Waste Services currently is the only hauler that offers on-site collection for recycling to Parish residents and businesses. Only Mandeville provides separate recycling service for residents under the Coastal Waste Service contract. Otherwise residential recycling is based on a subscription service, whereby they provide curbside collection once a week for recyclables which usually falls on the same day as waste collection. The collected recyclables are picked up on a single stream approach, where the homeowners place paper, plastic, aluminum, and glass in a single container. Containers are bought by residents and businesses that choose to recycle.

Recycling in unincorporated St. Tammany Parish is on a voluntary basis only at this time. Residents and businesses that choose to recycle have to pay an extra fee for the service. Residents pay between $1.50 and $2.00 a month for this service. St. Tammany Parish has received many requests from residents for better access to recycling. It may be feasible to provide recycling opportunities through Parish sponsored drop-off sites in conjunction with the private garbage haulers. The current

privately operated transfer stations within unincorporated St. Tammany could provide a location for recycling drop off centers. This concept is currently being explored.

3.2 Transfer & Disposal

All municipal solid waste (MSW) generated within St. Tammany Parish is hauled out of the Parish for disposal at permitting landfill in nearby Parish's or Mississippi. Construction and Demolition Debris (C&D) is regulated separately from MSW. C&D waste is defined as "non-putrescible" (won't readily decompose) and consists of wood, sheet rock, bricks, concrete, roofing materials and similar debris generated from demolition and renovation activities.

Slidell Landfill is the only operating Type III C&D Debris Landfill (LDEQ Facility D-103-2721) located in St. Tammany Parish. The facility is located at 310 Howze Beach Road in Slidell, St. Tammany Parish, Louisiana and a location map can be seen in **Figure 3.2**. The landfill is divided into two cells that were originally permitted by LDEQ on September 26, 2000 (Permit No. P-0345) to the height of approximately 18-feet. Due to the C&D disposal needs for site after Katrina, a permit was issue to extend capacity to 65 feet. The permit for the disposal site expires January 31, 2010. The current operator, Slidell Landfill, LLC, has proposed to extend the lifespan of the facility through a permit modification with LDEQ. Although public opposition of the site is strong, it is unknown at this time if an extension will be granted. This C&D facility is located in a residential area and the public strongly feels it affects the community negatively. When this facility closes, St. Tammany Parish will be without an operating disposal site for C&D waste. Given the need for disposal of this type of waste, particularly due to hurricane generated waste, the loss of this facility without an appropriate replacement would result in a hardship for the citizens and businesses in the Parish.

Littering and illegal waste disposal practices are occurring in St. Tammany Parish. Residents that live in rural areas of the Parish that do not want to pay for curb-side pick up or tipping fees either burn or bury their waste. It is evident that some haulers are illegally dumping waste along roadsides to lower operational costs.

3.2.1 Transfer Stations

Due to the lack of a Municipal Solid Waste (MSW) landfill in the Parish, all of the MSW that is produced in St. Tammany is transferred out of the Parish to remote landfills. The waste handling process begins with haulers collecting the waste from the individual households and delivering it to transfer stations. These stations are sites permitted to receive waste and reload it to larger trucks for transfer to final disposal. Generally, storage of waste is not permitted beyond daily needs. The waste is handled by heavy equipment and loaded into tractor-trailer trucks that will make the long haul trip to the landfill. This operation is more economical and allows route trucks to concentrate on collections without having to make the long trip to the

landfill out of St. Tammany Parish. Currently, there are three privately owned transfer stations in St. Tammany Parish: one owned and operated by Stranco Solid Waste Management (Stranco), another one by Waste Management (WM), and the third one by Coastal Waste Services (CWS). A fourth is being developed by CWS north of Covington.

A tipping fee is charged for each delivery of waste to the transfer stations. The tipping fee is typically based on the weight (tonnage) of waste material delivered as measured by a truck scale at the facility entrance. The recent tipping fees charged by the local transfer stations are shown in **Table 3.2**.

Table 3.2

Transfer Station	Tipping Fee per Ton	Daily Tonnage Disposed
STRANCO	$51.60	500-700
WM	N/A	165
CWS	$42.00	180

3.2.2 Disposal Sites accepting Out-of-Parish Waste

Disposal facilities that accept out-of-Parish waste are shown in **Figure 2.2** along with the haul distance from the transfer stations.

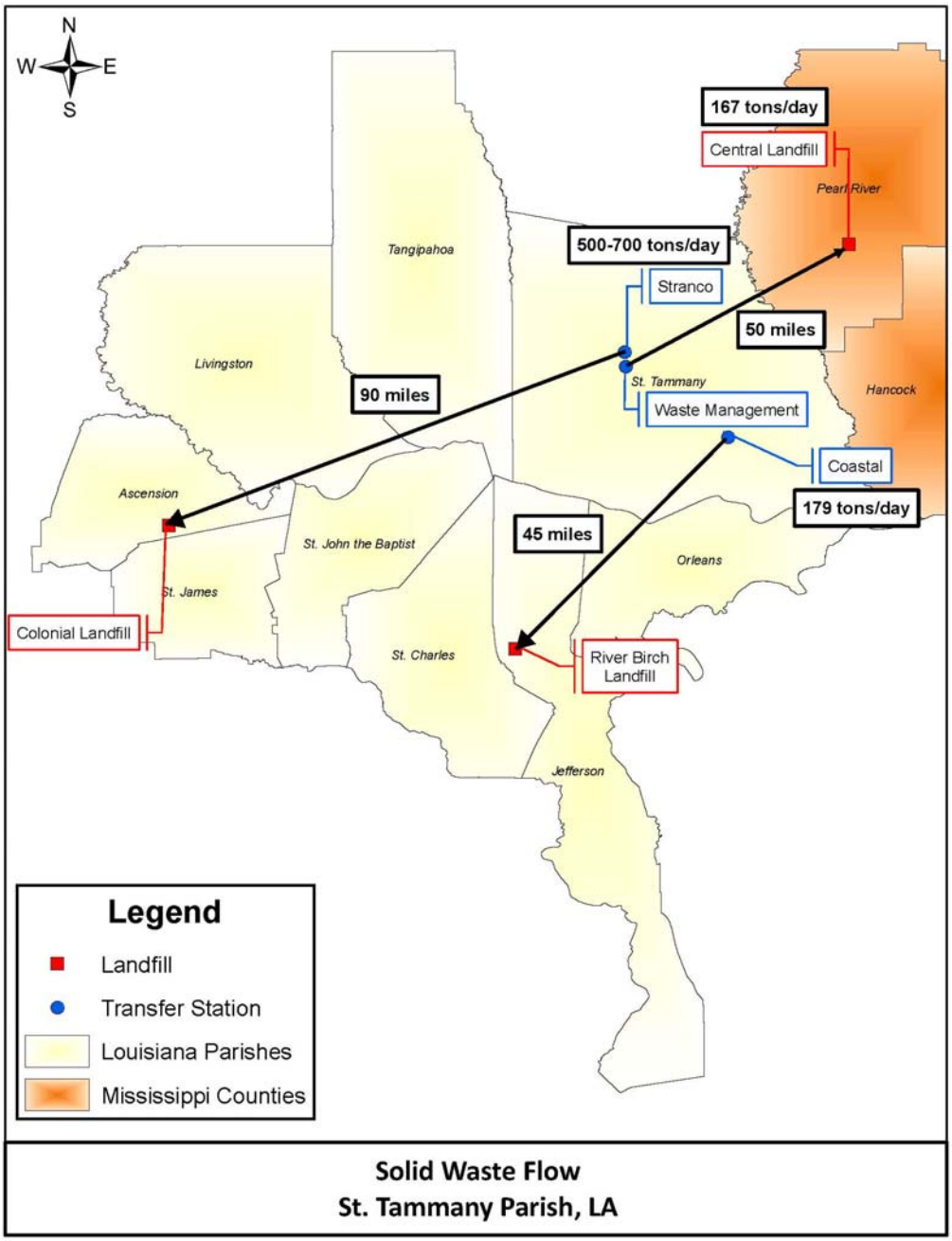


Figure 3.2 Solid Waste Facilities Serving St. Tammany Parish

Landfills are generally classified into three types by the Louisiana Department of Environmental Quality: Type I which accepts industrial waste, Type II accepts residential and commercial solid waste and Type III accepts construction and demolition and wood waste. Municipal solid waste (MSW) is generally referred to as residential and commercial solid waste. In Louisiana the number of MSW landfills has been reduced to 26 as of 2009. The out of Parish solid waste facilities and the types of solid waste accepted by each disposal facility is listed in **Table 3.3**.

Table 3.3
Disposal Facility Permits

Facility	Parish	Owner/Operator
Acadia Parish Landfill	Acadia	Parish
Coast Guard Road Landfill	Plaquemines	Tidewater Landfill, Inc.
Colonial Landfill	Ascension	Allied
CWI, White Oaks	Ouachita	CWI
DeSoto Parish Landfill	DeSoto	Parish
East Baton Rouge Parish Landfill	E. Baton Rouge	Parish/WM
Jefferson Davis Parish Landfill	Jefferson Davis	Parish/Allied
Jefferson Parish Landfill	Jefferson	Parish/WM
LaSalle/Grant Parish Landfill	LaSalle	Parish/IESI
Magnolia Landfill	Ouachita	WM
Reliable Landfill	Pointe Coupee	WM
River Birch Landfill	Jefferson	River Birch, Inc.
Sabine Parish Landfill	Sabine	IESI
Harold J. "Babe" St. Mary Landfill	St. Mary	Parish
St. Landry Parish Landfill	St. Landry	Parish
Tangipahoa Landfill	Tangipahoa	Parish
Tensas Parish Landfill	Tensas	IESI
Terrebonne	Terrebonne	Parish
Timberlane	Allen	IESI
Union Parish Landfill	Union	Parish
Vermilion Parish Landfill	Vermilion	Parish
Washington Parish Landfill	Washington	Parish
Webster Parish Landfill	Webster	Parish/WM
West Carroll Landfill	West Carrol	Parish
Woodside Landfill	Livingston	WM
Woolworth City of Shreveport LF	Caddo	Parish/Allied

3.2.3 Disposal Facilities, Hauling Routes, & Distances

The disposal site for solid waste collected in St. Tammany Parish is dependent on contracts established between the individual haulers and privately operated transfer stations and disposal facilities. These agreements are between private parties with the Parish having little or no control. The waste flow map depicted above illustrates that solid waste is transported long distances for disposal. In the case of the Stranco operation on Highway 59, solid waste is transported approximately 90 miles one way with a travel time of nearly two hours each way. For Waste Management, Inc., their Highway 59 transfer facility sends garbage to the Central Landfill in McNeill, MS., a distance of 50 miles. The haul distance for the Coastal Waste transfer facility in Slidell to the River Birch Landfill in Avondale, LA is approximately 45 miles or one hour travel time each way. All of these routes involve transfer to large capacity, long haul tractor trailer trucks.

Transfer and transportation costs makeup a significant portion of the disposal fee paid by the residential users. If waste continues to be disposed of out of St. Tammany Parish, tipping fees from transfer stations will continue to remain higher than some of our neighboring Parishes and may escalate further if fuel costs rise. In addition, the revenue generated by disposal will accrue to the out-of-parish landfill operator and host municipality.

Section 4
Disposal Alternatives
4.1 Alternatives

As described above St. Tammany Parish currently utilizes the Slidell Landfill for disposal of C&D materials and out of Parish landfills for MSW disposal. The current system is functional, but future landfill closures and economic factors will dictate new approaches. However, opportunities for recycling are very limited under this existing system.

The Slidell Landfill is likely to close as soon as LDEQ permit expires (January 2011) unless they are successful in gaining an extension. Public opposition to continued operation is strong and the location of the facility is in a high growth area with commercial and residential development. Therefore an alternative method of C&D disposal is critical both for economic and environmental reasons. Safe, affordable C&D disposal is a necessity for economic growth in St. Tammany Parish. C&D disposal capacity can be obtained either from development of a new landfill or hauling of the material to existing permitted facilities. Hauling of C&D to out of Parish facilities is likely to lead to unacceptably high disposal prices. The C&D market is very sensitive to cost and a local disposal solution is usually an economic necessity.

MSW has been managed by out-of-Parish disposal primarily at three landfills (see previous section). The Parish can continue to utilize this option as provided by the commercial haulers or it can exercise control of the waste stream by other means. The alternatives available are; 1) continue current practice, 2) develop a Parish MSW landfill, or 3) direct the flow of MSW through governmental control.

Continuing the current practice is feasible for the foreseeable future but transportation costs will adversely impact the economics as fuel prices rise and fluctuate. There is ample capacity at the out-of-Parish facilities to last for many years. The tipping fees can be fixed based on long term contracts, but eventually market conditions will result in higher disposal costs as well.

Development of a Parish Landfill would provide a number of significant benefits for MSW management. Tipping fee costs could be minimized and controlled. Capacity could be preserved for the residents of the Parish and transportation costs would be greatly reduced. Further, the costs could be reduced to the benefit of the paying residents. The landfill could also generate revenue at little or no cost to the users.

Another option would be Parish management and control of the MSW wastestream through regulation. Agreements with specific out-of-parish landfills and commercial haulers could allow the Parish to dictate the flow of solid waste and establish long term disposal costs. This would be difficult to implement, since the Parish doesn't yet control collection of residential waste on anything approaching a Parish-wide basis. This also makes it difficult to implement cost effective recycling programs.

Since C&D disposal will become a Parish problem when Slidell Landfill closes, a solution for this wastestream must be found quickly. MSW may continue with the existing management

system for the time being without any disruption while the alternatives are discussed and weighed. Recycling will likely continue to be problematic until more local solutions are implemented and large scale Parish garbage collection is available.

One possible solution to these problems is provided by the Eco Park concept described below.

4.2 Eco Park Capacity & Size

St. Tammany Parish is developing the concept of an Eco Park Solid Waste Management facility. This facility is to provide a means of solid waste disposal for St. Tammany Parish, recycling drop off and handling, and collection of excluded wastes such as yard waste, bulky white goods, batteries, tires, electronics and household hazardous waste, among others. The purpose of this facility is to provide a waste management facility for the parish to control the waste in a responsible, efficient, cost effective and environmentally friendly manner. This facility could provide a major portion of a comprehensive solid waste management system for the Parish for the foreseeable future.

Another element of the Eco Park is to provide the parish with a comprehensive recycling program where residents can easily participate in recycling and have a cost effective waste collection system. This approach will also encourage waste reduction through recycling to meet statewide and parish goals and provide a means for funding through recycling material contracts for end use. Public education is an important aspect to increasing cooperation and participation. Educational tours and public advisories are beneficial and will contribute to the success of this project.

The Eco Park concept is flexible and the facility could include C&D disposal, MSW disposal, many types of recycling, composting, and related waste management components. The Parish would decide which of the system components to activate based on need and the desires of the residents. The following section on population is provided to help determine the size and components of a Eco Park for St. Tammany Parish. Following the population evaluation, an Eco Park facility for St. Tammany is further defined and described.

4.2.1 Population Estimation & Project Life Span

4.2.1.1 Project Life Span

St. Tammany Parish wishes to provide a long term waste disposal option for the parish for a site life of 50 years. Population growth, service area, waste characterization, facility components and contingency plans must be evaluated and considered for the design and appropriate sizing of this facility.

4.2.1.2 Population Estimation

The most important factor for determining waste projections is population. Between 1990 and 2000, St. Tammany Parish had the highest growth rate of any Louisiana parish and was ranked among the top counties for growth rate nationwide. During this decade, the population of St. Tammany Parish increased by 32 percent, from 144,508 people to 191,268. **Table 4.1** shows a summary of the Parish growth from 1990 to 2000. St. Tammany Parish is part of the U.S. Census Bureau Standard Metropolitan Statistical Area (SMSA) of New Orleans. According to

SMSA information for the year 2000, St. Tammany Parish is the fifth largest Parish in Louisiana with a population of 191,268. According to the 2006 census data, the population increased by 21 percent from the years 2000 to 2006 to 230,605. This population growth is expected to continue.

Much of the recent population growth has been adjacent to and south of Interstate-12, in the Mandeville/Covington area, and on both the western and eastern sides of the City of Slidell. A majority of the growth has been outside of the incorporated cities. The driving force behind the high growth rate is migration from the New Orleans Metropolitan area. St. Tammany Parish has become an attractive location for families due to its excellent school system and proximity to New Orleans and Jefferson Parish via the Causeway and Interstate-10. The housing industry has flourished during the past decade with a 30 percent increase in house units, or approximately 17,405 units.

Table 4.1
St. Tammany Parish Total Population

Year	Population
1990	144,508
2000	191,268
Total Growth	32%
Growth Per Year	3.2%

Post–Hurricane Katrina population estimates for St. Tammany Parish are a highly debated topic. The 2006 U.S. Census official population estimate for St. Tammany Parish is 230,605.

The 2006 Louisiana Health and Population Survey, sponsored by the Louisiana Department of Health and Hospitals and the Louisiana Recovery Authority, employs standard U.S. Census Bureau methods with modifications made for the 2005 hurricane season. The 2006 Louisiana Health and Population Survey estimates the St. Tammany Parish population at 220,656. Population projection information in this report was determined by the methods used in *St. Tammany Parish Comprehensive Plan: New Directions 2025* and *Solid Waste Management Report for St. Tammany Parish*.

In this report the Parish is divided into 35 census tracts. The census tracts are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions and are usually bound by major roadways or bodies of water. Census can be seen in **Table 4.2.**

Estimated 25 year growth factors of 20, 50, or 80 percent were applied to the year 2000 populations and densities for each of the 35 census tracts in St. Tammany Parish, as part of the Land Use Plan Framework. The census tracts receiving the low population growth factor (20 percent) are either located partly or entirely within existing municipal boundaries, are close to built out, or are composed primarily of wetland/floodplain areas. Moderate growth (50 percent) is assumed in tract areas that are located adjacent to existing municipal boundaries or major transportation corridors or are located in northern areas targeted for growth management policies. High growth (80 percent) was assumed for census tracts that are both located adjacent to existing municipal boundaries or along major transportation corridors and have a significant portion of undeveloped land without environmental constraints.

To obtain population projections for the 25 year planning period, the 20, 50, and 80 percent growth factors were applied to the U.S. Census Bureau July 1, 2005 population estimate of 220,950, a conservative estimate regarding post-Katrina impact. The population per census tract for 2005 was interpolated using the U.S. Census Bureau 2000 population estimates per census tract. The growth factors were then applied to obtain the 2030 population and population densities. Using this method, the total estimated population of St. Tammany Parish in 2030 is 325,780. The results of these populations are provided in **Table 4.2**.

Table 4.2
St. Tammany Parish Population Projections to 2030 by Census Tract

Census Tract	Tract Land Area (mi²)	2000 Population	2005 Population Estimate	25 Year Growth Factor	Population Projections				
					2010	2015	2020	2025	2030
401.01	135.86	8,706	10,121	50%	11,133	12,145	13,157	14,169	15,182
401.02	169.75	7,506	8,726	50%	9,599	10,471	11,344	12,216	13,089
402.01	55.47	4,996	5,808	50%	6,389	6,970	7,550	8,131	8,712
402.02	56.32	5,757	6,693	50%	7,362	8,032	8,701	9,370	10,040
403.01	49.77	4,633	5,385	50%	5,924	6,462	7,001	7,539	8,078
403.03	8.65	6,922	7,608	20%	7,912	8,217	8,521	8,825	9,130
403.04	4.68	6,529	7,176	20%	7,463	7,750	8,037	8,324	8,611
404	13.89	4,002	4,906	80%	5,691	6,476	7,261	8,046	8,831
405.01	2.84	3,587	4,170	50%	4,587	5,004	5,421	5,838	6,255
405.02	7.68	3,011	3,500	50%	3,850	4,200	4,550	4,900	5,250
406.01	6.28	1,930	2,366	80%	2,745	3,123	3,502	3,880	4,259
406.02	1.94	2,719	2,989	20%	3,109	3,228	3,348	3,467	3,587
406.03	12.88	9,513	11,662	80%	13,528	15,394	17,260	19,126	20,992
407.01	78.75	5,740	6,673	50%	7,340	8,008	8,675	9,342	10,010
407.04	20.46	5,440	6,668	80%	7,735	8,802	9,869	10,936	12,002
407.05	4.52	4,628	5,673	80%	6,581	7,488	8,396	9,304	10,211
407.06	37.92	4,747	5,217	20%	5,426	5,634	5,843	6,052	6,260
407.07	4.64	8,885	10,329	50%	11,362	12,395	13,428	14,461	15,494
407.08	54.67	4,982	5,791	50%	6,370	6,949	7,528	8,107	8,687
408.01	1.88	3,550	4,352	80%	5,048	5,745	6,441	7,137	7,834
408.02	3.75	5,728	6,295	20%	6,547	6,799	7,050	7,302	7,554
408.03	24.14	7,348	8,542	50%	9,396	10,250	11,105	11,959	12,813
409	2.25	3,048	3,737	80%	4,335	4,933	5,531	6,129	6,727
410.02	1.15	2,920	3,209	20%	3,337	3,466	3,594	3,722	3,851
410.03	1.52	5,282	5,805	20%	6,037	6,269	6,502	6,734	6,966
410.04	1.54	4,899	5,384	20%	5,599	5,815	6,030	6,245	6,461
411.01	4.32	3,460	4,242	80%	4,921	5,599	6,278	6,957	7,636
411.02	6.36	7,145	8,306	50%	9,137	9,967	10,798	11,628	12,459
411.03	4.18	3,189	3,505	20%	3,645	3,785	3,926	4,066	4,206
411.04	9.4	3,428	3,767	20%	3,918	4,068	4,219	4,370	4,520
412.02	31.5	2,822	3,280	50%	3,608	3,936	4,264	4,592	4,920
412.04	26.53	7,073	8,671	80%	10,058	11,446	12,833	14,220	15,608
412.05	17.73	8,833	10,268	50%	11,295	12,322	13,348	14,375	15,402
412.06	7.94	11,806	12,975	20%	13,494	14,013	14,532	15,051	15,570
413	3.81	6,504	7,148	20%	7,434	7,720	8,006	8,292	8,578
Total		**191,268**	**220,950**		**241,914**	**262,880**	**283,847**	**304,814**	**325,780**

The population growth estimate from 2030 through 2060 used a 10.5 percent constant growth rate per five years. This growth rate was taken from *Solid Waste Management Report for St. Tammany Parish*. Using this method, the overall estimated population of St. Tammany is 593,059. The population projects are shown in **Table 4.3.**

Table 4.3
St. Tammany Population Projection 2030 - 2060

Population Projections						
2030	2035	2040	2045	2050	2055	2060
325,780	359,987	397,786	439,553	485,706	536,705	593,059

4.2.2 Service Area

St. Tammany Parish will need to decide if the new waste disposal site will accept out-of-Parish waste or only take waste generated inside of the Parish. There is a current need in Louisiana for more MSW facilities. The state currently has 26 operating Type I and Type II solid waste facilities for MSW. Out-of-parish waste is accepted by 19 of these, but only eight of them have the proper access and capacity to accept large quantities of MSW for the planning period. A map and list of present out-of-Parish Type I and Type II landfills are shown in **Appendix A**.

4.2.3 Waste Generation & Characterization

The amount of solid waste generated is directly correlation with population. The average Louisiana resident generates 1.10 tons per year, 6 lbs per day, of solid waste according to the Solid Waste Management Report for St. Tammany Parish. The estimated growth in St. Tammany was used when projecting the 50 year waste production.

The US EPA uses the following equation to determine waste generation:

Waste Generation = (Population) x (Waste Generation rate in pounds per person per day) / (2000 pounds per ton)

Table 4.4 and **Figure 4.1** shows the estimated daily and yearly waste generation in St. Tammany until 2060.

By 2010, St. Tammany Parish can expect to generate around 266,105 tons of a year, or 726 tons per day, of solid waste. If the population continues to grow at its present rate the Parish can expect waste generation to be around 652,365 tons a year, or 1779 tons per day, of solid waste. The makeup of a typical waste stream according to the US EPA 2007 is largely paper at 32.7 percent of the waste stream and yard trimmings and wood at 18.4 percent with food scraps 12.5 percent and plastics 12.1 percent. The remainder is metals, rubber, leather and textiles, glass and miscellaneous. **Figure 4.2** illustrates the waste generation composition that comprises the typical solid waste stream. This data confirms the importance of recycling and diversion of yard trimmings and wood from disposal in landfills.

A general rule-of-thumb as described in discussions with the Louisiana Department of Environmental Quality (LDEQ) states that a MSW disposal site becomes economically viable at

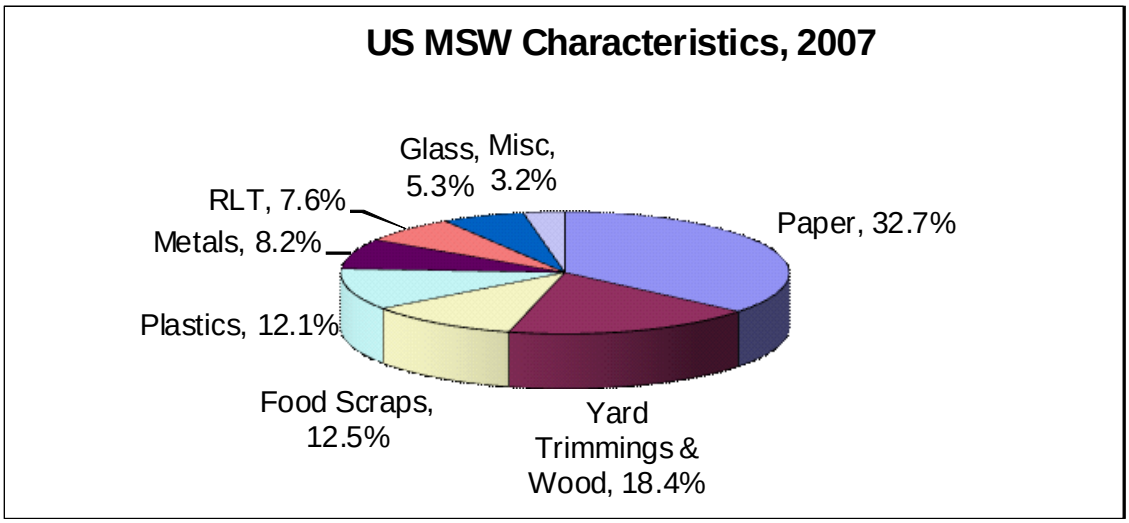
around 500 tons per day of waste. The Parish already surpasses this threshold, showing the need to explore new options for the disposal of solid waste.

Table 4.4
St. Tammany Parish Projected Solid Waste Generation

Year	Solid Waste (Tons/year)	Solid Waste (Tons/day)
2005	243,045	663
2010	266,105	726
2015	289,168	789
2020	312,232	852
2025	335,295	914
2030	358,358	977
2035	395,986	1080
2040	437,565	1193
2045	483,508	1319
2050	534,277	1457
2055	590,376	1610
2060	652,365	1779

Figure 4.1
St. Tammany Parish Projected Solid Waste Production

Figure 4.2
MSW Waste Generation Before Recycling



4.2.4 Project Site Sizing

Once project waste generation, service area, and waste characterization are identified, a disposal site sizing can be determined. This information will also be utilized to assist St. Tammany Parish with establishing goals of the program and identifying the waste processing and disposal options. The technology and practices in solid waste processing and disposal have vastly improved over the years. New practices are being developed and implemented to recycle a wide variety of solid wastes, establish markets for materials, process waste streams, reduce landfilled materials, emit less green house gases, and become more efficient. All the options for solid waste processing and disposal need to be analyzed to identify the best options for St. Tammany Parish.

Based on the population projections and assuming that a 50+ year facility is desired, the Eco Park should be developed on a parcel approximately 500 acres in size (see **Figure 4.3**).

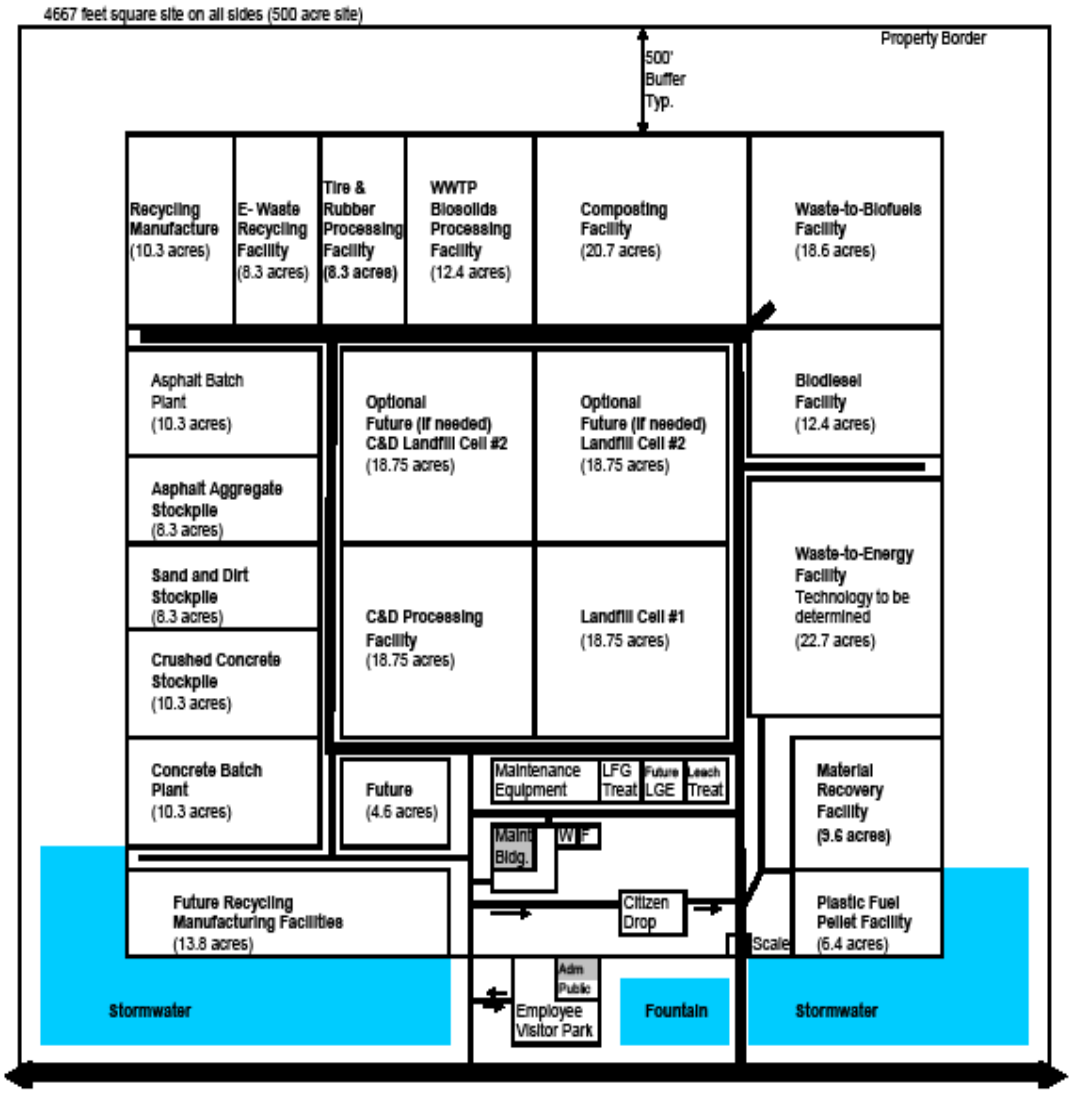


Figure 4.3 Eco Park Layout on a 500 Acre Site

4.3 Conceptual Design

The principal function of an Eco Park Solid Waste Management Facility is to provide an environmentally responsible and economically viable alternative to traditional solid waste management. The Eco Park puts an emphasis on recycling and waste minimization utilizing governmental controls, public participation and private sector involvement. Integrating as many solid waste processes, recycling, and conversion technologies as possible will develop a robust, flexible, and cost-effective approach to resource recovery. This will allow options to be exercised depending upon local conditions, quantity surges in materials due to storm events, fluctuations in market conditions, and periodic maintenance outages for various systems. The intent is for the facility to be economically viable and to provide for commercial participation in the management of the waste materials. A significant portion of the parcel will be devoted to buffer areas which shield the Eco Park from the surroundings. The time has come for proactive and progressive management of solid waste and the Eco Park concept can provide an innovative and sustainable solution for St. Tammany Parish.

The Eco Park concept is totally flexible. The facility can be developed in phases to allow for available funding and Parish priorities. Components can be added in the future to meet public needs and markets for materials. Private sector participation is crucial for the build out of recycling and processing components and commercial partners should be sought out as part of the development process.

4.3.1 Facility Components

A carefully coordinated solid waste processing and disposal facility design will minimize environmental impacts, provide maximize benefits, and keep operation and maintenance costs as low as possible. The site can be developed to manage four major solid waste categories: Concrete and Demolition (C&D), Municipal Solid Waste (MSW), Recyclables and excluded wastes such as yard wastes, white goods, batteries, tires, electronics and household hazardous waste. The choice of which materials will be accepted is up to the Parish based on compatibility, citizens needs, and market conditions. The list of potential components include:

- C&D material recycling (concrete, wood, dirt, etc.)
- Recycling household garbage
- Composting (green waste)
- C&D disposal
- MSW disposal
- Electronic waste recycling
- Tire recycling
- Household hazardous waste

- Used oil drop off
- Battery recycling
- Biosolids processing and recycling

Other important functions that can be integrated in the Eco Park are:

- Waste fuel processing (pelletizing)
- Waste to energy
- Recycled materials manufacturing
- Biofuel processing
- Landfill gas production

One of the largest components of a waste disposal facility is C&D waste. This waste consists of debris such as concrete, asphalt, wood, metals, bricks, and plastics to name a few. This is generally bulky, heavy material. The principal need for St. Tammany Parish's solid waste management plan is the development of a C&D disposal facility. When the Slidell Landfill closes in 2011 the Parish will need to transport C&D waste out of the Parish. With rising costs in fuel, transporting this waste out of the Parish is not economical. This component must be first priority for St. Tammany Parish.

A MSW site is the second stage for a waste disposal site. This site will be of similar sizing to the C&D site. MSW consists of waste commonly know as garbage. MSW waste is the sector of waste management where the most revenue can be generated. MSW contains recyclable waste and energy that global and local markets are seeking. Processing of MSW to extract recyclable component is readily available through the Eco Park concept (see below).

Creating facilities that collect and manage reusable materials is an important component of an Eco Park. Research and technology is continuing to evolve regarding the beneficial uses of solid waste. The cost of developing, building, and operating such infrastructure is initially expensive. These facilities usually pay for themselves in a span of 10 to 20 years. Afterwards the revenue generated can be used for new development and O&M of the disposal facility.

4.3.2 Recycling Stations

The development of a successful recycling facility must consider many factors in order to be effective and efficient. There are several different types of recycling facilities: a Materials Recovery Facility (MRF), single stream commingled recycling facility, and source separated target recyclable materials facility.

A MRF is a large separation facility that accepts municipal solid waste and sorts out the recyclable materials. The waste material is delivered to a building and dumped on the floor.

Large easily separated recyclables are removed and the remaining waste goes into a hopper that feeds a conveyor. Along the conveyor workers remove wood, paper, plastic, metal and glass from the waste stream and load into hoppers. The remaining waste stream goes through a series of magnets for metals removal and electronic eddy currents for non-ferrous metals removal. The remaining wastes go thought trommel and disc screens for fines removal and additional recycling separation. Additional equipment includes air separators for paper, crushers for glass and glass color separators. Compactors and balers and often used for packaging the recyclables such as paper, plastics and aluminum. A typical layout is illustrated in **Figure 4.4**. This process involves extensive personnel and equipment. Redundancy is often built into these facilities to provide for backup processes as others breakdown or go down for maintenance. This process greatly reduces the waste stream leaving only a residual in need of landfilling. This type of facility is also known as a "dirty" MRF owing to the dumping and sorting of commingled waste.

1. As incoming material moves along a **conveyer belt**, workers pull out large items, cardboard and plastic bags and toss them into bins. Unusable trash is thrown away.
2. The recyclables move into a double-deck **screening machine** that separates newspapers, mixed paper and containers into separate streams. Material bounces over rows of square wheels spinning 1,000 times per minute. Blasts of air dislodge cans and bottles from newspapers. Gaps between rollers allow smaller items to fall onto conveyer belts.
3. Workers again pull out any trash and discard it.
4. Next is the **trommel-mag** - a large, rotating tube with small holes in the sides and an **electromagnet** at one end. Small items such as bottle caps fall through holes. The electromagnet snags tin cans. Then it's on to the **air classifier**, where a powerful fan blows lightweight aluminum and plastic onto one conveyer, and heavier glass falls onto another. Workers sort glass and plastics.
5. An **electromagnetic device** diverts aluminum cans into a storage bin.

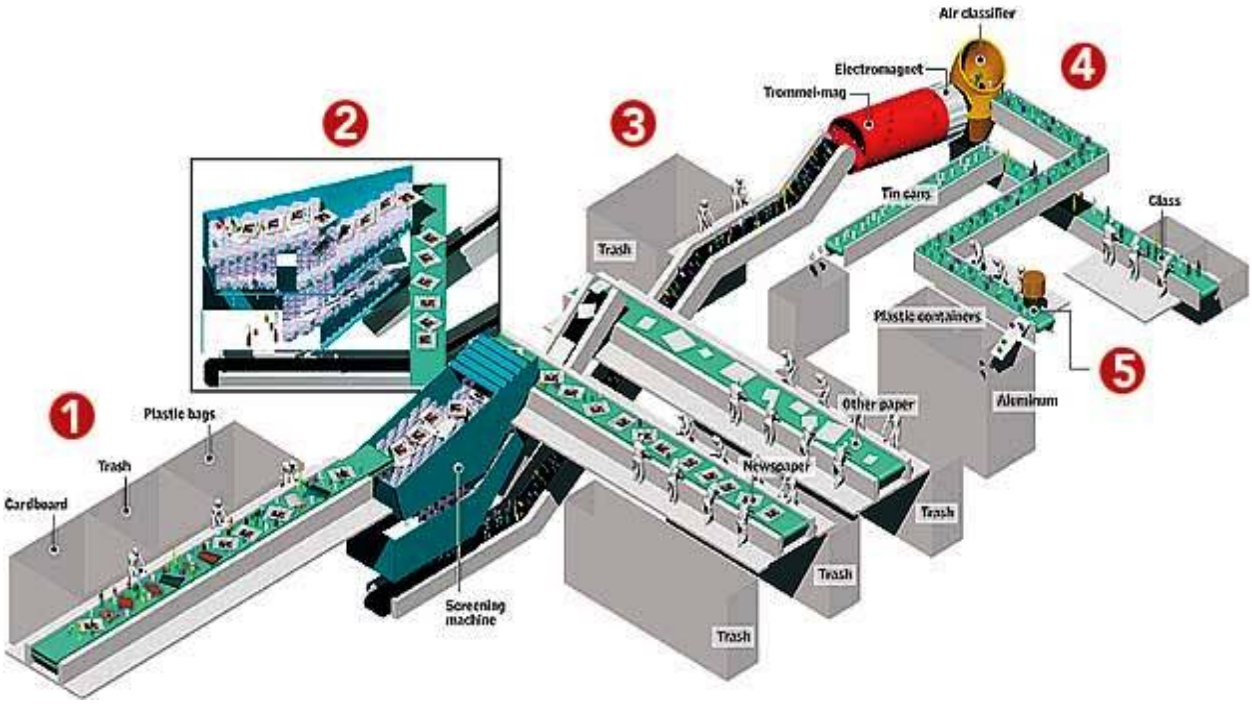


Figure 4.4 Typical MRF Layout

A similar facility can be employed to separate single-stream commingled recycling which is known as a "clean" MRF. The processes are similar, but more automated. These MRFs also require a significant investment in capital to separate the recyclables. From a municipal government standpoint, there are firms that will buy single-stream recyclables and sort them at their own facility. This approach is very attractive to many governments, and reduces the capital expenditure yet providing a revenue stream.

Another option for recycling is to have the customer sort the materials at the source. This option requires the collection vehicle to have separation bins and usually requires the municipality to provide bins to the customer. This approach has a lower success of participation due to the extra effort required of the customer. Drop off centers located in convenient locations provide this same source separation scheme.

The recycling process with the best record of success is the collection of single stream recyclables and a contract with an end user separator. This approach can yield revenues ranging from $20 to $30 a ton depending on market conditions and the availability of the separators.

4.3.3 Eco Park Approach

Based on the impending Slidell Landfill closure, the need for a C&D disposal facility for St. Tammany Parish is the initial determinant for the Eco Park development. Replacement capacity for C&D disposal is critical. Therefore, this should be the central theme in the Eco Park development while providing flexibility and room to grow for all of the other components.

Other initial components of the Eco Park should include:

- Green waste management (composting)
- Recycling drop off center for household materials
- Used oil and battery drop off center
- Used tire drop off
- Other recycling to be determined

The Eco Park is a component based concept and should be able to pick up and drop services as dictated by public need and markets. The facility should be sized for the most ambitious of operations possible to ensure that future needs are met. Initial operation will meet current needs and grow as demand for services increases. Flexibility is the key as is the participation of private and commercial operators.

Special consideration should be provided to operators wishing to lease or utilize the facility for waste recycling, processing and marketing activities. Favorable terms should be established to promote these activities and businesses.

There are a number of owner/operator options for this type of service. One of the most efficient and effective formulas for solid waste facilities is for public ownership and private operation. Options include:

- Private owned and operated (examples River Birch, Colonial, Woodside)
- Publicly owned and operated (Tangipahoa, Washington Parishs)
- Publicly owned, privately operated (Jefferson Parish and Baton Rouge)
- Public Private partnerships

Another factor to consider is whether to accept waste from outside of the Parish. For C&D and recycling materials, it's not likely that very much material would be brought in unless it functioned as a regional facility. In general, C&D waste is a low cost waste that is typically disposed of near the source. Long haul of C&D is rare. Recycled materials are also usually processed close to where they are generated unless there is no available processing facility. In this case, the Eco Park could present an opportunity for regional collection and processing of materials if a MRF is developed. This would represent an added economic benefit to the Parish both in terms of revenues for the Eco Park and it's operator and also for local employment.

4.4 Regulation and Siting Criteria

The Eco Park facility includes components for solid waste recycling, processing, disposal, environmental controls, and site support facilities. This solid waste management facility will require permit applications for solid waste processing, waste tire storage and processing, recycling, transfer operations and waste disposal in accordance with the State of Louisiana Environmental Regulation Code, Louisiana Administrative Code (LAC) Title 33 Environmental Quality, Part VII Solid Waste, Subpart 1 Solid Waste Regulations and Subpart 2 Recycling. This Environmental Regulation Code was developed to:

1. Establish standards governing the storage, collection, processing, recovery and reuse, and disposal of solid waste;
2. Implement a management program that will protect the air, groundwater, and surface water, and the environment from pollution from solid wastes and thus eliminate the potential threat to human health from such pollution;
3. Encourage both citizens and industry to reduce the amount of waste developed and generated in the state.

These rules and regulations were developed under the authority of the secretary of the Department of Environmental Quality (DEQ) as mandated by the Louisiana Solid Waste Management and Resource Recovery Law, and became effective on June 20, 2007.

4.4.1 Regulatory Applicability and Requirements

The Eco Park facility is subject to the requirements of the state DEQ LAC Title 33 Part VII Subparts 1 and 2 regulations for solid waste recycling, processing and disposal. In addition to

state regulations, these facilities must also meet local city and parish zoning and land use ordinances and codes. No new solid waste facility can be constructed without approval issued by the administrative authority in accordance with the state and local regulations.

The facility will require a Standard Permit as defined by LAC 33:VII.509.B for new solid waste processing and disposal facilities. These permits are issued for a period of 10 years and must be renewed with a new permit application at least 455 days prior to the expiration date. Permits are issued in accordance with the type of facility as defined by LAC 33:VII.405.A. These types are defined below:

- *Type I*- industrial disposal facilities (e.g., landfills, surface impoundments, or landfarms);
- *Type I-A*- industrial disposal facilities (e.g., balers, shredders, transfer stations (processing), etc.);
- *Type II*- non-industrial disposal facilities (e.g., landfills, surface impoundments, or landfarms);
- *Type II-A*- non-industrial disposal facilities (e.g., composting municipal solid waste facilities, balers, shredders, transfer stations (processing), refuse- derived fuel facilities, autoclaves, etc.); of
- *Type III*- construction/ demolition- debris and woodwaste landfills, separation facilities, composting facilities, or other.

The Eco Park will require Standard Permits for *Type I* and *Type II* facilities for the municipal solid waste disposal area and *Type III* for the construction/demolition debris, woodwaste and composting organic wastes. The materials recovery facility (MRF) will require a permit for *Type I-A and Type II-A*.

The area most feasible to site the Eco Park Solid Waste Management Facility will likely be zoned R- Rural District located in the northern central portion of the parish. In order to allow this project a rezoning process may be required by the parish. Since this project would be a parish owned facility, the process may be largely administrative allowing a potentially expedited procedure. The design of the facility and the components would conform to the design regulations and guidelines for the parish. Special land use permits may be required by the parish to allow the development and construction of this project. Further discussions and meetings with the parish Planning Department would be required to identify the necessary permits for this parish project.

4.4.2 Siting Criteria

The Eco Park Solid Waste Management Facility is a new solid waste processing and disposal facility and must meet the state and local requirements and regulations for location, design and operations for Type 1, Type II and Type III facilities. The location of the proposed Eco Park will be determined by the restrictions placed on such facilities by several controlling authorities including,

- Louisiana Department of Environmental Quality Solid Waste Regulations.
- St. Tammany Zoning Ordinances
- Environmental resistrictions (wetland, threatened and endangers species, etc.)
- Public involvement

A large parcel of land will be required and the site must be compatible with the surroundings. While is it possible to develop smaller sized sites to accomplish more limited goals, the largest site possible should be considered to assure flexibility for future usages. A site consisting of approximately 500 to 600 acres is recommended.

Ideally the facility should have good access to roadways and be located centrally. The restrictions described in the LDEQ solid waste regulations must be evaluated and mapped. In order to move forward, a site selection study should be implemented. Opposition to waste management facilities including recycling sites can be quite strong so the candidate sites should be as remote from population centers as possible.

A process called constraint mapping is typically employed to evaluate potential sites for solid waste facilities. This process involves mapping the restrictive criteria and looking for areas that remain after all the restrictions are overlaid. **Figure 4.5** is a constraint map showing some of the restrictive criteria. Public involvement during the "Siting Study" is extremely important. The need for the facility must be clearly defined and communicated so that the public understands. In the end, there is never a perfect location, but the hope is that there will be a location that is acceptable and functional.

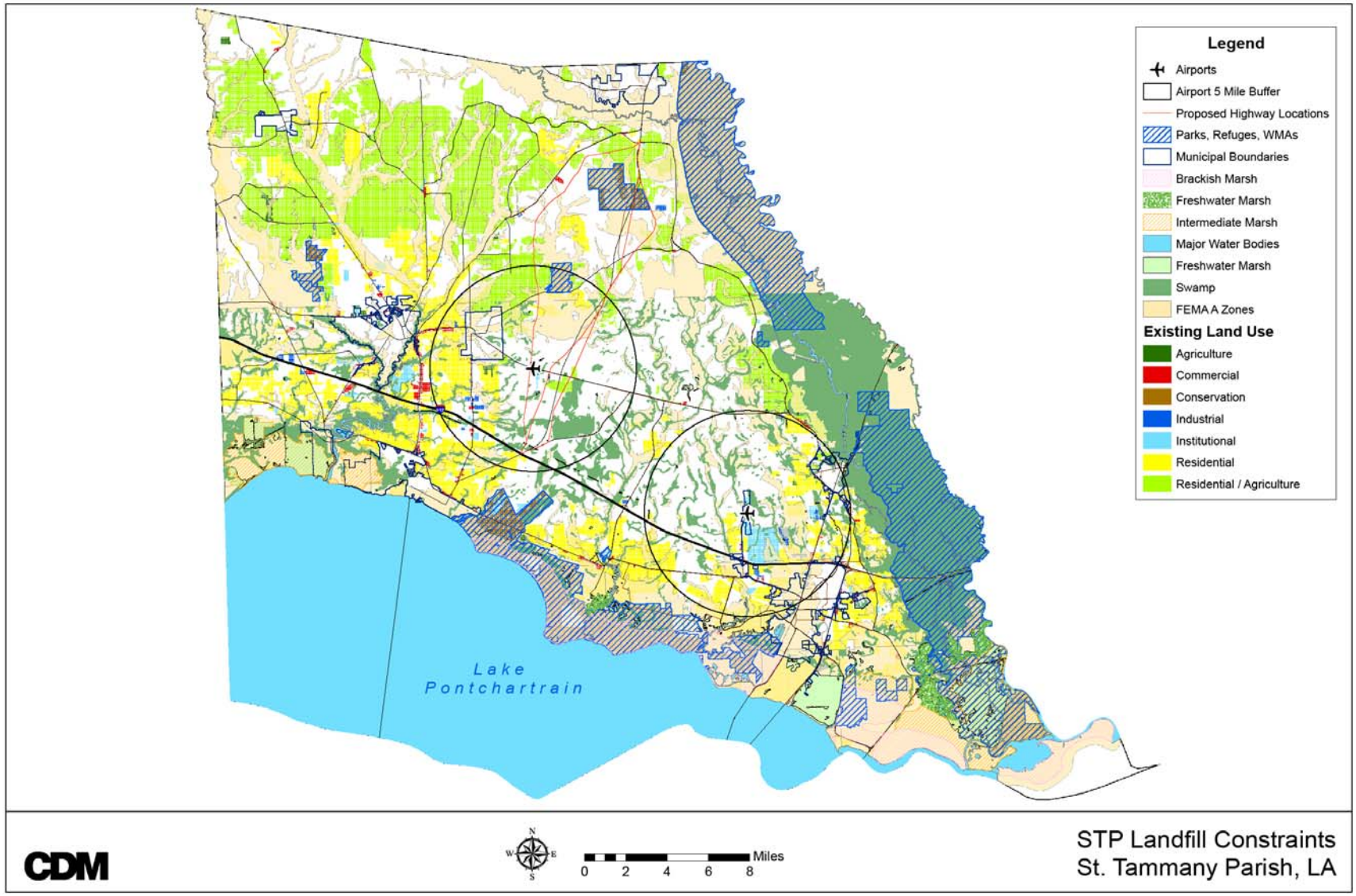


Figure 4.5 Constraint Map

In order to demonstrate compliance with location restriction criteria, a master plan is required to identify the elements of the project and the composition of the surrounding lands that may affect the location and functionality of the proposed development.

The master plan shall include location maps, engineering drawings and other pertinent information to demonstrate compliance with the location restrictions defined in LAC 33:VII.709 for Type I and Type II facilities and LAC 33:VII.719 for Type III facilities. The master plan must address the following:

- Facility layout;
- Road network;
- Major drainage systems;
- Drainage flow patterns;
- Location of the nearest population centers;
- Location to the nearest airport if within 5 miles;
- Location of the 100-year flood plain;
- Other pertinent information.

A siting study must be conducted to evaluate the applicability of the proposed facility location to the requirements of LAC 33:VII.709 and LAC 33:VII.719. This study must consider the following:

- Access considerations with roadway design, pavement adequacy, bridge weight limits, sharp turns and traffic flow and design;
- Letter from the appropriate agency stating that the facility will not have a significant adverse impact on the traffic flow of area roadways;
- Notification of airports if within 5 miles of the facility and shall not be located within 10,000 feet of the end of any public-use airport runway used by turbojet aircraft or within 5,000 feet of the end of any public-use airport runway used by only piston-type aircraft;
- A aerial photograph showing land use within a 1 mile radius of the facility and descriptions of land use within 3 miles of the facility to include:
    - Residential
    - Healthcare facilities and schools;
    - Agricultural;
    - Industrial and manufacturing;

  - Other commercial;
  - Recreational;
  - Undeveloped.

- Define important and critical environmental areas within 1000 feet of the facility to provide effective barriers and environmental controls. Critical areas are identified as:
  - Swamps, marshes, wetlands and estuaries;
  - Wildlife hatchery areas;
  - Habitat of endangered species;
  - Archeological sites;
  - Historic sites;
  - Publicly-owned recreation areas;
- Define the population and density within a 3 mile radius of the facility;
- Identify all operating or abandoned private water wells, oil and/or gas wells, shot holes and seismic lines within 2000 feet of the facility and public water systems, industrial water wells, and irrigation wells within 1 mile of the facility;
- Locate all recorded faults within 1 mile of the facility and prevent the facility to be located within 200 feet of a fault that has had displacement in Holocene time;
- Must demonstrate that the landfill facilities can withstand stresses from the maximum ground motion from seismic impact zones if present;
- Facility must not be located in an unstable area;
- Provide location map of all pipeline, power lines and utility right of ways within the site;
- Facilities may be subject to a comprehensive land use or zoning plan established by local regulations or ordinances.

Type III facilities are required to meet the above location restriction criteria with the exception of wells, faults, seismic impact zones, unstable areas and utilities.

During the application process Supplemental information is required to address the following issues:

- Discussion that potential and real adverse environmental affects of the facility have been avoided to the maximum extent possible;
- Cost-benefit analysis demonstrating that the social and economic benefits of the facility outweigh the environmental impacts;

- Discussion and description of possible alternative *projects* that would offer more protection to the environment without unduly curtailing non-environmental benefits;
- Discussion of possible alternative *sites* that would offer more protection to the environment without unduly curtailing non-environmental benefits;
- Discussion and description of the mitigation measures which would offer more protection to the environment than the facility as a proposed, without unduly curtailing non-environmental benefits.

This supplemental information is critical in convincing the DEQ of the need for the project and the expected impacts to social, economic and environmental factors.

4.4.3 Design Requirements

Design considerations are important elements for developing solid waste management facilities. Buffer zones, landscaping, access roads and yards, and stormwater control features require additional area for design consideration. Geology of the subsurface, liner and leachate collection, storage and handling systems, environmental monitoring and financial assurance are crucial design requirements that protect human health and the environment.

Buffer zones of 200 feet are required from the property line to the facility where waste is processed, stored or disposed. This buffer may be reduced if agreed upon by adjacent landowners. In addition to the buffer, landscaping is required along the boundaries of the facility to improve aesthetics of the facility.

Access roads and storage yards for equipment parking and maintenance are needed for design at solid waste management facilities. A system of roadways for waste processing and disposal must be designed for safe and efficient operations. A truck scale and scale house are needed to weigh in coming waste trucks and track solid waste quantities for recycling, processing and disposal. Sufficient traffic controls and signs are required for optimum traffic flow and safety. Important considerations include separating truck traffic from potential resident drop off areas. Locking access control gates are needed to secure the facility entrance when not in operation. Access control is also provided around the perimeter of the solid waste management facility property to secure the facility from trespassing.

Stormwater control features are used to convey stormwater run-on and runoff from around the landfill to a control pond that will provide for a controlled release of the stormwater from the site. Control of erosion and sedimentation is also an important function of these devices, and additional measures must be included in the design to increase the effectiveness of the control features. These control features include ditches, berms, pipes, manhole structures and ponds. These stormwater controls must be designed to accommodate the 24 hour/ 25 year storm event. Facilities located within the 100-year flood plain must be filled to bring the elevation above flood levels or provide a perimeter levee system for protection against the 100-year flood.

Subsurface geology must be evaluated to determine the groundwater elevation and flow direction and the subsurface soil and foundation properties ultimately used to determine the

elevation of the facility liner system. This evaluation is conducted utilizing an extensive network of subsurface borings, documented research on area geology and knowledge of the area subsurface. Borings must be spaced at a minimum of 450 feet apart and must extend to a depth of 30 feet below the proposed excavation. 10 percent of these borings must extend 100 feet below the proposed excavation. Type III landfills shall have a minimum of 3 borings or 1 per every 8 acres to a minimum depth of 5 feet below the proposed excavation. The soils and groundwater data obtained from these borings must be characterized by a professional geologist of engineer licensed in the state of Louisiana.

Type I and Type II solid waste disposal facilities require a liner and leachate collection system for waste containment. The liner system is comprised of 3 feet of clay soils with a maximum permeability of $1x10^{-7}$ cm/sec overlain with a geomembrane 30-mil in thickness or a high density polyethylene (HDPE) geomembrane with a minimum thickness of 60 mils. Liner systems must be tested during construction and certified by a professional engineer licensed in the state of Louisiana. Type III facilities do not require a liner system due to the low pollution potential of this waste.

Leachate is the liquid that percolates through the waste to the liner system. The landfill is required to employ a drainage and collection system to capture the leachate for disposal. The leachate collection system shall include a series of perforated pipes encased in crushed stone bedded in a minimum 12-inch thick drainage media usually comprised of sand or granular material meeting a minimum permeability of $1x10^{-3}$ cm/sec. Leachate is collected from the lined waste disposal cells and pumped to storage tanks for treatment as wastewater onsite or hauled by truck to a publically owned treatment works (POTW) plant. Type III facilities are not required to utilize liners or leachate collection systems.

Type I and Type II facilities are required to install a groundwater monitoring system of monitoring wells for sample collection and analysis. A minimum of one upgradient well is required per each monitoring zone. Downgradient wells are required at a minimum of two monitoring zone and spaced no greater than 800 feet. Sampling of the wells shall be conducted quarterly for the first year to establish background concentrations then semi annually thereafter. Groundwater detection monitoring results shall be compared to the monitoring parameters and constituents listed in **Table 4.5** from LAC 33:VII.3005.Appendix C as shown below.

Table 4.5
Detection Monitoring Parameters

	Common Name[1]	CAS RN[2]
	Inorganic Constituents	
(1)	Antimony	(Total)
(2)	Arsenic	(Total)
(3)	Barium	(Total)
(4)	Beryllium	(Total)
(5)	Cadmium	(Total)
(6)	Chromium	(Total)
(7)	Cobalt	(Total)
(8)	Copper	(Total)
(9)	Lead	(Total)
(10)	Nickel	(Total)
(11)	Selenium	(Total)
(12)	Silver	(Total)
(13)	Thallium	(Total)
(14)	Vanadium	(Total)

Table 4.5
Detection Monitoring Parameters

	Common Name[1]	CAS RN[2]
(15)	Zinc	(Total)
	Organic Constituents	
(16)	Acetone	67-64-1
(17)	Acrylonitrile	107-13-1
(18)	Benzene	71-43-2
(19)	Bromochloromethane	74-97-5
(20)	Bromodichloromethane	75-27-4
(21)	Bromoform; Tribromomethane	75-25-2
(22)	Carbon disulfide	75-15-0
(23)	Carbon tetrachloride	56-23-5
(24)	Chlorobenzene	108-90-7
(25)	Chloroethane; Ethyl chloride	75-00-3
(26)	Chloroform; Trichloromethane	67-66-3
(27)	Dibromochloromethane; Chlorodibromomethane	124-48-1
(28)	1,2-Dibromo-3-chloropropane; DBCP	96-12-8
(29)	1,2-Dibromoethane; Ethylene dibromide; EDB	106-93-4
(30)	o-Dichlorobenzene; 1,2-Dichlorobenzene	95-50-1
(31)	p-Dichlorobenzene; 1,4-Dichlorobenzene	106-46-7
(32)	trans-1,4-Dichloro-2-butene	110-57-6
(33)	1,1-Dichloroethane; Ethylidene chloride	75-34-3
(34)	1,2-Dichloroethane; Ethylene dichloride	107-06-2
(35)	1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride	75-35-4
(36)	cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	156-59-2
(37)	trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene	156-60-5
(38)	1,2-Dichloropropane; Propylene dichloride	78-87-5
(39)	cis-1,3-Dichloropropene	10061-01-5
(40)	trans-1,3-Dichloropropene	10061-02-6
(41)	Ethylbenzene	100-41-4
(42)	2-Hexanone; Methyl butyl ketone	591-78-6
(43)	Methyl bromide; Bromomethane	74-83-9
(44)	Methyl chloride; Chloromethane	74-87-3
(45)	Methylene bromide; Dibromomethane	74-95-3
(46)	Methylene chloride; Dichloromethane	75-09-2
(47)	Methyl ethyl ketone; MEK; 2-Butanone	78-93-3
(48)	Methyl iodide; Iodomethane	74-88-4
(49)	4-Methyl-2-pentanone; Methyl isobutyl ketone	108-10-1
(50)	Styrene	100-42-5
(51)	1,1,1,2-Tetrachloroethane	630-20-6
(52)	1,1,2,2-Tetrachloroethane	79-34-5
(53)	Tetrachloroethylene; Tetrachloroethene; Perchloroethylene	127-18-4
(54)	Toluene	108-88-3
(55)	1,1,1-Trichloroethane; Methylchloroform	71-55-6
(56)	1,1,2-Trichloroethane	79-00-5
(57)	Trichloroethylene; Trichloroethene	79-01-6
(58)	Trichlorofluoromethane; CFC-11	75-69-4
(59)	1,2,3-Trichloropropane	96-18-4
(60)	Vinyl acetate	108-05-4
(61)	Vinyl chloride	75-01-4
(62)	Xylenes	1330-20-7

NOTES:
[1] Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

[2] Chemical Abstracts Service registry number. Where "Total" is entered, all species in the groundwater that contain this element are included.

Control of methane gas from the waste decomposition is also a major element of landfill design. Landfill gas is comprised of about 50 percent methane, which could create an explosive condition if mixed with the right proportion of oxygen in a confined area. Landfills are required to install a gas collection/treatment or removal system to reduce the potential for methane gas migration to the facility boundary. Also, monitoring wells are required around landfills to monitor the vadose or unsaturated zone for methane gas migration. These wells are usually monitored on a quarterly basis for submittal to the Agency. If methane is detected at the facility boundary then emergency agencies, DEQ and local residences are notified. A mitigation plan is immediately implemented requiring additional monitoring and aggressive means to collect or treat the methane migration.

Landfill owners are required to provide financial assurance for the life of the facility. This financial assurance includes liability insurance for personnel injury and property damage owing from the operations of the site. Also, the owner must provide funding for the closure of the site and post closure activities to ensure compliance and environmental protection. This financial assurance can be in the form of an insurance policy, letter of credit, financial test and corporate guarantee.

4.4.4 Operational Considerations

Solid waste management facilities require effective, competent and efficient operations in order to protect human health and the environment. Landfill operators are required to be certified by the Board of Certification and Training for Solid Waste Disposal System Operators. Solid waste management facilities shall be operated to maintain compliance, provide for workers safety, control disease vectors (mosquitos, flies, rodents, birds, etc.), minimize sedimentation and erosion, fire, odors and litter. Landfills must also develop programs for the inspection of incoming waste loads to ensure compliance with acceptable waste materials.

4.5 Proposed Development Process and Schedule

The need for a new C&D landfill for St. Tammany Parish is the most sensitive time element of the Eco Park approach. Given that the Slidell Landfill is slated to close in 2011, the need to start the process of locating a replacement is paramount.

The Parish should start in early 2009 with a study to locate a new Eco Park with C&D landfill capacity as the initial and central component. After a suitable site has been determined and secured, the next step is permitting followed by final design and construction of the facility.

The Parish can move forward independently or team with the private sector to secure, permit and operate the site. It is recommended that the Parish maintain control of the site either contractually or through the permit so that all of the aspects of the Eco Park can be implemented as desired.

The steps necessary for development of the site are summarized as:

1. Site location study 6 months

2. Procurement 6 months
3. Permitting 9 months
4. Construction 9 months
5. Operation

The total time estimated to reach operational status is 30 months or 2 and a half years. The actual time could be more or less depending upon the difficulty of locating and securing a site and the permitting effort required. This schedule could result in a gap where local C&D disposal was not available after closure of the Slidell facility.

Note that this schedule pertains to development of only the C&D and recycling components of the Eco Park. The inclusion of an MSW facility would likely increase all phases significantly. Typically, the time to permit a new MSW disposal facility is in the neighborhood of 5 years. Therefore, the site should reserve an area for future MSW cells but only permit the C&D and recycling components at this time. The current MSW disposal practices (out-of-parish) should continue to suffice for several more years.

The development of the proposed Eco Park Solid Waste Management Facility will require property acquisition, planning, public involvement, design, permitting and construction activities. This project implementation will require a complex process that could take several years to complete. To ensure success the process must include communication with the public, waste haulers, state government officials, parish government officials, private recycling firms, contractors, waste reduction coalitions, community recycling groups, and educational institutions.

4.5.1 Facility Siting

The siting of the Eco Park Solid Waste Management Facility must begin with the property search and acquisition. This process must take into account the siting criteria for waste processing and disposal facilities for suitability. Once several property options are identified, then an in depth siting study must be conducted to determine the best option for the parish meeting all requirements. A cost analysis must also be performed in conjunction with the siting study to determine costs for land purchase, infrastructure development, facility development and operating costs including waste transportation, proximity to recycling markets, leachate disposal and proximity of utilities and services.

CDM has performed a cursory review of population maps, airport locations and land use maps to determine the general area that could be considered for the location of the Eco Park. A major consideration was the distance to existing airports and population centers. Slidell and Mandeville/Covington areas have the highest populations within the Parish with 28,237 and 19,416 respectively. Therefore, a logical location for this solid waste management facility would be between these population centers.

DEQ regulates landfills in relation to airports. Therefore, the conservative approach was used by drawing a 5 mile radius from the private airport just east of Abita Springs along Highway 36 and the airport just west of Slidell and north of Interstate 12. These geographic references

created a zone of acceptable land areas just west of Highway 434 and a larger area north of Highway 36 bounded by Highway 41 and Highway 435 as shown in **Figure 4.5**. The area identified just west of Highway 434 provides access from Interstate 12 and could easily service the highest populated areas of the parish. Proximity to the populated areas does have some drawbacks. As the parish grows residential and commercial areas could encroach into this area increasing the likelihood of complaints due to nuisance odors, traffic, litter and noise.
The area north of Highway 36 is largely undeveloped with a lower population density and larger tracts with less swamp and flood plain lands. Infrastructure for access, utilities and leachate and wastewater treatment may create challenges and increase development costs. The operational costs could also be higher with the waste transportation needed to reach this location. Further study for the evaluation of these areas is needed to determine the best option areas.

4.5.2 Permitting and Design

The development of the Eco Park Solid Waste Management Facility will require a Standard Permit issued by the Louisiana Department of Environmental Quality. This permit requires public notices, applications and potentially a public hearing process to site a new solid waste management facility. The process of siting a new landfill could take as long as 4 years according to Bijan Sharafkhani, PE, Administrator of the Waste Permits Division for the Office of Environmental Services at the Louisiana Department of Environmental Quality. The construction of the facility could take an additional year to provide the necessary improvements and to construct initial phase of this project.

Establish Need
The first step in the process is to establish the need for a new solid waste management facility. In St. Tammany Parish the need arises as the existing construction/demolition landfill in the city of Slidell approaches the end of it's permitted life. The landfill is owned and operated by Slidell Landfill, LLC a subsidiary of Environmental Services Management and is due to close in the year 2010. According to the Solid Waste Management Report for St. Tammany Parish dated May 15, 2005, there is more than 240,000 tons of construction/demolition waste produced each year in St. Tammany Parish which equates to almost 1000 tons per day. This quantity does not include peak loading values due to storm debris or large scale revitalization initiatives. Due to the Hurricane Katrina that impacted Louisiana on August 29, 2005, the amount of construction/demolition waste increased to about 15,000 tons per day. In order to provide for emergencies and storm debris removal St. Tammany Parish needs to develop a C&D landfill. This landfill should be sized to accommodate average tonnages and peaks that could occur once every 10 to 20 years. Due to the permitting times required to permit a Type III landfill, St. Tammany Parish should support the Slidell Landfill, LLC to petition the LDEQ to extend the permit for the Slidell Landfill until a new landfill can be permitted. This strategy will provide for uninterrupted waste disposal for the parish and provide for lower disposal costs.

St. Tammany Parish has a population of 230,605 identified by the 2006 census which represents a population growth of about 21 percent from the year 2000. According to the Solid Waste Management Report for St. Tammany Parish dated May 15, 2005 the per capita waste generation rate is about 6 pounds of waste per person per day. This waste per capita generation

rate yields a parish wide daily waste generation of 692 tons per day according to the 2006 census numbers. As St. Tammany Parish continues to grow with growth rates continuing to increase, the current and future waste tonnages would warrant a new municipal solid waste landfill in St. Tammany Parish.

The concept of the Eco Park Solid Waste Management Facility was developed to provide St. Tammany Parish with the ability to handle the municipal solid waste and the construction and demolition waste from the parish and the ability to handle emergency debris management from a regional area. The Eco Park will also provide for the handling and processing of recyclable materials and excluded waste materials such as yard waste, batteries, tires, and household hazardous waste.

Permitting Process
The permitting process for proposed solid waste disposal facilities begins with the preparation of the application. This application includes Part I: Permit Application Form; Part II: Supplemental Information, All Processing and Disposal Facilities; and Part III: Additional Supplementary Information. Part I consists of a questionnaire form requiring general data and information. This information includes at a minimum:

- Applicant information and contacts;
- Facility type;
- Location, acreage;
- List of environmental permits that relate to the facility;
- Zoning;
- Types, quantities and sources of waste;
- Geographic service area;
- Proof of publication of the public notice;
- Signature of the authorized person.

Part II of the application process includes the siting study, site evaluation, design and operational plans. This part of the application is significant and requires resources and time to complete. The Part II section of the application must include at a minimum:

- Location characteristics;
- Facility characteristics;
- Surface hydrology;

- Facility plans and specifications;
- Administrative procedures;
- Operational plans;
- Implementation plans;
- Closure and post-closure plans;
- Financial assurance;
- Geology and subsurface characterization;
- Groundwater and methane monitoring plan;

Part III of the application process requires addressing supplemental information related to adverse environmental effects, cost-benefit, alternatives to the project, alternative sites, and a discussion of mitigating measures that would offer more protection than the facility as proposed.

Six copies of the application are required along with a permit review fee of $3,300 for Type I and Type II facilities and $660 for Type III facilities.

A public notice of intent to submit an application must be published 1 to 45 days prior to the submission of the application to the LDEQ Office of Environmental Services. This notice must be published one time as a single classified advertisement in the legal or public notices section of the official journal of this state and in a major local newspaper of general circulation.

The LDEQ Office of Environmental Services will review the application for technical completeness. Once LDEQ determines that the application is complete then the application is available for public review and additional copies are requested. These additional copies are distributed for public review at the local parish, the parish public library, regional office and at the Department headquarters in Baton Rouge. When these copies are distributed then a public notice is placed by the LDEQ in the department's bulletin, official journal of the state, and in major local newspapers of general circulation. The notice will solicit comment from interested individuals and groups where the LDEQ will review.

The permit holder shall publish a notice of issuance of the standard permit no later than 10 days following the issuance of the permit. This notice must also be published in the official journal of the state and in major local newspapers of general circulation.

Public hearings may be held concerning standard permits at the discretion of the administrative authority and on the basis of comments received and other information. Any person may within 30 days after the date of publication of the newspaper notice request that the administrative authority consider whether a public hearing is necessary. If the requests raise

genuine and pertinent issues then the public hearing may be scheduled. If determined that a public hearing is needed then a public notice will be published 20 days before the hearing. Public hearings must be conducted in accordance with the Environmental Quality Act for fact-finding hearings or other hearing procedures developed by the administrative authority.

4.6 Economic Impact

The economic impact of developing an Eco Park in St. Tammany can be defined in terms of both avoided and reduced costs as well as revenue generated. By operating it's own facility, St. Tammany Parish would avoid the cost of sending materials out of parish for disposal. Also, the tipping fee (cost of disposal per ton) could be reduced both for C&D and MSW under a public ownership scenario since no profit margin is necessary. A commensurate reduction in cost could be realized by a parish owned facility.[i] Another significant avoided cost would be that of transfer to out-of-parish landfills. Estimating the avoided costs to be between 10 and 20 percent, the avoided cost for a 500 ton per day MSW facility could be between $500,000 to $1,000,000 per year.

On the revenue side of the equation, it is more difficult to determine the financial impacts. Monies would be generated from leasing space for waste processing. Royalties could also be collected based on the quantities of materials processed. The potential profit from the sale of recycled materials could be significant depending on market conditions. At the least the recycling activities could be break even resulting in a benefit to the environmental and residents of the Parish.

4.7 Anticipated Budget Needs

The development of any new industrial facility requires the resources of funding, expertise of professional personnel, and an understanding of the schedule. The Eco Park adds an additional element of solid waste processing and disposal which requires additional infrastructure and environmental controls for consideration. As with any development, location is an important factor in determining design and construction costs. The proximity to water and sanitary sewer facilities as well as adequate three phase electrical service and major highways must be considered. The difficulty with solid waste management facilities is that the population wants them remote from their neighborhoods and communities to reduce truck traffic, noise, noxious odors, litter, vectors and environmental concerns. These concerns could increase the development costs for this project.

The preparation of this Preliminary Budget Development Cost was prepared without the benefit of predetermined location for the facility. Therefore, the additional costs for water and wastewater treatment, electrical service and improvements of existing roadways could not be determined at this time. Once a location or siting study has been performed then these factors can be identified and can become a part of the decision model.

Moving forward with the Eco Park concept will require several phases of work and associated funding. The Parish can provide the funding itself or through a public private partnership with a waste management firm or other business entity. For purposes of this report, the estimated

costs will be independent of the source of funding. The budget needs track the development plan and schedule outlined above.

1.	Site Location Study	$100,000
2.	Procurement[ii]	$50,000
3.	Permitting	$500,000
4.	Construction[iii]	$5,000,000

The cost of land will be a significant factor. For a 500 acres rural site, the cost could approach $10,000,000. It may be prudent to consider working with landowners in a partnering arrangement where they are compensated over time.

In any case, the first step is to fund the Site Location Study which will include a public outreach effort to help present and justify the need to the public and solicit support. This study will result in the selection of a candidate site or sites and subsequently negotiations with the owners over terms. As soon as a site is chosen, the LDEQ Solid Waste Permit Application process should commence. This is an exhaustive process of obtaining, analyzing and presenting information and data about the site in accordance with the regulations.

Finally, construction of the site is the final major cost of development. The cost of site development will be very dependent on the Eco Park components to be constructed and the condition of the site. For a C&D facility the cost will likely be much lower. If an MSW landfill were constructed, the development cost for lined landfill cells can be as much as $350,000 per acre. Typically Site development costs associated with this type of project include clearing and grubbing, construction of access roads, stormwater control facilities, utilities and earthwork. The facilities for this project include the construction of truck scales, scale house, offices, maintenance facility and a covered recycling/drop off area. The C&D disposal area includes the construction of stormwater controls, earthwork, access, containment berms and environmental monitoring. The MSW disposal cell includes the construction of the earthwork, composite liner system, leachate collection, handling and storage system, access, containment berms and environmental controls.

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[i] Jefferson Parish Landfill is an example of a public facility serving it's residents for 30 years with reduced cost for disposal.
[ii] Surveying, title work, negotiations, but not including cost of land
[iii] The cost of construction cannot be accurately estimated until the site location and facility design are established

Section 5
Criteria for Organized Solid Waste Collection

An integrated solid waste management system is a comprehensive process or series of processes that encompasses the management of solid waste in a community. This comprehensive process includes education, waste reduction, collection, reuse, recycling, composting, incineration and other alternative approaches and landfilling for final disposal. A comprehensive integrated solid waste management approach focuses on the material and the energy within the solid waste and the reuse/recycling and disposal. The typical goals of an integrated system include the retention of as much energy as possible and keeping the materials in a useful state and to avoid releasing that energy or matter into the environment as a pollutant.

A hierarchy of solid waste management approaches and technologies has been developed to help meet the goals of a community as depicted in **Figure 5.1**. In general terms, the higher up on the hierarchy in which a technology is implemented the more benefits in efficiency and retained economic value. Conversely, the lowest tier on the hierarchy is landfilling which is the ultimate disposal for much solid waste. These solid waste technologies strive to reduce the amount of waste that ends up in landfills.

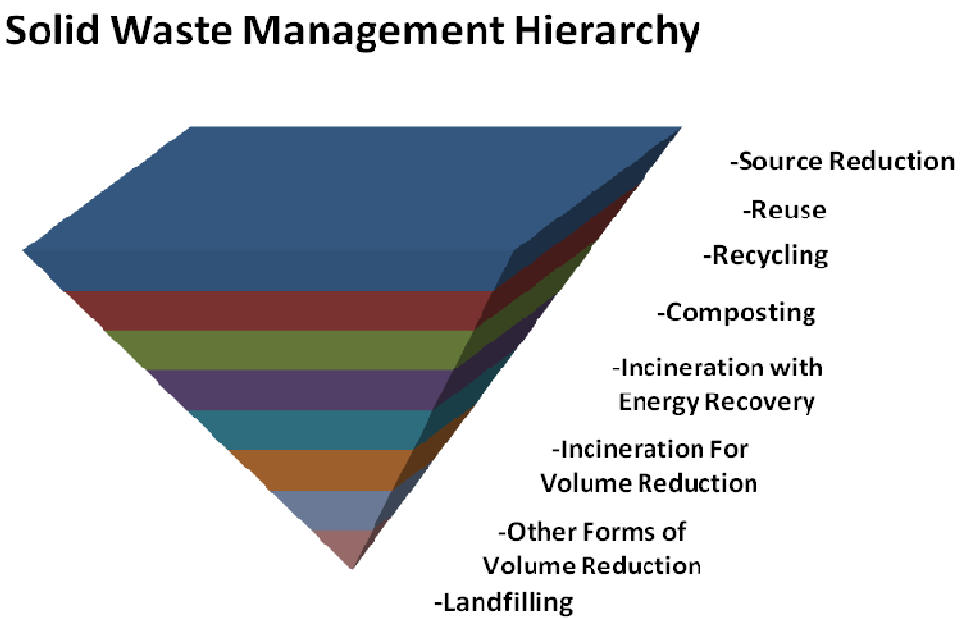

Figure 5.1- Source: Integrated Solid Waste Management for Rural Areas, A planning Tool Kit from Solid Waste Managers, USDA, 1995.

The top option is source reduction which is reducing the amount of waste at the source. This strategy can be accomplished by manufacturers that devise processes to create fewer and less toxic waste products. Consumers can also choose to purchase fewer products with excessive

packaging materials, require large amounts of energy and natural resources and or cause toxic waste problems in manufacturing, use or disposal. This strategy requires education of the consumers and a commitment from the manufacturers to improve internal processes and practices.

The other higher level strategies are reuse, recycling and composting. Reuse is using a product more than once in its same form for the same or similar purpose. This strategy can be accomplished in manufacturing down to the end user or consumer. This approach also requires education and creativity for finding secondary uses for products instead of characterizing them as waste.

Recycling has emerged as tremendous opportunity to reclaim materials from the waste stream and provide them into markets that utilize the materials as raw materials for products. These materials can be reclaimed and use to manufacture new products conserving raw materials and landfill space. There are many strategies used to increased participation for recycling programs and identifying markets where revenue can be attained. **Section 5.4** discusses this process in depth and provides strategies for developing successful recycling programs.

Composting is the controlled process whereby organic materials are biologically broken down and converted into a stabilized humus material. This waste process can be accomplished by residents at their homes with the aid of composters. These devices provide a location that people can discard food scraps in their own back yard and provide the necessary process to obtain a humus material. Community governments can accomplish this task, but a costly material recovery facility (MRF) must be implemented to separate the organic fraction from the waste stream. These MRFs can also provide for separation of paper, plastics, aluminum, metal and glass, but this process is further down on the solid waste hierarchy resulting in increased costs and potentially environmental impact. Yard waste is another material that is a significant portion of the waste stream (approximately 18 %) that can be composted. These wastes need to be turned periodically for aeration and to increase the effectiveness of the biologic processes.

The hierarchy of solid waste management is a tool to begin the process of planning a comprehensive integrated solid waste management system. The overall system will be a combination of processes that work in unison to meet the community goals. Additional discussions of the recommended processes for St. Tammany Parish are described in the following sections.

5.1 The Need for an Organized Solid Waste Collection System

An important component of a comprehensive solid waste management system is an organized and efficient solid waste collection system. Solid waste collection systems provide a convenient service for the population while ensuring responsible handling and disposal of putrescible solid waste. According to EPA 1999, solid waste and recyclable collection costs accounted for approximately thirty nine (39) to sixty two (62) percent with an average of fifty (50) percent of the management of municipal solid waste as shown in **Figure 5.2**. These estimates depend on the population of the service area and costs of services for system maintenance and operations and fuel. In 2008 this fractional cost could easily account for a larger percentage due to the cost

of fuel and system operations and maintenance. Therefore, an organized and efficient collection system is critical to a successful integrated solid waste management program.

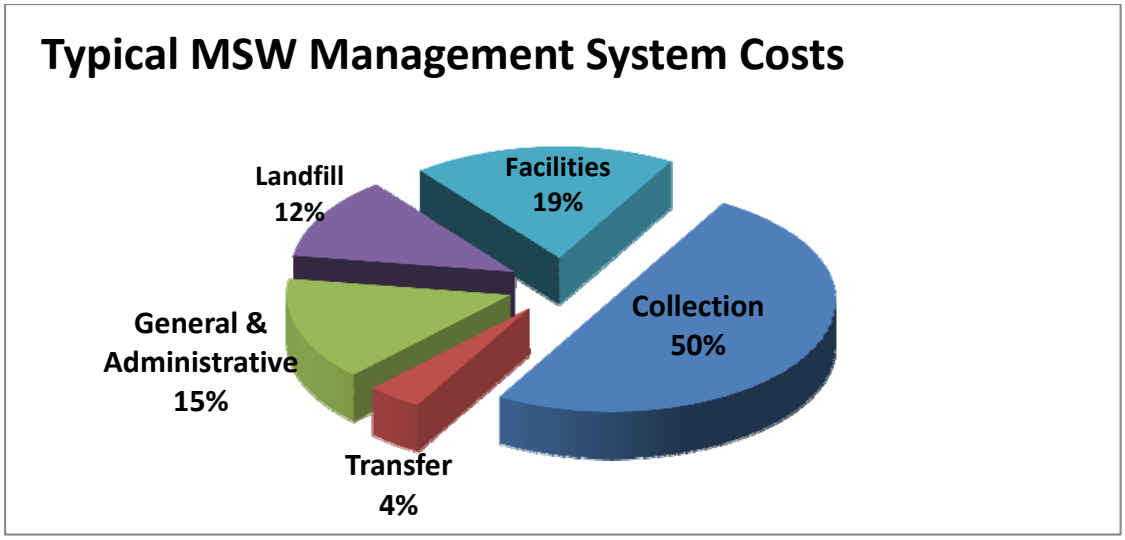

Figure 5.2-Source: Getting More for Less Improving Collection Efficiency, EPA 1999.

The need for an organized and efficient solid waste collection system is focused on providing a service for the residents that will meet health, regulatory and community requirements. Having many solid waste collection companies in an area can create increased truck traffic on residential roads potentially causing safety hazards. Also, different set out days per week for these different companies can increase the potential for insects, rodents and disease.

Currently St. Tammany Parish allows haulers to collect within the parish on a subscriber basis allowing the residents to pick and choose their collection company. Franchising the collection on a district basis will provide for a consistent service with larger buying power to reduce collection costs to the residents. These lower costs will allow for the increase in service for additional services such as recycling, yard waste collection and special collection. An organized and efficient solid waste collection system will provide a framework for the control of haulers, set out requirements, service standards and responsible disposal.

As St. Tammany Parish evaluates their solid waste collection and disposal options, clear goals for the short term and long term need to be established for the community. Close coordination with the state of Louisiana should be conducted to establish the goals that support the overall state goals for collection and disposal. This process will also allow the parish to identify available grants and funding sources that could assist with education and processing of recyclables and sustainable activities. The following describes the necessary steps in implementing a solid waste collection system. These steps are further refined in Section 4.5 to assist the parish with a customized plan and program for implementation.

5.2 Collection System Implementation

5.2.1 Key Steps to Develop a Waste Collection System

Development and implementation of a solid waste collection system must be designed to meet the community's needs. There are many factors that contribute to the methods, equipment and service providers of a collection system. These factors are identified and evaluated throughout the development process to tailor a system that coincides with the goals of the community, local government and state regulators. The key steps in developing an effective waste collection system are:

- Define goals and constraints of the community and the local government;
- Characterize the waste generation and the service area;
- Determine the public and private collection and transfer options;
- Determine and develop the system funding structure;
- Identify waste preparation and collection procedures;
- Identify collection equipment and crew size requirements;
- Evaluate waste transfer needs and options;
- Evaluate collection and transfer alternatives;
- Develop collection routes and schedules;
- Implement the collection system;
- Monitor system performance and adjust as necessary.

The first key step in the process is to define the goals and constraints of the community and the local government. This step sets the framework for the system where funding can be identified and evaluated.

5.2.1.1 Define Goals and Constraints

Defining goals, objectives and constraints can help guide the planning and decision making process. In St. Tammany Parish there are several municipalities that contract out their waste collection. A cooperative planning effort is key in coordinating a parish-wide collection system that would include the cities within the parish. This cooperation would include sharing of potential revenues and contributions to funding of the collection system. During this initial planning the following factors need to be considered:

- Level of service including material type collection and frequency of pickup;

- Roles of the public and private sectors whether the Parish will provide collection or contract out to the private sector using franchise agreements, licensing requirements and contracts;
- Establishing waste reduction goals and providing convenient collection of recyclables and banned landfilling materials and consider a volume based system of garbage collection known as Pay as You Through (PAYT) in provide incentives;
- Identify and structure a funding system to provide sufficient operating capital for these programs;
- Understand the local contracts and the potential for labor unions that may affect the procurement and operations of the services.

An important aspect of developing a waste collection system is to educate and involve the public at large, the media, elected officials, parish staff and front line workers and supervisors throughout the entire process. An outreach and public awareness campaign should be conducted through media and information brochures defining the upcoming changes, reasons for changes and goals for waste reduction, questionnaires to solicit opinion on services and public meetings to inform and solicit local area input are keys in addressing shifting attitudes.

Providing a questionnaire to the public through mailings or phone polls to measure the level of interest and to obtain opinions on the important solid waste issues of the community are effective techniques. Also, conducting meetings with focus groups and community civic groups to work on determining the need of the community related to solid waste is also an effective approach.

5.2.1.2 Waste Generation and Service Area Characterization

St. Tammany Parish is a varied landscape of urbanized areas with suburbs and rural settings with sparse population densities. The waste generation type and amount is expected to vary by region and landuse. The location of the parish is also a factor with the impacts of recent hurricanes and the debris associated with the cleanup. Historic data for waste generation amounts provides an average generation rate for planning purposes. This data also includes spikes due to hurricane cleanup operations. In order to plan for collection, waste reduction and recycling a waste composition study should be prepared to determine the amount of recyclable and reuseable materials that exist in the current waste stream. This data gathered from these studies will be used to set waste reduction and recycling goals and objectives.

5.2.1.3 Public and Private Collection and Transfer Options

In most communities public and private collection will depend on the resources and equipment of the local government and the availability of reputable private collectors. In the case of St. Tammany Parish, there is no current parish provided waste collection system or infrastructure to provide this service. This decision would require significant capital for the purchase of trucks and equipment and operations and maintenance personnel to develop a new collection system. St. Tammany Parish would benefit immediately from the contracting of a private waste collection service. Collection can be franchised by zone or region allowing several reputable

waste collection firms to provide this service to the residents of the parish. With these franchise agreements, the parish could even require the firm to dispose of the waste at a facility identified by the parish. In addition to waste collection, the firm should also be required to collect recyclables, yard waste and batteries, paints and other landfill banned materials. These additional services would be defined in the franchise agreement executed for this service. The franchise agreement would also identify the type and frequency of the collection service whether it be curbside collection in the urban and suburban areas or collection from drop off centers located around the parish in more rural less populated areas.

As any new venture results in growing pains, it is always easier to manage and evaluate if the system is implemented in a smaller area. This approach is the pilot study that will enable the parish to evaluate the effectiveness and willing participation with the program on a study type basis. This pilot study will provide a strengths and weakness type evaluation to determine the most optimal approach for collection type and frequency, disposal container type, collection vehicle type, crew size, disposal options, recycling markets, recycling processing and handling and updated parish specific per capita waste generation rates. This information will be vital for the design of a parish-wide waste collection system.

5.2.1.4 Funding Structure

There are several mechanisms used for the funding of solid waste collection and disposal systems. Tax based systems, flat fee systems, variable rate systems and hybrid funding methods are the most popular means of governmental funding systems.

Taxed based systems are a portion of the property tax revenues used to fund solid waste collection and disposal. These revenues are collected annually, are easy to collect, and are successful since they are a part of the tax system. Even though there is a high percentage of participation, the revenues are generally low compared to the actual cost to fund a complete system. The disadvantages of the tax system is there lacks an incentive for waste reduction, revenues are difficult to adjust if more funds are needed, and can lead to objections if all residents are not provided with the same level of service.

Flat fee systems are based on a fee per month that the residents must pay for waste collection. These systems are relatively easy to administer, adjustable according to increases in operating costs, waste collection cost is not counted against property tax limits, and the billing and collection can be assigned to a private hauler where the local government does not have to staff and administer a billing and collection department. The disadvantages of the flat fee system is that it too does not encourage waste reduction, some residents may try to save costs by finding other means of disposal (i.e. illegal dumping, burning and disposal in other's and commercial containers), fees are more difficult to collect, these fees are usually higher than tax based fees, and the governments find these funds less flexible due to difficulty re-appropriating funds for other uses.

Variable-rate systems are funding mechanisms based on a sliding scale dependent upon how much a resident sets out for collection per week. This system can also allow the customer to subscribe to a particular amount such as one 30-gallon can per week. This system also allows flexibility for different types of waste pickup such as large items like sofas, mattresses, banned

items such as yard waste, tires and batteries and other types of special waste such as paint, scrap building materials and household hazardous waste. There would be additional costs associated with each type of extra waste pickup. PAYT systems are considered variable-rate funding systems. This system encourages waste minimization, allows for customers to choose their level of service, increases recycling rates, and encourages onsite composting of yard waste and food waste. There are disadvantages to these systems due to the complexity. The administrator has to keep track of the charges that may change each week which in turn could create some variability in predicting revenues. Some contracts have guaranteed minimum revenue amounts. Also, volume based systems cause some residents to compact the waste excessively causing bag ruptures and excessively heavy containers causing strain on the workers. This system increases the likelihood of contaminants showing up in the recyclables and the waste in attempts to minimize charges. Under this system larger families can expect to pay more than the flat-fee system.

Hybrid funding methods are a combination of the aforementioned systems. These could include a variable rate system that is also funded with a base rate or tax system. There are many advantages and disadvantages depending on the combination of systems provided.

5.2.1.5 Waste Preparation and Collection Procedures

Waste preparation and collection procedures provide the residents with the information needed on how to prepare waste and recyclables for pickup, what containers are allowable, how frequently the collection occurs and where to set the materials out for collection. The most widely used container is the 30 to 35 gallon container. 55 gallon drums and cardboard containers are usually prohibited, since they are difficult to handle and increase the chance of worker injury. Pre-purchased metered bags or stickers are sometimes used in the pay per container system.

Automated collection systems require containers specially designed for the truck-mounted loading mechanism as shown in **Figure 5.3.** These systems require less labor for collection, but may require the collector to supply the customer with the container. These containers are usually 90 gallon wheel containers set at the curb that are tipped automatically by the loading mechanism as the truck makes it rounds. These systems are becoming increasingly popular for single family neighborhoods.

Separation of recyclables from the garbage is usually required by the municipality. The recyclables include paper, cardboard, glass, aluminum, tin, and plastic. These recyclables are usually mixed and hauled to a processor where they are separated for shipment to an end user. The recycling collection is set in accordance with the market and the end user.

Figure 5.3 Automated Collection Truck

The most prevalent collection frequency is weekly at the curbside. This provides for the highest efficiency without causing undue inconvenience to the customer. Studies have shown that once a week systems collect 25 percent more

waste per hour while serving 33 percent fewer homes. Communities with hot, humid climates maintain twice a week collection due to health and odor concerns. The most popular collection site is curbside and alley collection and drop off centers in rural areas. Backyard collection is still performed in some areas, but this requires additional personnel and is more costly.

5.2.1.6 Collection Equipment and Crew Size Requirements

Equipment for collection and processing of recyclables and solid waste is a major expenditure for any collection system. As we have seen, the cost of collection can attribute to 50 percent of the integrated solid waste management system. Capital expenditures are required to procure the equipment and manpower to execute the collection task as a municipality develops a collection system. Careful planning and waste stream analysis is crucial to the purchase or lease of the proper equipment. Rear loader compactor trucks are typically used for residential solid waste collection. But if recyclables are also picked up with the same load, then a compartmental truck would be required for this collection method similar to **Figure 5.4**.

The labor crew size depends on the costs of labor and equipment, the collection methods and routes and potentially labor union contracts. As collection costs have risen there has been a trend toward decreasing the frequency of collection, increasing the requirements on residents to sort materials and transport them to the pickup location, and increasing the degree of automation. These factors result in smaller crews. The optimum crew size is one person, but increased automation is required for this operation.

Figure 5.4 Compartmental Collection Truck

5.2.1.7 Waste Transfer Needs and Options

The need for a solid waste transfer station depends on the costs for direct hauling to a solid waste disposal facility versus the costs and savings associated with construction and operations of a transfer facility. There are several benefits to a transfer station which are lower collection costs not wasting time hauling to the landfill, reduced fuel and maintenance costs for the trucks, opportunity to recover recyclables and compostables at the transfer station site, the opportunity to bale the waste or recyclables at the transfer station and potentially being able to use alternate waste disposal sites.

There are currently 3 solid waste transfer stations located in St. Tammany Parish shown on **Figure 3.2** that are privately owned and operated which provides a benefit to the parish. These stations allow for the private collectors to provide a more efficient collection system thereby creating lower collection costs in their service area.

5.2.1.8 Evaluation of Collection and Transfer Alternatives

Collection and transfer alternatives should be evaluated once the options are identified. This evaluation should be conducted for consistency with the defined goals of the collection program. The evaluation should consider economic criteria balanced with the level of service. The following criteria should be used to evaluate the parameters affecting the decision matrix:

- Costs of new equipment and ability to obtain financing;
- Costs to operate collection and transfer facilities;
- Compatibility of total costs with budget available for solid waste services;
- Differences in levels of service provided by alternates and options;
- Proposed methods for financing system costs and public acceptability;
- System's ability to meet community waste reduction goals;
- Compatibility of proposed roles for public and private sectors and political support;
- Public's interest in changing present solid waste and recyclable collection.

These criteria need to be evaluated to determine the best fit for the community. As the Parish moves forward with a collection/franchised system requirements can be set forth for minimum standards that must be met for equipment and facilities, costs, service, financing, meeting waste reduction goals and involving the public and creating interest.

5.2.1.9 Develop Collection Routes and Schedules

The results of the evaluation of the collection and transfer alternatives will allow for the development of collection routes and schedules. A typical schedule will include the following:

- Weekly curbside collection of mixed solid waste;
- Weekly curbside collection of mixed recyclables including newspaper, aluminum cans, tin cans, plastic, and glass;
- Weekly collection of yard waste;
- Monthly collection of bulky items;
- Drop off facility(ies) for collection of tires, used motor oil and batteries.

Collection routes will be determined to develop franchising areas.

5.2.1.10 Implementation of the Collection System

Implementation of a well planned collection system is critical to its success. The important elements of implementation include:

- Finalizing and implementing the system management plan;
- Purchasing and managing collection and transfer equipment;
- Hiring and training personnel;
- Developing and managing contracts with labor unions and private collection companies;
- Providing public information;
- Construction and operating transfer, administrative and maintenance facilities.

These steps represent the culmination of the evaluation and planning required to define the goals of the parish and the community, evaluate the waste and the needs of the community and the equipment to accomplish these, evaluate options for collection and transfer, identify the procedures and requirements, and develop the funding and collection system.

Finalizing and Implementing the System Management Plan

The development of a management plan is an important element of the implementation process. This management plan is needed whether the parish develops its own system of collection or manages private companies for this function. The plan will identify the organizational structure and define the mission and roles of the employees. The management plan emphasizes the importance of team contribution and customer oriented focus. The management plan function will also define the system funding, accounting, billing and performance monitoring; thereby, creating the cornerstone mechanism for the management of the collection system.

Purchasing and Managing Collection and Transfer Equipment;

The purchasing of equipment is a large portion of the capital costs for a collection system. Municipalities will craft performance or detailed specifications for the equipment, which in turn would be bid out for selection. These specifications would be written to meet the standards for capacity, speed, maneuverability, power ratings for certain available models.

The maintenance of this equipment is crucial for providing a consistent level of service. A preventative maintenance program is effective in preventing breakdowns of the equipment. A maintenance department or a maintenance contracted service should be utilized to accomplish this goal. Spare parts and tracking of repair and maintenance costs for each truck and equipment is an efficient means of evaluating the replacement potential for the equipment as it ages.

As the parish contracts with private haulers, then maintenance programs, spare parts and performance requirements for the equipment shall be made a part of the contract to ensure

competent service and parish representation to the public. The contracted company shall be responsible to property damage as well as damage to public roads due to leaking of petroleum products. Repairs to property and equipment must be made promptly to prevent further damage.

Hiring and Training Personnel;

Personnel are the most important resource that a company or a parish can utilize for a solid waste collection system. Therefore, a system must be developed to hire competent and well qualified people. Management of these employees is an important function to retain workers and to provide a safe working environment that encourages career advancement, participatory problem solving, and worker incentives.

Training is an essential aspect of keeping workers safe in the solid waste industry. Extensive training must be conducted to identify and avoid traffic accidents, sharp edges of waste and containers, injury from powerful loading machinery, heavy containers, and dangers from discarded household hazardous wastes such as herbicides, pesticides, solvents, fuels, batteries, and other chemicals. In addition to training, safety equipment such as hard hats, goggles, gloves, safety shoes and high visibility vests must be mandated to ensure a consistent protective environment. Reporting and documentation procedures for all accidents must be developed to protect the worker and the parish. These training procedures must be communicated to the workers with annual refreshers required for compliance.

The development of an incentive program for the workers should be developed to recognize and reward outstanding performance by employees. Rewards in an incentive program include merit-based compensation, awards programs, and work structure that emphasizes task completion. An awards program can be internal such as employee of the month or through regional or national organizations such as the Solid Waste Association of North America (SWANA) or National Solid Waste Management Association (NSWMA).

A system to address customer complaints needs to be developed to ensure a high quality of service. Crew supervisors should handle customer complaints and require the same crew to correct the mistake. This process is used not as a disciplinary tool, but as a learning exercise to increase the quality of the service.

Developing and Managing Contracts With Labor Unions and Private Collection Companies;

Privatization of solid waste collection can increase cost effectiveness while providing a higher level of service. The first steps in developing a contract for collection is to review the goals of the community and the local government. These goals set the framework for the requirements of the contract. When privatizing a solid waste collection system there are several main components that must be defined:

- Define the scope of services;
- Select the procurement approach;

- Consider alternative approaches to rate adjustments;
- Consider alternative waste collection approaches;
- Select the term of the agreement;
- Consider liquidated damages;
- The importance of contract monitoring and importance.

The scope of services shall be defined with the community goals in mind. The scope of services should define the materials to be collected which would include solid waste, recyclables, yard waste, storm debris, special collection of large items, and landfill banned items from residential and commercial sources. Requirements shall include specifications and required information for collection containers, routes and service areas, material handling and disposal locations. Performance requirements must be set for equipment age, operation, maintenance and safety requirements.

The procurement approach should be defined whether the parish is soliciting for bids or for proposals. This process will also help define the number of contracts that will be issued and the selection criteria for their implementation. These procurement processes will require working closely with the parish purchasing and legal departments to craft these documents.

Alternative approaches to rates and adjustments will need to be addressed. If rates are allowed to be adjusted annually then the basis should be tied to cost components such as labor, fuel, and vehicle replacement and not to the consumer price index. This will provide for lower rates overall.

A collection system with flexibility is the ideal system for the customer. A volume based pay as you throw system to encourage source reduction and recycling will provide the most benefits to the parish. Other collection systems should be considered as proposed by the respondent collection providers.

The contract term needs to be identified. The longer the contract term the better the prices. At a minimum it is a good approach to match the contract term to the expected life of a garbage truck which is typically 7 to 10 years.

Contracts need to include a liquidated damage clause for failure to perform. These liquidated damages should include failures noted by response to complaints, delivery of materials to designated locations, or ability to meet collection schedules. In addition to the liquidated damages, default, suspension and termination clauses need to be included in the contract. Also, the contract should limit subcontracting and transfer of assignment to other providers. The parish attorney should be consulted to craft the language of such limitations and to provide insurance and liability clauses that are important for protecting the parish's interests.

Labor unions are a realistic potential in dealing with solid waste management operations. Truck drivers, mechanics and waste handlers are sometimes represented by labor unions. If the parish

is required to deal with unions, then a formal labor management relations group should be designated to handle collective bargaining. Also, the parish would need to develop a formal procedure for managing employee grievances without concern for reprisal and for resolving them quickly and fairly.

The contract must be monitored and enforced once the contract has been issued and the collection provider is operating the system. The parish must provide oversight to ensure the measures are being provided. The contractor must be monitored and communication with the customer must be performed in order to determine customer satisfaction. The contract must be enforced with the terms and conditions, and the contractor must be held accountable.

Providing Public Information;

Communication with the public is an integral part of implementing and maintaining a solid waste collection system. Residents can greatly affect the success of a solid waste collection system by cooperating with set out and separation requirements and assisting with keeping out undesirable wastes such as used oil, batteries, paint, household hazardous waste and other banned wastes from entering the collected waste stream.

Public communication is effective in the form of information meetings, brochures, articles in community newsletters, newspaper articles, announcements and advertisements on the radio and television, information attachments to utility bills and school handouts. These materials shall provide new information and reminders of service and set out requirements and provide key contact information as well as provide feedback on system performance. Residents should be informed of the waste reduction goals, the recycling markets and progress and the cost and site life of local landfills. It is important for residents of the parish to understand the waste management issues and how they can contribute to solving the community's problems.

Construction and Operating Transfer, Administrative and Maintenance Facilities.

The development of a collection system may require the construction of facilities in support of the operations. As the parish's needs arise for transfer stations, additional administrative and maintenance facilities construction costs shall be programmed into the overall solid waste management costs. The construction shall require the design by an experienced and competent engineering and architectural firm licensed to practice in the state of Louisiana. The design shall be conducted with the parish's goals considered and integrated with the solid waste collection and disposal operation.

The private sector company that the parish may contract with for collection may request the construction of a transfer or administration/maintenance facilities to improve their efficiency. These facilities shall be indentified during the contracting process and shall be approved by the parish prior to the design and permitting. The parish shall approve the design, architectural elements and the use and ownership of the facility after the term of the contract.

5.2.1.11 Monitor System Performance and Adjust as Necessary

Maintaining records of collection activities is essential in providing improvements to the system, increasing efficiency and providing measures for meeting goals and objectives. Collection and transfer facilities shall develop a system to gather information on costs and performance. This information shall include:

- Total quantity hauled
- Total distance and travel times to and from the disposal and transfer sites;
- Amounts delivered to each disposal, transfer, or processing facility;
- Waiting times at the sites;
- Number of loads hauled;
- Vehicle or operational problems needing attention.

A computerized and GIS system shall be used to collect data on vehicles including vehicle ID, weight, waste quantities, vehicle origins, delivery times. This system can be developed to encompass maintenance and repairs on the equipment as well as include GPS data to track drivers, location and vehicle speed. The data collected can be used to forecast workloads, track costs, identify changes in service needs and to evaluate the effectiveness of the collection system meetings the goals and objectives.

5.3 Regional Waste Collection Alternatives

A regional approach to solid waste collection is an important concept for a municipality with a varied population density and land use. An approach that is appropriate for an urban or suburban region may not be appropriate for rural or less populated areas. That is why a flexible regional approach is important for the parish to consider in dealing with solid waste collection. There are many different collection alternatives that must be considered to accomplish waste collection in the parish's urban, suburban and rural areas. Curbside collection, automated curbside collection, backyard collection, dual stream collection, pay as you throw (PAYT) for weight and volume based collection, and regional convenience drop off centers are successful approaches depending on the area to be serviced.

5.3.1 Analysis of Types of Waste Collection

5.3.1.1 Curbside Collection

Curbside collection is an effective means of providing solid waste collection for residents. This approach is best suited for urban and suburban areas. This approach becomes costly in rural areas due to the distance between pickups and the amount of time required to obtain a full truckload for disposal. Therefore, curbside collection is recommended for the areas of the parish that are in and around the parish cities of Slidell, Mandeville, Madisonville, Covington, Abita Springs, and Lacombe. Solid waste collection is recommended on a weekly basis in conjunction with recycling pickup. A separate yard waste collection is recommended weekly for these

areas. This collection strategy must be provided in conjunction with other strategies in order to reduce the amount of waste put out and the separation of other wastes for collection.

Weekly collection is the best option since studies have shown repeatedly that the second collection day is underutilized. Weekly collection encourages residents to recycle and to reduce waste generation. The benefits of a weekly curbside collection are:

- Decreased costs and improves efficiency: lowers operating costs of the system and forces residents to put out more on their collection day thereby improving collection efficiency.
- Decreases vehicle and labor needs: cuts vehicle capital and maintenance costs by 20 to 40 percent and also reduces labor costs.
- Reduces environmental impact: fewer trucks and trips translate into lower fuel usage, fewer air emissions, reduced traffic and safety impacts on residential roads.
- Provides opportunities for expanded service: with less frequent collection, the parish can provide additional solid waste programs such as increased recycling and yard waste pick up and processing.
- Increased waste diversion: reducing collection frequency encourages residents to increase efforts for waste reduction and recycling.
- Balances workload: reducing collection frequency allows for routes to be balanced and evenly distributed among work days.

Most residential collection is accomplished with the use of a rear loader compactor truck. This type of vehicle requires 1 to 2 workers on the rear to dump the cans into the truck. 35 gallon containers are common due to the manageable weight. In order to make the once per week collection more manageable for larger families, larger containers could be provided to or allowed by the residents. This approach would require an automated or a semi-automated tipper in order to accomplish the tipping of heavy containers.

Trucks with side-mounted automatic tippers can be used to dump large containers. This approach is used to increase collection efficiency and reduce the amount of labor required to collect solid waste. A driver can operate this automatic system alone thereby eliminating the additional workers needed to accompany the collection route. The benefits of this type of collection system are:

- Reduced injury risk: injuries from lifting, punctures and lacerations are reduced.
- Reduced vehicle needs: the number of households served per hour can be tripled and the truck fleet can be smaller.
- Decreased labor needs: with an automated system the driver works alone, while with a semi-automated system one or two additional workers are needed.

- Reduced environmental impacts: automated collection systems mean fewer trucks, lower fuel usage, fewer air emissions, and fewer traffic and safety impacts on residential roads.
- Reduced tipping fees: the containers have lids which keep out rain thereby keeping the waste lighter and lower cost at the transfer station or landfill when weighed.
- Improved neighborhood aesthetics: the containers and uniform and will eliminate bags and litter set out as well as eliminate containers tipped over by animals.
- Reduced public health risk: Containers with lids help mitigate odors and health concerns from vectors.

This type of system would require the additional costs of providing a standard container to the residents to ensure compliant containers for this type of automation. Also the maintenance on the automated systems would be slightly higher than standard trucks. The containers are usually larger than standard containers, so some residents may need assistance handling the containers.

5.3.1.2 Backyard Collection

Backyard collection may still be needed for elderly, handicap or residents with physical limitations. This type of service is usually subscribed by the residents at a higher price per billing period. Flexibility in a collection is essential for the implementation of a successful solid waste collection system.

5.3.1.3 Dual Collection

Dual collection systems are an effective way to efficiently collect separate solid waste streams using the single pass method along the route. This method requires specialized trucks with compartmented chambers for the collection of solid waste and select recyclables. There are several benefits to this system:

- Reduced vehicle and labor needs: reduces the number of specialized vehicles needed to provide multiple collection services which reduces the fleet size and labor costs.
- Reduced environmental impacts: fewer trucks result in lower fuel usage, fewer air emissions, and fewer traffic and safety impacts on residential roads.
- Increased diversion: allows communities to add diversion programs while controlling costs.
- Lower housing density: this system can be employed in areas of lower waste generation and lower populated areas due to limited size of the chambers.

5.3.1.4 Pay As You Throw (PAYT)

Pay as you throw (PAYT) systems allow for the charging of customers for the amount of waste that is set out. These waste generation rate charges can be based on volume or weight. If weight is used then the container must be weighed at collection requiring scales on the collection trucks. This takes more time for collection, but increases the effectiveness of the billing with few customer questions. A billing system is needed in order to obtain revenues under this method.

When volume based systems are employed the container may have a tendency to be over filled resulting in a heavy load and potential for increased lifting injuries. A bag/sticker system is more effective with the volume based system. These bags/stickers are for set volumes and can be set up to purchase at retail outlets including grocery stores. This system allows for the pre-purchase of bags/stickers, so no additional billing system would be needed.

5.3.1.5 Convenience Drop Off Centers

Convenience drop off centers are another collection system that has merit for a lower cost system. These centers provide containers for the disposal of household waste, large items and recyclables and even yard waste usually in lower populated areas as shown in **Figure 5.5**.

Figure 5.5 Drop Off Center

The success of these centers is increased where the municipality does not currently provide collection. To maintain a higher level of participation for waste and recyclable drop off, the centers should be located within 3 to 5 miles of residents and the each center should provide disposal for 5000 to 10,000 people. The convenience drop off center usually requires a low capital expense to construct with the majority of the cost for grade separation to provide easy dumping of waste into the top of 30 to 40 cubic yard containers. These sites are typically manned by one full time employee or part time staff to provide assistance to residents and ensuring the proper container is used. The adoption of the site by civic organizations has been successful in controlling litter and unauthorized dumping. There is no typical design of these facilities, since they are designed to meet the needs of each community. Drop off bins for recyclables can also be located in populated areas on community corners or in shopping centers to provide for increased participation in areas where recycling collection is limited as shown in **Figure 5.6**.

Figure 5.6 Drop Off Bin

5.3.2 Collection in Rural Areas

Solid waste collection in rural areas adds the challenges of lower efficiencies combined with a comprehensive solid waste collection system. The population in rural areas is spread out causing the collection efficiencies to be lower and the costs to be higher per capita compared to urban areas where economies of scale are realized. There are several principles to the approach in rural areas that could provide great benefit to the localized areas:

- Search for value in materials in the local area;

- Start upstream of the waste;
- Start where the community is;
- Keep materials separated;
- Minimize handling, transportation and processing;
- Start with low-tech, low-cost, flexible solution;
- Measure results in a meaningful way.

Materials in the waste stream have residual value to someone or some business in the community. The key to this concept is to identify the value and user and redirect it back into the community. This identification is to find local markets or even create markets for reused, recycled, reprocessed, or composted materials. This concept can create new local enterprises based on the waste stream redirection.

Starting upstream refers to intercepting the potential waste material and identifying reuses before this material can become waste. This can be done as broader thinking to change the mindset of the community and encourage creative ideas for reuse. Benefits can be realized with higher value in the product if intercepted earlier, easier to reuse and recycle, less energy for transporting the material, and the original purchaser of the material has the first opportunity for reuse. Keeping materials out of the waste stream can be accomplished by composting food waste and yard waste in backyards thereby significantly reducing the waste stream.

Starting where the community is allows the planner to focus on the issues that are most important to a rural community. The values of the community and the local approach to solid waste management are important factors for this idea. Important issues may include: disposal costs, flow control, toxic wastes, regulatory mandates and controversial technologies. Evaluation of the community and surrounding areas for regionalization is also an important focus. This will allow the rural community to pull needed resources from other municipalities thereby benefiting more than one community. The important factor is to evaluate the motivation of the waste generator and to encourage innovation and localized solutions.

An efficient means of saving waste collection and processing costs is to keep the materials separated at the point of collection. This approach saves costs of separation which could be more expensive later in the process. Using the single pass method for waste and recyclable collection is an effective means of accomplishing this key principle.

Minimize handling, transporting and processing will save a great deal of cost by reducing fuel and its polluting effects, labor and equipment costs. The idea is to intercept the materials upstream in the solid waste hierarchy and to keep them separated until collected for an end user.

Low-tech, low-cost and flexible solutions are the best way to start a program and saving costs. Residents find it easier and must cheaper to participate in low-tech solutions rather than

sending waste materials to a high tech incinerator. These solutions are usually more flexible allowing change without great effort and costs. An example is composting yard waste in backyards as opposed to placing it at the curb for collection and delivery to a commercial composting operation then being delivered back to the residents in the form of mulch. Also, variations in recyclable market materials will determine the viability of collection and processing or the disposal.

Once a program has been implemented, then the progress should be measured against the community goals and objectives and costs and benefits. A meaningful process should be adopted to provide evaluation of results with real meaning to program participants.

Another important consideration for rural communities is the concept of regionalization. This concept pulls the resources from two or more local municipalities to provide a more efficient and cost effective solid waste system. The communities can pull their financial resources to fund solid waste collection and handling. This approach also allows for the greater selling power when it comes to contracting with a buyer for recyclables. Other economic incentives would include sharing the costs of landfill development, buying power for recycled materials, and implementation of state-of-the-art technologies. Environmental improvements are also realized with a more efficient collection, recycling and technologically advance solid waste management system.

5.4 Waste Reduction and Recycling Component

Reduce, Reuse and Recycle have been popular terms for many waste reduction and recycling programs across the country. These terms have actually been used as slogans, but also identify the processes that define the waste programs. Waste reduction and reuse are processes that start upstream and are usually low-tech and low-cost solutions for waste diversion and processing through composting and reuse, while recycling requires separation, handling, processing and remanufacturing to accomplish the useful benefit. The market conditions for recyclable materials has dramatically improved thereby creating a market for recyclable materials and recycled end products. An analysis of the waste, market and community attitudes will help the parish set short term and long term waste reduction and recycling goals.

5.4.1 Waste Reduction and Reuse

According to the EPA, containers and packaging represented approximately 28 percent of the materials source reduced in 2000, in addition to nondurable goods (e.g., newspapers, clothing) at 17 percent, durable goods (e.g., appliances, furniture, tires) at 10 percent, and other MSW (e.g., yard trimmings, food scraps) at 45 percent. And, there are more than 6,000 reuse centers around the country, ranging from specialized programs for building materials or unneeded materials in schools to local programs such as Goodwill and the Salvation Army, according to the Reuse Development Organization. Between two and five percent of the waste stream is potentially reusable according to local studies in Berkeley, California, and Leverett, Massachusetts. Also since 1977, the weight of 2-liter plastic soft drink bottles has been reduced from 68 grams each to 51 grams. That means that 250 million pounds of plastic per year has been kept out of the waste stream.

5.4.1.1. Composting

Composting plays an integral part in waste reduction. Organic materials such as yard wastes and food wastes can be composted. According to the EPA, these organics account for about 23 percent of the total waste stream in the United States. Approximately 57% of the yard waste alone was collected and composted in year 2000, while only 2.6 percent of food waste was composted. Today this percent is even higher as more municipalities provide for collection of yard waste to ensure compliance with the landfill ban of this material.

- Suppress plant diseases and pests due to high temperatures;
- Reduce or eliminate the need for chemical fertilizers;
- Promote higher yields of agricultural crops;
- Facilitate reforestation, wetlands restoration, and habitat revitalization efforts by amending contaminated, compacted, and marginal soils;
- Cost-effectively remediate soils contaminated by hazardous waste;
- Remove solids, oil, grease, and heavy metals from stormwater runoff;
- Capture and destroy 99.6 percent of industrial volatile organic chemicals (VOCs) in contaminated air;
- Provide cost savings of at least 50 percent over conventional soil, water, and air pollution remediation technologies, where applicable.

Most composting is conducted in the backyards of residents for yard waste. Many communities are now collecting yard waste and composting the material in central location at a landfill site or municipal complex. Animal waste and biosolids can be added to the yard waste to increase the organic quality of the material and the value as a soil amendment and fertilizer.

Food waste recovery for composting is increasing in popularity. Restaurants, supermarkets, schools, hospitals, prisons, food processors, farmers and community events contribute to the majority of food waste that can be easily collected by an organic food collection program. Separate containers can be employed to collect this waste for removal from the waste stream and for processing at a composting facility. This waste can be mixed with yard waste to enhance the biodegradation of the entire compost mass. Carbon/nitrogen ratios are important and should range from 20 to 35. This proper ratio will provide the environment for microorganisms to break down the waste and for respiration and reproduction of the microorganisms. Food scraps provide nitrogen while wood and paper added the carbon. This ratio can be calculated from published data on the carbon and nitrogen content of common substances.

There are several different types of composting approaches: unaerated static pile, aerated windrow/pile, in-vessel composting and vermicomposting using red worms. The unaerated static pile is for small operations where the aerated windrow/pile is for larger systems. The in-vessel type can accommodate meat and grease and is in a temperature and moisture controlled

vessel while the other types cannot. The vermicomposting system is fast and produces a high quality compost material.

5.4.2 Recycling

Recycling is an increasingly important component of a comprehensive solid waste collection system to provide municipalities with financial, environmental, and social returns. There are three key general steps in recycling a product: collection and processing, manufacturing and the purchasing of recycled products. These steps complete a process that has sustainable returns for environmental conservation. According to the EPA, the main benefits of a recycling program are:

- Recycling protects and expands U.S. manufacturing jobs and increases U.S. competitiveness;
- Recycling reduces the need for landfilling and incineration;
- Recycling prevents pollution caused by the manufacturing of products from virgin materials;
- Recycling saves energy;
- Recycling decreases emissions of greenhouse gases that contribute to global climate change;
- Recycling conserves natural resources such as timber, water, and minerals;
- Recycling helps sustain the environment for future generations.

Typical materials that are recycled from the waste stream are:

- Plastics- with numbers 1 through 7 identifying the type:

1	PET	**Polyethylene terephthalate** - Fizzy drink bottles and oven-ready meal trays.
2	HDPE	**High-density polyethylene** - Bottles for milk and washing-up liquids.
3	PVC	**Polyvinyl chloride** - Food trays, cling film, bottles for squash, mineral water and shampoo.
4	LDPE	**Low density polyethylene** - Carrier bags and bin liners.
5	PP	**Polypropylene** - Margarine tubs, microwaveable meal trays.
6	PS	**Polystyrene** - Yoghurt pots, foam meat or fish trays, hamburger boxes and egg cartons, vending cups, plastic cutlery, protective packaging for electronic goods and toys.
7	OTHER	**Any other plastics** that do not fall into any of the above categories. - An example is melamine, which is often used in plastic plates and cups.

No plastic bags, styrofoam, plastic packaging or wrap, six pack rings, petroleum product bottles.

- Paper- newspaper, magazines, mixed paper and cardboard; No waxed cardboard, pizza boxes, hard cover books, frozen food boxes, photos, carbon paper.
- Aluminum cans;
- Steel cans;
- Glass- food and drink bottles, but no light bulbs, drinking glasses, window glass or ceramics.
- Yard waste and light construction debris are also allowed by some recycling programs.

The keys to a successful program with a high participation level are to make the program convenient, enact mandates and institute a PAYT program. Some programs have enacted mandates requiring residents to source separate or their waste will not be collected. The city of Griffin, Georgia has enacted such a program with great success. The initial opposition was eventually overcome with increased education of the purpose and results.

Step 1. Collection and Processing: Collecting recyclables includes four primary methods: curbside, drop-off centers, buy-back centers, and deposit/refund programs.

The collected recyclables are usually sent to a materials recovery facility (MRF) to be sorted and prepared into marketable commodities for manufacturing. Recyclables are bought and sold just like any other commodity, and prices for the materials change and fluctuate with the market.

Step 2. Manufacturing: Once cleaned and separated, the recyclables manufactured into new products with total or partial recycled content. Common household items that contain recycled materials include newspapers and paper towels; aluminum, plastic, and glass soft drink containers; steel cans; and plastic laundry detergent bottles. Recycled materials also are used in innovative applications such as recovered glass in roadway asphalt (glassphalt) or recovered plastic in carpeting, park benches, and pedestrian bridges.

Step 3. Purchasing Recycled Products: Purchasing recycled products completes the recycling loop. By "buying recycled," governments, as well as businesses and individual consumers, each play an important role in making the recycling process a success. As consumers demand more environmentally sound products, manufacturers will continue to meet that demand by producing high-quality recycled products.

5.4.2.1 Curbside Collection Options

Curbside collection of recyclables is the most convenient collection system for the residents and encourages high participation. But, this collection system is also the most expensive for a municipality. Collection is usually handled in three ways: collection of recyclables and waste separately, collection of commingled recyclable items and waste separately and collection of recyclables and waste together. The collection type depends upon the waste stream, available facilities, available collection equipment and the market for the recyclables.

The most efficient means of collecting recyclables is to have the residents sort the materials and set out the containers as shown in **Figure 5.7**. This approach allows the collectors to dump the materials in the bins in the truck according to type. Then the materials can be delivered to a central staging area to allow for the stockpiling of sorted materials prior to pickup or delivery to an end user. Solid waste is picked up in a separate truck or in the same truck in a separate compartment. This approach is dependent upon the set-out density, equipment, labor and distance to disposal/ processing area.

The second collection method allows the residents to collect the recyclables mixed in one container. These mixed recyclables are known as single stream recyclables as shown in **Figure 5.8**. This approach is a popular means of collection, due to the convenience for collection and for the residents. This process requires the collector to store the materials or deliver them to the recycling processor where they are separated for the end user markets. Solid waste is picked up in a separate truck or in the same truck in a separate compartment. This approach is less dependent upon the set-out density, equipment, labor and distance to disposal/ processing area. In fact, this collection option can also be administered in rural areas, but with higher costs due to travel distances.

Figure 5.7 Sorted Recyclables

Collection and processing of single stream or commingled recyclables is a process that has become the method of choice for many municipalities. This method provides for ease of contracting, public participation, collection, handling, processing and is efficient and cost effective. Several municipalities have developed a successful curbside single stream recyclable collection system including:

- Lafayette Consolidated Government
- The City of Baton Rouge and East Baton Rouge Parish
- City of New Iberia, LA
- City of Shreveport, LA

Figure 5.8 Mixed Recyclables

The third collection method is to pick up all the recyclables and waste mixed. This approach is flexible for collection since no special equipment is needed to accomplish collection. This approach does require a MRF facility for the separation of the recyclable material from the waste. MRFs require labor and handling in conjunction with the transfer of waste residuals to the landfill.

Innovative and flexible collection system is important for participation and efficiency. Collection containers

should be provided. Collection of recyclables should be collected at the same frequency of waste collection, and yard waste collection should be frequent with seasonal considerations considered such as fall leaves. Establish drop off sites in conjunction with waste drop off and at convenient locations.

There are several factors that affect the cost of recyclable collection. The set-out containers, density of set-out locations, set-out rates, compartmentalization of trucks versus the material collected, labor costs, vehicles, weather, distance and time to processing center from route, amount of advertisement, publicity and education required to meet goals.

5.4.2.2 Recycling Drop off Centers

As discussed previously, the centers should be located within 3 to 5 miles of residents and the each center should provide disposal for 5000 to 10,000 people to maintain a higher level of participation for recyclable drop off. Recycling drop off centers can be located in conjunction with solid waste drop off areas to increase participation and to promote source separation. Drop off bins for recyclables can also be located in populated areas on community corners or in shopping centers for convenience- in areas where recycling collection is limited. Soliciting sponsorship is important such as from paper companies to sponsor containers for newspapers. This approach can also be used for glass, metals and plastics once an end user is identified.

5.4.2.3 Buy Back Centers and Deposit/Refund Programs

Buy back and refund centers are established to pay collectors for recyclables. The cost is based on the market for these materials and must consider fluctuations in the market prices. These systems are economically based and could experience difficulty in down markets. Also, an increase in littering and illegal dumping occurs during these down markets when recyclables are difficult to sell.

5.5 St. Tammany Parish Progress Towards Regional Collection

5.5.1 Garbage Collection Districts

St. Tammany Parish currently has two functional management units for residential solid waste collection and management; Garbage District No. 1 and No. 2. These districts are both located west of Slidell within unincorporated St. Tammany Parish. District No. 1 is centered on the Crossgates Subdivision while District No. 2 is located to the south encompassing Oak Harbor and Lakeshore Estates Subdivisions among others. **Figure 5.9** shows both Garbage Districts and the underlying subdivisions.

As previously discussed, the existence of a billing mechanism is a critical factor enabling municipal garbage collection service. Without this, the options for municipal collection are limited. Tax based systems are feasible, but require initiation of a new tax millage for the district or for the Parish as a whole if expanded service were desired. With the current state of the economy and recent turmoil over reassessments, the environment is not conducive for tax based services such as this.

Garbage District No. 1 has an existing municipal billing system with Crossgates Utilities (water and sewer system). Overlaying a garbage system with Crossgates would be relatively simple

and in fact has been targeted by St. Tammany Parish as the pilot for Parish garbage service. After implementation of the initial service, it is recommended that adjacent and surrounding subdivisions who have billing mechanisms be encouraged to piggyback onto the Crossgates contract. **Figure 5.10** shows the utility areas and the subdivisions.

Service to Crossgates should be bid through a competitive process utilizing bid specification developed by and for the Parish with terms and conditions established in the interest of effective, efficient and environmentally compatible service. Many decisions should be made at the outset to ensure that the service is compatible with public needs. Service variables such as frequency of service, type of container, manual versus automated, inclusion of recycling and other factors must be decided and implemented. More details on implementation of a solid waste collection system centered on existing and future garbage districts are outlined below.

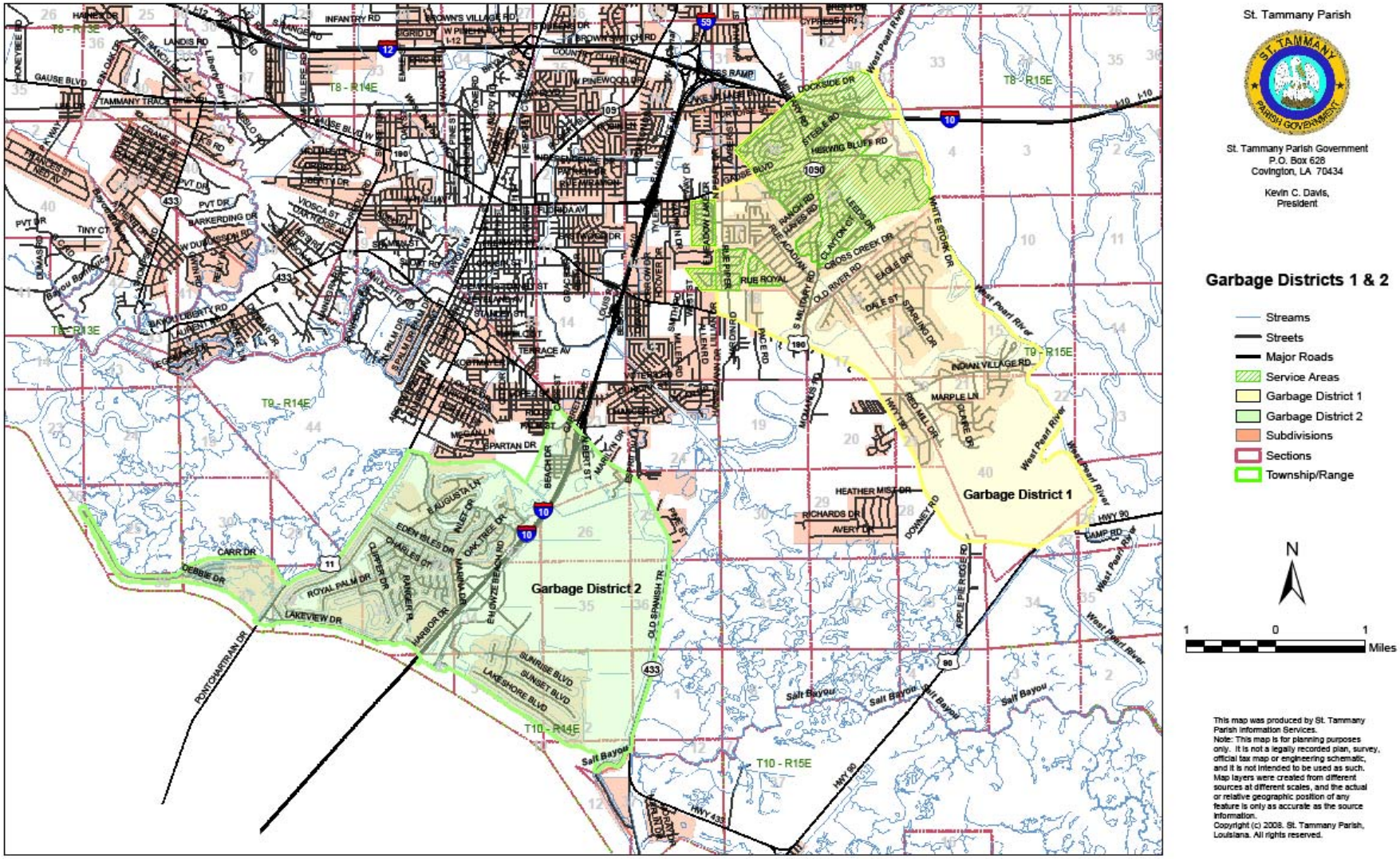

Figure 5.9 Garbage District Map

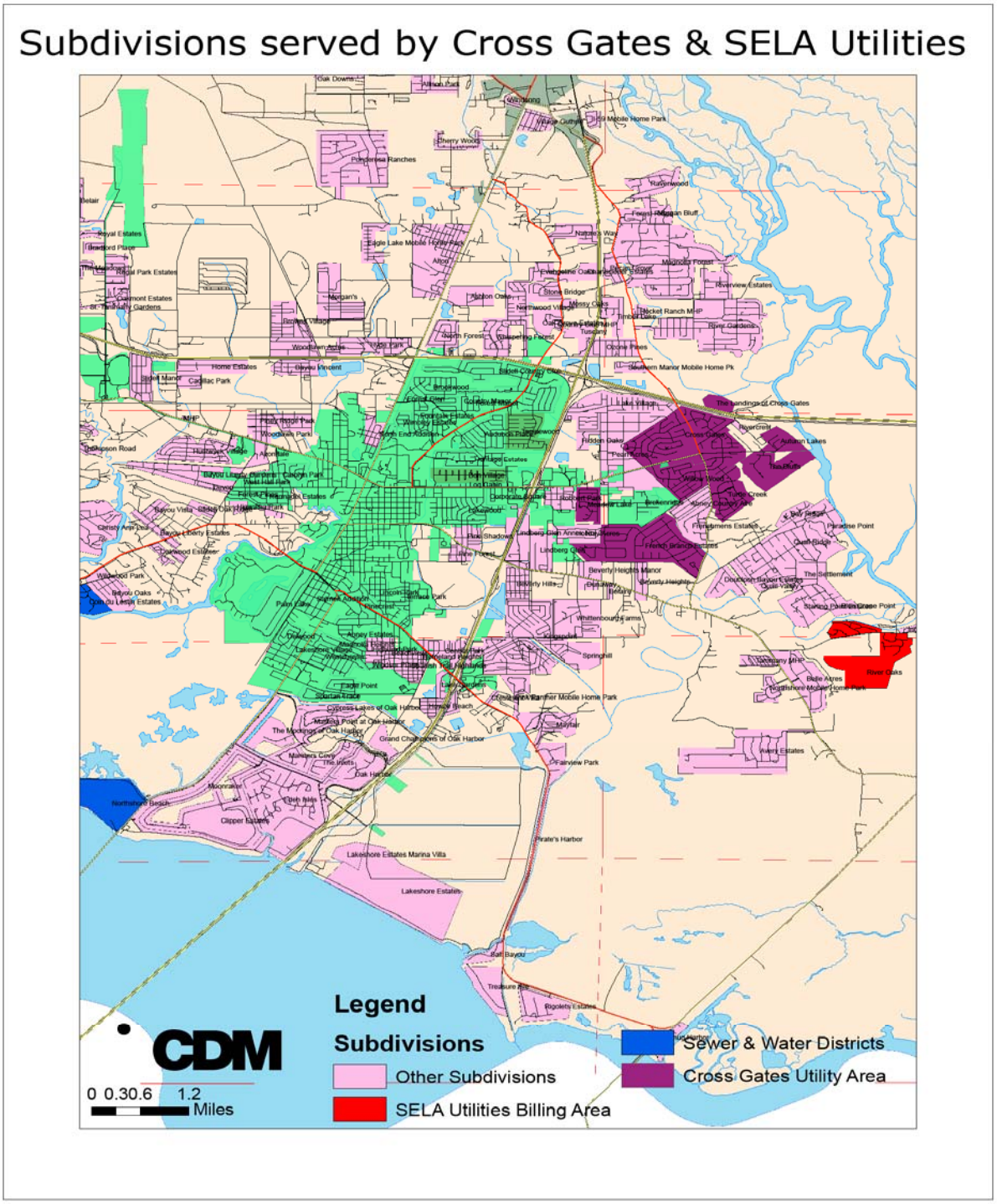

Figure 5.10 Utility Areas and Subdivisions

5.5.2 Proposed Activation Plan

In order for St. Tammany Parish to develop a solid waste and recyclable collection program the developmental steps must be taken to plan and develop an organized and efficient program.

- Perform an analysis of the waste stream to identify potential recyclable materials and quantity, develop a correlation between urban and rural waste types and quantities, and develop an expected waste stream for landfilling.
- Solicit input from the community regarding their opinions on recycling, collection and disposal from meetings and questionnaires;
- Define the goals of the community using public input, local and state governments, and waste coalitions and associations(Recycling, SWANA, NSWMA);
- Analyze the service area;
- Determine public and private collection and transfer options and determine what facilities the parish may need;
- Determine and develop the system funding structure;
- Identify waste preparation and collection procedures and prepare an RFP for privatization on a pilot program for a district;
- Develop collection routes and districts for pilot program and for future;
- Review proposals and determine best provider;
- Contract for collection on a pilot study and develop infrastructure as needed for support;
- Provide education brochures and news for upcoming pilot program.
- Monitor system performance and make adjustments prior to selection on future districts.
- Provide education brochures and news for upcoming wider scale program.

For a successful collection program it is crucial to provide immediate customer service throughout the process to answer questions and address concerns. The early implementation stage will require increase effort to ease customer complaints and to keep the system functioning smoothly. This initial stage of system implementation is the most critical, where the success or failure could determine customer acceptance as the system expands throughout the parish.

Section 6
Funding Alternatives

Funding for an integrated solid waste management system is critical to the success of the program. Understanding what goes into each element is important for allocating funding for an efficient system. By far the largest cost component of an integrated solid waste management system is the collection of municipal solid waste and recyclables accounting for 39 percent to 62 percent of the costs with an average of 50 percent according to EPA 1999. Facilities are next with 19 percent followed by 15 percent for administrative costs, 12 percent for landfill costs and 4 percent for waste transfer operations.

There are several mechanisms used for the funding of solid waste collection and disposal systems. As previously discussed tax based systems, flat fee systems, variable rate systems and hybrid funding methods are the most popular means of governmental funding systems.

Taxed based systems are a portion of the property tax revenues used to fund solid waste collection and disposal. These revenues are collected annually, are easy to collect, and are successful since they are a part of the tax system. Even though there is a high percentage of participation, the revenues are generally low compared to the actual cost to fund a complete system. The disadvantages of the tax system is there lacks an incentive for waste reduction, revenues are difficult to adjust if more funds are needed, and can lead to objections if all residents are not provided with the same level of service.

Flat fee systems are based on a fee per month that the residents must pay for waste collection. These systems are relatively easy to administer, adjustable according to increases in operating costs, waste collection cost is not counted against property tax limits, and the billing and collection can be assigned to a private hauler where the local government does not have to staff and administer a billing and collection department. The disadvantages of the flat fee system is that it too does not encourage waste reduction, some residents may try to save costs by finding other means of disposal (i.e. illegal dumping, burning and disposal in other's and commercial containers), fees are more difficult to collect, these fees are usually higher than tax based fees, and the governments find these funds less flexible due to difficulty re-appropriating funds for other uses.

Variable-rate systems are funding mechanisms based on a sliding scale dependent upon how much a resident sets out for collection per week. This system can also allow the customer to subscribe to a particular amount such as one 30-gallon can per week. This system also allows flexibility for different types of waste pickup such as large items like sofas, mattresses, banned items such as yard waste, tires and batteries and other types of special waste such as paint, scrap building materials and household hazardous waste. There would be additional costs associated with each type of extra waste pickup. PAYT systems are considered variable-rate funding systems. This system encourages waste minimization, allows for customers to choose their level of service, increases recycling rates, and encourages onsite composting of yard waste and food waste. There are disadvantages to these systems due to the complexity. The administrator has to keep track of the charges that may change each week which in turn could create some variability in predicting revenues. Some contracts have guaranteed minimum

revenue amounts. Also, volume based systems cause some residents to compact the waste excessively causing bag ruptures and excessively heavy containers causing strain on the workers. This system increases the likelihood of contaminants showing up in the recyclables and the waste in attempts to minimize charges. Under this system larger families can expect to pay more than the flat-fee system.

Hybrid funding methods are a combination of the aforementioned systems. These could include a variable rate system that is also funded with a base rate or tax system. There are many advantages and disadvantages depending on the combination of systems provided.

6.1 Eco Park Funding

6.1.1. Parish Owned Site

Funding for a Parish owned facility can be accomplished several ways. The most common methods of funding are tax base systems and flat fee systems where the residents are assessed a tax or a flat fee on an annual basis or a monthly basis to cover the capital and operating costs of the facility over the lifetime expectancy of the facility. As a public entity St. Tammany Parish may be eligible for grants and low interest loans or municipal bonds which may also be an option for additional funding to keep the resident fees lower. The project becomes more attractive to government funding especially if the project can show "green" aspects or LEED certification with a renewable energy component.

Tax or flat fee funding structures must take into account avoided and reduced costs as well as revenue generated. By operating it's own facility, St. Tammany Parish would avoid the cost of sending materials to out-of-parish landfills for disposal. Estimating the avoided costs to be between 10 and 20 percent, the avoided cost for a 500 ton per day MSW facility could be between $500,000 to $1,000,000 per year. Also, the tipping fee (cost of disposal per ton) could be reduced both for C&D and MSW under a public ownership scenario since no profit margin is necessary.

Moving forward with the Eco Park concept will require several phases of work and associated funding. As previously discussed the development of the Eco Park would include the approximate costs as estimated below:

1. Site Location Study $100,000
2. Procurement $50,000
3. Permitting $500,000
4. Construction $5,000,000

The cost of land will be a significant factor. For a 500 acres rural site, the cost could approach $10,000,000. It may be prudent to consider working with landowners in a partnering arrangement where they are compensated over time.

For a tax based system, raising the millage rate in St. Tammany Parish by 1 mil could generate about $863,000 per year. This tax would allow for the project to be paid for in less than 20 years with the tax alone. Other revenues from tipping fees and public private partnerships would allow for operational funding and future improvements.

6.1.2 Public- Private Partnerships

An effective means of developing and operating a solid waste handling and disposal facility is through a public-private partnership with cost and revenue sharing agreements. Monies could be generated from leasing space to the private sector for waste processing. This approach would also allow the private sector to share in the revenues from that waste stream. The Parish could also collect royalties from the private sector based on the quantities of materials processed and disposed.

The potential profit from the sale of recycled materials could be significant depending on market conditions. At the least the recycling activities could be break even resulting in a benefit to the environmental and residents of the Parish.

6.2 Collection System Funding

Similarly to the Eco Park facility funding, there are several mechanisms used for the funding of solid waste collection. Tax based systems, flat fee systems, variable rate systems and hybrid funding methods are available funding systems for collection. Since collection is the highest cost of an integrated solid waste management system additional funding is necessary to provide these services.

Most funding systems for collection are based on the flat fee system. This system allows for ease of revenue projections and calculation of bills. In general waste collection can cost each household about $25 per month for 86,400 households yielding monthly revenue of about $2.16 million. This equates to annual revenues of $25.92 million.

The variable rate system may be advantageous to some residents over the flat fee system to encourage recycling which can provide for lower fees for residents for lower set out waste volumes. This system is fairly based on the amount of waste collected at the curb using volume based containers or the PAYT basis for billing. This system encourages waste reduction and increases recycling participation to meet community goals.

Section 7
Conclusion and Recommendations

St. Tammany Parish has experienced population growth of 20 percent since the year 2000 with continued growth rates estimated to be 35 percent over the next ten years. This growth has created an increase of solid waste generation within the Parish for MSW and C&D waste. MSW waste volumes have increased from around 570 tons per day in 2000 to 663 tons per day in 2006 and expected to reach 726 tons per day in 2010. In 20 years the tonnage generated in St. Tammany Parish could reach up to 980 tons per day. For C&D waste the volume is slightly lower with a per capita generation rate of about 1 lb per day per person yielding about 121 tons per day in 2010. This growth requires St. Tammany Parish to plan an organized and controlled approach to provide an effective long term solid waste management program.

There is only one Type III landfill that accepts C&D waste in the parish that is owned and operated by a private company. This landfill accepted less than 200 tons per day before Hurricane Katrina, but recently has been accepting around 500 tons per day. The permit for this landfill is due to expire on January 31, 2010. After this date, C&D waste disposal will be required to go out-of-Parish thereby increasing the cost of disposal.

7.1 Solid Waste Management Improvement

CDM has reviewed the existing Parish solid waste management system and has provided recommendations for the improvements and implementation measures. Improvements to the solid waste management system for St. Tammany Parish were focused on the development of a multi-purpose solid waste management facility and to provide for an organized waste and recyclable collection system. CDM, in working closely with the Parish, has developed the concept of an Eco Park Solid Waste Management Facility.

7.1.1 Eco Park Solid Waste Management Facility

The Eco Park is a solid waste management facility that establishes an emphasis on recycling and waste minimization utilizing governmental controls, public participation and private sector involvement. Integrating as many solid waste processes, recycling, and conversion technologies as possible will develop a robust, flexible, and cost-effective approach to resource recovery. This will allow options to be exercised depending upon local conditions, quantity surges in materials due to storm events, fluctuations in market conditions, and periodic maintenance outages for various systems. The intent is for the facility to be economically viable and to provide for commercial participation in the management of the waste materials. A significant portion of the parcel will be devoted to buffer areas which shield the Eco Park from the surroundings. The time has come for proactive and progressive management of solid waste and the Eco Park concept can provide an innovative and sustainable solution for St. Tammany Parish.

The Eco Park concept is totally flexible. The facility can be developed in phases to allow for available funding and Parish priorities. Components can be added in the future to meet public needs and markets for materials. Private sector participation is crucial for the build out of

recycling and processing components and commercial partners should be sought out as part of the development process.

A carefully coordinated solid waste processing and disposal facility design will minimize environmental impacts, provide maximize benefits, and keep operation and maintenance costs as low as possible. The site can be developed to manage four major solid waste categories: Concrete and Demolition (C&D), Municipal Solid Waste (MSW), Recyclables and excluded wastes such as yard wastes, white goods, batteries, tires, electronics and household hazardous waste. The choice of which materials will be accepted is up to the Parish based on compatibility, citizens needs, and market conditions. The list of potential components include:

- C&D material recycling (concrete, wood, dirt, etc.)
- Recycling household garbage
- Composting (green waste)
- C&D disposal
- MSW disposal
- Electronic waste recycling
- Tire recycling
- Household hazardous waste
- Used oil drop off
- Battery recycling
- Biosolids processing and recycling

Other important functions that can be integrated in the Eco Park are:

- Waste fuel processing (pelletizing)
- Waste to energy
- Recycled materials manufacturing
- Biofuel processing
- Landfill gas production

One of the largest components of a waste disposal facility is C&D waste. This waste consists of debris such as concrete, asphalt, wood, metals, bricks, and plastics to name a few. This is generally bulky, heavy material. The principal need for St. Tammany Parish's solid waste

management plan is the development of a C&D disposal facility. When the Slidell Landfill closes in 2010 the Parish will need to transport C&D waste out of the Parish. With rising costs in fuel, transporting this waste out of the Parish is not economical. This component must be first priority for St. Tammany Parish.

A MSW site is the second stage for a waste disposal site. This site will be of similar sizing to the C&D site. MSW waste is the sector of waste management where the most revenue can be generated. MSW contains recyclable waste and energy that global and local markets are seeking. Processing of MSW to extract recyclable component is readily available through the Eco Park concept.

Creating facilities that collect and manage reusable materials is an important component of an Eco Park. Research and technology is continuing to evolve regarding the beneficial uses of solid waste. The cost of developing, building, and operating such infrastructure is initially expensive. These facilities usually pay for themselves in a span of 10 to 20 years. Afterwards the revenue generated can be used for new development and O&M of the disposal facility. The Eco Park concept is flexible and the facility could include C&D disposal, MSW disposal, many types of recycling, composting, and related waste management components. The Parish would decide which of the system components to activate based on need and the desires of the residents. The following section on population is provided to help determine the size and components of an Eco Park for St. Tammany Parish.

The facility can be developed and permitted in phases. The initial phase is expected to include the C&D landfill, green waste processing, recycling drop off center, and areas for tire, used oil and battery drop off. The design and permitting is expected to take up to 3 years for regulatory approval from LDEQ.

The benefits to the Parish include a long term option for disposal of waste, cost competitive waste disposal without shipping to out-of-Parish facilities, an effective recycling program and a more environmentally friendly solid waste management system.

7.1.2 Collection System

LDEQ records show that there are 24 haulers operating in St. Tammany Parish for waste collection. This many haulers cause an inefficient and potentially harmful collection system. This situation produces several negative consequences:

- Safety issues due to increased truck traffic in neighborhoods and on the roads;
- Environmental impacts due to pollution of additional truck traffic;
- Deterioration of Parish roads due to unnecessary heavy traffic;
- Traffic impacts on some rural roads, which are not wide enough to have trucks collecting waste and traffic on both lanes;
- Difficulty to enforce Parish minimum standards for garbage trucks ;

- Deterioration of the curb appeal of the neighborhoods due to having garbage containers and/or garbage bags out on the curb different days a week on different houses;

- Lack of control over implementation of new waste collection strategies, such as recycling;

Therefore, an organized and controlled approach to solid waste collection must be implemented.

A regional approach to solid waste collection is an important concept for a municipality with a varied population density and land use. An approach that is appropriate for an urban or suburban region may not be appropriate for rural or less populated areas. That is why a flexible regional approach is important for the parish to consider in dealing with solid waste collection. There are many different collection alternatives that must be considered to accomplish waste collection in the parish's urban, suburban and rural areas. Curbside collection, automated curbside collection, dual stream collection, pay as you throw (PAYT) for weight and volume based collection, and regional convenience drop off centers are successful approaches that would be effective in St. Tammany parish. Each approach has it's advantages and disadvantages and depend on the service area, distance to the disposal site or transfer station and the population density.

Recycling

The keys to a successful recycling program with a high participation level are to make the program convenient, enact mandates and institute a PAYT program. Some programs have enacted mandates requiring residents to source separate or their waste will not be collected. When developing a recycling system the market for the materials must also be considered.

The first step in the process is collecting recyclables via curbside, conveniently located drop-off centers, buy-back centers, and deposit/refund programs. The collected recyclables are usually sent to a materials recovery facility (MRF) to be sorted and prepared into marketable commodities for manufacturing. Recyclables are bought and sold just like any other commodity, and prices for the materials change and fluctuate with the market.

The next step is getting the materials manufactured into a new product. Once cleaned and separated, the recyclables manufactured into new products with total or partial recycled content. Common household items that contain recycled materials include newspapers and paper towels; aluminum, plastic, and glass soft drink containers; steel cans; and plastic laundry detergent bottles. Recycled materials also are used in innovative applications such as recovered glass in roadway asphalt (glassphalt) or recovered plastic in carpeting, park benches, and pedestrian bridges.

Then the purchasing of recycled products completes the recycling loop. By "buying recycled," governments, as well as businesses and individual consumers, each play an important role in making the recycling process a success. As consumers demand more environmentally sound products, manufacturers will continue to meet that demand by producing high-quality recycled products.

Garbage Districts

St. Tammany Parish currently has two functional management units for residential solid waste collection and management; Garbage District No. 1 and No. 2. These districts are both located west of Slidell within unincorporated St. Tammany Parish. District No. 1 is centered on the Crossgates Subdivision while District No. 2 is located to the south encompassing Oak Harbor and Lakeshore Estates Subdivisions among others.

Garbage District No. 1 has an existing municipal billing system with Crossgates Utilities (water and sewer system). Overlaying a garbage system with Crossgates would be relatively simple and in fact has been targeted by St. Tammany Parish as the pilot for Parish garbage service. After implementation of the initial service, it is recommended that adjacent and surrounding subdivisions who have billing mechanisms be encouraged to piggyback onto the Crossgates contract.

Service to Crossgates should be bid through a competitive process utilizing bid specification developed by and for the Parish with terms and conditions established in the interest of effective, efficient and environmentally compatible service. Many decisions should be made at the outset to ensure that the service is compatible with public needs.

Once the program has become a success then the garbage districts can be expanded for growth and creation of new districts.

Funding

There are several mechanisms used for the funding of solid waste collection and disposal systems. As previously discussed tax based systems, flat fee systems, variable rate systems and hybrid funding methods are the most popular means of governmental funding systems.

As a public entity St. Tammany Parish may be eligible for grants and low interest loans or municipal bonds which may also be an option for additional funding to keep the resident fees lower. The project becomes more attractive to government funding especially if the project can show "green" aspects or LEED certification with a renewable energy component.

By operating it's own facility, St. Tammany Parish would avoid the cost of sending materials to out-of-parish landfills for disposal. Estimating the avoided costs to be between 10 and 20 percent, the avoided cost for a 500 ton per day MSW facility could be between $500,000 to $1,000,000 per year.

For a tax based system, raising the millage rate in St. Tammany Parish by 1 mil could generate about $863,000 per year. This tax would allow for the project to be paid for in less than 20 years with the tax alone. Local option sales tax can also provide revenue for funding the system. Other revenues from tipping fees and public private partnerships would allow for operational funding and future improvements.

Most funding systems for collection are based on the flat fee system. This system allows for ease of revenue projections and calculation of bills. In general waste collection can cost each household about $25 per month for 86,400 households yielding monthly revenue of about $2.16 million. This equates to annual revenues of $25.92 million.

7.2 Next Step

In order for St. Tammany Parish to develop a solid waste management program the developmental steps must be taken to plan and develop an organized and efficient program.

- Perform an analysis of the waste stream to identify potential recyclable materials and quantity, develop a correlation between urban and rural waste types and quantities, and develop an expected waste stream for landfilling.
- Solicit input from the community regarding their opinions on recycling, collection and disposal from meetings and questionnaires;
- Define the goals of the community using public input, local and state governments, and waste coalitions and associations(Recycling, SWANA, NSWMA);
- Analyze the service area;
- Determine public and private collection and transfer options and determine what facilities the Parish may need;
- Determine and develop the system funding structure;
- Determine the location for the Eco Park Solid Waste Management Facility and commence design, permitting and construction;
- Identify waste preparation and collection procedures and prepare an RFP for privatization on a pilot program for a district;
- Provide education brochures and news advertisements for upcoming pilot program.
- Develop collection routes and districts for pilot program and for future;
- Review proposals and determine best provider;
- Contract for collection on a pilot study and develop infrastructure as needed for support;
- Monitor system performance and make adjustments prior to selection on future districts.
- Provide education brochures and news advertisements for upcoming wider scale program.

Development and implementation of a solid waste management system must be designed to meet the needs of the community and the Parish. This process takes extensive planning and solicitation of input from the community to provide the expected services for an efficient and cost effective solution as possible.

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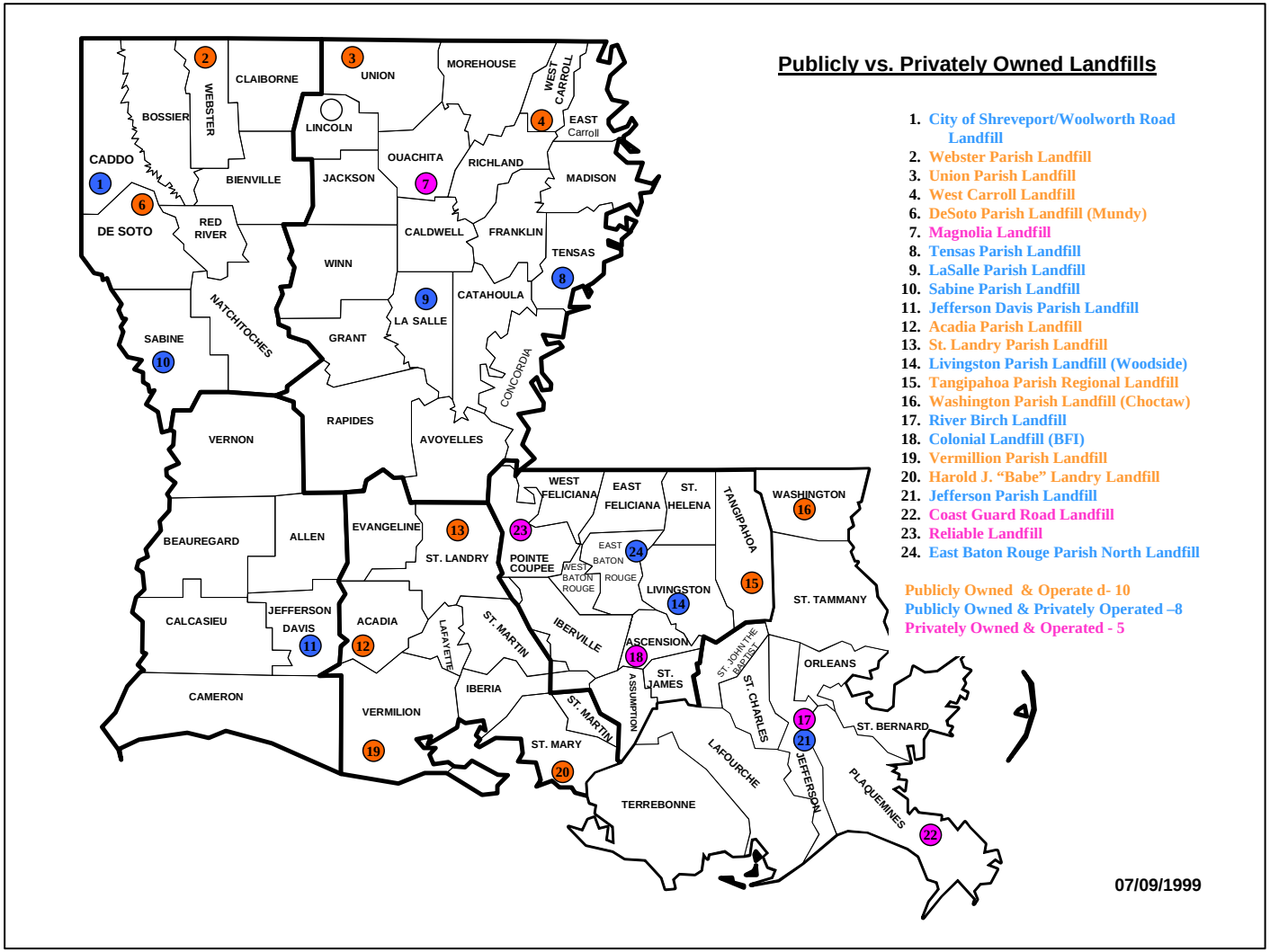

Solid Waste Landfills in Louisiana from "Solid Waste Management Report" for St. Tammany Parish, by: Tamplan, LLC and The CAID Group, LLC, dated May 15, 2005

LDEQ Interactive Mapping

LDEQ LANDFILLS TYPE 1 AND 2

LDOTD PARISHES

LDOTD LA BOUNDARY

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February 4, 2009

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PERMITTED TYPE I and II FACILITIES

Facility Name	ID #/(AI#)	Type	Contact	Address	Phone	Parish	Owner/ Operator
Acadia Parish Landfill	D-001-1522/P-0029R1 (20036)	II	Raymond Breaux	611 Petal Rd., Egan, LA 70531	337-783-4834	Acadia	Parish
Coast Guard Rd. Landfill	D-075-1639/P-171R1 (20061)	I & II	Kevin Guidry	P.O. Drawer 647. Venice, LA 70091-0647	504-534-7886	Plaquemines	Tidewater Landfill, Inc.
Colonial Landfill (BFI)	TD-005-0532/P-0021 (4803)	I & II	Matt Robillard	P.O. Box 605, Sorrento, LA 70778	225-771-1212/ 225-268-0869	Ascension	BFI
CWI, White Oaks	D-073-7744/P-0357 (42312)	I & II	Bill Hay	P.O. Box 13355 Monroe, LA 71207		Ouachita	CWI
DeSoto Parish Landfill (Mundy)	D-031-1827/P-0035R1 (19803)	I & II	Bill Smith	P.O. Box 898 Mansfield, LA 71052	318-872-2500/ 318-872-0739/ 318-872-2131	DeSoto	Parish
East Baton Rouge North Landfill	D-033-2885/P-0269 (25385)	I & II	Jorge Ferrer	P.O. Box 1471, Baton Rouge, LA 70821	225-389-5476/ 225-389-5245/ 225-389-4813	E. Baton Rouge	Parish/BFI
Jefferson Davis Parish Landfill	D-053-1871/P-0100 (18935)	I & II	Daniel Hylton	P.O. Box 1207, Jennings, LA 70546	337-734-4135	Jefferson Davis	Parish/BFI
Jefferson Parish Landfill	D-051-0090/P-0297 (6961)	I & II	Marnie Winter	5800 Hwy 90, Avondale, LA 70094	504-436-0152	Jefferson	Parish/WM
LaSalle/Grant Parish Landfill	D-059-1658/P-0119R1 (19447)	I & II	Dorsel Cobb	P.O. Box 1180, Jena, LA 71342-1180	318-992-5571	LaSalle	Parish/IESI
Magnolia Landfill	D-073-1848/P-0046R1 (12241)	I & II	Gabe Landry	P.O. Box 13467, Monroe, LA 71213	318-343-5636	Ouachita	WM
Reliable Landfill, LLC	D-077-1314/P-0032R1 (25491)	I & II	David Mason	P.O. Box 576, Livonia, LA 70755	225-665-8225	Pointe Coupee	WM
River Birch Landfill	D-051-6741/P-0321 (32219)	I & II	A. J. Ward, Jr.	P.O. Box 1938, Gretna, LA 70054	504-364-1140	Jefferson (Avondale)	River Birch, Inc.

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FACILITIES

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Sabine Parish Landfill	D-085-1837/P-0170R1 (12448)	I & II	Pete Chreene	P.O. Box 507, Many, LA 71458	318-256-6361	Sabine	IESI
St. Mary Parish (Harold "Babe" Landry) Landfill	D-101-0079/P-0193 (9340)	I & II	Norris Crappell	P.O. Box 251, Berwick, LA 70342	985-385-4531	St. Mary	Parish
St. Landry Parish Landfill	D-097-1836/P-0043 (19220)	II	Kathy Martin	P.O. Box 610, Washington, LA 70589	337-826-5211	St. Landry	Parish
Tangipahoa Regional Landfill	D-105-1852/P-0127 (19190)	II	Buddy Till	P.O. Box 215, Amite, LA 70422	504-748-3211/ 504-878-2808	Tangipahoa	Parish
Tensas Parish Landfill	D-107-0265/P-0260R1 (20130)	I & II	John Wynn	P.O. Box 598, St. Joseph, LA 71366	318-766-9219	Tensas	IESI
Terrebonne Parish Ashland Landfill	D-109-0127/P-0004 (19179)	II	Tom Bourg	Terrebonne Parish Council, P.O. 2768, Houma, LA 70361	985-873-6519	Terrebonne	Parish
Timberlane Landfill	D-003-8646/P-0339 (52277)	I & II	Phil Smith	2301 Eagle Parkway, Suite 200, Fort Worth, TX 76177	817-632-4000	Allen	IESI
Union Parish Landfill	TD-111-0108/P-0179 (20131)	II	Stanley Glossen	P.O. Box 723, Farmerville, LA 71241	318-368-3296/ 318-368-3374	Union	Parish
Vermilion Parish Landfill	TDP-113-0023/P-0030 (148)	II	Ricky Leblanc	Dept. of Public Works, 8500 Birch St., Abbeville, LA 70510	337-898-4338	Vermilion	Parish
Washington Parish Landfill (Choctaw Rd.)	D-117-1980/P-0155 (20076)	II	Raymond Miller	26400 Buford Creel Rd., Franklinton, LA 70438	504-848-2920	Washington	Parish
Webster Parish Landfill	TD-119-1916/P-0165 (85534)	I & II	Dan Frazier	P.O. Box 389, Minden, LA 71058-0389	318-377-9193	Webster	Parish/WM
West Carroll Parish Landfill	D-123-2069/P-0121 (20079)	II	Clyde McBride	P.O. Drawer 630, Oak Grove, LA 71263	318-428-4835/ 318-428-2437	West Carroll	Parish

PERMITTED TYPE I and II
FACILITIES

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Woodside Landfill and Recycling Center, Livingston Parish	D-063-1941/P-0080R1 (11767)	I & II	David Mason	29375 Woodside Dr., Walker, LA 70785	225-665-8225	Livingston	WM
Woolworth Road Landfill, (City of Shreveport)	D-017-1909/P-0120R1 (9077)	I & II	Fred Williams	P.O. Box 31109, Shreveport, LA 71130,	318-673-6300/ 318-925-3500	Caddo	City/BFI

PERMITTED TYPE III FACILITIES

Construction/Demolition Debris and Woodwaste Landfills

Site	AI #	Permit	Parish	Contact	Phone
Amid C/D Landfill	30439	P-0337	Orleans	Mr. Patrick Roth	(504) 415-4282
Angco, Inc. C/D Landfill	28008	P-0305R1	Lafayette	Mr. George Lockhart	(225) 667-1707
BMW Enterprises, Inc. (Grace Sugar Hill)	81991	OU-0154A	Bossier	Mr. David Strong	(318) 688-9609
BMW Enterprises, Inc. (Mt. Zion Road)	52368	OU-0155A	Caddo	Mr. Michael Harrelsin	(318) 286-6882
Catahoula Parish C/D Landfill	30569	OU-0157	Catahoula	Mr. Charlie Meyers	(318) 744-5435
Chaney Trucking	40072	OU-0159	Calcasieu	Mr. James Chaney	(337) 855-6496
Chaney Trucking	92737	P-0356	Vernon	Mr. James Chaney	(337) 855-6496
CWI White Oak	41194	P-0357	Ouachita	Mr. Bill Hay	(318) 343-2026
D&J Fill, Inc.	28092	OC-0354A	Ascension	Mr. Joseph Rodosta	(225) 445-5396
David Trahan Landfill	28058	P-0303	Iberia	Mr. David Trahan	(337) 365-0240
DeRouen's Heavy Equipment C/D Landfill	91014	P-0364	Lafayette	Ms. Sandra DeRouen	(337) 873-6336
DeSoto Parish Landfill (Mundy)	19803	P-0035R1	DeSoto	M. Lafitte	(318) 872-2500
Gentilly C/D Landfill	1036	P-0375	Orleans	Ms. Veronica T. White	(504) 299-3670
Gordon Doerle C/D Landfill	30245	P-0287	St. Martin	Mr. Gordon Doerle	(337) 365-9034

PERMITTED TYPE III FACILITIES

Construction/Demolition Debris and Woodwaste Landfills

Greater Metro C/D Landfill	27956	P-0341	Jefferson	Mr. Bill Strain	(504) 893-5308
Greenpoint, Inc. C/D Landfill	41660	P-0317	St. Martin	Mr. Ricky Suire	(337) 560-5433
Harrellson Materials C/D Landfill	28118	OU-0158	Caddo	Mr. Michael Harrelson	(318) 425-3218
Hwy 90 C/D Landfill	100642	P-0374	Jefferson	Mr. Jim Ward	(504) 364-1140
Iberia Parish C/D Landfill	113894	P-0370	Iberia	Mr. David Moore	(337) 365-9535
IESI Alexandria Transfer and Material Processing Facility	14662	P-0295	Rapides	Mr. Jeff Peckman	(888) 734-8678
Industrial Pipe C/D Landfill	14689	P-0367	Plaquemines	Mr. Hans Christensen	(708)764-4000
Jackson Parish	25814	P-0306	Jackson	Mr. Curtis Blakely	(318) 259-5662
TLA - Killona Holdings	92039	P-0355	St. Charles	Mr. Wade Scott	(985) 783-1918
Krause & Managan Disposal C/D Landfill	67860	P-0336	Calcasieu	Mr. William R. Hays, Jr.	(337) 527-8101
Lincoln Parish Police Jury C/D Landfill	19444	OU-0166	Lincoln	Mr. Benny K. Cockerham	(318) 251-5159
McManus C/D Landfill	7744	P-0371	Calcasieu	Mr. Shelton McManus	(337) 433-2959
Mikeebo, Inc.	117009	P-0381	Caddo	Mr. Duwain Taylor	(318) 425-5039
Morehouse Parish Police Jury C/D Landfill	28818	OU-0171A	Morehouse	Mr. D.W. Thomas	(318) 281-4132
Morgan Roofing C/D Landfill	52121	OU-0255	Calcasieu	Mr. Robert Morgan	(337) 436-0594
Natchitoches Parish C/D Landfill	15427	P-0382	Natchitoches	Mr. Joe Irchirl	(318) 357-2218
Natural Resources Recovery, Inc.	42610	P-0318	East Baton Rouge	Mr. Philip Speyrer	(225) 766-1443
Pellerin & Wallace C/D Landfill	80799	P-0290	Vermilion	Mr. Kent Savoir	(337) 235-1585

PERMITTED TYPE III FACILITIES

Construction/Demolition Debris and Woodwaste Landfills

Pineville (Wardville C/D)	28070	P-0368	Rapides	Mr. Clarence Fields	(318) 449-5660
Schamerhorn C/D Landfill	82479	OU-0192	Vernon	Mr. Rodney Schamerhorn	(337) 238-2700
Scott Construction Co., C/D	28168	OU-0178	Lafayette	Mr. Charles Bundrick	(337) 662-1006
Slidell Landfill C/D	6054	P-0345	St. Tammany	Mr. Chris Jean	(985) 641-7330
Southern Disposal Services	105476		Bossier	Mr. David Shinpoch	(318) 949-2410
St. Mary Parish C/D Landfill	9340	P-0316	St. Mary	Mr. Henry C. LaGrange	(337) 828-4100 ext.500
SWISCO C/D	28375	OC-0339	Calcasieu	Mr. Tom Cholley	(337) 625-1234
Tensas Parish C/D Landfill	43507	P-0340	Tensas	Mr. John Wynn	(318) 766-9219
Terrebonne Parish C/D Landfill	97112	P-0360	Terrebonne	Mr. Tom Bourg	(985) 873-6739
Tommasi Brothers, Inc. C/D Landfill	30781	P-0377	Calcasieu	Mr. Ricky Tommasi	(337) 478-9799
Vermilion Parish Sanitary Landfill	148	P-0030	Vermilion	Hubert Faulk	(337) 898-4300
Vernon Parish	52141	OU-0187	Vernon	Mr. Jim Tuck	(337) 238-0324
Webster Parish C/D Landfill	85534	P-0331	Webster	Mr. William O'Neal	(318) 377-9193
West Carroll Parish C/D Landfill	20079	P-0347	West Carroll	Mr. Clyde McBride	(318) 428-2437