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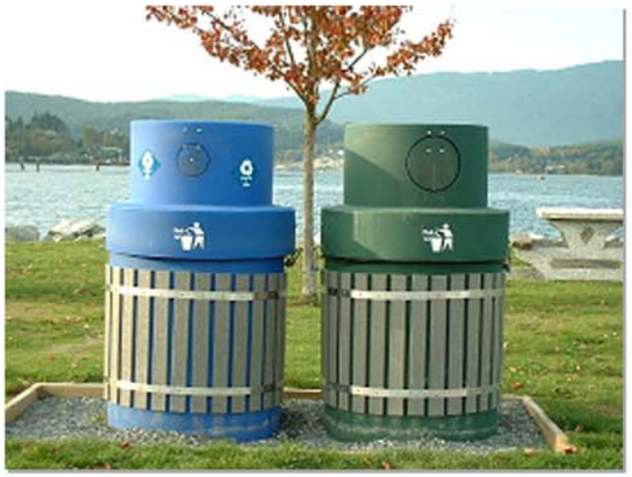
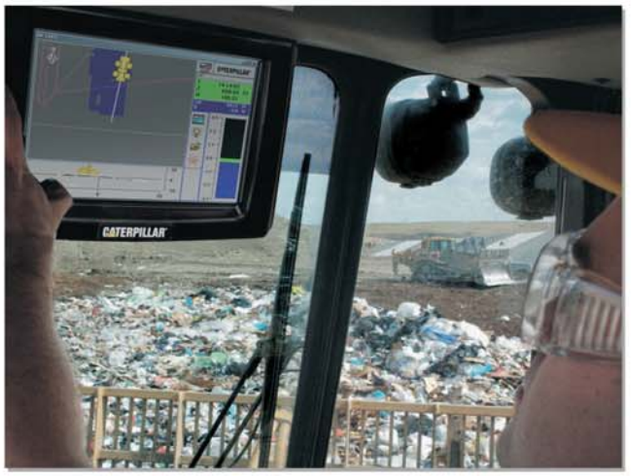


Phase II
Long-Term Resource Management Options
Strategic Plan for the City of San Diego



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CITY OF SAN DIEGO
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EXECUTIVE SUMMARY

INTRODUCTION

The Long-Term Resource Management Options Strategic Plan (LRMOSP) is a planning process initiated by the City of San Diego in 2007 to develop and evaluate options for managing solid waste disposal needs in San Diego through the year 2045. Miramar Landfill, the City of San Diego's only landfill, is anticipated to close under current conditions and projections in 2021.

The LRMOSP assesses the City's current disposal system capabilities, projects future solid waste management demands and presents long-term options for consideration by City staff and elected officials.

The LRMOSP is a three phase process. Phase I consisted of a system analysis, regional demand and capacity analysis, and identification and screening of options. Phase II provides a review of the City's existing diversion programs and disposal system, an update of future disposal demands, evaluates options to meet disposal demand after diversion programs, identifies potential system configurations, evaluates potential City roles in future solid waste management systems, provides a financial analysis for maintaining the status quo or implementing various system configurations, identifies potential revenue opportunities and provides implementation strategies for each of the five identified system configurations. Phase III will recommend a specific strategy and configuration system, including a detailed implementation plan.

BACKGROUND

The City of San Diego has been providing solid waste management services since May 1919 when the 1919 People's Ordinance was enacted. Currently, the services include: residential refuse, recyclable materials and green waste collection from single family residences and some apartment complexes; recycling and waste diversion programs; operation of the Miramar Landfill;

maintenance of closed landfills; litter control; cleanup of illegal dumps, and the management of franchises for private solid waste enterprises to provide commercial waste collection and hauling and/or operate solid waste facilities. The LRMOSP's primary focus is on options to maximize the capacity and extend the life of Miramar Landfill while continuing to expand waste reduction and diversion programs. Since the review and approval process to establish new solid resources facilities, including waste transfer facilities or expanding an existing facility is complex and extensive; a lead time of 5 to 10 years or longer is generally required for planning, engineering, environmental review, permitting and construction before a new facility can become operational. Therefore, the City initiated this study in 2007 so that new disposal capacity could be identified and available when the Miramar Landfill reaches its existing capacity.

LRMOSP GOALS

The original goals identified in Phase I were:

- Develop a long-term resource management plan to address solid waste generation and disposal up to 2030;
- Anticipate the closure of the West Miramar Landfill in and evaluate waste reduction, recycling, reuse, conversion technologies and in-county and out-of-county disposal options;
- Evaluate opportunities to promote and expand zero waste;
- Consider technically and economically feasible resource management options that protect public health and the environment;
- Sustain the economic viability of ESD collection, disposal, energy conservation, waste reduction, environmental protection, sustainability and resource management services;
- Seek stakeholder input in developing the LRMOSP; and,
- Recommend system options to meet projected resource management needs.

In Phase II, the goals were redefined to add:

- Expand the time line for the plan to 2045 when the Miramar Landfill ground lease ends;
- Evaluate diversion and disposal solutions to the City's future resource management needs; and,
- Evaluate what roles the City should perform in those solutions based on

cost, social, legal, environmental and efficiency.

LRMOSP PROCESS

The LRMOSP includes input from the public and stakeholders. A Resource Management Advisory Committee (RMAC) consisting of representatives from the following organizations; San Diego County Disposal Association, Integrated Waste Management Technical Advisory Committee, Integrated Waste Management Citizens Advisory Committee, San Diego County Apartment Association, San Diego County Taxpayers Association, Department of Navy, Southwest Division, Solid Waste Local Enforcement Agency, San Diego State University, Council District nominees, and City staff, provided valuable public input during the process and developed the criteria for screening waste management options.

The Phase I study report, presented to City Council in November 2009, identified 40 potential options that could help meet the future resource management needs of the City. These options were ranked using the criteria developed by the RMAC, and those with medium to high feasibility were recommended for further analysis in Phase II of the study.

In the Phase II study, regional disposal demand and disposal capacity projections were updated based on the assumption that the West Miramar Landfill would reach capacity in 2021 and the Sycamore Landfill if expanded would provide capacity up to 2037. The study further evaluated the 40 options recommended in Phase I and identified 27 final options which were grouped in the following major categories:

- Zero Waste Programs and Policies;
- Zero Waste Infrastructure;
- Transport; and,
- Miramar Landfill Optimization.

In Phase III of the process, recommendations for the implementation of specific short-term (< 5 years), mid-term (5–10 years) and long-term (> 10 years) strategies, policies, programs and projects will be developed for consideration by City elected officials. A major factor in the specific implementation plans will be the financial viability or impact of the specific program or project.

LRMOSP PHASE II REPORT

The LRMOSP Phase II report consists of six main sections as follows:

1. Introduction and Overview
2. System Demand and Capacity Analysis
3. Potential Solutions to Meet Demand
4. Potential System Configurations
5. Financial Plan
6. Implementation Plan

Section 1.0, Introduction and Overview, summarizes the Phase I process, Phase II Goals, and provides a condensed version of the Phase II Report findings.

Section 2.0 System Demand and Capacity Analysis, provides an updated demand and capacity analysis for both the City of San Diego and the Region. Utilizing the updated projections of waste volume and current permitted capacities, the West Miramar Landfill is anticipated to reach capacity in 2021 and the Sycamore Landfill is projected to reach capacity in 2025.

Section 3.0, Potential Solutions to Meet Demand, discusses Zero Waste Programs, a Miramar Resource Recovery Center, Conversion Technologies, Waste-To-Energy, Transfer Station/Materials Recovery Facility, North Miramar Landfill Reclamation, North Miramar Landfill Expansion, West Miramar Landfill Lateral Expansion, Alternative Disposal Options, Final Resource Management Options and the Interconnectedness of System Elements. Estimated costs for the development of some of the options included:

- Resource Recovery Center, for self-haul vehicles is estimated to cost between $6 and $7 million;
- Transfer Station Facility (75,000 sq feet) is estimated to cost between $25 million to $27.5 million;
- North Miramar Vertical Expansion (assuming the ability to utilize an interim cover instead of a Subtitle D liner, removal of existing 6 mcy stockpile and an additional height increase of 40 feet over permitted elevations) is estimated to cost approximately $28 million and to generate up to 10.2 million tons of additional refuse capacity. This does not include the additional estimated Closure cost of $20.0 million; and,
- West Miramar Lateral Expansion (Option B, assuming relocation of power lines) is estimated to cost $38 million and to generate 20.1 million tons of additional refuse capacity. This does not include the estimated additional Closure cost of $8.0 million.

A conclusion reached in this section is that there is the potential for an interconnection among some system elements, with three practical groupings of these elements.

a) Recyclables collection and materials recovery facilities;
b) Green waste collection and composting facilities; and,
c) Solid waste collection, solid waste transfer stations, HHW collection and landfill facilities.

The section further concludes that there is no necessity for public ownership or operation of the services and facilities, but that there are advantages to public ownership of essential hard-to-site facilities.

Section 4.0, Potential System Configurations, groups specific options which are discussed and includes the potential City roles in their development and operations. Utilizing the screening criteria established in Phase I, the final options were integrated into five system configurations to meet demand over the study period:

CONFIGURATION 1 – BASELINE, STATUS QUO

- Continue existing zero waste programs;
- Continue Recycling and C&D Ordinances;
- Continue current landfill operations; and,
- Direct transport waste to Sycamore or Otay landfills after Miramar closure.

CONFIGURATION 2 – ZERO WASTE

- Configuration 1 plus:
- New Zero Waste programs;
- Resource Recovery Center at Miramar Landfill;
- Evaluation of Conversion Technology;
- Transfer Station at Miramar Landfill;
- Transfer waste to expanded Sycamore Landfill after Miramar closure; and,
- Transfer waste out-of-county after Sycamore Landfill closure.

CONFIGURATION 3 – ZERO WASTE AND MIRAMAR LANDFILL VERTICAL HEIGHT INCREASE

- Configuration 2 plus:
- North Miramar Landfill Vertical Increase; and/or,

- Additional West Miramar Landfill Vertical Increase.

CONFIGURATION 4 – ZERO WASTE AND WEST MIRAMAR LATERAL EXPANSION

- Configuration 2 plus:
- West Miramar Landfill Lateral Expansion A (Smaller); and,
- West Miramar Landfill Lateral Expansion B (Larger).

CONFIGURATION 5 – COMBINATION OF CONFIGURATIONS 3 AND 4

With regard to the facilities and functions in the Configurations listed above, the study assessed potential City roles as:

- Own and operate the facilities, equipment and programs;
- Own the facilities, contract for operations of the programs and facilities;
- Regulate the facilities and programs through franchise or permits; or,
- Set policy through resolutions and ordinances and let the open market regulate the performance of the functions.

The general conclusion was that economic incentives may work for collection, transfer and disposal operations in an open, non-regulated environment, but such arrangements are typically not cost effective (several companies sending collection vehicles on the same street), consistent in customer charges or competitive. The City could ensure the cost effectiveness, consistency and competitiveness of charges through operating, contracting for operation, or regulating the operation of these functions. The City may improve the non-economic results of these services (e.g. higher diversion and customer service) if it were to operate these functions because it could direct the management and control the performance of the non-economic functions, rather than contracting for or regulating them.

For Zero Waste programs, it was concluded that sufficient economic incentives do not exist for their comprehensive and consistent performance. Close direction and control of their conduct is most appropriate, since these programs are policy related. The City's operation of these programs (directly or contracting them out) and ownership of facilities would result in the most prompt and complete response to City policy direction.

Section 5.0, Financial Analysis, looked at the projected revenue streams and expenses of the Refuse Disposal Fund and the Recycling Fund for each System Configuration (including the Baseline or Status Quo Configuration) and found expenses exceed revenues in all scenarios without rate increases. The study also

looked at various rate increase scenarios to determine the least impact to the City's General Fund.

The analysis concluded that there were financial and societal benefits to City departments, residents, businesses, non-profit organizations and the military by continuing to operate the Miramar Landfill and Greenery Operations as long as possible to receive continuing revenues. System Configuration 5 would retain the benefits virtually intact through 2045. Additionally, it was identified that the Status Quo Configuration would have the greatest impact on the General Fund due to transport costs increasing in 2021. A dramatic increase in the General Fund will occur once Sycamore closes due to longer transport cost and significantly higher out of County tipping fees.

Configuration 5, which includes the expansion of West Miramar and North Miramar landfill, would create significant additional capacity and revenue streams that would be maintained for the longest period of time.

Section 6.0, Implementation Plan, provides the results of financial models and discusses the implementation schedule needed for each System Configuration in order to meet projected disposal demands through 2045. The implementation schedules for each System Configuration identify key steps and milestones in which the permitting/development process for each system option is to be started and when each option is projected to be initiated and completed.

The following strategies were recommended for each System Configuration:

- Implement new/additional Zero Waste Programs;
- Implement a Resource Recovery Center at the Miramar Landfill by 2014;
- Start the permitting and development process for a Transfer Station at the Miramar Landfill by early 2015; and,
- Assess the viability of a Conversion Technology facility at Miramar by 2016.

With the City's goal of sustainability and to minimize costs for the residents and businesses in the City of San Diego, developing and implementing the following options included in Configuration 5 will provide the most effective means to control cost impacts while conserving available resources:

- Zero Waste programs;
- Resource Recovery Center at Miramar Landfill;
- Evaluation of Conversion Technology;
- Transfer Station at Miramar Landfill; and,

- North and/or West Miramar Landfill Vertical Increase.

West Miramar Landfill Lateral Expansion Configuration 5 will increase the capacity at Miramar landfill and extend the current capacity by approximately 14 additional years from 2021 to 2035 (assuming a vertical expansion at either North or West Miramar). The LRMOSP includes a comprehensive and aggressive plan for integrated resources management.

SECTION 1.0

INTRODUCTION AND OVERVIEW

1.0 INTRODUCTION AND OVERVIEW

1.1 INTRODUCTION

The Long-Term Resource Management Options Strategic Plan (LRMOSP) for the City of San Diego is a three phase planning process that includes a Phase I system analysis, regional demand and capacity analysis, identification of options, and screening of options. Phase II further evaluates the options preliminarily screened in Phase I, including an update of demand and capacity, establishment of potential system configurations for the future, a financial analysis, and development of implementation plan strategies. Phase III is the implementation phase of the LRMOSP.

The LRMOSP Phase I report dated December 2008 was presented to the City of San Diego (City) Natural Resources and Culture Committee and City Council members in October and November 2009, respectively. At that time, the report was accepted and the LRMOSP Consultant Team, with support from the City's Environmental Services Department (ESD) staff, began the Phase II evaluation of medium-to-high feasibility options identified in Phase I.

This Phase II report documents the Phase II LRMOSP evaluation and includes an updated demand and capacity analysis as well as further analysis and development of short- and long-term strategies for managing the City's waste system resources to meet projected future demand, including zero waste programs and policies, zero waste infrastructure, transport options, and Miramar Landfill capacity optimization options that were initially screened in Phase I. The report also includes potential system configurations to meet future demand, results of a financial analysis, potential revenue generating options, and implementation strategies.

1.2 BACKGROUND

In 2007, the ESD initiated the development of a LRMOSP to address the resource management needs of the City for managing solid waste through the year 2030. The purpose of the LRMOSP was to consider short- and long-term

strategies for waste management including zero waste strategies (reducing, recycling, and reusing solid waste to the maximum extent feasible) and to provide for the management of the City's waste in a safe and cost-effective manner.

In April 2007, the San Diego City Council approved an agreement for professional services with the BAS Consultant Team (Consultant Team) to assist ESD in the preparation of a LRMOSP for the City. The Consultant Team included Katz & Associates, Clements, JRMA, and HF&H Consultants. A list of the Consultant Team members is presented in Table 1-1.

A Resource Management Advisory Committee (RMAC) was established during Phase I to work with the Consultant Team and ESD in development of the LRMOSP for the City (see Table 1-2 for a list of the committee members). RMAC input was sought throughout the Phase I process and culminated in the development of preliminary options to be advanced for further analysis in Phase II.

During Phase I, the Consultant Team, in collaboration with ESD staff and the RMAC, identified and evaluated various programs, policies, infrastructure facilities, conversion technologies, waste-to-energy, in- and out-of-County disposal, and landfill optimization options to address the City's future resource management needs. The effort included discussions and consensus building with representative stakeholders of the community who were part of the RMAC. A website was established to make information available to the public regarding the LRMOSP (meeting notices, agendas, meeting summaries, and other relevant information) at www.sandiego.gov/environmental-services/geninfo.

The Phase I Long-Term Resource Management Options Strategic Plan for the City of San Diego, dated December 2008, documented the Phase I LRMOSP process. It includes data gathered, landfill demand and capacity model runs, and identification and screening of the over 100 options that were evaluated. It included a comprehensive study of the current and projected disposal needs of the City, and considered the potential for diversion from existing recycling and zero waste programs. The report also included the current ESD resource management and financial programs, regulatory requirements, and key policy

and planning issues impacting waste management in the City, and the region, that were considered during the review and analysis of options to meet future system demand.

At the end of the Phase I process, 40 potential options were identified that could help meet the future resource management needs of the City. Options, policies, and programs were ranked and those with medium to high feasibility were recommended for further analysis in Phase II.

1.3 PHASE II LRMOSP GOALS

A recap of the LRMOSP Phase I goals is presented below, followed by additional goals established for Phase II. The overall goals of the LRMOSP identified in Phase I were as follows:

- Develop a plan for the residents and businesses of the City of San Diego for the long-term management of resources in addressing solid waste generation and disposal up to year 2030. At the inception of Phase II, the time period of the study changed from 2030 to 2045, which coincides with the City's ground lease agreement with the United States Department of the Navy for the Miramar Landfill.
- Anticipate the projected closure of the City's only landfill disposal site, West Miramar Landfill (WML), and evaluate options for solid waste reduction, recycling, reuse, conversion, and disposal in- and out- of San Diego County.
- Evaluate opportunities for promoting and expanding zero waste philosophies and programs in the City of San Diego.
- Consider options that are technically and economically feasible and protective of public health and the environment.
- Sustain the economic viability of ESD programs which provide collection, disposal, energy conservation, waste reduction, environmental protection, sustainability, and resource management services.
- Seek stakeholder input in developing recommendations for the LRMOSP.
- Provide recommendations at the end of Phase II to address the City's resource management issues.

Prior to initiating Phase II, the goals were re-defined to also address the following

questions:

1. What are the best diversion and disposal solutions to address the City's future resource management needs?
2. What role(s) should the City perform in those solutions based on cost, social, legal, environmental and efficiency considerations?

To that end, this Phase II report includes a discussion of how the resource management system elements are interconnected (Section 3.14) and evaluates potential City roles (Section 4.3).

1.4 RESOURCE MANAGEMENT ADVISORY COMMITTEE (RMAC)

The mission of the RMAC was to review potential options for the LRMOSP and to provide input to ESD and the Consultant Team on how to address significant resource management and source reduction program and policy issues affecting the City of San Diego.

A neutral third-party facilitator, Mr. Lewis Michaelson with Katz & Associates, conducted all of the RMAC meetings. His role was to ensure that all perspectives were heard through a collaborative discussion process. Meeting discussions were allowed to be audio-taped to aid in the preparation of meeting summaries.

1.4.1 COMMITTEE MEMBERS

The RMAC was assembled from a variety of stakeholders and community interest groups. Representatives from the City of San Diego Business Office, the San Diego County Disposal Association, the County of San Diego Integrated Waste Management Technical Advisory Committee, the County of San Diego Integrated Waste Management Citizens Advisory Committee, the San Diego County Apartment Association, the San Diego County Taxpayers Association, the Department of the Navy (Southwest Division), the Solid Waste Local Enforcement Agency for the California Integrated Waste Management Board , (now CalRecycle), the League of Women Voters, the Department of Civil and Environmental Studies - San Diego State University, the City of San Diego ESD,

and representatives of the San Diego City Council comprised the membership. A complete list of member names and affiliation is presented in Table 1-2.

1.4.2 RMAC MEETINGS

The RMAC met five times during Phase I and provided input on the Phase II criteria for evaluation of options in a meeting on November 4, 2009 (see Sections 4.1 and 4.2 for more information). Agendas and RMAC meeting summaries for Phase I are included in the Phase I report dated December 2008. For Phase II, a RMAC meeting was held on November 9, 2009 to apply importance weighting to the criteria to be used in developing potential system configurations to meet the City's short-term and long-term system demands in Phase II. The agenda and meeting summary for the Phase II RMAC meeting is included in Appendix A.

1.5 PHASE II REPORT OVERVIEW

This LRMOSP Phase II report provides a review of the City's existing diversion programs and disposal system; provides an update of future system disposal demand including waste generation and diversion projections; further evaluates options screened in Phase II to meet the disposal demand after diversion; identifies potential system configurations to meet future demand; provides an evaluation of potential City roles in solid waste management; presents results of a financial analysis of the status quo and various system configurations identified; identifies potential revenue opportunities to mitigate shortfalls in financial projections; and provides implementation strategies for each of the configurations through 2045. It should be noted that the analysis of data was performed in 2010/2011 time frame.

A summary of what was analyzed during the Phase II process follows.

1.5.1 UPDATED SYSTEM DEMAND AND CAPACITY ANALYSIS

During Phase I, the City's and region's projected solid waste disposal tonnages were developed using the most recent San Diego Association of Governments' (SANDAG) population projections. Landfill capacity modeling was then

performed using current and proposed capacities for the landfills in San Diego County. The demand and capacity projections were updated in Phase II and take into account the WML height increase approved on April 8, 2008, the proposed Sycamore Landfill expansion and the diversion that has occurred from the implementation of mandatory recycling and C&D ordinances in the City. Potential capacity for the region with the approval of the proposed new Gregory Canyon Landfill is also discussed. The results were used to determine current and projected waste management system deficiencies for both the City and the San Diego region.

Based on currently permitted capacities, the City's WML is projected to reach capacity in 2021 and the Sycamore Landfill in 2025.

Republic Services, Inc. is proposing an increase in the capacity at the Sycamore Landfill, and if approved, the Sycamore Landfill is projected to provide regional capacity to 2037.

Therefore, based on the updated demand and capacity analysis, the San Diego region is projected to have disposal capacity up to 2037 using the following assumptions:

1. Continued Implementation of Existing Zero Waste Programs,
2. Continued implementation of the City's Recycling Ordinance and Construction and Demolition Debris Diversion Deposit Program, and
3. Approval of the Sycamore Landfill expansion.

A detailed discussion of the demand and capacity projections can be found in Section 2.0, System Demand and Capacity Analysis.

1.5.2 POTENTIAL SOLUTIONS TO MEET DEMAND

One of the goals of Phase II was to further evaluate the 40 potential options (see Table 3-1) screened down from a list of over 100 potential options in Phase I to meet the City's current and future resource management needs. During the Phase II evaluation process, several options were grouped for consideration as a whole, several options were removed from further consideration, and several

options were added. Section 3.0 provides information regarding the grouping of Zero Waste programs and policies and grouping of transport options as well as the removal of the North Miramar Landfill Reclamation Project; Waste-to-Energy (WTE); and construction and demolition debris and material recovery processing facilities at the Miramar Landfill as potential options. Conversion Technologies were further evaluated and it was determined that the City should continue to monitor the development of ongoing Conversion Technology projects in other jurisdictions before implementing a Conversion Technology project within the City. Landfill optimization options have also been added to include a vertical expansion at the North Miramar Landfill (NML) and lateral expansions at the WML.

As shown on Table 3-13**,** out of 40 options considered and evaluated in Phase II, 27 final options were identified for developing potential future system configurations and were re-grouped into the following major categories:

- Zero Waste Programs and Policies,
- Zero Waste Infrastructure,
- Transport, and
- Miramar Landfill Capacity Optimization.

The options evaluated are summarized in the following sections. For a complete description of the potential options to meet the City's resource management needs, see Section 3.0.

ZERO WASTE PROGRAMS AND POLICIES

For Phase II, ESD staff provided an evaluation of future zero waste policies and programs to be enhanced or implemented including program costs and projected level of increased diversion. The analysis conducted by ESD reviewed the sixteen Zero Waste programs/ideas that were "finalists" in Phase I as well as additional Zero Waste programs being considered by ESD for future implementation (see Table 3-2). It was determined that it was not possible with many Zero Waste programs to attribute specific diverted tonnages or costs to individual programs, and that Zero Waste initiatives should be viewed as part of an overall suite of programs designed to encourage ongoing participation in

existing programs and to effect change. Therefore, Zero Waste programs/policies were combined and proposed together as one option in the system configurations identified in Section 4.0.

ZERO WASTE INFRASTRUCTURE

Construction and Demolition/Material Recovery Facilities

Conceptual plans previously developed in Phase I for a Material Recovery Facility/Transfer Station (MRF/TS) at the Miramar Landfill included a state-of-the-art MRF capable of processing 200 to 400 tpd. Upon further analysis in Phase II, it was determined that processing capabilities for the City's existing and projected commingled recyclables as well as construction and demolition (C&D) materials already exist elsewhere in the City through the Alan Company and IMS Recycling Services, respectively, who currently handle these materials. Therefore, the building of a MRF or C&D Facility at the Miramar Landfill has been removed as a system configuration option for inclusion in the LRMOSP.

Resource Recovery Center

As part of ESD's ongoing Zero Waste programs and proposed initiatives, an evaluation of a potential Miramar Resource Recovery Center (RRC) for self haul customers at the landfill is being conducted. ESD staff is currently evaluating the feasibility of developing a comprehensive recycling facility at the entrance to the Miramar Landfill that would require all self-haul vehicles to participate in recycling and separating materials in their loads prior to disposal at the landfill.

The RRC is proposed to augment the diversion and separation occurring at the existing Miramar Recycling Center buy-back and Goodwill collection facility also located at the entrance to the WML.

Conversion Technologies

Due to increasing regulatory landfilling restrictions for solid waste management and the current energy situation in the U.S, research and development of Conversion Technologies (CTs) is gaining new ground. The key factors that have

slowed development of CT projects in California are:

- Cost (when compared to continued, relatively inexpensive landfilling),
- Perceived risk, and
- Financing (particularly during the recession)

For the first time in history, there is a nexus of forces driving the development of CT projects forward in California, including:

- Climate Change and AB32 GHG reduction,
- Renewable Portfolio Standard (RPS),
- Low Carbon Fuel Standard,
- Proposed increases in mandatory diversion rates,
- Public and elected official sentiment against continued landfilling, and
- Public support for renewable, domestic energy and fuel.

Many new technologies are currently being developed in California and Nevada and are being put into operation by numerous companies on a trial basis. Because facilities have not yet been demonstrated at a commercial level and due to competitive landfill disposal options in San Diego County, CTs are not proposed as a system configuration option for the LRMOSP financial model. However, it is recommended that continued monitoring of other jurisdictions developing CTs (City and County of Los Angeles, Santa Barbara, Salinas); monitoring and support of future legislation providing diversion credits; and continued evaluation of vendors interested in developing a pilot CT facility in San Diego (providing initial capital investment) be pursued. Periodic evaluation of a CT facility (every 5 years) has been added as an option in the Zero Waste Infrastructure category for implementation of the LRMOSP.

WASTE-TO-ENERGY

There are several hurdles to the development of new WTE facilities in the City of San Diego, including lack of diversion credits and Proposition H. WTE facilities are categorized as "combustion" facilities and not "conversion facilities" and any diversion credits allowed are for existing facilities only. Proposition H places stringent conditions on the development of WTE facilities of 500 tpd or larger in

the City of San Diego. As such, facilities under 500 tpd will have a higher tipping fee ($85 to >$100) than those larger than 500 tpd, making it a costly alternative for the City of San Diego when compared to landfilling.

A potential large-scale WTE facility sited on Miramar might not be within the sphere of influence for Proposition H due to its location on Federal land. However, public opposition would make it extremely difficult and costly to site and permit. Therefore, a WTE facility is not considered an option in any of the system configurations, but could be included in the recommended evaluation of CTs in the future.

TRANSPORT OPTIONS

Transfer Station

As mentioned above under Zero Waste Infrastructure, a MRF element in conjunction with a transfer station at the Miramar Landfill was not considered an option for potential future system configurations in Phase II of the LRMOSP. The conceptual transfer station site design utilizes 12.5 acres of 19 acres that are available for the facility. The 12.5 acre portion of the site provides sufficient area for a 5,000 tpd transfer station facility with adequate circulation, tipping, waste handling, and load-out operations area. The design capacity will have to be further evaluated to identify potential utilization rates. For some haulers, it will be more convenient to direct transport to another landfill than to utilize a transfer station at Miramar. The transfer building footprint is approximately 75,000 square feet (sf) with administration and maintenance buildings, at 8,000 sf each, there is room for a total of 91,000 sf of building footprint.

A self-haul tipping area was not proposed for the conceptual transfer station plan due to ESD's near-term proposal to develop a RRC that will serve self-haul customers at the entrance of the Miramar Landfill.

In-County Disposal

San Diego County currently has seven landfills that are in operation and the proposed Gregory Canyon Landfill which is in the permitting stages. Sycamore

Landfill provides solid waste disposal capacity for the City of San Diego, as well as the rest of San Diego County. Remaining capacity at the Sycamore site, under a revised 2006 Solid Waste Facilities Permit (SWFP), is approximately 47 million cubic yards (or 27.5 million tons assuming an Airspace Utilization Factor of 0.58). Other in-County disposal options for the City include the Otay Landfill (located further away from the Miramar Landfill than the Sycamore Landfill) and the proposed Gregory Canyon Landfill. At this time, due to the uncertainty with permitting the Gregory Canyon Landfill, it has been removed as a potential option in the system configurations for the City's LRMOSP. Since the Sycamore Landfill has more remaining capacity than the Otay Landfill and its owner is pursuing a substantial expansion of 80 million cubic yards, it is the In-County option assumed for alternative disposal in the LRMOSP system configurations.

Out-of-County Disposal

Out-of-County disposal sites in nearby counties (Riverside, Orange, and Imperial) were also considered as potential disposal options for the City. There are currently seven permitted landfills in Riverside County. The only landfill in Riverside County with sufficient daily tonnage capacity and ability to receive out-of-County waste is the El Sobrante Landfill which is the closest to the Miramar Landfill at 82 miles. There are currently three landfills in Orange County. The distance from the Miramar Landfill to Orange County's closest landfill (Prima Deshecha Sanitary Landfill) is 62 miles, which is closer than the El Sobrante Landfill in Riverside County. However, importation of out-of-County waste is only permitted at Orange County landfills until 2015 when existing importation agreements expire. There are currently nine permitted landfills in Imperial County. Nine are in operation including the Mesquite Regional Landfill (MRL) which is approved to receive waste by truck. The MRL is expected to be ready to receive up to two trains per week starting in 2014. Although sufficient capacity is available at the MRL, there is no inter-modal facility in San Diego that could transfer the waste by rail to the MRL. Other Imperial County sites are, in general, too distant and have insufficient daily permitted tonnage capacity to serve as alternative disposal sites for the City. Currently, the Imperial County sites do not provide a feasible alternative for disposal of City refuse. Therefore, the out-of-County disposal option assumed in the LRMOSP system configurations only includes the El Sobrante Landfill located in Riverside County.

MIRAMAR LANDFILL CAPACITY OPTIMIZATION

North Miramar Landfill (NML) Reclamation

The goals of the NML Reclamation project were to:

- Recover soil for developmental and operational use at the Miramar Landfills;
- Recover and sell marketable materials; and
- Provide for airspace expansion of the NML by excavating the underlying native materials.

Based on a development model prepared for the project that considered varying assumptions for reclamation, (excavation, material recovery [soil and/or recyclables], airspace expansion) at the WML to provide additional time for reclamation, the first two goals cannot be achieved for the NML reclamation project due to timing. The analysis found that reclamation of the NML is only viable if the waste is excavated at a rate of 7,000 cy/day and the material is not processed (i.e., direct relocation). In order to achieve the third goal of the NML reclamation project, the analysis results also indicated that the project could not be implemented without a high rate of reclamation excavation (7,000 cy per day) in addition to a significant expansion of airspace at the WML to provide time for the excavation of NML.

The NML reclamation project was removed as an option to be included in any of the system configurations, given that the NML reclamation project would not meet its recovery goals, is not feasible without a substantial expansion at the WML (of at least 14.5 million cy), and the timing issues previously identified. However, an option to vertically expand the NML to permitted elevations has been included.

North Miramar Landfill (NML) Vertical Expansion

Two scenarios for repermitting North Miramar Landfill along with a vertical increase was evaluated. The first scenario analyzed a vertical height increase for the NML to a height of the currently permitted elevation for the WML. Vertical

expansion of the existing landfill surface to a permitted elevation of 485 feet above mean sea level (amsl) could provide an estimated 10.5 million cubic yards or 6 million tons of capacity (assuming an Airspace Utilization Factor of 0.58). This will increase the landfill life an additional 5.1 years based on an average of 1.2 million tons of waste inflow per year, which is the approximate anticipated waste inflow rate projected for the site by 2021, when the WML is projected to reach its currently permitted capacity. The second scenario analyzed a vertical height increase of an additional 40 feet to 525 msl providing and estimated 17.6 million cubic yards or 10.2 million tons of capacity which could increase the landfill life an additional 8.5 years.

West Miramar Landfill Vertical Expansion

During Phase I, ESD processed and obtained approvals for a vertical height increase to elevation 485 feet amsl at the WML in April 2008. Another vertical height increase is being evaluated by ESD. The range of height increase proposed is twenty to forty feet with a potential additional capacity range of 10 million cubic yards (mcy) to 18 mcy.

West Miramar Landfill Lateral Expansions

As part of Phase II, the Consultant Team evaluated other options to expand capacity at the WML by laterally extending the current landfill footprint to the west. The two expansion options were designated as Alternatives A and B. The Alternative A conceptual lateral expansion would extend west enough to avoid relocation of existing electrical transmission and gas pipeline utilities within the City's Miramar leasehold property. Alternative A creates an airspace capacity of 4.1 million cubic yards (mcy), and will increase the landfill life by approximately 2 years. The Alternative B conceptual lateral expansion includes relocation of existing utilities and extends to the western limit of the City's leasehold property. Alternative B creates an airspace capacity of 20.1 mcy, and will increase the landfill life by 9.7 years.

The system configurations to be analyzed in the Phase II financial model include both Alternatives A and B for the WML and will increase the landfill life from 2 to 9.7 years.

West Miramar Landfill (WML) Operations Optimization

The WML is a valuable asset to the City because it is an active, permitted landfill that provides disposal and diversion opportunities for the residents of the City of San Diego in a safe, environmentally sound, and cost effective manner.

During Phase II, daily landfill operations at the WML were evaluated in a systemic approach to optimize capacity and preserve the life of the WML as further discussed in Section 3.0.

FINAL RESOURCE MANAGEMENT OPTIONS

A complete evaluation of the options developed to address the City's resource management needs and a qualitative identification of the interconnectedness of the City's solid waste management system's[1] elements (options) is included in Section 3.0 Potential Solutions to Meet Demand.

Table 3-13 shows the list of final options that were narrowed down after further evaluation in Phase II, which were utilized in the composition of the system configurations identified in Section 4.0.

1.5.3 POTENTIAL SYSTEM CONFIGURATIONS

Once a list of final options was identified based on the Phase II evaluations, the screening criteria developed in Phase I to rank options was utilized in the development of four system configurations in addition to a status quo baseline configuration. The following provides a brief description of the recommended system configurations. It should be noted that the options considered in system configurations identified in Section 4.0 are those to be implemented and funded by the ESD.

[1] This system is the current City system and does not consider the commercial collection system that is franchised by the City.

CONFIGURATION 1 - BASELINE, STATUS QUO

- Continue existing zero waste programs;
- Continue Recycling and C & D Ordinances;
- Continue current landfill operations;
- Direct transport to Sycamore or Otay when capacity at Miramar is reached.

CONFIGURATION 2 - ZERO WASTE (Higher Sustainability)

- System 1 plus:
- Zero Waste suite of new or expanded programs;
- Resource Recovery Center at Miramar;
- Conversion Technology Facility Development Evaluation;
- Transfer Station at Miramar;
- Transport to expanded Sycamore Landfill when capacity at Miramar is reached;
- Transport to El Sobrante Landfill when capacity at Sycamore Landfill is reached.

CONFIGURATION 3 – ZERO WASTE AND NORTH and/or WEST MIRAMAR LANDFILL VERTICAL INCREASE (Higher Environmental Viability than lateral expansion options)

- System 2 plus:
- North or West Miramar Landfill Vertical Increase;

CONFIGURATION 4 – ZERO WASTE AND WEST MIRAMAR LANDFILL LATERAL EXPANSION (Higher Financial Viability due to greater capacity/additional revenue/lower tip fees than transport options)

- System 2 plus:
- West Miramar Landfill Lateral Expansion A (without utility corridor relocation) (Configuration 4a) or
- West Miramar Landfill Lateral Expansion B (with utility corridor relocation) (Configuration 4b)

CONFIGURATION 5 - COMBINATION OF OPTIONS 3 AND 4

- Maximum Capacity scenario with North or West Miramar Landfill Vertical Increase and West Miramar Landfill Lateral Expansion B.

1.5.4 FINANCIAL PLAN

During Phase I, the Consultant Team reviewed ESD's three major operating funds (the General Fund, Refuse Disposal Fund, and the Recycling Fund) to determine their financial health, such as adequacy of reserves to manage cash flow demands. No significant adverse trend was identified regarding total General Fund operating expenditures, which increased at a rate less than inflation. However, given the overall trend of the Refuse Disposal and Recycling funds and the additional impacts from diversion efforts, both of those funds are expected to be in a deficit in the near term. This is in spite of ESD implementing cost cutting measures and increased efficiencies to maintain the funds in a positive financial position.

For Phase II, ESD provided their latest 5-year projected financials at the time the LRMOSP financial analysis was initiated (2010 to 2015) which was used as a basis to develop financial projection models through 2045 for the five system configurations developed for the LRMOSP. In Configuration 1, the benefits to City Departments, residents, businesses, non-profit organizations, and the military of the City owning and operating WML for refuse disposal would terminate in 2021. In Configuration 5 these financial and societal benefits would remain intact through 2045 and possibly beyond. With Configurations 2, 3, 4a, and 4b, the benefits would cease at some point in between. The financial models show continuing deficits in the intermediate and long term without implementation of revenue generation mitigation measures. It would be advantageous to the City and its customers for the City to continue operating the WML and Greenery Operations as long as possible to receive continuing revenues, and to concurrently begin the processes for permitting, designing, and implementing future options for diversion and optimizing long-term disposal capacity. A detailed discussion of the financial analysis, potential impact on future tipping

fees, and other revenue generation options is included in Section 4.0, Financial Analysis.

1.5.5 IMPLEMENTATION PLAN

Implementation schedules were developed for each system configuration to provide timing on individual system components. Because of the long lead time for permitting and development of various system recommendations, target start dates were established to complete the development process at least six months prior to the recommendations needing to come on-line (i.e., prior to capacity being reached at the WML). The planning schedules are based on the demand/capacity models for each system configuration developed for the financial analysis. Because the choice of which system configuration is financially feasible depends on the revenue sources available, a preferred system configuration has not been recommended. Therefore, implementation schedules have been developed for each system configuration.

A detailed discussion on implementation plan strategies is included in Section 6.0, Implementation Plan.

SECTION 2.0

SYSTEM DEMAND AND CAPACITY ANALYSIS

2.0 SYSTEM DEMAND AND CAPACITY ANALYSIS

2.1 INTRODUCTION

As part of Phase II, HF&H Consultants performed an update of Phase I disposal demand and capacity projections with the assistance of ESD staff who provided their latest 5-year financial projections for years 2010-2015. A description of the work performed for this task and the results of the analyses are provided in this section.

2.2 DEMAND ANALYSIS UPDATE

2.2.1 DEMAND ANALYSIS

The purpose of the demand analysis update was to project solid waste generation for the LRMOSP study period for approximately 35 years from a base year of 2010 to year 2045 for the City and the surrounding region.

2.2.2 POPULATIONS FORECAST

Population projections up to the year 2045 were developed for each of the cities in San Diego County. The growth projection percentages used by ESD in their 5-year projections for years 2010-2015 resulted in a 0.87% average increase per year. For years 2016-2045, the growth projection percentage used was 0.94%, the average identified by the California Department of Finance for that period (Table 2-1).

2.2.3 DISPOSAL PROJECTIONS FROM CITIES AND UNINCORPORATED AREAS

Annual waste disposal volumes from 2001 through 2009 were collected for each of the seven landfills in San Diego County (Borrego, Otay, Ramona, Camp Pendleton, Sycamore, Otay, West Miramar). Based on the actual historic reported waste disposal volumes, future disposal volumes for each city and unincorporated areas were projected from 2010 to 2045 (Table 2-2).

It was assumed that each city would continue to dispose the same portion of its waste at the same landfill disposal sites. Information was tabulated by each jurisdiction's disposal tonnages to a landfill (Table 2-3) and by the percentage of the jurisdiction's solid waste to each landfill (Table 2-4). In addition, the percentage of each landfill's waste stream by jurisdiction is presented in Table 2-5.

2.2.4 SENSITIVITY ANALYSIS

Because actual disposal tonnages in the County have continued to decline, a sensitivity analysis was performed of the diminishing capacity model run. This was performed by increasing and decreasing the County's population projections from the 2008 California Department of Finance projected annual population percent increase by 150 percent and 50 percent, respectively. In other words, the projected annual population increase, which for the County was 1.09 percent from 2010 to 2011, was increased 150% (1.64 percent) and decreased 50 percent (0.55 percent) and then these new percent changes were used to develop diminishing capacity models. The purpose for doing this is to provide a range of demand that reflects differences in assumed changes in growth.

2.3 CAPACITY ANALYSIS UPDATE

2.3.1 LANDFILL CAPACITY

For each landfill disposal site in the County, the following determinations were made based on the latest data posted on the CalRecycle website.

- Total cubic yard capacity,
- Remaining cubic yard capacity (this was converted to tons assuming a density of 1,160 cubic yards per ton or 0.58 tons/cy Airspace Utilization Factor),
- Closure date, and
- Disposal tons per day.

For each landfill in the County, HF&H then calculated the annual beginning capacity in tons, the annual disposed tonnage (from all jurisdictions), and the

annual ending capacities in tons were calculated. As each landfill's total permitted capacity was reached, it was assumed that the waste tonnage would be redirected to the landfill with remaining capacity closest to the city from which it was generated.

At the time this portion of the report was developed, only the 2009 CIWMB Jurisdiction of Origin Waste Disposal Report was available which indicated that the City of Oceanside and several other municipalities in San Diego County were disposing of their waste in Orange County's Prima Deshecha Landfill. The Prima Deshecha Landfill is the primary disposal site for the City of Oceanside. Disposal of waste at the Prima Deshecha Landfill for the other municipalities in San Diego is a supplementary site. The Orange County out-of-County waste disposal contracts expire on in 2015 and the contracts are not expected to be renewed. Therefore, this northern San Diego waste stream was assumed in the modeling to be directed to the Miramar Landfill in 2016 and then the Sycamore Landfill once Miramar reaches capacity. Additional potential disposal capacity available if the Sycamore Landfill Expansion is approved was also evaluated.

2.3.2 TRANSFER/PROCESSING FACILITIES

The permitted capacity of the 13 existing transfer/processing facilities in the region that could transport waste to out-of-County landfills and process recyclable materials was taken from the CalRecycle's Solid Waste Information System as of July 2011. The 13 available transfer/processing facilities and their associated permitting capacities are summarized below and more detailed information can be found in Table 2-6.

All of the transfer/processing facilities are viable to take City of San Diego waste, except for Ramona, Fallbrook, and Escondido which are located too far away from the City of San Diego to be considered as potential transfer stations for the City's waste.

2.3.3 COMPOSTING FACILITIES

The permitted capacity of the seven composting facilities in San Diego County with capacity of 100 tpd or greater and the planned Starstream Valley Center 1 Composting Facility were identified from the CalRecycle's Solid Waste Information System as of July 2011. The composting facilities, their operator, city location, and permitted capacities are shown on Table 2-7.

2.3.4 RECYCLABLES PROCESSING CENTERS

The 52 recycling centers in San Diego County were identified from the State of California, Department of Conservation records, as of August 2010 and detailed information regarding their name, city location, and materials accepted is shown on Table 2-8.

2.4 FINDINGS

2.4.1 CITY PROJECTED DEMAND

The City of San Diego's population is anticipated to increase from 1,367,210 in 2009 (Fiscal Year 09-10) to 1,869,844 by 2045 (see Table 2-1). Using the most recent projections, the City of San Diego's 2009 annual disposal rate of 1,429,064 tons is anticipated to be 1,976,694 tons in 2045 (Table 2-2).

In 2009, the City's waste was disposed of as follows: 411,635 tons (27.5 percent) went to Otay, 172,011 tons (11.5 percent) went to Sycamore, and 911,275 tons (61 percent) went to West Miramar (see Table 2-3).

The remainder of waste disposed of at the WML was primarily from the Cities of Coronado, Del Mar, and National City at 50.5 percent, 23 percent, and 13.5 percent of each City's waste stream, respectively (Table 2-4).

Assuming municipal solid waste disposal volumes increase proportionately, the WML is anticipated to reach its current permitted capacity and closure date in early 2021 (Table 2-9).

2.4.2 REGIONAL PROJECTED DEMAND

According to State of California Department of Finance Population Projections for the City of San Diego 2010 countywide population is anticipated to increase from approximately 3.18 million in 2009 to approximately 4.3 million in 2045, for a total increase of 27 percent or an average of slightly less than 1 percent annually (Table 2-1).

By 2016, nearly 3.3 million tons of waste per year are projected to be generated in the County and will need to be reduced, recycled, converted, and/or disposed. This does not include the projected 153,000 tons per year disposed of in Orange County landfills, primarily at the Prima Deshecha Landfill, under a disposal agreement with the County of Orange that terminates in 2015. By 2045, the Countywide generated waste tonnage amount is projected to increase to over 4.1 million tons per year (Table 2-2).

Based on the current permitted capacities at WML and Sycamore Landfill, the WML is projected to reach capacity in 2021, and the Sycamore Landfill in 2025 (Table 2-9).

2.4.3 ADDITIONAL CAPACITY

WEST MIRAMAR LANDFILL

The permitted height increase at the WML increased the total permitted capacity of the WML from the maximum 1996 permitted airspace volume of 75,210,000 cy to a total permitted airspace capacity of 87,760,000 cy. This additional capacity will allow WML to remain open until 2021 with impact from the diversion ordinances taken into account.

SYCAMORE LANDFILL

The City of San Diego certified the Environmental Impact Report (EIR) and approved the proposed 80 million cubic yard landfill expansion at the Sycamore Landfill which is about 8 miles from the WML. That decision was legally

challenged by neighboring City of Santee who was seeking a compromise with Republic Services, Inc., the site owner, to allow the project to move forward with additional environmental safeguards for City of Santee residents. In November 2011, the City of Santee and Republic Services, Inc. came to an agreement which will allow the landfill expansion to continue with a maximum landfill height of 1,050 feet amsl (100 feet lower than originally proposed). For the purposes of the LRMOSP demand/capacity analysis, expansion of the Sycamore Landfill has been considered.

GREGORY CANYON LANDFILL

If the proposed Gregory Canyon Landfill receives all of its regulatory permits and is allowed to operate, it could provide an additional 30.8 million tons of capacity and provide additional regional landfill capacity for approximately 30 years. However, given its northern San Diego location, approximately 41 miles from West Miramar, it is not likely that the City's waste would be landfilled there while the Sycamore Landfill has capacity. There are several pending issues before the Gregory Canyon Landfill can begin operating as discussed further in Section 3.11 herein. For purposes of this report, waste is assumed to be transported out of the County after the Sycamore Landfill reaches capacity but Gregory Canyon Landfill would be a closer alternative if it is permitted and operational.

2.5 POTENTIAL STRATEGIES FOR MANAGING THE WASTE STREAM

2.5.1 EXPORTATION

Currently, there are 13 large scale transfer stations with approximately 4.2 million tons of capacity per year that can be used for transporting waste to distant landfills. A planned transfer station at Miramar could provide additional transfer capacity of approximately 1.6 million tons per year or approximately 5,000 tpd, six days a week (see Table 2-6).

2.5.2 WASTE DIVERSION

The cities in the County have a relatively high diversion rate as calculated using reported CalRecycle data from CY 2009 with a median rate of 66 percent and a

mode of 67 percent. For calendar year (CY) 2009, the City was up to a 66 percent diversion rate, and for CY 2010, the City's diversion rate increased to 68 percent. This has been achieved in part through the use of:

- Existing Zero Waste Programs.
- Diversion Ordinances.
- Seven large scale composting facilities, not including the proposed Starstream Valley Center 1 Composting (Ag) Facility in Valley Center (Table 2-7).
- Over 50 recyclable processing locations in the County (Table 2-8).

For the purposes of the LRMOSP demand projections, regional diversion rates were conservatively assumed to be at the same level as in 2006. If the cities were able to reach higher diversion rates this could provide additional landfill capacity than the demand projections anticipate. For the City of San Diego, the effect of the ordinances on increased diversion was included in the analysis.

2.5.3 SENSITIVITY ANALYSES

The City's two ordinances anticipated effect on future disposal tonnages was reflected in the projected capacity analysis tables. The first is a recycling ordinance and the second is a C&D debris deposit ordinance. Due to the decline in disposal volumes from 2005 to 2009 as a result of the recession and the unknown impact caused by the City recycling ordinances on disposal volumes, a sensitivity analysis was performed to evaluate future potential impacts.

As previously discussed, the disposal projections were adjusted by assuming the annual change in population at 50 percent and 150 percent of the Department of Finance population percent projections.

2.6 PROJECTED CAPACITY SCENARIOS

2.6.1 PROJECTED CAPACITY - WITHOUT SYCAMORE EXPANSION, AND WITH IMPACT FROM CITY ORDINANCES

Based on the 100 percent projections, the WML would reach capacity in 2021 and the region would have capacity at the Sycamore Landfill up to the year 2025. These projected dates include the impact from the implementation of the City's recycling and C&D debris deposit ordinances. A detailed modeling run is included in Table 2-9 of this report.

2.6.2 PROJECTED CAPACITY – WITH SYCAMORE EXPANSION AND IMPACT FROM CITY ORDINANCES

To determine the potential system capacity with the Sycamore Expansion, three different regional landfill system capacity models were run based on the following variables:

- Proposed capacity increase from the Sycamore Landfill proposed expansion;
- Diversion impacts from the City's recycling and C&D ordinances; and
- Growth at 100 percent and a sensitivity analysis at 50 percent and 150 percent of the population increase projections.

These three modeling efforts resulted in these projected system capacities:

	Reference Table	Year West Miramar Reaches Capacity	Year Regional Capacity is Reached
Growth at 100 percent Projections (with City ordinances)	2-10	2021	2037
Growth at 50 percent Projections (with City ordinances)	2-11	2021	2039
Growth at 150 percent Projections (with City ordinances)	2-12	2020	2036

Detailed modeling results are included in Tables 2-10, 2-11, and 2-12. The modeling results indicate that the WML currently is projected to have capacity to 2021. With the expansion and diversion ordinances, Sycamore is projected to have capacity to 2037 (Table 2-10).

2.7 CONCLUSION

The City faces running out of landfill capacity at the WML by 2021. The region is projected to have capacity only until 2025 if the Sycamore Landfill expansion is not approved (Table 2-9). These projected dates include the capacity gained from the City's recycling and C&D ordinance implementation.

If the Sycamore Landfill expansion is approved and diversion continues from implementing the City's recycling and C&D ordinances, as well as continued implementation of existing zero waste programs, the region is projected to have capacity until 2037 at the Sycamore Landfill (Table 2-10).

SECTION 3.0

POTENTIAL SOLUTIONS TO MEET DEMAND

3.0 POTENTIAL SOLUTIONS TO MEET DEMAND

3.1 INTRODUCTION

During Phase I, the Consulting Team, ESD staff, and the RMAC (Strategic Plan Team) identified over 100 options to meet the City's short- and long-term resource management needs. These options included various zero waste programs and policies, zero waste infrastructure, conversion technologies, waste-to-energy, landfill optimization, and in-County and out-of-County landfill disposal options, including rail haul. Screening criteria were developed by the Consulting Team and ESD staff and were refined by the RMAC to measure, compare, and rank the relative merits of the various resource management options developed during Phase I. Each option was ranked as High, Medium, or Low Feasibility based on the following criteria:

Financial Viability: Options provide financial support for the City's environmental programs, are economically viable for the City of San Diego, and are reasonably competitive with future alternatives.

Technical Viability: Options are technically sound with a proven track record at needed volumes.

Regional Viability: Options and/or technologies that are viable (legal, compliant with regulations, and socially acceptable) in the San Diego region and address local needs. Options should consider existing assets, civic structure, geology, and climate.

Environmental Viability: Options have minimal impact to California Environmental Quality Act (CEQA) and National Environmental Protection Act (NEPA) environmental parameters and are environmentally beneficial such as providing green energy, renewable fuels, and reducing greenhouse gas emissions.

Capacity Optimization: Options minimize disposal demand and optimize remaining landfill capacity at WML.

Sustainability: Options provide for the highest and best use of material generated by the City's residents and businesses.

At the end of Phase I, the Strategic Plan Team selected 40 options with medium to high feasibility for further review in Phase II as presented in Table 3-1. This section provides detailed information on the evaluations conducted to develop the final options identified in this LRMOSP Phase II Report. Additionally, a qualitative analysis was conducted to identify the interconnectedness of the City's solid waste management system options.

3.2 ZERO WASTE PROGRAMS

3.2.1 INTRODUCTION

The goal of zero waste is to reduce, reuse, recycle, or convert to beneficial use, resources that are now being disposed so as to divert waste from landfills. To reach higher diversion goals, zero waste strategies must consider the entire life-cycle of a product or material. By designing and managing materials with a "cradle to cradle" instead of "cradle-to-grave" mindset, zero waste eliminates the need for raw materials and waste disposal and instead holds producers responsible for their products and packaging, as well as consumers for their purchases.

Zero waste focuses on a "closed-loop" process where all products are designed to be cycled safely back into the economy or the environment. This closed-loop system not only heightens diversion levels but also helps communities achieve a local economy that operates efficiently, sustains jobs, and provides a measure of self-sufficiency.

In continuing to develop and implement comprehensive zero waste programs at the City, a review was conducted in Phase I of other programs and policies developed in jurisdictions throughout California. Four types of zero waste

activities were examined in each jurisdiction: 1) Resource Conservation and Reuse, 2) Transportation, 3) Waste Reduction and Recycling, and 4) Outreach and Education. After reviewing these programs and comparing them to the City's existing programs, it was determined that the City's existing zero waste programs are already very robust (see list of existing Zero Waste Programs in Table 4-1). In fact, diversion programs such as ordinances for Mandatory Recycling (i.e., commercial, single and multi-family residential, and mixed use) and C&D Debris Deposit Recycling, as well as increased diversion from the City's Miramar Greenery operations have resulted in an overall diversion rate of 68 percent for calendar year 2010, a 13 percent increase over the diversion rate of 55 percent in 2006. During the strategic planning process sixteen new zero waste options were recommended for further analysis in Phase II.

3.2.2 ESD ZERO WASTE PROGRAMS AND POLICIES ANALYSIS

ESD staff provided an analysis of the future policies and programs to be enhanced or implemented, program costs and projected level of increased diversion for zero waste (diversion) programs. Table 3-2 summarizes the recommended options and the projected diversion and cost for these programs.

The analysis conducted by ESD reviewed the sixteen zero waste programs/ideas that were "finalists" in Phase I as well as analysis of additional zero waste programs being considered by ESD for future implementation. It is not possible with many zero waste programs to attribute specific diverted tonnages or cost to individual programs. Zero waste initiatives should be viewed as part of an overall suite of programs designed to effect change and encourage participation in existing recycling programs.

1. ZW-SR-2 Implement rigid plastic recycling at curbside.

Due to improved recycling markets for rigid plastics, ESD successfully negotiated with its vendor that processes and markets the curbside recyclable materials and added rigid plastics to the program effective November 15, 2010 at no cost to ESD.

2. ZW-SR-3 Ban single use polystyrene food containers.

As a Policy Issue, this option would probably meet stiff resistance from the business community and significant support from the environmental community. A ban would need approval from the Mayor's office. A polystyrene food packaging ordinance banning such containers was taken to Council in the early 1990's but was rejected in favor of a plastics industry proposed voluntary program that was discontinued within 12 months of rollout due to contamination and poor program design.

Enforcement costs after the first year would be minimal since it would be self-enforcing by customer complaints to ESD. The first year costs are estimated to be less than $50,000.

Supporting program: Start Date: January 2012 – City Administrative Regulation amended to ban the purchase of polystyrene food containers by the City. In addition, special event and park use permits revised to discourage the use of EPs (expanded polystyrene) food containers. This program also bans the use of City funds on the purchase of non-essential bottled drinking water.

3. ZW-SR-9 Extended Producer/Manufacturer Responsibility.

The Mayor and Council would need to adopt a policy for extended producer/manufacturer responsibility. This type of policy is much more effective when adopted at the state or federal level.

There would be little anticipated staff cost in the implementation – it would be restricted to crafting the policy and the necessary outreach to secure passage.

It is not feasible to attribute diverted tons to the policy. Diversion will occur to the extent that its existence facilitates the adoption of new recycling

programs and product redesign that divert materials - for example advance disposal fees on specific waste types.

4. **ZW-RU-3 Recycle plastic bags using blue bins.**

This will take a negotiation with the vendor to add these items to those that they separate and market for ESD. These commodities have historically cost more to process and market than the residual value of the resin when sold on the secondary materials market. There has historically only been one market for the plastic bags that are collected curbside and that is in China. ESD considers this to not be a sustainable base on which to add this commodity to the curbside recycling program. Once additional markets open up for curbside plastic bags, ESD will review the feasibility of adding to the existing curbside recycling program.

Based on today's markets and processing costs, it is anticipated that revenues to ESD could drop by up to $75,000 to $150,000 per year if these materials were added. The amount that might be diverted would be in the range of 2,000-3,000 tons per year.

5. **ZW-RY-2 Establish future "MRF First" - MSW to be processed through a MRF if available.**

While a very good idea in terms of minimizing landfill disposal, this is a very expensive option, as it is essentially calling for the construction of dirty MRFs to sort through waste that is not already being diverted through source separation programs and clean MRFs. The diversion rate for a dirty MRF will be especially low given source separated programs will already be in place to divert targeted recyclables – so the cost per ton will be high. A variant could be to establish a "dusty" MRF as has been done in San Francisco and other locations so that specific dry wastes could be processed and this could result in approximately 40% diversion of selected waste streams. There would also be significant costs with this option.

ESD is following a model of further enhancing source separation and zero waste options rather than relying specifically on these MRF options. Private companies are looking at potentially adding further MRF capacity in the City.

6. **ZW-OD-1 Increase green waste pickup from bi-weekly to weekly.**

The current greenery tonnage collected is 31,000 tons. The current estimated capital cost to convert existing greenery services to automated and expand the program to the entire City is$14.8 M including costs for trucks and containers. This cost has been decreased from $18.3M previously assumed for the Financial Model discussed in Section 5 herein due to replacement of trucks in phases. The current estimated additional operational cost, if all current routes were converted to automated collection, is $450K and the estimated greenery tonnage collected would increase 54.2%.

The historical tonnage collected on City of San Diego greenery routes when it was collected manually (in the mid 1990's) on a weekly basis was approximately 0.3 tons/home/year. Under the current system of biweekly manual collection, the tonnage collected is only 0.16 tons/home/year.

7. **ZW-OD-2 Create a cost incentive for business participation in a food discards program as markets become available.**

There is already a cost incentive for composting food waste – there is no AB939 or franchise fee to pay on source separated recyclable loads and there is a discounted tipping fee at the Miramar Greenery. The City does not regulate fees charged by private waste haulers and this would be a significant departure from the status quo. One mechanism, that would likely meet significant opposition, would be to require the haulers to offer a discount under the franchise agreements.

Food waste is the heaviest and most corrosive type of waste to handle and is very wet which can lead to waste code violations for haulers if the seals on the trucks are not in very good condition. It is one of the more expensive types of wastes for the haulers to handle so requiring a discount would force

the haulers to have to increase their standard refuse fees to cover actual costs.

It would be a significant change in policy that would require agreement by the Mayor's office and the City Council if ESD were to require pricing structures/controls. San Francisco used cost incentives to promote food waste recycling but they have a single hauler, a unique arrangement and a very expensive overall fee structure, which would not be applicable in San Diego.

It is estimated that up to 40,000 tons of food waste could be diverted from the commercial waste stream if a sector-wide diversion requirement was in place. The City is already engaged in developing mixed organics composting capacity at Miramar.

8. ZW-OD-4 Establish restaurant food waste collection and composting requirements as markets become available.

ESD staff have been working with franchise waste haulers to develop food waste routes for selected restaurant and other food waste customers. The Pilot route started in calendar year 2011.

9. ZW-SR-5 Provide business tax credits/incentives for certified Green Businesses.

Business tax credits would require policy being set by the Mayor's office and is not in the domain of ESD policy development. Efforts previously undertaken or ongoing are listed below:

- San Diego County already has a green business program for dry cleaners and auto repair shops that has met with minimal success. This program does not include business tax credits.

- The San Diego Green Business Network (SDGBN) was founded by a local green investor in 2007 as a way to help San Diego businesses respond to

the challenges of the emerging green market, but has since been disbanded. It worked to help green enterprises succeed through networking and education, thereby, encouraging a sustainable San Diego economy. The mission of the group was to combine business success with socially and environmentally responsible actions. Meetings were held in ESD's training room every third Wednesday of the month. The majority of the members were small business owners.

- The SEEDS biotech working group, with representatives from local companies was recently formed and ESD staff attends and participates in both general monthly meeting and meetings of its recycling subcommittee.

10. ZW-SR-7 City Procurement Policy - Return usable shipping containers.

ESD staff coordinated with City stores to evaluate the need for this program. Packaging waste is addressed on a case-by-case basis. The evaluation determined that there is minimal excess packaging. All fiber based packaging is currently recycled. Efforts to reduce and recycle EPs packaging received by City IT staff and also by the street light replacement program are ongoing.

11. ZW-RY-7 Establish on-call bulky item pick-up for single, multi-family, and businesses.

A legal opinion from ESD's attorney will need to confirm that this does not contravene the People's Ordinance. A preliminary evaluation deemed that this type of waste is covered by the definition of the People's Ordinance waste and so this service would have to be provided at no cost. The current budget does not allow for the provision of additional services at this time.

Large scale bulky item collection events that are open to all City residents are being trialed during CY 2011 and 2012 as a cost effective alternative to a collection program.

12. ZW-ED-1 Develop/promote e-newsletters to schools. (Education)

ESD will investigate the feasibility of partnering with San Diego Unified School District (SDUSD) and using its contractor, San Diego County Office of Education, to use existing electronic communications within the schools to place articles in publications on waste reduction, zero waste, and recycling.

13. ZW-ED-2 Educate Restaurants about source reduction. (Education)

ESD has provided outreach in the past to the restaurant sector, and could continue to do so. ESD had hired the Green Restaurant Association to enlist restaurants into green practices. After a 12 month effort, 30 new restaurants committed to implementing green practices.

ESD contacted the California Restaurant Association in San Diego to determine if they would be interested in partnering to reduce water bottle use by distributing information to their members about an existing program. The infrastructure for this web-based program was already in place and the costs minimal. However, there were concerns that this was not an item the association would like to promote.

14. ZW-ED-5 Establish Re-Create Art Contest and Exhibition for youth.

ESD contracts with the San Diego County Office of Education and the Solana Center to educate over 20,000 students and community members on recycling, waste reduction and zero waste concepts. The various forums include:

- Envirotours to the landfill and local recycling centers
- On-site Enviroschools which travel to schools and host over 100 pupils for each schools session
- Assemblies in schools
- Training master composters in a 9 week course
- Conducting composting workshops around the City

- Sponsoring an environmental innovation in video production award
- Community booths at a wide range of special events and festivals in the City.

ESD added a task related to an art contest with an environmental theme to its contract with the San Diego County Office of Education for FY 2011 with a budget of $1,918 for the task. This contest is designed to encourage students (grades 1-6) to express through art the importance of using found objects in artwork. Children can create art pieces or draw a picture that makes one important point about reducing/reusing/recycling. Pieces displayed at a local community festival. Task included again FY12.

15. ZW-RY-4 Coordinate large retailer drop-off locations for specific wastes.

A successful take back program was established in San Luis Obispo for paint, sharps, and compact fluorescents. Their program is operated by a contractor who charges a service fee for collection of these wastes after they have been accumulated by the participating sites. This program would need approval by the Mayor and Council to require participation.

16. ZW-OD-9 Allow inclusion of certain residential food waste in the green can (Bi-weekly).

ESD is interested in piloting this strategy when the Miramar Greenery has purchased the equipment needed and has established the on-site infrastructure to handle mixed organic loads for composting.

3.3 MIRAMAR RESOURCE RECOVERY CENTER (RRC)

As part of ESD's ongoing zero waste programs and proposed initiatives, evaluation of a potential Miramar Resource Recovery Center (RRC) is being conducted. ESD is considering developing another comprehensive recycling facility at the entrance to the Miramar Landfill that would require all self-haul vehicles to participate in recycling and separating materials in their loads. Separation of recyclable materials and disposal of residual waste would be

conducted at the proposed facility. This facility will provide service for self-haulers currently disposing their waste at the working face of the West Miramar Landfill. Capital cost is expected to be in the $6M-$7M range and annual estimated cost of $960,000 after full implementation. Diverted tonnage is expected to be approximately 50,000 tons per year.

Due to the proposed/potential development of an RRC at the entrance to the Miramar Landfill, the conceptual future transfer station design does not include a self-haul tipping area. It is assumed that self-haulers will be directed to the proposed RRC for materials separation and residual disposal.

3.4 CONVERSION TECHNOLOGIES

3.4.1 INTRODUCTION

Included in the LRMOSP Phase I report was an evaluation of Conversion Technologies (CT) and Waste-to-Energy (WTE). Several CT's and a WTE facility greater than 500 tpd was recommended for further review in Phase II. The following provides an update of conversion technology (CT) development in California with the inclusion of a few notable projects from other areas of the country. CTs include a wide array of thermal, biological, chemical, and mechanical technologies capable of converting municipal solid waste (MSW) into energy such as steam and electricity; fuels such as hydrogen, natural gas, ethanol and biodiesel; and other useful products and chemicals, which can provide greater than 80 percent diversion from landfill disposal.

CTs are successfully used to manage solid waste in Europe, Israel, Japan, and some other countries in Asia. Pilot and demonstration CT facilities in the United States and Canada have led the way toward development of larger-scale demonstration and commercial facilities in these countries.

Several jurisdictions in California are in the process of developing CT projects. These jurisdictions include County of Los Angeles, City of Los Angeles – Bureau of Sanitation, Santa Barbara County, Salinas Valley Solid Waste Authority, City of Glendale, and San Bernardino County. For a summary of the conversion

technology initiative in California see Appendix C.

The information presented herein is based on available, published information, and the LRMOSP Consulting Team knowledge.

3.4.2 STATUS OF NOTABLE CONVERSION TECHNOLOGY PROJECTS IN NORTH AMERICA

The following is a list of several of the most notable CT projects in various stages of development throughout North America. For a complete description see Appendix C.

- **Enerkem:** Enerkem, as part of Enerkem Alberta Biofuels (EAB), has signed a 25-year agreement with the City of Edmonton, Alberta, Canada to build and operate a plant that will produce and sell ethanol from non-recyclable and non-compostable MSW.

- **Plasco Conversion Facility:** On September 5, 2008 Plasco Energy Group Inc. (Plasco) signed a contract with Red Deer County, Alberta, Canada to build a 200 ton per day waste processing facility. Plasco uses plasma technology to convert MSW into a syngas that is used to generate electricity

- **BIOFermTM Energy Systems:** In September 2010, The University of Wisconsin – Oshkosh began construction of a commercial dry fermentation anaerobic digester. The renewable energy facility is to include heat and power generators and is expected to produce 5% to 10% of the campus's electricity and heat with an electricity output of over 3,000 megawatt hours (MWh) per year.

- **Zero Waste Energy:** Zero Waste Energy (ZWE) and GreenWaste/Zanker have been working extensively with the City of San Jose, California to develop, permit, construct and operate a dry fermentation anaerobic digestion (AD) and in vessel composting (IVC) facility utilizing Kompoferm technology. The Kompoferm dry AD system and IVC are licensed exclusively to ZWE and the project will make San Jose the first city in the U.S. to use this

technology. As of early 2012, the proponent is looking at implementing technical updates to the planned facility.

- **Fulcrum Sierra BioFuels:** Fulcrum Sierra BioFuels, LLC (Sierra BioFuels) is developing an MSW processing facility to generate ethanol in McCarran, Nevada (Reno area). Sierra BioFuels' process converts organic waste materials to ethanol utilizing a two-step thermochemical process.

- **INEOS BioEnergy Indian River BioEnergy Center:** INEOS Bioenergy, a cellulosic ethanol technology vendor is developing a facility in Vero Beach, Florida that will process post-recycled MSW and forestry and agricultural waste. In addition to 8 million gallons per year of ethanol, six (6) MWs of electricity will be produced, a third of which will be sold to the utility grid.

- **Grand Central Anaerobic Digestion:** The Grand Central Recycling & transfer station is planning to site an anaerobic digestion project on their property using UC Davis technology. The project is being developed by Onsite Power, who has the license for the technology, and is being sized at 250 TPD in the first phase. The plan allows for buildout in the future of a second 250 TPD phase. Feedstock will be a 50/50 blend of food waste and green waste.

3.4.3 PERMITTING OVERVIEW (CALIFORNIA)

The permitting situation in California related to CT projects can be divided into three tracks: anaerobic digestion (AD), gasification, and pyrolysis. These three categories make up virtually all the CT projects moving ahead in the U.S. and Canada. None of the CT technologies being evaluated for potential application in the City of San Diego are affected by Proposition H because none of them are defined as "incineration".

AD projects have a clear permitting pathway under the composting regulations of CalRecycle. In addition, CalRecycle is completing a state-wide EIR for AD that should aid specific projects in navigating the CEQA process. The energy generated by these projects has already been designated as "renewable" by the California Energy Commission (CEC).

Gasification projects must meet a very strict set of criteria in State code in order to be defined as a "gasification" facility. The failed AB222 legislation was to have revised this code and created a clear permitting pathway; but it died in the last legislative session of 2010. However, over the past several months, gasification project developers have submitted project-specific requests to CalRecycle related to the gasification definition and have received affirmative responses. In addition, the CEC has recently revised their Renewable Portfolio Standard (RPS) Guidebook to state that with a positive ruling from CalRecycle on the gasification definition, a project will be rated as RPS eligible by the CEC – meaning that the energy it generates will be considered "renewable". This is very important for the economics of these projects as renewable electricity is in demand and has a much higher value than non-renewable electricity. In addition, a "gasification" project also receives full diversion credit, as defined in statute. Thus all material converted by such a project would count towards participating jurisdictions diversion, not disposal.

Unfortunately for pyrolysis projects, there is no such definition to provide either renewable energy certification or diversion credit. As currently defined in statute, pyrolysis projects are defined as disposal, and the energy as non-renewable. This is not to say a project cannot be built, but it would have to be in a jurisdiction for whom more diversion is not an issue, and in which the economics of non-renewable energy would still be feasible.

It is anticipated that during 2012 the first commercial CT projects will enter the permitting process; most likely in Salinas, San Jose, the City of Industry, the County of Los Angeles, and/or Santa Barbara.

3.4.4 TIPPING FEES

Tipping fees depend on many factors including the type of technology, the type and value of end products (electricity, fuel, etc.), revenue sharing, and many other contract issues. Although it is difficult to obtain project specific tipping fee information, especially for the private "greenfield" type projects, some

information is becoming available through public competition and projects as follows:

- Typical Tipping Fee ranges from competitions:
  - AD: $60-$100
  - Gasification and pyrolysis: $65-$150
- Project specific tipping fees:
  - Enerkem (Edmonton): $66/ton
  - Plasco (Salinas): $70-80/ton

Once final contracts have been signed on several more projects, the tipping fee picture will become clearer.

3.4.5 CONCLUSION

CT projects continue to move forward in North America. Of most importance is the start of construction of three projects: Enerkem (Edmonton), BIOFermTM (Oshkosh), and INEOS (Vero Beach).

The key factors that have slowed development of the MSW CT projects are:

- Cost (versus continued, relatively inexpensive landfilling),
- Perceived risk, and
- Financing (particularly during the recession)

However, at least in several instances, these barriers have been overcome. A periodic review of the status and programs of these technologies may result in potential feasibility for the City of San Diego in later years to come.

3.4.6 RECOMMENDATIONS

With tipping fees for various CTS ranging from $60 per ton to $150 per ton as outlined in the previous section, these projects are not likely to be economically feasible for the City at this time. Currently, tipping fees at the Miramar Landfill range between $40 and $54 per ton. At its present size, Miramar Landfill is expected to reach capacity in 2021. The alternative waste disposal option to

Miramar Landfill is to transfer waste to the Sycamore Landfill. The City anticipates that tipping fees at Sycamore Landfill in 2022 will be $11.90 more per ton than the current rate at Miramar.

Additionally, with about 3,000 TPD disposed of at the Miramar Landfill, CTs discussed in this summary have much smaller capacities, on the order of hundreds of tons, rather than the thousands of tons that the City requires.

It is recommended that the City perform a basic annual review of available CTs to stay apprised of the progress of existing and proposed projects. Also, the City should budget for a full CT evaluation in five years in order to review the economics and capacity of a potential project in more detail.

3.5 WASTE-TO-ENERGY (WTE)

There are several hurdles to the development of new WTE facilities in the City including lack of diversion credits and Proposition H. WTE facilities are categorized as "combustion" facilities and not "conversion facilities" and any diversion credits allowed are for existing facilities only. Proposition H places stringent conditions on the development of WTE facilities of 500 tpd or larger in the City. As such, facilities under 500 tpd will have a higher tipping fee ($85 to >$100) than those larger than 500 tpd, making it a costly alternative for the City when compared to landfilling.

Other issues with WTE include:

- Diversion versus Disposal: WTE plants are defined as "Transformation" facilities in California. As such, they are classified as "Disposal" not "Diversion" and all waste processed in them is counted as *disposal* for AB939 reporting purposes. (The exceptions are the three existing WTE plants in the State that are grandfathered in as "Diversion" up to 10 percent of a jurisdiction's total diversion).
- Public Opposition: The greatest challenge to developing a new WTE plant in California is the overwhelming and sometimes brutal opposition from environmental groups and the public at large (especially in the local area of

the proposed plant). This opposition has become so organized and mobilized that it has been virtually impossible to site a new facility for years. This is particularly true in California where the environmental groups are very powerful.

- Permitting: Due to the opposition stated above, permitting would be extremely arduous. Any CEQA analysis could be expected to be attacked and challenged in court. Although these plants have proven that they can meet all air quality requirements, there is still a perception that WTE plants are hazardous to public health. In addition, because WTE plants are classified as "Disposal", jurisdictions must amend their Countywide Siting Element to include such a facility which is a daunting process.
- Best and Highest Use: There is a judgment in the environmental community that material should be recycled or composted and that WTE plants destroy the material, even though energy is produced. Energy production is deemed a lower use, and should only be applied after all efforts at recycling have been exhausted. This argument is also used against CTs.

Although a potential WTE facility sited on Miramar might not be within the sphere of influence for Proposition H due to its location on Federal land, public opposition would make it extremely difficult and costly to site and permit. Therefore, a WTE facility is not considered an option in any of the system configurations, but could be included in the recommended evaluation of CTS in five years.

3.6 TRANSFER STATION/MATERIAL RECOVERY FACILITY

3.6.1 INTRODUCTION

The purpose of this section is to present an updated evaluation of a potential Material Recovery Facility (MRF)/Transfer Station option at the Miramar Landfill. The City of San Diego Miramar Landfill General Development Plan (dated September 1994) considered a new MRF/Transfer Station facility adjacent to the Miramar Landfill to serve its residents once the landfill closes. In anticipation of building a MRF/Transfer Station, the City entered into a long-term lease agreement with the Marine Corps Air Station (MCAS) to use a 19-acre parcel at

Miramar. The Consultant Team developed a conceptual plan for a MRF/Transfer Station on the 19-acre parcel as part of a feasibility study conducted in Phase I of the LRMOSP. The purpose of the feasibility study was to evaluate the potential for development of a full-scale MRF/Transfer Station on the parcel available for such use.

As part of Phase II of the LRMOSP, the Consultant Team was asked to evaluate the feasibility of developing a transfer station only on the 19-acre portion of the property as the current and future anticipated need for a conventional MRF facility is being met by private operators serving the City. Additionally, the ESD is considering a RRC at the landfill entrance for self-haul vehicles. Therefore, a self-haul tipping area has not been programmed into the transfer station design. Preliminary capital and annual operating costs for the proposed transfer station were developed for incorporation into the financial models being developed as part of Phase II of the LRMOSP.

3.6.2 SUMMARY OF PHASE I CONCEPTUAL DESIGN

Phase I of the LRMOSP considered the development of a facility with adequate space to provide transfer station capacity for 5,000 tons per day (tpd) of waste and a state-of-the-art MRF capable of processing between 200 and 400 tpd. The 19-acre site would accommodate a 180,000 to 190,000 square foot (sf) building. The building would be divided into a transfer station roughly between 80,000 to 90,000 sf and a MRF ranging from 100,000 to 110,000 sf. Ancillary facilities would include an administration/employee building, maintenance facility, and space for a future conversion technology facility. Total cost of construction was estimated to range between $51 million and $55 million for the MRF/Transfer Station facility.

3.6.3 MATERIAL RECOVERY FACILITY (MRF) ELEMENT

As mentioned above, previously developed conceptual plans for the MRF/Transfer Station identified a state-of-the-art MRF capable of processing 200 to 400 tpd. After further analysis and conversations with City ESD staff, it was determined that processing capabilities for the City's existing and future source

separated recyclables already exist, through the Alan Company and IMS Recycling Services who currently handle these materials. Recycled product and marketing are closely tied together so having a MRF operated by the company marketing the materials is an incentive to remove as many materials as possible and reduce the quantity of waste requiring transfer and landfill disposal.

The only other option for a MRF at Miramar would be a "dirty MRF" to sort through waste that is not already being diverted through source separation programs and existing MRFs (operated by others). Diversion rates for dirty MRFs are especially low and costs are high, given that source separated programs are already in place to divert targeted recyclables. ESD is following a model of further enhancing source separation and zero waste options rather than relying specifically on a dirty MRF option. Additionally, private companies are looking at potentially adding further MRF capacity in the City. Therefore, the building of a MRF has been eliminated as an option for implementation by ESD in Phase II of the LRMOSP.

3.6.4 CONCEPTUAL TRANSFER STATION SITE DESIGN

The primary consideration for the 19-acre site was to develop a facility to provide transfer station capacity for up to 5,000 tpd of waste, which is consistent with the design criteria identified in Phase I of the LRMSOP. The result of the feasibility study demonstrated that the site is able to accommodate a transfer station with a multi-scale entrance and scalehouse facility capable of adequately handling estimated tonnages and associated vehicles (see Table 3-3). The facility will utilize approximately 12.5 acres of the 19-acre site. The 12.5-acre portion of the site provides sufficient area for a 5,000 tpd facility with adequate circulation, tipping, waste handling, and load-out operations space. The estimated amount of vehicles expected at the facility, when operating at the maximum capacity of 5,000 tpd is approximately 1,065 trucks per day (see Table 3-3). The remaining 6.5 acres could be provided for a future conversion technology facility or relocated RRC for self-haul vehicles. The conceptual design proposes a building for the transfer station of roughly 75,000 sf to 80,000 sf.

The conceptual layout of the transfer station includes the following operational and design features consistent with the Phase I feasibility study (see Figure 3-1):

1. Full-scale transfer station to service commercial haulers;
2. Transfer Station with 5,000 tpd Throughput Design Capacity;
3. 10-Hour Day Operation;
4. 15 Commercial Tipping Bays;
5. Storage Capacity, approximately 13,000 cubic yards (2,500 tons);
6. 4 Load-out Tunnels;
7. Administration/Employee Building;
8. Maintenance Center with three bays for rolling stock maintenance;
9. Adequate Parking for rolling stock (transfer trailer); and
10. Separate Circulation Paths (for collector and transfer trucks).

As previously stated in Phase I of the LRMOSP, the facility can be designed to be compatible with the adjacent Kinder-Morgan fuel storage facility operation; however, the entrance facility would have to be designed to reduce conflicts with traffic to both the adjacent sludge reclamation plant, as well as any activity related to the fuel storage facility. The site can also be designed to be screened along Highway 52, which is a required mitigation measure for the site.

3.6.5 ESTIMATED COST

DEVELOPMENT COSTS

The Consultant Team has prepared a preliminary construction cost estimate for the development of a transfer station facility on 12.5 acres of the 19-acre parcel. It includes construction costs for a 75,000 sf transfer station building, administration building, maintenance facility, and necessary support infrastructure. Total cost of construction is estimated to range between $25 million and $27.5 million. This includes a design cost of approximately $2 million which includes legal, architectural-engineering, solid waste facilities permit, geotechnical, and project management costs. This represents a planning level cost estimate and has a 20 percent range of accuracy (see Table 3-4).

ANNUAL COSTS

The Consultant Team has developed a cost per ton estimate for both transfer and transport costs with the operation of the conceptual transfer station facility based on costs developed in Phase I of the LRMOSP. It covers annual operating costs for labor, utilities, tipping, and hauling. The cost per ton for the transfer station is estimated at $17.19 per ton, and the transport costs range from $3.69 per ton for the Sycamore Landfill to $37.37 per ton for the El Sobrante Landfill.

3.6.6 FACILITY PERMITTING

In accordance with the California Code of Regulations, Title 14 (14 CCR), large volume (greater than 100 tpd) transfer/processing facilities are required to obtain a full Solid Waste Facilities Permit (SWFP). This includes obtaining several regulatory permits and approvals. Among the most significant documents needed to obtain a full SWFP are the following:

- Transfer Processing Report (TPR);
- California Environmental Quality Act (CEQA)/National Environmental Protection Act (NEPA) Documentation;
- Confirmation of Non-Disposal Facility Element (NDFE) status/inclusion; and
- Storm Water Pollution Prevention Plan (SWPPP).

Permitting of the transfer station is expected to take approximately four years to complete. Therefore, if the transfer station is to be on-line before the ultimate capacity of the WML is reached and assuming a one year design and one year construction period, the permitting process should begin six years prior to capacity being reached or sooner to provide a buffer. Permitting and design costs have been included as part of the capital cost presented in Table 3-4**.**

A schedule for the six year permitting and development process for a transfer station at the WML is presented in Table 3-5.

3.6.7 FINDINGS

After analyzing projected waste management needs and other existing and proposed system elements for the City, a transfer station without a MRF element at Miramar Landfill is proposed for Phase II of the LRMOSP. Currently, source separated recyclables are being processed by others at several nearby MRFs in the City and a dirty MRF option would have a low diversion rate with high cost and does not support the City's source separation and upstream zero waste goals. A self-haul tipping area was not proposed for the conceptual transfer station plan due to ESDs proposal to develop a RRC that will serve self-haul customers at the entrance of the Miramar Landfill.

The conceptual transfer station site design is shown on Figure 3-1 and information on permitting timelines and costs are described above.

3.7 NORTH MIRAMAR LANDFILL RECLAMATION EVALUATION

The purpose of this section is to summarize the findings of a detailed evaluation of reclaiming the inactive North Miramar Landfill.

The goals of the North Miramar Landfill (NML) Reclamation project were to:

- Recover soil for developmental and operational use at the Miramar Landfills;
- Recover and sell marketable materials; and
- Provide for airspace expansion of the NML by excavating the underlying native materials.

Based on a development model prepared for the project that considered varying assumptions for reclamation excavation, material recovery (soil and/or recyclables), airspace expansion at the WML to provide additional time for reclamation, the first two goals cannot be achieved for the NML reclamation project due to timing. The analysis found that reclamation of the NML is only viable if the waste is excavated at a rate of 7,000 cy/day and the material is not processed (i.e., direct relocation). In order to achieve the third goal of the NML

reclamation project, the analysis results also indicated that the project could not be implemented without a high rate of reclamation excavation (7,000 cy per day) in addition to a significant expansion of airspace at the WML.

Given that the NML reclamation project would not meet its recovery goals and is not feasible without a substantial expansion at the WML (of at least 14.5 million cy) and the timing issues previously identified, the NML reclamation project was removed as an option to be included in any of the Phase II system configurations. See Appendix B for a complete report presenting the North Miramar Landfill Reclamation Evaluation and preliminary design drawings.

3.8 NORTH MIRAMAR LANDFILL VERTICAL EXPANSION

3.8.1 INTRODUCTION

The purpose of this section is to present the results of a technical and economic evaluation of a NML vertical increase.

The NML is bound to the north by the Miramar Naval Air Station, Highway 163 to the east, the active WML to the west and State Route 52 to the south (see Figure 3-2). The active WML operated by the City has a projected closure date of 2021 based on the site's permitted remaining capacity and assumptions for future tonnage projections in Phase II of the LRMOSP. The 250-acre landfill site is located within federal land leased from the United States Navy on the Marine Corps Air Station (MCAS).

The NML operated from 1973 to 1982 and the material permitted for disposal at the site included residential, commercial, construction and demolition waste, and tires. Because the site has not accepted waste since 1982, before Subtitle D of the Resource Conservation Recovery Act requirements for liner systems became effective on October 9, 1993, there is no existing liner system. The NML has a landfill gas (LFG) collection system. The gas collection system in each of the Miramar Landfills (West, South, and North Miramar) collectively have approximately 200 extraction wells, 73,000 feet of piping, automatic condensate

handling system, 3 blowers, 2 flares and a gas-to-energy plant owned and operated by Fortistar Methane.

3.8.2 REGULATORY STATUS

CalRecycle's, formerly the California Integrated Waste Management Board (CIWMB), Solid Waste Information System (SWIS) number for the NML is 37-CR-0103. CalRecyle's regulatory status for the NML is unpermitted and the operational status is closed. The NML was issued Waste Discharge Requirements by the California Regional Water Quality Control Board – San Diego Region (SDRWQCB) for post-closure maintenance and a Monitoring and Reporting Program (M&RP) under Order No. 96-15, which is still active.

The NML is currently classified as an inactive landfill by the SDRWQCB. Revisions to the M&RP No. 96-15 were submitted to the SDRWQCB on January 30, 1997, and subsequent requests for modifications in the M&RP have been approved by the SDRWQCB to address changes to the ground water monitoring network, sampling methods (e.g. low-flow sampling methods), and laboratory analytical methods. The City monitors and maintains the site for gas control and groundwater protection.

There are no known impacts to groundwater beneath the landfill site based on ongoing groundwater monitoring program results. A cover was placed on the NML based on the requirements at the time of closure (1982). Under WDR Order No. 96-15, compliance with current regulatory closure requirements may be imposed for the site under the following conditions: a) when there is a proposed site development or land use change that jeopardizes the integrity of the existing cover; b) when water quality impairment is found, as part of a ground water monitoring program; or c) when nuisance conditions exist that warrant such activity.

3.8.3 PROPOSED VERTICAL INCREASE

A vertical increase was evaluated for the NML to a height of the currently permitted elevation for the WML at 485 feet above mean sea level (AMSL). The

available vertical airspace capacity at the NML includes excavating stockpile volumes, estimated to range from 2.8 to 6 mcy, assumed to be removed and also accounts for airspace capacity to be consumed by intermediate liner and final cover systems. The stockpile volume of 2.8 mcy is based on borings; however, according to ESD staff, up to 6 mcy may have been placed on the deck.

Vertical expansion of the existing landfill surface to 485 amsl (see Figure 3-3) will provide an estimated 6.3 to 10.5 mcy or 3.6 to 6.1 million tons of capacity (using a conversion factor of 0.58 tons per cubic yard) depending on the volume of soil stockpiled on the deck. This will increase the landfill life an additional 3.5 to 5.1 years based on an average of 1.2 million tons of waste inflow per year (Table 3-6**),** which is the approximate anticipated waste inflow rate projected for the site by 2021, after the WML reaches its currently permitted capacity.

Filling to the permitted elevation leaves a substantial deck area (approximately 125 acres) and potential for additional capacity. An additional evaluation was performed should there be an opportunity for an additional 40-foot lift of capacity. Vertical expansion of the landfill an additional 40 feet above the elevation of 485 feet amsl to 525 feet amsl (see Figure 3-4) would provide an estimated 13.4 to 17.6 million cubic yards or 8.4 to 10.2 million tons of capacity (see Table 3-6) depending on the deck stockpile volume. This would increase the landfill life an additional 7.0 to 8.5 years based on an average of 1.2 million tons of waste inflow per year projected for the year 2022. The deck area would be approximately 98 acres at elevation 525 feet.

The proposed vertical increase may require establishment of a minimum interim cover or preferential drainage grades above the existing landfill surface before additional waste can be placed.

3.8.4 SOIL BALANCE

Table 3-7 illustrates estimated soil needs for the NML vertical increase scenarios. Development and operational soil needs include either the interim cover or Subtitle D liner, daily and intermediate cover, and final cover. With a stockpile

volume of approximately 2.8 mcy and with an interim cover, there would be a surplus of soil in the amount of approximately 0.04 mcy in filling to the permitted elevation and a deficit of approximately 1.4 mcy in filling an additional 40 feet above the permitted elevation. With a stockpile volume of approximately 2.8 mcy and a Subtitle D liner, there is a soil deficit of approximately 0.8 mcy in filling to the permitted elevation and 2.2 mcy in filling an additional 40 feet above the permitted elevation. With a stockpile volume of approximately 6 mcy, there is a surplus of soil in all scenarios ranging from approximately 1.17 to 2.6 mcy.

Removal of an estimated 2.8 to 6 mcy of soil overburden stockpile overlying the waste is proposed, as previously mentioned, prior to placement of waste over the existing NML. This soil is assumed to be used in the proposed development and operations of the site.

It is also proposed that requirements for a minimum interim cover over waste to establish grades for preferential drainage be negotiated with the SDRWQCB. For purposes of this evaluation, a range of costs are assumed to only include grading costs for establishing a minimum interim cover to installation of a fully compliant Subtitle D liner system.

For volume estimating purposes, the intermediate liner design was assumed to be consistent with the permitted base composite liner system for the WML, which yields approximately 1.3 million cubic yards of material based on a 5-foot thick intermediate liner section. This assumption provides a conservative estimate of volume occupied by the liner system. Negotiations with the SDRWQCB may result in a reduced thickness for the liner system and/or additional soil for establishing positive grades, both of which would affect expansion airspace capacity.

For final cover, Title 40 of the Code of Federal Regulations (40 CFR) §258.60 and Title 27 of the California Code of Regulations (27 CCR) §21090 prescribe final cover requirements. 27 CCR §21090 specifies a 4-foot thick cover layer consisting of:

- 2 feet of foundation materials.
- 1 foot of low hydraulic conductivity layer soil above the foundation layer.
- 1-foot thick erosion resistant layer.

The final landfill grades for filling up to elevation 485 amsl are assumed to include a 4-foot thick final cover layer. This final cover design is consistent with the WML final cover design proposed in unlined areas. The final cover would require approximately 1.0 million cubic yards of soil material for both vertical increase alternatives.

3.8.5 DEVELOPMENT COSTS

A range of costs are presented in Table 3-8 for vertical expansion with and without a Subtitle D liner system. For purposes of this evaluation, a range of costs are assumed from only including grading costs for establishing an interim cover to installation of a fully compliant Subtitle D liner system. The cost is estimated to range from $38 to $48 million with an interim cover and approximately $59 to $78 million with a Subtitle D liner system. The costs include closure, but do not include daily disposal operations nor ongoing maintenance during post-closure, which are assumed to be similar to those for the WML. Although maintenance costs are not included, because the entire site may be considered gnatcatcher habitat, prior to development, an estimated $25,000 per year ($100 per acre) should be budgeted for maintenance of gnatcatcher habitat mitigation areas elsewhere.

For the LRMOSP Financial Model, the scenario with a 6 mcy stockpile, interim cover, and filling up to the WML permit elevation of 485 feet (estimated unit cost of $8/ton) is assumed since the permit height would be easier to get approved and the higher cost associated with a liner system would deem this NML alternative cost prohibitive, as compared to expansion of the WML. For comparison purposes to other expansion alternatives, a unit cost in dollars per ton of capacity is presented in Table 3-8 for the NML vertical increase with the

unit cost decreasing substantially with additional airspace.[1] For a NML vertical expansion to the permitted height of the WML, if a Subtitle D liner is required, the unit development costs range from $14/ton to $16/ton which is significantly higher than WML lateral expansion development unit costs ranging from $5.00/ton to $7.00/ton.

3.8.6 PERMITTING

The ESD would be responsible for obtaining regulatory permits and approvals related to a vertical increase at the NML. Prior to moving forward on potential capacity increase options, ESD must first begin discussion and consultation with the MCAS (anticipated to take 1.5 years according to ESD) in order to determine if they would be amenable to such a project on their property. Once it is determined that there would be potential support for the concept, then ESD would engage in discussions with regulatory agencies and other approving agencies.

A vertical increase would require evaluation of environmental impacts through the National Environmental Protection Act (NEPA) and California Environmental Quality Act (CEQA) process. NEPA and CEQA analyses for a vertical expansion are likely to include aesthetics, biological impacts, Marine Corps height restrictions, and extended operating life for the site. The following table lists permits that would need to be revised, updated or obtained and agency approvals that would be needed following the NEPA/CEQA process.

Permits and Approvals	Agency
Finding of Conformance	San Diego County Department of Public Works Solid Waste Planning and Recycling
Solid Waste Facilities Permit	CalRecycle
Joint Technical Document including Preliminary Closure/Post-Closure Plan	CalRecycle
	County of San Diego Department of Environmental Health
	Regional Water Quality Control Board

[1] June 18, 2010, memo Re. City of San Diego, Long-Term Resource Management Options Strategic Plan, West Miramar Landfill Expansions, to Chris Gonaver, from Christine Arbogast and Burrill McCoy.

Permits and Approvals	Agency
Title V Permit • Permits to Construct and Operate Landfill Gas System • New Source Review and BACT Compliance	San Diego County Air Pollution Control District
Resource Agency Permits/ Requirements	Army Corps of Engineers Section 404 Permit US Fish & Wildlife Service Section 7 Consultation California Dept. of Fish and Game Section 1602 Regional Water Quality Control Board Section 401
Site Development Permit	City of San Diego
Waste Discharge Requirements Amendment	Regional Water Quality Control Board
National Pollutant Discharge Elimination System Industrial General Permit	Regional Water Quality Control Board

Depending on the requirements for an intermediate liner system, an Industrial Waste Discharge permit may also be needed from the City's Sewer/Sanitation District.

A new Solid Waste Facility Permit (SWFP) may be necessary for implementing active operations at the NML because the current WML SWFP and Joint Technical Document (JTD) do not include the NML. NML operations would be similar to WML; therefore, it is recommended that the City explore including NML operations in an amendment to the WML JTD and a revision to the existing SWFP. Other permits that do not currently cover the NML should also be evaluated to add the NML expansion in lieu of obtaining a new permit.

The estimated schedule for permitting and development of the NML Vertical Expansion is presented in Table 3-9 (for a vertical expansion at NML or lateral expansion Alternative A at WML) which includes 1.5 years for MCAS concurrence, 5 years for permitting, 1 year for final design and bidding, and 1 year for construction; totaling 8.5 years.

3.9 WEST MIRAMAR LANDFILL LATERAL EXPANSION (2 OPTIONS)

3.9.1 INTRODUCTION

The purpose of this section is to present two preliminary expansion alternatives for future development of the West Miramar Landfill (WML). The two expansions are designated as Alternative A and Alternative B and would laterally expand the current landfill footprint to the west.

The WML is an active Class III refuse disposal facility located adjacent to and east of State Route 52 (SR-52) and Highway 805 to the northeast and west of the North Miramar Landfill. The land has been leased to the City by the federal government since 1959 and lies within the MCAS Miramar.

The leased land for the WML has been divided into two Phases: Phase 1 located on the east half of the WML and Phase 2 located to the west. Phase 1 reached its current grade in 1993 and has been used, temporarily, only when liner installation was taking place in Phase 2. Phase 2 began receiving waste on July 5, 1993 and has continued to the current date, where it is currently projected to reach its capacity by 2021.

3.9.2 ALTERNATIVE A

Alternative A is a western expansion to the current Phase 2 landfill in WML encompassing approximately 26.0 acres. The subgrade minimum elevation is approximately 315 feet above mean sea level (amsl) and the resulting excavation generates approximately 1.0 mcy (see Figure 3-4) of soil. The excavated soil will be used for landfill development, daily and intermediate cover, and final cover. Soil balance is discussed in more detail below.

As shown on Figure 3-5, Alternative A is wedged between the existing WML and a utility corridor containing two high pressure gas/oil lines and transmission power lines. The western limit of Alternative A was constrained to the west with the high pressure gas/oil lines so further expansion is constrained.

The final grading plan for Alternative A (see Figure 3-6) incorporates 3H:1V (horizontal:vertical) slopes and reaches a maximum elevation of approximately 470 feet amsl, creating a gross airspace volume of approximately 4.5 mcy. A net airspace volume available for municipal solid waste and daily cover of approximately 4.1 mcy was determined by subtracting the LCRS, operations layer, and final cover volumes from the gross airspace.

SITE LIFE

The lifespan of Alternative A was determined using HF&H's demand and capacity model for projected capacity. The annual waste acceptance rate was inflated by 0.94% annually following FY 2022. Based on a net airspace of approximately 4.3 mcy, an Airspace Utilization Factor of 0.58 tons per cubic yard and a projected annual tonnage of 1.2 million by year 2021, a lifespan of approximately 2 years is estimated for Alternative A.

SOIL BALANCE

As mentioned previously, excavation to the subgrade contours shown on Figure 3-5 will generate approximately 1.0 mcy of soil (engineered fill is already taken into account). Development and operational soil needs include the LCRS and operations layer, daily and intermediate cover, and final cover (see Table 3-10). Daily and intermediate cover is the largest soil demand.

With all site development and operational volumes considered, Alternative A would realize a soil deficit of approximately 311,000 cubic yards.

DEVELOPMENT COSTS

Table 3-11 presents estimated total development costs for Alternative A. These costs only include the incremental capital costs associated with permitting, developing and closing the expansion area and do not include operational costs (assumed to be similar to current operations costs). The development costs include the following:

- Permitting – Same permits as for NML vertical expansion including EIR/EIS preparation; potential biological resource agency permits (FWS consultation; possible CWA 401,404 and CDFG 1602); JTD and preliminary closure/post-closure plan; City Site Development Permit application; APCD permits to construct and operate gas systems, dust control plan, new source review and BACT compliance; and NPDES permit requirements including SWPPP and SPCCP), public outreach, and environmental mitigation;
- Expansion Development – Design, excavation, engineered fill, liner and LCRS, and construction quality assurance (CQA);
- Infrastructure - Leachate management, landfill gas collection and control system expansion, groundwater monitoring wells, and landfill gas migration monitoring probes; and
- Closure - Final closure plan and construction documents preparation, final cover construction to include stormwater management controls, and CQA.

The total capital costs associated with the development of Alternative A were then normalized with respect to the expansion capacity reported in tons to form a basis of comparison with other expansion alternatives. BAS estimated the total development costs for Alternative A, to include closure costs (but not post-closure maintenance), to be approximately $17,400,000; when divided by the expansion's capacity of approximately 2,300,000 tons results in an amortized cost per ton of $7.00. An itemized summary is provided in Table 3-11.

Assuming a cell life of approximately 2.0 years, Alternative A would be constructed in one (1) phase. It is assumed that construction would take one year and would be completed by 2020.

DEVELOPMENT CONSIDERATIONS

Both lateral expansion alternatives of the WML would encounter its own set of challenges associated with permitting, design and development. While those for Alternative A are more technical, Alternative B must address more aesthetic,

environmental, and third-party infrastructure issues than Alternative A (further discussed in the following section Alternative B).

The final grading plan for Alternative A may experience unacceptable deformations during a seismic event. As can be seen in Figure 3-6, portions of the western edge do not have a slope against which waste could be placed. The slope would act as a buttress helping to stabilize the waste mass and reduce seismic deformation. Inclusion of a slope/buttress large enough to reduce seismic deformations to acceptable levels may significantly impact airspace and/or operational efficiency. Analysis of slope stability is outside the scope of this alternative evaluation.

3.9.3 ALTERNATIVE B

Alternative B is also a western expansion to the current Phase II landfill in WML consisting of approximately 77.7 acres. The subgrade minimum elevation is approximately 280 feet amsl and the resulting excavation generates approximately 4.1 mcy (see Figure 3-7) of soil. The excavated soil will be used for landfill development, daily and intermediate cover, and final cover. Soil balance is discussed in more detail below.

The final grading plan for Alternative B (see Figure 3-8) incorporates 3H:1V (horizontal:vertical) slopes and reaches a maximum elevation of approximately 480 feet amsl, creating a gross airspace volume of approximately 21.1 mcy. A net airspace available for municipal solid waste and daily cover of approximately 20.1 mcy was determined by subtracting the LCRS, operations layer, and final cover volumes from the gross airspace.

SITE LIFE

The lifespan of Alternative B was determined using HF&H demand/capacity projections for the WML. The annual waste acceptance rate was inflated by 0.94% annually following FY 2022. Based on a net airspace of approximately 20.1 mcy, an Airspace Utilization Factor of 0.58 tons/cy and a projected annual

disposal rate of 1.2 million by year 2021, a lifespan of approximately 9.7 years is estimated for Alternative B.

SOIL BALANCE

As mentioned previously, excavation to the subgrade contours shown on Figure 3-7 will generate approximately 4.8 mcy of soil (engineered fill is already taken into account). Development and operational soil needs include the LCRS and operations layer, daily and intermediate cover, and final cover (see Table 3-7). As can be seen in Table 3-7, daily and intermediate cover is the largest demand.

With all development and operational volumes considered, Alternative B would realize a soil deficit of approximately 1.0 mcy. However, if the base were excavated deeper this deficit could be reduced or eliminated. The deeper excavation would also provide additional airspace in addition to addressing the soil deficit. The excavation depth was limited to the canyon floor elevation consistent with the last phase of development in the currently permitted WML.

DEVELOPMENT COSTS

BAS estimated the total development costs for Alternative B. These costs only include the incremental capital costs associated with permitting, developing and closing the expansion area and do not include operational costs (assumed to be similar to current operations costs). The development costs include the following:

- Permitting – Same permits as for NML vertical expansion permitting including EIR/EIS preparation; potential biological resource agency permits (FWS consultation; possible CWA 401,404 and CDFG 1602); JTD and preliminary closure/post-closure plan; City Site Development Permit application; APCD permits to construct and operate gas systems, dust control plan, new source review and BACT compliance; and NPDES permit requirements including SWPPP and SPCCP, public outreach, and environmental mitigation;
- Expansion Development – Design, excavation, engineered fill, liner and LCRS, and construction quality assurance (CQA);

- Infrastructure - Leachate management, landfill gas collection and control system expansion, groundwater monitoring wells, landfill gas migration monitoring probes, utilities relocation including the high pressure gas/oil lines and the three (3) power lines; and
- Closure - Final closure plan and construction documents preparation, final cover construction to include stormwater management controls, and CQA.

The total capital costs associated with the development of Alternative B were then normalized with respect to the expansion capacity reported in tons to form a basis of comparison with other expansion alternatives. BAS estimated the total development costs for Alternative B, to include closure costs (but not post-closure maintenance) to be approximately $56,220,000; when divided by the expansion's capacity of approximately 11.8 million tons results in an approximate amortized cost per ton of $4.77. An itemized summary is provided in Table 3-11.

Assuming a cell life of approximately 5 years, Alternative B would be constructed in two (2) phases. The second phase would be constructed four years after the first phase is constructed which would provide a one year buffer prior to when the airspace available in Alternative B is reached.

3.9.4 EXPANSION CONSIDERATIONS

Both lateral expansion alternatives of the WML would encounter their own set of challenges associated with permitting, design and development. While those for Alternative A are more technical, Alternative B must address aesthetic, environmental, and third-party infrastructure issues.

Aesthetic impacts have played a role in the development of the WML. The western limit of Alternative B would be located adjacent to CA-52 and I-805 (see Figure 3-8) and would cause view impacts to residents of University City. The only way to reduce impacts would be berming, or to offset the landfill further back from the highways which would impact airspace. Other impacts to be mitigated include air quality, which could involve expensive emission control measures, an Odor Impact Management Plan, and biology, which could require

on and offsite mitigation, including, potentially, land identification and purchase. Biological mitigation costs would be much higher for Alternative B than A. The air quality issues for the project would be substantial and expensive to mitigate, however the expense could be incorporated into ongoing costs of the project, whereas the costs of biological mitigation would be upfront costs.

Permitting for either project would be time intensive (expected to be 5 years) and costly due to the aesthetic, air quality, and biological impacts. Previous permitting efforts in the site's General Development Plan indicate that an expansion project could obtain regulatory approvals if adequate mitigation is provided, however, opposition from University City Citizens Against Waste, or other sectors, would be substantial to overcome. The overall schedule for Alternative A would be similar to the NML vertical expansion presented in Table 3-9 which includes 1.5 years for MCAS concurrence, 5 years for permitting, 1 year for final design and bidding and 1 year for construction totaling 8.5 years. A Schedule for Alternative B is presented in Table 3-12 that also shows a 8.5 year process for permitting and development, but includes a time-line for utility relocation.

As shown in Figure 3-8, a utility corridor that runs the width of the site is located nearly in the middle of the expansion area for Alternative A. The utilities that reside in that corridor include transmission power lines carried by three power poles and two (2) buried high pressure gas/oil lines that are parallel to the power lines. Additionally, there is distribution power line (not shown) that connects to the transmission lines and runs to the southeast. All of these utilities would have to be relocated outside of the landfill footprint. The cost to relocate these utilities was included in the development costs discussed above, however, the respective parties that own these utilities may not want to relocate them.

3.10 WEST MIRAMAR LANDFILL VERTICAL EXPANSION

The previous WML Height Increase project proposed a maximum 20-foot increase in permitted height of the landfill and was approved by CalRecycle on April 8, 2008. The expansion increased the height of the existing WML from 470 feet above mean sea (amsl) to 485 feet amsl in the 239-acre Phase I area and

from 465 feet amsl to 485 feet amsl in the 238-acre Phase II area. The total permitted capacity of the WML increased from the maximum 1996 permitted airspace volume of 75.2 mcy to a total permitted airspace capacity of 87.7 mcy. This additional airspace volume has been included in the demand model update for Phase II of the LRMOSP which now provides capacity at the West Miramar Landfill to at least 2021.

The ESD is evaluating the potential for an additional height increase for WML. With tapering side slopes, an additional twenty foot vertical increase in volume could result in approximately 20% less capacity than the prior vertical increase, or 5.9 mcy according to ESD staff. The range in height increase proposed is twenty to forty feet with a potential additional capacity range of 10 mcy to 18 mcy. For purposes of the LRMOSP, only one vertical expansion is assumed in the system configurations (NML vertical increase capacity of 10.5 mcy).

3.11 WEST MIRAMAR LANDFILL OPERATIONS OPTIMIZATION

3.11.1 INTRODUCTION

During Phase II of the LRMOSP, a systemic approach was taken by ESD to evaluate landfill optimization methods in addition to existing measures (e.g., compaction, alternative daily cover) to optimize capacity and preserve the life of the WML.

ESD initiated a new Environmental Management Program that incorporates Standard Operating Procedures (SOPs) from ESD's International Standards Organization ISO 14001 Certification while revising SOPs to ensure operational efficiencies.

ESD has also recently hired a third-party consultant to perform a Comprehensive Operational Review to evaluate the landfill disposal and greenery operations, and provide recommendations for improvement. A brief discussion of these programs follows.

3.11.2 ENVIRONMENTAL MANAGEMENT PROGRAM

On July 31, 2002, the WML was the first municipally owned-and-operated landfill in the U.S. to successfully attain ISO 14001 Certification. The ISO (International Standards Organization) 14000 Environmental Management Standards help organizations minimize how their operations might negatively affect the environment.

The Disposal Division of the ESD developed an Environmental Management System in order to qualify for ISO 14001 Certification. ESD subsequently reviewed its operational procedures on an annual basis and continually refined its procedures and looked for ways to improve their operations.

In 2009, ESD looked at the cost/benefit associated with continuing the ISO 14001 certification versus transferring of the "essence" of the ISO 14001 program to an internal Environmental Management System. On May 21, 2010, ESD notified the auditing firm that they were officially ending the ISO 14001 certification.

ESD's new Environmental Management Program is actively being implemented internally by ESD staff. ESD has maintained all of the Standard Operation Procedures (SOPs) that were fundamental to the ISO 14001 program, while introducing several new SOPs since launching the internal program. They include, developing complete SOPs for all the operations at the Miramar Greenery, developing a brush clearing SOP that protects native species, enhances fire prevention, and removes fire hazards, and revising existing SOPs to ensure operational efficiencies are incorporated.

3.11.3 COMPREHENSIVE OPERATIONAL REVIEW (CORE)

In an effort to reduce costs, maximize landfill life, and improve the overall efficiency of the WML, ESD is in the process of performing a Comprehensive Operational Review (CORE) assessment – including the fee booth operations and an evaluation of the material handling equipment and protocols at the Miramar Greenery facility. Conducting a CORE assessment of the WML is an

important part of effective landfill management. Past experience has shown that a CORE assessment is not only a complimentary part of planning and design, but that both the design and operation are improved through this process.

Perhaps even more valuable, a CORE assessment helps lead the landfill operations beyond simply measuring current performance by setting goals for peak production and providing the means to reach them. The goal of the assessment is to work with the parameters of existing permits/design to help landfill operations function at their highest and most cost-effective potential.

3.12 ALTERNATIVE DISPOSAL OPTIONS

SYCAMORE LANDFILL (IN-COUNTY)

A Draft Environmental Impact Report (EIR) was circulated for public review in April 2008 for the proposed 47.2 million ton landfill expansion at the Sycamore Landfill which is about 8 miles from the WML. The City of San Diego subsequently certified the EIR and approved the expansion in 2008 which decision was legally challenged by the neighboring City of Santee. A Superior Court judge granted a Writ of Mandate requested by the City of Santee on August 2010. The City of Santee sought a compromise with Republic Services, Inc., who owns the site, to allow the project to move forward with additional environmental safeguards for the City of Santee residents. In November 2011, City of Santee and Republic Services, Inc. came to agreement which will allow the landfill expansion to continue with maximum landfill height of 1,050 feet (100 feet lower than originally proposed).

GREGORY CANYON LANDFILL (IN-COUNTY)

If the Gregory Canyon Landfill were to obtain all of its permits and begin operating, it could provide an additional 30.8 million tons of capacity and provide regional landfill capacity for 30 years. However, given its northern San Diego location, approximately 41 miles from West Miramar, it is not likely that the City's waste would be landfilled there while capacity is available at the Sycamore Canyon Landfill.

On May 30, 2010, the Court of Appeals of California dissolved a writ of mandate, allowing the project to proceed; however, there are several pending issues before the Gregory Canyon Landfill can begin operating, such as completion of the NEPA Environmental Impact Statement (EIS) being prepared by the Army Corps of Engineers (ACOE), and adoption of the Waste Discharge Requirements by the Regional Water Quality Control Board. The ACOE plans to issue the draft EIS for public review in mid-2012 with certification anticipated by end of 2012 and issuance of a 404 Permit thereafter. The RWQCB is planning a Board hearing in 2012 to consider the WDR's and 401 Certification for the project. The Department of Environmental Health deemed the SWFP permit application package complete and correct on February 1, 2011, CalRecycle concurred on the SWFP on July 15, 2011 and the Department of Environmental Health issued the permit on August 1, 2011.

EL SOBRANTE LANDFILL (OUT-OF-COUNTY)

The El Sobrante Landfill is located east of Interstate 15 and Temescal Canyon Road, south of the City of Corona and Cajalco Road at 10910 Dawson Canyon Road. The landfill is owned and operated by USA Waste of California, a subsidiary of Waste Management, Inc., and encompasses 1,322 acres, of which 645 acres are permitted for landfill operation. The El Sobrante Landfill is currently permitted to receive 70,000 tons of refuse per week, of which 28,000 tons are reserved for refuse generated within Riverside County and the remaining 42,000 tons is allowed for import. This waste is generated and delivered to El Sobrante from surrounding cities and counties, including San Diego, San Bernardino, Los Angeles and Orange. The landfill has a total permitted capacity of 209.91 mcy (approximately 161.6 million tons) of which approximately 64.7 million tons are reserved for in-County waste. The landfill had a remaining in-County disposal capacity of approximately 40.0 million tons as of January 1, 2009. During the last six months of 2009, the El Sobrante Landfill accepted a total of approximately 919,000 tons of waste, of which approximately 360,000 tons were generated within Riverside County. The daily average for in-County waste was 2,337 tons and 3,629 tons for out of County waste. The landfill is expected to reach capacity in approximately 2045.

There are currently seven permitted landfills in Riverside County. The only landfill in Riverside County with sufficient daily tonnage capacity and ability to receive out-of-County waste is the El Sobrante Landfill which is the closest to the Miramar Landfill at 82 miles.

3.13 FINAL RESOURCE MANAGEMENT OPTIONS

Table 3-13 shows the list of final options that were narrowed down after further evaluation in this Phase II, which were utilized in the composition of the system configurations identified in Section 4.0.

3.14 INTERCONNECTEDNESS OF SYSTEM ELEMENTS

3.14.1 PURPOSE

The purpose of this section is to qualitatively identify the interconnectedness of the City's solid waste management system's[2] elements and whether public ownership or operation of one element necessitates or advantages public ownership or operation of another.

3.14.2 BACKGROUND

Phase I of the Strategic Plan identified the following solid waste system elements.

1. Zero Waste Programs and Policies
   a) Upstream options (i.e., source reduction)
   b) Downstream options (i.e., reuse, recycling, organics diversion and education)
2. Household Hazardous Waste (HHW) Management
   a) Transfer Facility
   b) Collection Centers
3. Solid waste, recyclables and green waste collection

[2] This system is the current City system and does not consider the commercial collection system that is franchised by the City.

4. Solid Waste Transfer Stations
5. Material Recovery Facilities
6. Construction and Demolition Facilities
7. Green waste/Composting Facilities
8. Conversion Technologies
9. Landfill Facilities

From a practical standpoint there are five common and practical groupings of these elements.

1. Recyclables collection and material recovery facilities
2. Green waste collection and composting facilities
3. Solid waste collection, solid waste transfer station(s), HHW collection and landfill facilities
4. Solid waste, recyclables and green waste collection
5. Zero waste upstream and downstream education programs

The necessity for, or advantages of public or private ownership or operation are based on:

1. Environmental considerations (highest and best use of materials)
   a) Reduce
   b) Reuse
   c) Recycle and Compost
   d) Convert to beneficial use
   e) Landfill
2. Economic considerations (cost effectiveness)
3. Risks and benefits of public vs. private ownership

3.14.3 GROUPING OF ELEMENTS

Theoretically, there are a multitude of groupings of these elements. For purposes of this report, we have identified 3 broad groupings of elements that might result in complete subsystems. For reasons discussed below we have not included

solid waste, recyclables and green waste collection, and zero waste upstream and downstream education programs.

1. **Recyclables collection and material recovery facilities.** This grouping may provide some advantages (over independent elements) by focusing management on this single mission (allowing for quicker feedback from recyclables marketing, through processing, and to collection activities as well as to the generator) and more closely integrating the collection element with the processing facility (e.g., designing collection vehicles that deliver materials to the processing facility in a manner that maximizes effectiveness while minimizing contamination). This creates greater opportunities for environmental and economic benefits. An example of this is the Central Contra Costa Solid Waste Authority contract with Waste Management for residential curbside collection and processing of recyclables.

2. **Green waste collection and composting facilities[3].** This grouping may provide some advantages (over independent elements) by focusing management on this single mission (allowing for quicker feedback from green waste marketing through composting and to collection activities as well as to the generator) and more closely integrating the collection element with the processing facility (e.g., designing collection vehicles that deliver materials to the processing facility in a manner that maximizes effectiveness while minimizing contamination). This creates greater opportunities for environmental and economic benefits. An example of this is the City of San Jose's contract with GreenWaste Recovery for residential collection and composting of green waste.

3. **Solid waste collection, solid waste transfer station(s), HHHW collection and transfer centers, and landfill facilities.** This grouping may provide some advantages by focusing management on this single mission, making possible the separate management of the recyclables and green waste streams and taking advantage of the need for hazardous waste management requirements

[3] Currently food waste is not included in the composting program.

on transfer stations and landfills to provide for residential collection locations and transfer functions. This creates greater opportunities for economic benefits and contributes to the achievement of economic benefits. An example of this is the Central Contra Costa Solid Waste Authority contract with Republic for solid waste collection, transfer, and disposal.

The conversion technology element has not been included in this grouping. The co-location of the conversion technology and landfill facilities has some definite advantages over the independent operation of the two facilities (e.g., directing material to the proper facility, short distance for transport of residual material for disposal (assuming the landfill facility is properly permitted), and less disruption when the CT facility is down for scheduled or unscheduled maintenance). However, the operation of the CT facility and the landfill are typically under different organizations. An example of this is Covanta's operation of the Stanislaus Resource Recovery Facility and the County's operation of the Fink Road landfill.

4. **Solid waste, recyclables, and green waste collection.** This grouping may provide some advantages by making possible larger scales of economy (e.g., a reduced pool of standby drivers, reduced spare vehicles, reduced parts inventory), if equipment is selected with this objective. An example of this is the South Bayside (San Mateo County's) Waste Management Authority's contract with Recology for solid waste, recyclables, and green waste collection. However, given the size of the City, it may be that economies of scale can be achieved while specializing the collection as described in 1 through 3 above and optimizing the environmental benefit. An example of this is the City of San Jose's contracts with Garden City Sanitation for solid waste collection, Green Team for recyclables collection and processing, and GreenWaste Recovery for green waste collection and composting. Therefore, the groupings evaluated were limited to the 3 broad groupings above.

The **Zero Waste** element "upstream options" (i.e., source reduction) and the "downstream option" of reuse have no obvious interconnection with the other

elements. The downstream option or recycling and organics diversion and education can be included in groupings 1 and 2 above.

3.14.4 EVALUATION OF GROUPINGS FOR PUBLIC OWNERSHIP/OPERATION

The 3 groupings can be qualitatively evaluated in terms of their necessity for public or private ownership or operation based on environmental considerations, economic considerations, and risks and reward considerations.

	Scenario	Environment	Economics	Risks of Public Ownership	Rewards
1	Combined Recyclables Collection and Material Recovery Facilities	May tend to enhance diversion through a consistent focus and coordination.	Customer base is large enough to achieve economies of scale. Focus on reducing collection of contaminated loads should reduce residual disposal expense. Costs of services are cost-based (as opposed to market based).	Risks of public ownership are relatively small. Recyclables market risk might be mitigated through contracting with private company for some or all collection, processing, and brokering services.	City can implement policy and regulatory changes quickly. City may decide to improve environmental performance at a cost. City has flexibility to use City work force and or contractors. City can use competitive processes to select contractors maintaining competitive environment.
2	Combined Green Waste Collection and Composting Facilities	May tend to enhance diversion through a consistent focus and coordination.	Customer base is large enough to achieve collection economies of scale. Focus on reducing collection of contaminated loads should reduce residual disposal expense. Costs of services are cost-based (as opposed to market based).	Risks of public ownership are relatively small although, if not properly managed, composting can result in the spread of some pathogens. Compost market risk might be mitigated through contracting with private company for some or all processing and marketing services.	City can implement policy and regulatory changes quickly. City may decide to improve environmental performance at a cost. City has flexibility to use City work force and or contractors. City can use competitive processes to select contractors maintaining competitive environment.

	Scenario	Environment	Economics	Risks of Public Ownership	Rewards
3	Combined Waste Collection, Solid Waste Transfer, HHW Collection and Transfer and Landfill facilities	Allows for other waste streams to be collected by specialized work forces. Creates an incentive and ability to minimize collection and transfer of materials contaminated with hazardous materials.	Customer base is large enough to achieve collection economies of scale. Focus on reducing collection of contaminated loads should reduce residual disposal expense. Services are cost-based (as opposed to market based).	Risks of public ownership of collection and transfer facilities and equipment are relatively small. Risks of public ownership of landfill facilities are significant but manageable and cannot be entirely prevented through contracting.	City can implement policy and regulatory changes quickly. City may decide to improve environmental performance at a cost. City has flexibility to use City work force and or contractors. City can use competitive processes to select contractors maintaining competitive environment.

In general, there is no necessity for public or private ownership. Many communities with privately owned facilities are effectively implementing policy controls, enforcing regulations, and achieving their environmental goals through their municipal codes and contracts. Such methods may take relatively more time (than if the City owned and operated the services and facilities) and require negotiated compromises with contractors to do so.

The ownership by the City of hard to site and expensive infrastructure (even if operated by contractors) may help ensure lower costs and competitiveness over time, making public ownership advantageous. Generally, operation of the programs and facilities may be done in a less costly manner by private contractors (typically, due to: lower wages and benefits; lower supervisory, and general and administrative costs; more liberal work rules; and, the avoidance of "mission creep"). These advantages may be offset by higher costs of capital and profit.

3.14.5 CONCLUSION

There is the potential for an interconnection (or synergy) among some system elements. From a practical standpoint there are three common and practical groupings of these elements.

a) Recyclables collection and material recovery facilities
b) Green waste collection and composting facilities
c) Solid waste collection, solid waste transfer station(s), HHW collection, and landfill facilities

There is no necessity for public ownership or operation of these services and facilities.

Public ownership of essential hard-to-site facilities has the advantage of helping to ensure cost-based pricing of services, rather than higher market-based pricing associated with private ownership.

SECTION 4.0

POTENTIAL SYSTEM CONFIGURATIONS

4.0 POTENTIAL SYSTEM CONFIGURATIONS

4.1 INTRODUCTION

The goal of the LRMOSP is to consider short- and long-term strategies for the management of the City's municipal solid waste (MSW), including zero waste strategies, in a sustainable, safe, and cost-effective manner for the next 35 years. In order to evaluate scenarios for addressing that goal, various system configurations were proposed for Phase II.

With the goal of providing the City with economically feasible options that address the management of City resources regarding solid waste, five system configurations were developed by the Consultant Team with concurrence from the City's ESD staff and using input from the RMAC. The system configurations include a baseline system configuration plus four additional configurations that were developed based on the detailed evaluation of options in Phase II as identified in Section 3.0 and taking into consideration the screening criteria developed in Phase I of the LRMOSP.

This section provides a discussion of the system configuration development process, and a description of the five system configurations. Potential roles were also evaluated by which the City can perform the functions necessary to meet the projected demand for resource management through the policies, programs, and facilities identified in the system configurations.

4.2 SYSTEM CONFIGURATION DEVELOPMENT PROCESSS

4.2.1 BASELINE CONFIGURATION

The existing solid waste management system for the City was evaluated in Phase I of the LRMOSP. Table 4-1 provides a summary of the existing system which provides the foundation for the baseline system configuration. The baseline identifies existing zero waste programs, processing facilities, disposal sites, and

regulatory/policy issues which provide a backdrop for proposed system configurations.

4.2.2 ADDITIONAL SYSTEM CONFIGURATIONS

Once a final list of resource management options was identified the screening criteria developed in Phase I (see Section 3.1) to rank options was utilized in the development of four additional system configurations. In order to develop a weighted score based on level of importance for each criterion, City staff and RMAC members were asked to distribute 100 points across the six screening criteria at a meeting held on November 9, 2009 upon initiation of Phase II. The significance of this exercise was to apply the level of importance to each of the screening criteria and consequently to development of the system configurations based on the results of such exercise.

Results of the weighted scoring exercise from City staff and RMAC members were combined to identify level of importance from highest to lowest for which each screening criteria results are shown on Table 4-2 and are listed below:

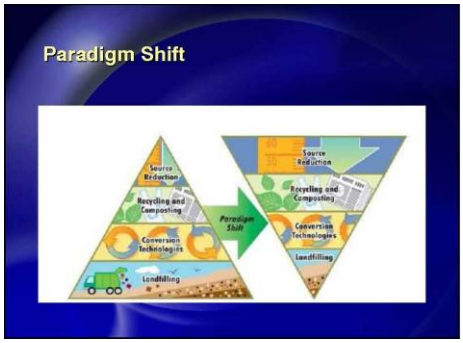
1. Sustainability (21.7%);
2. Environmental Viability (19.9%);
3. Financial Viability (18.9%);
4. Technical Viability (15.3%);
5. Capacity Optimization (14.1%); and
6. Regional Viability (10%).

The highest ranking criterion were Sustainability, Environmental Viability and Financial Viability. All three of the highest ranking criteria were utilized in the development of the system configurations. Each system configuration includes different resource management options and programs designed to meet the City's long-term resource management needs.

The following provides a description of the recommended system configurations.

4.2.3 PROPOSED SYSTEM CONFIGURATIONS

The system configurations evaluated for the LRMOSP integrate the final options recommended in Phase II (see Table 3-13) for:



- Zero Waste Programs and Policies;
- Zero Waste Infrastructure;
- Transport; and
- Miramar Landfill Capacity Optimization.

The five configurations consider the paradigm shift hierarchy from Phase I and the highest ranking criterion described in Section 4.2.2 above. Therefore, zero waste programs for source reduction, recycling and composting are a component of each configuration with three of the configurations increasing landfill capacity to improve financial viability.

CONFIGURATION 1 - BASELINE, STATUS QUO

- Continue existing zero waste programs;
- Continue Recycling and C & D Ordinances;
- Continue current landfill operations;
- Direct transport to Sycamore when capacity at Miramar is reached; and
- Direct transport to El Sobrante.

Maintain existing waste reduction, collection and diversion programs (including composting); close Miramar landfill at the end of the current permitted capacity; and, dispose of waste at alternative landfill(s) (Sycamore and El Sobrante assumed).

CONFIGURATION 2 - ZERO WASTE (Higher Sustainability)

- Configuration 1 plus:
- Zero Waste suite of programs;
- Resource Recovery Center at Miramar;
- Conversion Technology Facility Development Evaluation;

- Transfer Station at Miramar;
- Transport to expanded Sycamore Landfill when capacity at Miramar is reached;
- Transport to El Sobrante Landfill when capacity at Sycamore Landfill is reached.

Maximize waste reduction, collection and diversion through the addition of zero waste policies, programs and facilities to those currently performed; close Miramar Landfill at the end of the current permitted capacity; develop a resource recovery center; develop a transfer facility (facilities); and, dispose of waste at alternative landfill(s) (Sycamore and El Sobrante assumed).

CONFIGURATION 3 – ZERO WASTE AND NORTH and/or WEST MIRAMAR LANDFILL VERTICAL INCREASE (Higher Environmental Viability than lateral expansion options)

- Configuration 2 plus:
- North Miramar Landfill Vertical Increase; and/or
- Additional West Miramar Landfill Vertical Increase.

Maximize waste reduction, collection and diversion through the addition of zero waste policies, programs and facilities to those currently performed; develop a resource recovery center; vertically expand the capacity of North and/or West Miramar Landfill; close Miramar Landfill at the end of the potential expansion capacity; develop and operate a transfer facility (facilities); and, dispose of waste at alternative landfill(s) (Sycamore and El Sobrante assumed).

CONFIGURATION 4 – ZERO WASTE AND WEST MIRAMAR LANDFILL LATERAL EXPANSION (Higher Financial Viability due to greater capacity/additional revenue/lower tip fees than transport options)

- Configuration 2 plus:
- West Miramar Landfill Lateral Expansion A without utility corridor relocation (Configuration 4a); or

- West Miramar Landfill Lateral Expansion B with utility corridor relocation (Configuration 4b).

Maximize waste reduction, collection and diversion through the addition of zero waste policies, programs and facilities to those currently performed; develop a resource recovery center; laterally expand the capacity of West Miramar Landfill; close Miramar Landfill at the end of the potential expansion capacity; develop and operate a transfer facility (facilities); and, dispose of waste at alternative landfill(s) (Sycamore and El Sobrante assumed).

CONFIGURATION 5 - COMBINATION OF CONFIGURATIONS 3 AND 4

Maximize waste reduction, collection and diversion through the addition of zero waste policies, programs and facilities to those currently performed; develop a resource recovery center; vertically expand the capacity of North and/or West Miramar Landfill; laterally expand the capacity of West Miramar Landfill; close Miramar landfill at the end of the potential expansion capacity; develop and operate a transfer facility (facilities); and, dispose of waste at alternative landfill(s) (Sycamore or El Sobrante).

4.3 POTENTIAL CITY ROLES

4.3.1 PURPOSE

The purpose of this section is to identify potential roles by which the City can perform the functions necessary to meet the projected unmet demand for the processing and disposal of discarded materials through the alternative policies, programs, and facilities identified in Section 3.0. The objective is to determine whether a particular role (or roles) are most appropriate for the City to:

- Comply with the City Charter and other regulations;
- Establish policy and provide planning direction;
- Exert management authority (command and control) over the programs;
- Achieve short and long term economies and ensure competitiveness; and,

- Provide for its legacy obligations including, but not limited to, environmental (e.g., closure, post-closure maintenance and monitoring) and employee matters (employee retirement funding).

4.3.2 BACKGROUND

The City is faced with choosing among five alternative directions (system configurations) previously identified. The potential roles for the City must be identified in relationship to the functions to be performed. The functional programs and facilities include:

- Implementation and maintenance of Zero Waste Upstream policies and education;
- Collection of solid waste, recyclable materials, and green waste;
- Operation of existing material diversion programs;
- Implementation and operation of additional Zero Waste Downstream policies, programs, and facilities (e.g., transfer station/MRF);
- Implementation and operation of material recovery facilities;
- Operation of existing Greenery processing facilities;
- Development and operation of C&D processing facilities;
- Development and operation of material transfer facilities; and
- Expansion and operation of landfill disposal facility.

With regard to each of these functions, the City can perform one of the following four roles:

- Own the facilities and equipment and operate the programs and facilities related to the functions;
- Own the facilities and contract for the operation of the programs and facilities related to the functions;
- Regulate (including exclusive/non-exclusive franchises and permit systems) the functions; or
- Set policy (through resolutions and ordinances) regarding the functions and rely on the unregulated open market for performance of the function.

To evaluate each of these four possible roles, we considered the ability of the City to:

- Comply with the City Charter and other regulations;
- Establish policy and provide planning direction;
- Exert management authority (command and control) over the programs;
- Achieve short and long term economies and ensure competitiveness; and
- Provide for its legacy obligations including, but not limited to, environmental (landfill post-closure management and monitoring) and employee (retirement-related) matters.

4.3.3 DESCRIPTION OF ALTERNATIVE ROLES BY FUNCTION

For each function, the following summarizes the analysis of the different roles using the evaluation criteria. This is followed by a brief narrative.

Zero Waste Upstream Policies and Education

	Control/ Operate	Control/ Contract	Regulate through Franchise/Permit	Set Policy/ Privatize
Compliance	Not aware of any Charter or regulatory requirements for Zero Waste.			
Policy Direction	City policy can direct operations at a detailed level.	City policy can direct operations, subject to contractual/regulatory limitations.		City ordinances can require programs at a high level subject to legal authority.
Command and Control	Maximizes City's command and control over management and operations.	City authority may be limited by contract and operational decision making would be delegated to contractor. Under certain conditions, the City could replace the contractor	City authority may be more limited than in the contract scenario by the franchise agreement and managerial decision making regarding the means and methods of performance would be delegated to franchisee.	City would have no command and control authority over the means and methods of performance.

	Control/ Operate	Control/ Contract	Regulate through Franchise/Permit	Set Policy/ Privatize
Economies and Competitiveness	If maintenance effort justifies a full-time position, and one can be recruited with appropriate skills, this may be more cost effective than typically higher hourly costs of contractor.	If maintenance effort does not justify a full-time position, or if special skills are needed, the contractor arrangement may be more cost effective.	These functions could be required of a regulated company although their performance may be limited to the achievement of creation minimum standards.	There are no significant market forces related to these functions.
Legacy Obligations	There is little risk of environmental legacy obligations and an immaterial risk of employee related obligations from zero waste upstream programs.			

Findings

Although interest groups (e.g., Zero Waste San Diego) help guide public opinion regarding this function, sufficient economic incentives do not currently exist for comprehensive and consistent performance of Zero Waste Upstream program and education functions. Therefore, a purely policy role would not be effective. This function is relatively inexpensive with small legacy obligations and is a policy-related matter where close direction of activities and control over the performance of this function (exemplified by City operation or contracting) is most appropriate.

Collection of Solid Waste, Recyclable Materials and Green Waste

	Control/ Operate	Control/ Contract	Regulate through Franchise/Permit	Set Policy/ Privatize
Compliance	Helps fulfill compliance obligations.			May not comply with Charter obligation (e.g., the "Peoples Ordinance").
Policy Direction	City policy can direct operations at a detailed level.	City policy can direct operations, subject to contractual limitations.	City policy can direct operations, subject to regulatory requirements.	City policy can require programs at a high level, subject to legal authority.

	Control/ Operate	Control/ Contract	Regulate through Franchise/Permit	Set Policy/ Privatize
Command and Control	Maximizes City's command and control over management and operations.	City authority may be limited by contract and operational decision making would be delegated to contractor. Under certain conditions, the City could replace the Contractor	City authority may be more limited than in the contract scenario by the regulatory agreement and managerial decision making would be delegated to the regulated company.	City would have no command and control authority over the means and methods of performance.
Economies and Competitiveness	Savings from lower public costs of capital and profit may be offset by higher costs for compensation and work rules.	Private companies' savings from lower compensation and work rules may be offset by higher costs of capital and profit.		Since multiple companies would be operating in the same areas of the City there would be inefficiencies (e.g., different company trucks on the same street) and pricing would be inconsistent and may not be competitive.
Legacy Obligations	There is modest risk of environmental legacy obligations resulting from the unintended collection of hazardous materials. There are long-term employee legacy obligations related to workers compensation and retirement benefits.	There is modest risk of environmental legacy obligations resulting from the unintended collection of hazardous materials, however the City may obtain indemnification from the private company. Long-term employee obligations related to workers compensation and retirement benefits (except for past City employees) are shifted to the private company.		City may have little or no ability to require and enforce proper operational requirements to prevent environmental legacy obligations, although City's lack of involvement may protect it from legally having to assume any such obligations.

Findings

Economic incentives exist for performing these functions in an open market, non-regulated environment. However, such arrangements are typically not cost effective (several companies sending collection vehicles on the same street), consistent in customer charges (customers receiving the same level of service may pay different rates), or competitive (where a few companies are able to informally set rates and apportion service districts). The City could ensure the cost effectiveness consistency and competitiveness of charges through operating, contracting for operation, or regulating the operation of these functions. The City may improve the non-economic results of these services (e.g., higher diversion and customer service) if it were to operate these functions because it could direct the management and control the performance of the functions, rather than contracting for or regulating them.

Maintenance of Existing Waste Diversion Programs

<table>
<tr><th></th><th>Control/ Operate</th><th>Control/ Contract</th><th>Regulate through Franchise/Permit</th><th>Set Policy/ Privatize</th></tr>
<tr><td>Compliance</td><td colspan="3">Helps fulfill compliance obligations.</td><td>It may be difficult for the City to meet its AB 939 compliance obligations without City financial support of diversion programs through operation, contracting or regulation of the programs.</td></tr>
<tr><td>Policy Direction</td><td>City policy can direct operations at a detailed level.</td><td colspan="2">City policy can direct operations, subject to contractual limitations.</td><td>City policy would be subject to legal and economic constraints.</td></tr>
<tr><td>Command and Control</td><td>Maximizes City's command and control over management and operations.</td><td>City authority may be limited by contract and operational decision making would be delegated to contractor. Under certain conditions, the City could replace the contractor</td><td>City authority may be more limited than in the contract scenario by the regulatory authority. Managerial decision making would be delegated to the regulated company.</td><td>City would have no command and control authority over operations.</td></tr>
</table>

	Control/ Operate	Control/ Contract	Regulate through Franchise/Permit	Set Policy/ Privatize
Economies and Competitiveness	The City's lower costs of capital and profit may be offset by the private sectors lower compensation and more favorable work rules.	Private companies' savings from lower compensation and work rules may be offset by higher costs of capital and profit.	Private companies' savings from lower compensation and work rules may be offset by higher costs of capital combined and profit.	Since multiple companies might be operating in the same areas there may be a loss of efficiency..
Legacy Obligations	There is little risk of environmental legacy obligations from waste diversion programs; however, there are long-term employee legacy obligations related to workers compensation and retirement benefits.	There is little risk of environmental legacy obligations from waste diversion programs. Certain contractor indemnifications could reduce the City's exposure. Long-term employee obligations related to workers compensation and retirement benefits (except for past City employees) are shifted to the private company		There is little risk of environmental legacy obligations from waste diversion programs, and employee-related legacy obligations may be avoided through this open market approach.

Findings

Economic incentives for the performance of waste diversion program functions do not always favor diversion of materials over disposal, within the open market condition resulting from the City assuming a Policy only role; therefore, a purely policy role for the City would not be effective. The City could better balance its diversion and economic objectives through operating or contracting for operation of the necessary facilities or regulating this function.

Zero Waste Downstream Policies, Programs, and Facilities

	Control/ Operate	Control/ Contract	Regulate through Franchise/Permit	Set Policy/ Privatize
Compliance	Not aware of any Charter or regulatory requirements for Zero Waste.			
Policy Direction	City policy can direct operations at a detailed level.	City policy can direct operations, subject to contractual limitations.		City policy would be subject to legal and economic constraints.

	Control/ Operate	Control/ Contract	Regulate through Franchise/Permit	Set Policy/ Privatize
Command and Control	Maximizes City's command and control over management and operations.	City authority may be limited by contract, and operational decision making would be delegated to contractor. Under certain conditions, the	City authority may be more limited than in the contract scenario by the regulatory authority, and managerial decision making would be delegated to the regulated company.	City would have no command and control authority.
Economies and Competitiveness	The City's lower costs of capital and profit may be offset by the private sectors lower compensation and more favorable work rules.	Private companies' savings from lower compensation and work rules may be offset by higher costs of capital and profit.		Since multiple companies might be operating in the same areas there may be a loss of efficiency
Legacy Obligations	There is little risk of environmental legacy obligations from waste diversion programs; however, there are long-term employee legacy obligations related to workers compensation and retirement benefits.	There is little risk of legacy obligations from well run Zero Waste Downstream operations. Certain contractor indemnifications could reduce the City's exposure. . Long-term employee obligations related to workers compensation and retirement benefits (except for past City employees) are shifted to the private company		There is little risk of environmental legacy obligations from waste diversion programs, and employee-related legacy obligations may be avoided through this open market approach.

Findings

Economic incentives for the performance of waste diversion program functions do not always favor diversion of materials over disposal, within the open market condition resulting from the City assuming a Policy only role. Therefore, a purely policy role for the City would not be effective. The City could better balance its diversion and economic objectives through operating or contracting for operation of the necessary facilities or regulating this function.

Operation of Existing Organic Processing Facilities

	Control/ Operate	Control/ Contract	Regulate through Franchise/Permit	Set Policy/ Privatize
Compliance	Helps fulfill compliance obligations, as part of AB 939.			It may be difficult for the City to meet its AB 939 compliance obligations, without City financial support, through contracting or regulation.
Policy Direction	City policy can direct operations at a detailed level.	City policy can direct operations, subject to contractual limitations.		City policy would be subject to legal and economic constraints.
Command and Control	Maximizes City's command and control over management and operations.	City authority may be limited by contract and operational decision making would be delegated to contractor. Under certain conditions, the City could replace the contractor	City authority may be more limited than in the contract scenario by the regulatory authority and managerial decision making would be delegated to the regulated company.	City would have no command and control authority.
Economies and Competitiveness	The City's lower costs of capital and profit may be offset by the private sectors lower compensation and more favorable work rules.	Private companies' savings from lower compensation and work rules may be offset by higher costs of capital and profit.		Since multiple companies might be operating in the same areas there may be a loss of efficiency.

	Control/ Operate	Control/ Contract	Regulate through Franchise/Permit	Set Policy/ Privatize
Legacy Obligations	There is little risk of legacy obligations from well run composting operations; however, there is a risk of pathogens entering the food stream from poorly planned and operated composting programs.	There is little risk of legacy obligations from well run composting operations; however, there is a risk of pathogens entering the food stream from poorly planned and operated composting programs. Certain contractor indemnifications could reduce the City's exposure. Long-term employee obligations related to workers compensation and retirement benefits (except for past City employees) are shifted to the private company		There is little risk of legacy obligations from well run composting operations; however, there is a risk of pathogens entering the food stream from poorly planned and managed composting programs. Because of lack of City involvement, it may be protected from such risks.

Findings

Economic incentives for the performance of organic diversion program functions rarely if ever favor diversion of materials over disposal, within the open market condition resulting from the City assuming a Policy only role. Therefore, a purely policy role for the City would not be effective. The City could better balance its diversion and economic objectives through operating or contracting for operation of the necessary facilities or regulating this function.

Development and Operation of C&D Processing Facilities

	Control/ Operate	Control/ Contract	Regulate through Franchise/Permit	Set Policy/ Privatize
Compliance	May fulfill compliance obligations as part of AB 939.			It may be difficult for the City to meet its AB 939 compliance obligations without contracting or regulation.
Policy Direction	City policy can direct operations at a detailed level.	City policy can direct operations, subject to contractual limitations.		City policy can require or incentivize programs at a high level, subject to legal authority.

Command and Control	Maximizes City's command and control over management and operations.	City authority may be limited by contract, and operational decision making would be delegated to contractor. Under certain conditions, the City could replace the contractor	City authority may be more limited than in the contract scenario by the regulatory authority, and managerial decision making would be delegated to the regulated company.	City would have no command and control authority.
Economies and Competitiveness	City compensation and work rules may result in higher direct costs than private companies, although such costs can be offset by lower costs of capital and profit.	Private companies may have lower compensation and work rules that result in lower direct costs than public operations, although these can be offset by higher costs of capital and profit.		City may have little or no ability to ensure the establishment of such facilities or the economy of operations and competitiveness of costs.
Legacy Obligations	There is little risk of environmental legacy obligations from C&D diversion programs; however, there are long-term employee legacy obligations related to workers compensation and retirement benefits.	There is little risk of legacy obligations from well run C&D operations. Certain contractor indemnifications could reduce the City's exposure. Long-term employee obligations related to workers compensation and retirement benefits (except for past City employees) are shifted to the private company		There is little risk of environmental legacy obligations from C&D diversion programs, and employee-related legacy obligations may be avoided through this open market approach.

Findings

Economic incentives for the performance of C&D diversion program functions rarely if ever favor diversion of materials over disposal; therefore, a purely policy role would not be effective. The City could facilitate achieving its economic objectives through owning and operating/contract for operation, contracting or regulating this function. While most cities which are smaller than San Diego benefit from economies of scale of privately owned and operated facilities, the City of San Diego's size makes a dedicated facility quiet cost effective. Such a dedicated facility, if owned by the City would allow for greater policy direction and command and control ability.

Development and Operation of Material Recovery and Transfer Facilities (Miramar Material Recovery Facility (MRF)/Transfer Station)

	Control/ Operate	Control/ Contract	Regulate through Franchise/ Permit	Set Policy/ Privatize
Compliance	There are no specific compliance obligations related to MRF/Transfer Station facilities; however, they may be essential to satisfaction of expected "Mandatory Commercial Recycling" requirements of the Air Resources Board.			
Policy Direction	City policy can direct operations at a detailed level.	City policy can direct operations, subject to contractual limitations.		City policy can require or incentivize programs at a high level, subject to legal authority.
Command and Control	Maximizes City's command and control over management and operations.	City authority may be limited by contract and operational decision making would be delegated to contractor. Under certain conditions, the City could replace the contractor		City would have no command and control authority.
Economies and Competitiveness	City compensation and work rules may result in higher direct costs than private companies, although such savings can be offset by lower costs of capital and profit.	Private companies may have lower compensation and work rules that result in lower direct costs than public operations, although these can be offset by higher costs of capital and profit.		City may have little or no ability to ensure the establishment of such facilities or the economy of operations and competitiveness of costs.
Legacy Obligations	There is little risk of environmental legacy obligations from MRF and transfer station facilities; however, there are long-term employee legacy obligations related to workers compensation and retirement benefits.	There is little risk of environmental legacy obligations from MRF and transfer station facilities. Certain contractor indemnifications could reduce the City's exposure. Long-term employee obligations related to workers compensation and retirement benefits (except for past City employees) are shifted to the private company		There is little risk of environmental legacy obligations from MRF and transfer station facilities, and employee-related legacy obligations may be avoided through this open market approach.

Findings

While economic incentives exist for developing and operating MRF/Transfer Station facilities in a open market environment, the City could not ensure the cost-effectiveness, competiveness or capacity of operations if it assumed a purely policy role. The City could facilitate such economic objectives through owning

and operating or contracting for operation of the facilities or regulating this function.

Expansion and Operation of Landfill Disposal Facility

	Control/ Operate	Control/ Contract	Regulate through Franchise/ Permit	Set Policy/ Privatize
Compliance	Fulfills compliance obligations.			
Policy Direction	City policy can direct operations at a detailed level.	City policy can direct operations, subject to contractual limitations.		City policy can require programs at a high level subject to legal authority.
Command and Control	Maximizes City's command and control over management and operations.	City authority may be limited by contract, and operational decision making would be delegated to contractor. Under certain conditions, the City could replace the contractor	City authority may be more limited than in the contract scenario by the franchise agreement, and managerial decision making would be delegated to franchisee.	City would have no command and control authority.
Economies and Competitiveness	City compensation and work rules may result in higher direct costs than private companies, although such savings can be offset by private companies' higher costs of capital and profit.	Private companies may have lower compensation and work rules. Economies of scale may result in lower direct costs than public operations, although these can be offset by higher costs of capital and profit.		City may have little or no ability to ensure the establishment of such facilities or the economy of operations and competitiveness of costs.
Legacy Obligations	Landfills have significant legacy obligations resulting from operations, closure, and post-closure maintenance operations. There are also long-term employee legacy obligations related to workers compensation and retirement benefits.	Landfills have significant legacy obligations resulting from operations, closure, and post-closure maintenance operations. Indemnifications can be obtained from contractors to reduce the City's exposure. Long-term employee obligations related to workers compensation and retirement benefits (except for past City employees) are shifted to the private company		Landfills have significant legacy obligations resulting from operations, closure, and post-closure maintenance operations. Had the City never operated, contracted for, or directed waste to landfills, it may have been able to avoid the risk of such obligations. employee-related legacy obligations may be avoided through this open market approach.

Findings

While economic incentives exist for developing and operating landfill facilities in an open market environment, the City could not ensure the cost-effectiveness or competiveness of operations if it assumed a purely policy role in this function. The City could ensure the cost-effectiveness and competiveness of this function through owning and contracting or regulating this function.

4.3.4 CONCLUSION

Based on the analyses presented in Section 4.3.3, the following general conclusions are instructive:

1. With regard to Solid Waste Collection, Transfer and Disposal Functions:
   Economic incentives exist for performing these functions in an open market, non-regulated environment. However, such arrangements are typically not cost effective (several companies sending collection vehicles on the same street), consistent in customer charges (customers receiving the same level of service may pay different rates), or competitive (where a few companies are able to informally set rates and apportion service districts). The City could ensure the cost effectiveness, consistency and competitiveness of charges through operating, contracting for operation, or regulating the operation of these functions. The City may improve the non-economic results of these services (e.g., higher diversion and customer service) if it were to operate these functions because it could direct the management and control the performance of the functions, rather than contracting for or regulating them.

2. With regard to Zero Waste Upstream Functions:

   Although interest groups (e.g., Zero Waste San Diego) help guide public opinion regarding this function, sufficient economic incentives do not exist for comprehensive and consistent performance of Zero Waste upstream program functions. Therefore, a pure policy role would not be effective. This function is relatively inexpensive with small legacy obligations and is a policy-related matter where close direction of activities and control over the

performance of this function (exemplified by City operation or contracting) is most appropriate.

3. With regard to Existing Waste Diversion and future Zero Waste Downstream Programs:

   Economic incentives for the performance of waste diversion program functions fluctuate and do not consistently and comprehensively favor diversion of materials over disposal alternatives. Therefore, a pure policy role for the City would not be effective. The City could facilitate achieving favorable comprehensive and consistent incentives for diversion through owning facilities and operating programs, owning facilities and contracting for their operation, or regulating this function. It's ownership of facilities and operation of programs (or contracting for operation of programs) would result in the most prompt and complete responsiveness to City policy direction and control of operations.

SECTION 5.0

FINANCIAL ANALYSIS

5.0 FINANCIAL ANALYSIS

5.1 INTRODUCTION

As part of Phase II, Consultant Team member HF&H Consultants and ESD staff prepared annual financial projections for the Refuse Disposal and Recycling Funds through June 30, 2045. In order to provide a road map to better understand these financial projections, this Financial Analysis section includes the following:

- Description and summary of the fees collected at the Miramar Landfill Fee Booths (Section 5.2)
- Description of the "System Configurations" used for the analysis and the assumptions used to generate the projections (Section 5.3)
- Summary of the Refuse Disposal Fund Sources and Uses of the Funds (Section 5.4.1.1)
- Summary of the cumulative financial projections of the Refuse Disposal Fund over the projected 10, 20 and 35 year periods (Section 5.4.1)
- Summary of cumulative waste quantities and the relative cost per ton to dispose and/or divert waste (Section 5.4.1)
- Summary of the Recycling Fund Sources and Uses of Funds over the projected 10, 20 and 35 years (Sections 5.4.2 and 5.4.2)
- Summary of the cumulative financial projections for the Recycling Fund (Section 5.4.2)
- Summary of projected disposal and recycling rate increases for City departments (Section 5.5)

As discussed in previous sections, future options and projections include the potential for expanding the WML and re-permitting and expanding the NML. For the purposes of future fees and operations discussed in this section, "Miramar Landfill" is used to describe both WML and NML.

5.2 MIRAMAR LANDFILL DISPOSAL FEES

In FY 2011, nearly $50M in waste disposal related revenue was collected at Miramar. These revenues benefitted the City's General Fund ($13M), Refuse Disposal Fund ($28.7M; RDF), and Recycling Fund ($12M; RF). Each Refuse Disposal Fee assessed on a given transaction is composed of up to three components, each associated with one of these funds. All refuse disposal fees contain a Disposal Tipping Fee and an AB939 Fee component. Depending on certain customer criteria and other variables, the Refuse Disposal Fee will also contain either a Refuse Collector Business Tax or a Franchise Fee component.

In addition to the Refuse Disposal Fee, the Miramar Landfill has a Construction and Demolition (C&D) Disposal Fee. The C&D Disposal Fee contains the same components as the Refuse Disposal Fee. The difference is that for all loads designated as C&D loads, the Disposal Tipping Fee is multiplied by 2.75 to calculate the C&D Tipping Fee, which is then added to the other appropriate Refuse/C&D Disposal Fee elements to calculate the total C&D Disposal Fee.

Table 5-1 summarizes the Miramar Landfill Refuse/C&D Disposal Fees and their component parts.

5.3 SYSTEM CONFIGURATIONS

The following system configurations, discussed in detail in Section 4 of this report, are used for the financial projections of the Refuse Disposal and Recycling Funds:

1. Status Quo/Transfer Station;
2. Zero Waste Programs/Transfer Station;
3. Zero Waste Programs/Transfer Station/NML Vertical Increase;

4a. Zero Waste Programs/Transfer Station/WML Lateral Expansion (without utility corridor relocation);

4b. Zero Waste Programs/Transfer Station/WML Lateral Expansion (with utility corridor relocation); and,

5. Zero Waste Programs/Transfer Station/NML Vertical Increase; WML Lateral Expansion (with utility corridor relocation).

The key assumptions used in the System Configuration projections are described in Table 5-2.

It is important to keep in mind that while the assumptions used to develop the configurations are a "snapshot in time" for this report, in reality they are in constant flux. As such, the assumptions should only be considered for discussion purposes. This becomes more relevant due to the timeframe of the projections, which are through FY 2045. There is more inherent variability to the projections in the long term than in the short term.

5.4 FINANCIAL ANALYSIS OF SYSTEM CONFIGURATIONS

The following sections analyze the system configurations for the Refuse Disposal Fund (5.4.1) and the Recycling Fund (5.4.2).

It is critical to keep in mind that the fiscal analyses are focused on the direct impacts to the RDF and RF. Each system configuration has its own unique set of secondary impacts to the General Fund, other City departments/funds, and all other Miramar Landfill stakeholders. Identifying the nuances and details of these indirect impacts in some or all of the system configurations will require additional analysis.

5.4.1 REFUSE DISPOSAL FUND

SOURCES OF FUNDS

The following table presents the Refuse Disposal Fund's revenue sources. As shown, approximately 83% ($23.7M) of the total FY 2011 budgeted RDF revenues are from Disposal Tipping Fees.

Refuse Disposal Fund Revenue	
Revenue Sources	**FY 2011 Budget**
Disposal Tip Fees – City Dept. Collected Materials	$8.8M
Disposal Tip Fees – Commercial Franchisee Collected Materials	$8.7M
Disposal Tip Fees – Non-Franchised Haulers	$6.2M
Miramar Greenery Tip Fees	$1.7M
Interest	$1.3M
Lease Payment from the General Fund	$0.8M
Field Operations Services Provided to Other City Departments	$0.5M
Miramar Greenery Commodity Sales	$0.4M
Other	$0.3M
Total	$28.7M

USES OF FUNDS

As shown in the table entitled "Uses of the Refuse Disposal Fund", only 54% ($20.8M) of the RDF's annual expenses are related to the WML operations, while 83% of the RDF's revenues come from disposal tip fees. Uses of funds that are 100% attributable to West Miramar Landfill operations are noted with a single asterisk (*) and uses of funds that are split between WML operations and related off-site operations are noted with double asterisks (**).

Uses of the Refuse Disposal Fund	
Uses of Funds	**FY 2011 Budget**
West Miramar Landfill Disposal Operations*	$13.9M
FY 11 Capital Budget – Disposal Operations*	$2.1M
Fees Paid to Regulatory Agencies*	$1.5M
Transfer to Landfill Closure/Post Closure Reserve*	$1.4M
Field Operations[1]	$3.5M
Miramar Greenery	$2.8M
Closed Landfills and Burn Sites	$2.6M
FY 11 Capital Budget – Other RDF Functions[2]	$2.3M
Solid Waste Code Enforcement	$1.6M
Street Litter Container Collection	$1.5M
Commercial Recycling Ordinance and C&D Recycling Ordinance Administration	$1.4M
Office of the Director (Planning & Administration)**	$2.2M

Transfer to General Fund for General Government Services Billing[3]**	$1.1M
Contribution to Appropriated Reserves**	$0.9M
Total	$38.8M

Notes:

[1] Field Operations employees are responsible for ensuring the health and safety of San Diego residents and visitors by conducting illegal dump, litter, and transient encampment abatements; community cleanups; and dead animal collection from approximately 3,000 miles of City streets and rights-of-way; and for providing a variety of beneficial billable services to other City departments.

[2] Examples of RDF CIPs that are unrelated to Miramar Landfill Disposal Operations include, but are not limited to, closed landfill cover and drainage improvements and landfill gas collection system upgrades.

[3] General Government Services are centralized City departments budgeted in the General Fund that provide services to all City departments/funds. Examples include City Attorney, City Comptroller, Financial Management, Mayor's Office, and City Council. All non-General Fund funds/departments annually transfer to the General Fund an apportioned amount of the total costs of these centralized functions.

PROJECTED CUMULATIVE NET REVENUES/EXPENSES

Table 5-3 presents the key financial data and cumulative net revenues (expenses) for the Refuse Disposal Fund for each of the six system configurations.

Assuming no increase in disposal rates at Miramar Landfill; under all configurations the Refuse Disposal Fund would have a cumulative net loss from operations in the near (5 years), intermediate (10 years) and long term (more than 10 years), ranging from $528.7M (Configuration 1) to $731.9M (Configuration 5). While Configuration 5 has the highest cumulative net loss through 2045, it has the fewest years of incurring the additional costs associated with the transfer and transport of tonnage, and revenue streams are maintained for the longest period of time. The additional costs associated with transfer and transport of waste after Miramar closes in 2021 is not reflected in Configuration 1 since it is a General Fund cost, (further explanation below). The expansion of West Miramar and North Miramar Landfill in Configuration 5 would create significant additional capacity and revenue streams would be maintained for the longest period of time.

The appearance that Configuration 1 is the least expensive option warrants an explanation. In Configuration 1 the RDF is financing the disposal of waste through the anticipated closure of Miramar Landfill in 2021. In contrast, with Configuration 5 Miramar Landfill remains open through 2036. Tipping fees are assumed to remain at current levels while Miramar Landfill remains open, with revenue increases based solely on the anticipated increases in disposed tonnage. Costs are also assumed to increase, but at a faster rate than disposed tonnage. Additionally, in Configuration 5 there are new costs associated with expanding the landfill and constructing and operating a Resource Recovery Center for 31 years, and lost disposal based revenues from the City's Zero Waste Programs, none of which are aspects of Configuration 1.

Furthermore, the cumulative net revenues (expenses) captured in Table 5-3 represent the fiscal impact to the RDF only. The Configuration 1 costs to the General Fund and other stakeholders of directly hauling waste to other local, but private sector landfills beginning in 2022 (e.g. Sycamore and Otay Landfills), and upon their closure, to more distant regional private sector landfills beginning in 2026 (e.g. El Sobrante) will be significantly higher than the Configuration 5 costs for these stakeholders. This can be seen, in part, by comparing the current Refuse Disposal Tip Fees at Miramar, which range from $21/ton to $36/ton, with the current disposal fees at Sycamore and Otay, which are both $65.50/ton. The higher transportation costs associated with hauling waste to these landfills will make the cost differential, hence the benefit of keeping Miramar Landfill open as long as possible, even greater.

PROJECTED WASTE QUANTITIES AND COST PER CUMULATIVE TON

Table 5-4 presents the cumulative projected waste quantities and costs per ton of diverted and disposed of waste for the Refuse Disposal Fund for each of the six configurations.

Configuration 1 depicts a scenario in which revenues are eliminated upon the closure of Miramar Landfill. Configurations 2 – 5 depict varying scenarios in which Disposal Tip Fees from a transfer station generate sufficient revenues to cover the costs associated with operating the transfer station and transporting and disposing of waste material at a final disposal or processing destination.

By combining tonnage projections with financial projections, a somewhat clearer picture emerges than when considering the finances alone. Even though Configuration 1 has the lowest net cumulative expenditures (Table 5-3), it has the highest net expenditures per ton (Table 5-4) at $24/ton by 2045 versus $15 to $17/ton by 2045 for Configurations 2 through 5.

All else being equal, the configuration with the lowest net expenditures per ton would be the optimal configuration. However, all else is not equal. While Configurations 2 – 4 have slightly better net expenditures per ton values than Configuration 5, Miramar Landfill closes sooner and out of county transport and disposal of waste commences sooner than in Configuration 5. This means that Configuration 5 would result in the lowest cost increase to the General Fund and other stakeholders through 2045.

5.4.2 RECYCLING FUND

SOURCES OF FUNDS

As shown in the following table, 69% ($12.6M) of the Recycling Fund's annual revenue comes from AB 939 fee collected either as part of the Refuse Disposal Fee at Miramar Landfill or collected via quarterly invoicing of the City's Collections Division and of franchised waste haulers for all waste collected within the City of San Diego, regardless of the final destination of the material. At the time Miramar Landfill reaches its full capacity and no longer accepts waste, the Recycling Fund will only receive AB 939 fee revenues from the City-collected materials and Commercial Franchisee-collected materials. This will result in a loss of approximately 16% ($2M) of annual AB 939 fee revenues.

Recycling Fund Revenue	
Revenue Sources	**FY 2011 Budget**
AB939 Fees – Commercial Franchisee Collected Materials	$6.8M
Commodity Revenues	$4.0M
AB939 Fees – City-Collected Materials	$3.8M
AB939 Fees – Non-Franchised Haulers	$1.3M
Service Level Agreement with other City Departments for Household Hazardous Waste Management	$0.9M
AB939 Fees – Transfer from RDF for Fee Exempt/Navy tons	$0.7M
Used Oil Block Grant	$0.3M
Interest	$0.3M
Other	$0.3M
Total	$18.4M

USES OF FUNDS

As shown in the "Uses of the Recycling Fund" table that follows, the collection of curbside recyclable materials and green waste is approximately 70% ($13.8M) of the Recycling Fund's annual budget.

Uses of the Recycling Fund	
Uses of Funds	**FY 2011 Budget**
Curbside Recycling and Green Waste Collection	$13.8M
Household Hazardous Waste Services Program	$1.7M
Additional Zero Waste Programs	$1.6M
Office of the Director	$1.4M
Transfer to the General Fund for General Government Services Billing[1]	$0.7M
Contribution to Appropriated Reserves	$0.5M
Total	$19.7M

Notes:

[1] General Government Services are centralized City departments budgeted in the General Fund that provide services to all City departments/funds. Examples include City Attorney, City Comptroller, Financial Management, Mayor's Office, and City Council. All Non-General Fund

departments/funds annually transfer to the General Fund an apportioned amount of the total cost of these centralized functions.

PROJECTED CUMULATIVE NET REVENUES (EXPENSES) FROM OPERATIONS

Table 5-5 presents the key financial data and cumulative net revenues (expenses) for the Recycling Fund for each of the LRMOSP configurations.

Assuming no increase in AB 939 fees at Miramar Landfill; under all configurations the Recycling Fund would have a cumulative net loss from operations in the near (5 years), intermediate (10 years) and long term (more than 10 years), ranging from $176.9M (Configuration 5) to $247.5M (Configuration 2). Configuration 5 has the least cumulative net loss through 2045.

Furthermore, the cumulative net revenues (expenses) captured in Table 5-5 represent the fiscal impact to the Recycling Fund only. The AB939 fees paid by the General Fund, once Miramar Landfill closes, will not increase as a result of directly hauling waste to other local, but private sector landfills beginning in 2022, since the fees are based on where the waste was generated.

5.5 RATE INCREASE SCENARIOS

5.5.1 REFUSE DISPOSAL FUND

In order to achieve a zero net loss for RDF operations, assuming the actions of Configuration 5 and conservatively assuming no significant operational savings or new expenditures, various increases to the Refuse Disposal fees would be necessary throughout the next 30 years assuming no other sources of revenue.

The following table shows a rate increase scenario for Configuration 5, which achieves a cumulative zero net loss for the period 2013 - 2045. This scenario has a larger increase occurring at the beginning of each change in the method of handling waste materials delivered to Miramar Landfill followed by a steady increase mirroring anticipated inflation.

These disposal fee increases would result in additional charges to the City's General Fund for the disposal of material collected by the City of approximately $1.3 million in the year the initial increase becomes effective, and up to $498 million over the end of the projection period ending in 2045.

Refuse Disposal Fund Rate Increase Scenario for City Departments (Configuration 5) 2013-2045					
Time Period/ Event	**Initial % Rate Increase**	**Estimated Tip Fee for City Dept Tons**	**Year Increase Adopted**	**Annual % Rate Increase**	**Years of Annual Increase**
Miramar Landfill Accepting Waste	15%	$24.15	2013	2.36%	2014 - 2036
Transfer Station at Miramar (tonnage to Sycamore Landfill)	77%	$71.81	2037	2.36%	2038 - 2042
Transfer Station at Miramar (tonnage out of County)	76%	$142.02	2043	2.36%	2044 - 2045

The costs of continuing operations are anticipated to increase over time. The Refuse Disposal Fund is currently operating with expenditures exceeding revenues. The shortfall in current revenues is being made up from the fund balance accumulated during the time when significantly higher annual tonnages (1.2 - 1.5 million tons per year) and revenues were received. In order to maintain a positive cash flow in the future, additional revenues, or delays in capital projects will need to be initiated and implemented. The longer the delay in initiating fee increases, the more significant the fee increases will be.

Alternatively to disposal fee increases, (or in combination with lower disposal fee increases affecting the General Fund), the City could consider the following options:

- Evaluate the economic effect (reduction in operating expense and delay of capital expenditures) of limiting the disposal of materials from current

customers by accepting only materials generated within City limits and currently agreed upon Navy generated materials (approximately 90% of the current material disposal stream) and thereby extend the life of the Miramar Landfill.

- Evaluate the economic effect (reduction in operating expense and delay of capital expenditures) of limiting the disposal of materials from current customers by accepting only City-collected materials and Navy generated materials (approximately 46% of the current material disposal stream) and thereby extend the life of the Miramar Landfill.
- Negotiate waste delivery agreements with other cities (or their exclusive franchise) for the disposal of materials at rates advantageous to both parties. Because these rates would be for services provided and would be negotiated and not imposed, they are believed to be exempt from the provisions of Propositions 218 and 26; however, a legal analysis would be required.
- Find alternative funding sources for non-disposal related activities of the fund (closed/inactive landfill monitoring and maintenance, community clean-ups, street litter collection, illegal dump abatements, etc.) which currently amounts to $9.3 million annually.
- Implement a Flow Control Ordinance that would require materials generated in the City to come to a City-designated facility such as the City's landfill or transfer facility. This could theoretically reduce the per ton operating costs while increasing revenues. A flow control option would require legal analysis.
- Reduce or eliminate community clean-ups, street litter collection, and illegal dump abatement services provided to the public.

It was found that, except for the transfer station, debt financing of the capital costs of the facilities was not cost effective because of the small amount of additional capacity the landfill expansions and other projects provided.

5.5.2 RECYCLING FUND

The Recycling Fund has a net cumulative gain from operations in the short and intermediate terms but a net loss from operations in the long term under all configurations.

Recycling Fund Rate Increase Scenario for City Departments (Configuration 5) 2013-2045					
Time Period/Event	**Initial % Rate Increase**	**Estimated AB 939 Fee for City Dept Tons**	**Year Increase Adopted**	**Annual % Rate Increase**	**Years of Annual Increase**
Miramar Accepting Waste	0%	$10.00	-0-	0%	2013 - 2016
Automated Greenery Collection Implemented	2.77%	$10.28	2017	2.77%	2018 - 2019
Projected increase in volumes and other reduction in capital expenditures offset projected increase in operational expenditures	0%	$10.85	N/A	0%	2020 - 2026
Replacement of Automated Greenery Collection Equipment	2.77%	$11.16	2027	2.77%	2028 - 2036
Loss of North County Tonnage and Replacement of Automated Greenery Collection Equipment	25%	$17.83	2037	0%	2038 - 2045

The City could consider the following options in lieu of AB939 Fee Increases:

- Implement a City-wide fee for providing Household Hazardous Waste Programs that benefit all residents of the City, and/or a fee for service at the Household Hazardous Waste Transfer Station.
- Charge a cost recoverable fee for the replacement of automated curbside recycling and/or greenery recycling bins.
- Charge an AB 939 fee on some or all tons going into Sycamore Landfill. This would require a legal analysis under Proposition 26.
- Reduce or eliminate recycling services provided to the public. This carries the risk of reducing diversion and conflicting with the City's state approved waste management plan, which could result in fines of up to $10,000 per day.

- Perform a cost/benefit analysis on expanding green waste pickup and going from manual to automatic which is a $23.6M initial capital cost in the LRMOSP financial model (with other replacement and annual costs) vs. diversion achieved.

In order to continue providing citywide curbside collection of recyclable and greenery material, the City must consider what the most financially viable options are, both in the short and long term.

5.6 CONCLUSION

In Configuration 1, the benefits to City Departments, residents, businesses, non-profit organizations, and the military of the City owning and operating Miramar Landfill would terminate in 2021. In Configuration 5 these financial and societal benefits would remain virtually intact through 2045 and possibly beyond. With Configurations 2, 3, 4a, and 4b, the benefits would cease at some point in between.

It would be advantageous to the City and its customers for the City to continue operating the West Miramar Landfill and Greenery Operations as long as possible to receive continuing revenues, and to concurrently begin the processes for permitting, designing, and implementing future options for diversion and optimizing long-term disposal capacity as outlined in this report.

SECTION 6.0

IMPLEMENTATION PLAN

6.0 IMPLEMENTATION PLAN

6.1 INTRODUCTION

The last step in the strategic planning process is to develop an implementation schedule that coincides with the demand/capacity and financial models developed for all five system configurations. Because the choice of which system configuration is financially feasible depends on the revenue sources available, a preferred system configuration has not been recommended. Therefore, implementation schedules have been developed for each system configuration.

The financial analysis in Section 5 presents the results of financial models developed for each of the system configurations based on the projected demand capacity for the region under each system configuration. Projections for Miramar and Sycamore Landfills reaching capacity were used as a basis for the implementation schedule and are presented in the following table.

Projected Site Life

Configuration	Miramar Landfill	Sycamore Landfill
1	2021	2026
2	2021	2039
3	2027	2040
4a	2023	2039
4b	2031	2042
5	2036	2043

The implementation schedules for each system configuration identify key steps and milestones in which the permitting/development process for each system option is to be started and when each option is projected to be initiated and completed.

6.2 IMPLEMENTAITON SCHEDULE

The following provides a description of the implementation schedule for each of the system configurations.

6.2.1 CONFIGURATION 1 – BASELINE, STATUS-QUO

Configuration 1 is the status quo scenario under which all existing operations, programs, and policies as identified in Table 4-1 are expected to remain as is. An implementation schedule for Configuration 1 is shown on Table 6-1. The City would continue to provide Zero Waste programs and enforce/promote recycling and C&D ordinances. The WML would continue to receive waste until it reaches its current permitted capacity, which is projected to occur in 2021. Once capacity is reached at the WML, waste would be directly transported to the Sycamore Landfill until it reaches its projected permitted capacity in 2026. Once Sycamore Landfill reaches capacity, waste would be directly transported out-of-county to the El Sobrante Landfill through 2045, or perhaps in-County to the Gregory Canyon Landfill if it is permitted and operational.

6.2.2 CONFIGURATION 2 – ZERO WASTE (Higher Sustainability)

Configuration 2 would add to the existing operations (Configuration 1) additional Zero Waste programs/ideas that will be implemented on an ongoing basis. An implementation schedule for Configuration 2 is shown on Table 6-2. The proposed Resource Recovery Center at the WML is assumed to be operational by 2014 as currently planned by ESD. An evaluation to assess the viability of developing a Conversion Technology facility at Miramar is recommended to be budgeted and conducted in 5 years (2016) or less, to provide time to permit and construct a unit prior to the WML reaching capacity in 2021.

Under Configuration 2, a transfer station at Miramar would be developed and waste would be transferred to the Sycamore Landfill when capacity at the WML is reached in 2021. The permitting and development process for a new transfer station should start at the beginning of 2015 at the latest, which is 6.5 years prior to the WML reaching maximum capacity. Since a transfer station facility is included in the Miramar Landfill General Development Plan, dated September,

1994, the permitting and approval process is anticipated to take approximately 4 years (as shown on Table 3-5) which is 2.5 years less time than the process for approval of the other landfill development options. The development schedule assumes 1 year for final construction level design and bidding, as well as 1 year for construction, resulting in a 6 year permitting and development schedule as shown on Tables 3-5 and 6-2 and a 6-month buffer prior to WML's projected date to reach capacity in 2021.

Once capacity is reached at the WML and the transfer station is constructed, waste would be transferred and transported to the Sycamore Landfill until it reaches its projected capacity in 2039. Once the Sycamore Landfill reaches capacity, waste would be transferred and transported out-of-County to the El Sobrante Landfill or in-County to the Gregory Canyon Landfill if operating. For the financial models, transport to out-of-County El Sobrante Landfill was assumed.

6.2.3 CONFIGURATION 3 – ZERO WASTE AND NORTH and/or WEST MIRAMAR LANDFILL VERTICAL INCREASE (Higher Environmental Viability than Lateral Expansion Options)

Configuration 3 would include all of the options identified in Configuration 2 and would add landfill capacity at Miramar with a vertical increase at either the NML or WML. An implementation schedule for Configuration 3 is shown on Table 6-3.

ESD staff provided input on the permitting and approval schedule for a vertical increase in capacity at the NML, including a 1.5 year time line up-front to present and obtain input on the concept plan from Miramar Marine Corp Air Station (MCAS) representatives prior to starting the permitting process. The permitting and approval process is then anticipated to take up to 5 years; the construction plans and bid process is assumed to take 1 year, and the construction period is assumed to be 1 year to remove stockpiled soil on the deck and to establish positive interim cover grades. In total, the schedule for implementing a vertical increase option for the NML is 8.5 years, as reflected in Tables 3-9 and 6-3 and has been initiated in 2012.

A NML vertical increase could generate a net capacity of approximately 6.1 million tons (assuming an Airspace Utilization Factor of 0.58) which yields a lifespan of approximately 5.1 years (assuming an annual refuse tonnage rate of 1.2 million by year 2021), extending the life of Miramar through 2027. This assumes a scenario of a maximum elevation to the 485 feet amsl permitted for the WML, a stockpile volume on the deck of 6.0 mcy and the assumption that a prescriptive Subtitle D liner system would not be required. Assuming a cell life of up to 5 years, the NML Vertical Increase would be developed in one phase.

An additional vertical increase at the WML is also being considered by ESD which may provide more or less capacity than the capacity for a NML vertical increase depending on approval by the MCAS. A vertical increase at the WML is expected to take substantially less time to permit than at the NML since the City has recently completed a similar process at the WML with the MCAS and approving regulatory agencies. The two year final design and construction schedule proposed for removal of stockpiled material on the deck of the NML would also not be necessary for a WML vertical increase. That soil could be used for daily cover requirements at the WML, but would not be excavated at one time.

For purposes of the LRMOSP financial model, only one vertical increase (at the NML) is considered for Configuration 3. Under this scenario, the permitting/development of a potential transfer station at Miramar could be delayed another 5 years under Configuration 3 from the schedule in Configuration 2 (to early 2020) prior to the NML Vertical Increase reaching maximum capacity. Once capacity is reached for the NML Vertical Increase, waste would be transferred and transported to the Sycamore Landfill until it reaches its projected capacity in 2040. Once Sycamore Landfill reaches capacity, waste would be transferred out-of-County, and transported to the El Sobrante Landfill, or in-County to the Gregory Canyon Landfill, if operating. For the financial models, transport to out-of-County El Sobrante Landfill was assumed.

6.2.4 CONFIGURATION 4 – ZERO WASTE AND WEST MIRAMAR LANDFILL LATERAL EXPANSION (Higher Financial Viability due to greater capacity/additional revenue/lower tip fees than transport options)

Configuration 4 would include all of the options identified in Configuration 2 and would add landfill capacity through a West Miramar Landfill Lateral Expansion. Two WML Lateral Expansion alternatives were evaluated for the LRMOSP. Either Alternative A or B would be implemented under Configuration 4, but not both, as Alternative B includes Alternative A. An implementation schedule for Configuration 4 is shown on Table 6-4 for each Alternative A and B. An 8.5 year process for permitting and development is assumed for both Alternatives A and B shown in detail on Tables 3-9 and 3-12 respectively, and would need to be initiated in 2012. The implementation schedule for the WML lateral expansion alternatives is discussed below.

WML ALTERNATIVE A

Alternative A could generate a net airspace capacity of approximately 4.5 mcy or 2.5 million tons (assuming an Airspace Utilization Factor of 0.58) which yields a lifespan of approximately 2 years, or until 2023. Due to its small size, Alternative A would be developed in one phase. The start of the permitting/development for a potential transfer station at Miramar could be postponed 2 years (to early 2017) prior to the WML Lateral Expansion reaching maximum capacity. Once capacity is reached at the WML, waste would be transferred and transported to Sycamore Landfill until it reaches projected capacity in 2039. Once the Sycamore Landfill reaches capacity, waste would be transferred and transported to the El Sobrante Landfill or Gregory Canyon Landfill, if operating. For the financial models, transport to out-of-County El Sobrante Landfill was assumed.

WML ALTERNATIVE B

Alternative B could generate a net airspace of approximately 20.3 mcy or 11.8 million tons (assuming an Airspace Utilization Factor of 0.58 tons/cy) which yields a lifespan of approximately 9.7 years, or until early 2031. Assuming a cell life of approximately 5 years, Alternative B would be developed in two phases. The first phase would be constructed in 2020 prior to the existing WML reaching

capacity and the second phase would be completed in 2025. The permitting/development of the potential transfer station at Miramar could be postponed significantly to start in 2024, 6.5 years prior to the WML Lateral Expansion Alternative B reaching maximum capacity. Once capacity is reached at the WML, waste would be transferred and transported to Sycamore Landfill until it reaches projected capacity in early 2042. Once Sycamore Landfill reaches capacity, waste would be transferred and transported to the El Sobrante Landfill or Gregory Canyon Landfill, if operating. For the financial models, transport to out-of-County El Sobrante Landfill was assumed.

6.2.5 CONFIGURATION 5 – COMBINATION OF OPTIONS 3 AND 4

Configuration 5 would be a maximum capacity option that includes development of the NML Vertical Expansion and West Miramar Landfill Lateral Expansion Alternative B, in addition to the options identified in Configuration 2. An implementation schedule for Configuration 5 is shown on Table 6-5.

Under this configuration, the NML Vertical Increase would occur before the WML Lateral Expansion. The NML Vertical Increase could generate a net airspace of approximately 6.1 million tons which yields a lifespan of approximately 5.1 years, or until 2026. The lateral expansion of the WML could be either Alternative A or B, but not both. For consideration of a maximum capacity configuration, WML Lateral Expansion Alternative B is assumed for Configuration 5.

Alternative B could generate a net airspace of approximately 20.1 mcy or 11.7 million tons (assuming an Airspace Utilization Factor of 0.58 tons/cy) which yields a lifespan of approximately 9.7 years, or until 2036 in Configuration 5. Assuming a cell life of approximately 5 years, Alternative B would be developed in two phases. The first phase would be constructed in 2025 and the second phase would be completed in 2030. The start of permitting/development of a potential transfer station at Miramar would be postponed until 2028 prior to the WML Lateral Expansion B reaching maximum capacity. Once capacity is reached at the WML, waste would be transferred and transported to the Sycamore Landfill until it reaches projected capacity in the end of 2043 . Once Sycamore Landfill reaches capacity waste would be transferred and transported

out-of-County to the El Sobrante Landfill or Gregory Canyon Landfill, if operating. For the financial models, transport to out-of-County El Sobrante Landfill was assumed.

6.3 CONCLUSIONS

With the exception of other than the Status Quo Configuration scenario, which will have the greatest detrimental impact on the City's General Fund with transport costs being incurred as early as 2021, the following strategies are recommended under each LRMOSP system configuration:

- Continue implementation of additional Zero Waste Programs/Ideas recommended in LRMOSP;
- Implement Resource Recovery Center at WML by 2014;
- Start permitting and development process for new Transfer Station at Miramar by early 2015 at the latest;
- Continue to monitor and perform an assessment on the viability of a CT facility at Miramar by 2016.

For system configurations that include increasing capacity at the WML or NML, the planning and permitting process is to begin this year in 2012. ESD has initiated the planning process for a vertical increase at the WML as of late 2011. With approval of a vertical increase at the WML, the facility could potentially gain an additional 4.5 to 8.5 years of life depending on MCAS approvals. Extension of site life at Miramar (particularly with a vertical increase which is a low capital cost option) would provide more time to implement the various other LRMOSP options.

The implementation phase, Phase III of the LRMOSP will evaluate which of the system configurations or derivative of the configurations identified herein during Phase II of the LRMOSP will be pursued. Critical to the selection of implementation strategies going forward for the City will be an assessment of impacts on the General Fund for the various system configurations and development of financial strategies for addressing projected funding short-falls.

Because Miramar Landfill is a regional resource, moving forward it would be prudent to include the County and neighboring Cities in the implementation planning process.