February 2012
Final

Phase II
Long-Term Resource Management Options
Strategic Plan for the 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.

TABLES

TABLE 1-1

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

BAS CONSULTANT TEAM MEMBERS

COMPANY	TEAM MEMBER
Bryan A. Stirrat & Associates (BAS)	Bryan A. Stirrat, P.E.
	Christine M. Arbogast, P.E.
	Cesar A. Leon
Clements Environmental (Clements)	Chip Clements, P.E.
	Carrie Schneider
HF&H Consultants (HF&H)	Robert D. Hilton, CMC
	Marva Sheehan
J.R. Miller & Associates (JRMA)	Doug Drennen
Katz & Associates	Lewis Michaelson
	Kelly Thomas Jarosz

TABLE 1-2

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

RESOURCE MANAGEMENT ADVISORY COMMITTEE (RMAC) MEMBERS

MEMBER NAME	AFFILIATION
Mike MaDade	San Diego County Disposal Association
Lynn France	Integrated Waste Management Technical Advisory Committee
Richard Anthony	Integrated Waste Management Citizens Advisory Committee
Alan Pentico	San Diego County Apartment Association
Amy Harris	San Diego County Taxpayers Association
Leslie L. McLaughlin	Department of Navy, Southwest Division
Jacquie Adams	Solid Waste Local Enforcement Agency
Beryl Flom	League of Women Voters & Council Member Fry's Nominee
Fatih Buyuksonmez, PH.D., P.E.	San Diego Statue University - Dept of Civil & Environmental Studies
Jamie Fox Rice	Council District 2 Representative
Barbara Lamb	City of San Diego, Business Office
Andrea M. Eaton	Council District Nominee
Sylvia M. Castillo, P.E.	City of San Diego, Environmental Services Department
Brian Henry	City of San Diego, Environmental Services Department
Robert "Bob" Epler	City of San Diego, Environmental Services Department

TABLE 2-1

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

POPULATION PROJECTIONS TO 2045

Population Projections

	Population																		
JURISDICTION	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Carlsbad	97,853	98,922	99,991	101,061	102,130	103,200	104,272	105,348	106,426	107,506	108,587	109,818	111,051	112,287	113,524	114,758	115,986	117,207
Chula Vista	220,286	222,693	225,100	227,508	229,916	232,324	234,737	237,158	239,586	242,018	244,451	247,222	249,999	252,781	255,564	258,342	261,107	263,857
Coronado	28,071	28,377	28,684	28,991	29,298	29,605	29,912	30,221	30,530	30,840	31,150	31,503	31,857	32,211	32,566	32,920	33,272	33,623
Del Mar	4,796	4,848	4,901	4,953	5,005	5,058	5,110	5,163	5,216	5,269	5,322	5,382	5,443	5,503	5,564	5,624	5,684	5,744
El Cajon	103,104	104,231	105,358	106,485	107,612	108,739	109,868	111,002	112,138	113,276	114,415	115,712	117,012	118,314	119,616	120,917	122,211	123,498
Encinitas	65,939	66,659	67,380	68,100	68,821	69,542	70,264	70,989	71,716	72,444	73,172	74,001	74,833	75,665	76,498	77,330	78,157	78,981
Escondido	148,136	149,755	151,373	152,993	154,612	156,231	157,854	159,482	161,115	162,750	164,387	166,250	168,117	169,988	171,860	173,728	175,587	177,437
Imperial Beach	29,346	29,666	29,987	30,308	30,629	30,949	31,271	31,593	31,917	32,241	32,565	32,934	33,304	33,675	34,045	34,416	34,784	35,150
La Mesa	59,123	59,769	60,415	61,062	61,708	62,354	63,002	63,652	64,303	64,956	65,609	66,353	67,098	67,845	68,592	69,337	70,079	70,818
Lemon Grove	27,014	27,309	27,604	27,900	28,195	28,490	28,786	29,083	29,381	29,679	29,977	30,317	30,658	30,999	31,340	31,681	32,020	32,357
National City	59,135	59,781	60,427	61,074	61,720	62,366	63,014	63,664	64,316	64,969	65,622	66,366	67,111	67,858	68,605	69,351	70,093	70,831
Oceanside	182,484	184,479	186,473	188,467	190,462	192,457	194,456	196,462	198,473	200,487	202,503	204,798	207,099	209,404	211,709	214,010	216,300	218,579
Poway	53,346	53,929	54,512	55,095	55,678	56,261	56,845	57,432	58,020	58,609	59,198	59,869	60,541	61,215	61,889	62,562	63,231	63,897
San Diego	1,367,210	1,382,152	1,397,090	1,412,035	1,426,981	1,441,924	1,456,904	1,471,930	1,487,000	1,502,091	1,517,193	1,534,389	1,551,625	1,568,894	1,586,167	1,603,408	1,620,565	1,637,638
San Diego-Unincorporated	493,753	499,149	504,544	509,941	515,338	520,735	526,145	531,571	537,013	542,463	547,918	554,128	560,352	566,589	572,826	579,053	585,249	591,415
San Marcos	70,570	71,341	72,112	72,883	73,655	74,426	75,199	75,975	76,753	77,532	78,311	79,199	80,088	80,980	81,871	82,761	83,647	84,528
Santee	57,093	57,717	58,341	58,965	59,589	60,213	60,839	61,466	62,096	62,726	63,356	64,074	64,794	65,515	66,237	66,957	67,673	68,386
Solana Beach	14,141	14,296	14,450	14,605	14,760	14,914	15,069	15,225	15,380	15,536	15,693	15,871	16,049	16,227	16,406	16,584	16,762	16,938
Vista	99,262	100,347	101,431	102,516	103,601	104,686	105,774	106,865	107,959	109,054	110,151	111,399	112,651	113,905	115,159	116,410	117,656	118,895
TOTAL	3,180,661	3,215,421	3,250,173	3,284,942	3,319,711	3,354,474	3,389,324	3,424,279	3,459,338	3,494,445	3,529,580	3,569,583	3,609,682	3,649,857	3,690,038	3,730,148	3,770,063	3,809,780
PERCENT GROWTH	0.96%	1.09%	1.08%	1.07%	1.06%	1.05%	1.04%	1.03%	1.02%	1.01%	1.01%	1.13%	1.12%	1.11%	1.10%	1.09%	1.07%	1.05%

JURISDICTION	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**	**2045**
Carlsbad	118,421	119,626	120,821	121,764	122,693	123,610	124,514	125,406	126,285	127,155	128,015	128,866	129,709	130,544	131,372	132,195	133,013	133,827
Chula Vista	266,590	269,303	271,992	274,116	276,208	278,271	280,307	282,314	284,293	286,250	288,187	290,104	292,002	293,881	295,745	297,597	299,438	301,271
Coronado	33,971	34,317	34,659	34,930	35,197	35,459	35,719	35,975	36,227	36,476	36,723	36,967	37,209	37,449	37,686	37,922	38,157	38,390
Del Mar	5,804	5,863	5,921	5,968	6,013	6,058	6,102	6,146	6,189	6,232	6,274	6,316	6,357	6,398	6,439	6,479	6,519	6,559
El Cajon	124,777	126,047	127,306	128,299	129,278	130,244	131,197	132,137	133,063	133,979	134,886	135,783	136,671	137,550	138,423	139,290	140,152	141,009
Encinitas	79,799	80,611	81,416	82,051	82,678	83,295	83,905	84,506	85,098	85,684	86,263	86,837	87,405	87,968	88,526	89,080	89,631	90,180
Escondido	179,274	181,099	182,907	184,335	185,742	187,129	188,498	189,848	191,179	192,495	193,798	195,087	196,363	197,626	198,880	200,126	201,364	202,596
Imperial Beach	35,514	35,876	36,234	36,517	36,795	37,070	37,342	37,609	37,873	38,133	38,391	38,647	38,900	39,150	39,398	39,645	39,890	40,134
La Mesa	71,551	72,279	73,001	73,571	74,132	74,686	75,232	75,771	76,302	76,828	77,348	77,862	78,371	78,876	79,376	79,873	80,367	80,859
Lemon Grove	32,692	33,025	33,355	33,615	33,872	34,125	34,374	34,620	34,863	35,103	35,341	35,576	35,808	36,039	36,268	36,495	36,720	36,945
National City	71,565	72,293	73,015	73,585	74,147	74,701	75,247	75,786	76,317	76,843	77,363	77,877	78,387	78,891	79,392	79,889	80,383	80,875
Oceanside	220,843	223,090	225,318	227,077	228,810	230,519	232,206	233,869	235,508	237,129	238,734	240,322	241,894	243,450	244,995	246,529	248,054	249,572
Poway	64,559	65,216	65,867	66,382	66,888	67,388	67,881	68,367	68,846	69,320	69,789	70,253	70,713	71,168	71,620	72,068	72,514	72,958
San Diego	1,654,600	1,671,437	1,688,129	1,701,306	1,714,289	1,727,094	1,739,731	1,752,190	1,764,474	1,776,621	1,788,641	1,800,538	1,812,318	1,823,978	1,835,552	1,847,046	1,858,472	1,869,844
San Diego-Unincorporated	597,540	603,621	609,649	614,408	619,097	623,721	628,284	632,784	637,220	641,607	645,948	650,244	654,499	658,709	662,889	667,040	671,167	675,274
San Marcos	85,403	86,272	87,134	87,814	88,484	89,145	89,798	90,441	91,075	91,702	92,322	92,936	93,544	94,146	94,743	95,337	95,926	96,513
Santee	69,094	69,797	70,495	71,045	71,587	72,122	72,649	73,170	73,683	74,190	74,692	75,189	75,681	76,167	76,651	77,131	77,608	78,083
Solana Beach	17,114	17,288	17,461	17,597	17,731	17,864	17,994	18,123	18,250	18,376	18,500	18,623	18,745	18,866	18,986	19,104	19,223	19,340
Vista	120,127	121,349	122,561	123,518	124,460	125,390	126,308	127,212	128,104	128,986	129,859	130,722	131,578	132,424	133,264	134,099	134,928	135,754
TOTAL	3,849,241	3,888,409	3,927,242	3,957,898	3,988,101	4,017,891	4,047,288	4,076,274	4,104,849	4,133,108	4,161,073	4,188,749	4,216,154	4,243,280	4,270,206	4,296,945	4,323,527	4,349,983
PERCENT GROWTH	1.04%	1.02%	1.00%	0.78%	0.76%	0.75%	0.73%	0.72%	0.70%	0.69%	0.68%	0.67%	0.65%	0.64%	0.63%	0.63%	0.62%	0.61%

Source: State of California Department of Finance Population Projections for San Diego County 2008

TABLE 2-2

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

COUNTYWIDE SOLID WASTE
TONNAGE PROJECTIONS TO 2045

Jurisdiction	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Carlsbad	109,926	111,552	113,588	114,946	115,059	113,362	114,536	115,716	116,900	118,085	119,272	120,624	121,979	123,336	124,694	126,050	127,398	128,741
Chula Vista	158,384	160,795	163,730	165,687	165,850	163,404	165,090	166,790	168,495	170,202	171,912	173,860	175,814	177,770	179,727	181,681	183,625	185,559
Coronado	44,171	46,299	47,145	47,708	47,755	47,051	47,407	47,862	48,317	48,773	49,254	49,812	50,372	50,932	51,493	52,053	52,610	53,164
Del Mar	8,672	8,929	9,092	9,201	9,210	9,074	9,157	9,248	9,340	9,432	9,526	9,633	9,742	9,850	9,959	10,067	10,175	10,282
El Cajon	90,052	91,392	93,060	94,172	94,265	92,875	95,472	96,455	97,442	98,430	99,419	100,545	101,674	102,805	103,937	105,067	106,191	107,310
Encinitas	62,334	63,262	64,417	65,187	65,251	64,289	64,954	65,623	66,294	66,966	67,640	68,406	69,175	69,944	70,714	71,483	72,248	73,009
Escondido	141,339	143,404	146,022	147,767	147,913	145,731	148,398	149,927	151,462	152,998	154,536	156,287	158,042	159,801	161,560	163,316	165,064	166,803
Imperial Beach	12,857	13,056	13,294	13,453	13,466	13,267	13,404	13,542	13,680	13,819	13,958	14,116	14,275	14,433	14,592	14,751	14,909	15,066
La Mesa	35,259	35,791	36,445	36,880	36,917	36,372	36,748	37,126	37,506	37,886	38,267	38,700	39,135	39,571	40,006	40,441	40,874	41,305
Lemon Grove	18,503	18,781	19,124	19,353	19,372	19,086	19,283	19,482	19,681	19,881	20,081	20,308	20,536	20,765	20,993	21,222	21,449	21,675
National City	51,574	52,782	53,746	54,388	54,442	53,639	54,155	54,703	55,252	55,802	56,360	56,999	57,639	58,281	58,922	59,563	60,200	60,834
Oceanside	37,138	37,691	38,379	38,838	38,876	38,303	143,658	145,139	146,624	148,112	149,601	151,296	152,995	154,698	156,401	158,101	159,793	161,476
Poway	53,078	53,918	54,902	55,558	55,613	54,793	55,355	55,924	56,495	57,067	57,640	58,293	58,948	59,604	60,261	60,916	61,567	62,216
San Diego	1,429,064	1,507,784	1,535,309	1,553,660	1,555,189	1,532,251	1,546,103	1,560,726	1,575,365	1,590,014	1,605,622	1,622,069	1,640,291	1,658,547	1,676,806	1,695,032	1,713,170	1,731,218
San Diego-Unincorporated	440,220	446,730	454,886	460,322	460,776	453,979	493,986	499,076	504,182	509,295	514,415	520,240	526,081	531,937	537,793	543,638	549,456	555,244
San Marcos	80,485	81,649	83,140	84,133	84,216	82,974	84,927	85,803	86,682	87,561	88,441	89,444	90,448	91,455	92,462	93,467	94,467	95,462
Santee	44,559	45,221	46,047	46,597	46,643	45,955	47,793	48,286	48,779	49,274	49,769	50,333	50,898	51,464	52,031	52,597	53,159	53,719
Solana Beach	14,042	14,263	14,524	14,697	14,712	14,495	14,644	14,794	14,945	15,097	15,248	15,421	15,594	15,768	15,941	16,115	16,287	16,459
Vista	87,941	89,215	90,843	91,929	92,019	90,662	96,208	97,200	98,195	99,192	100,189	101,324	102,463	103,603	104,743	105,882	107,015	108,142
TOTAL	2,919,599	3,022,515	3,077,693	3,114,478	3,117,544	3,071,562	3,251,277	3,283,423	3,315,637	3,347,884	3,381,149	3,417,711	3,456,100	3,494,565	3,533,037	3,571,440	3,609,657	3,647,684

Jurisdiction	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Carlsbad	130,074	131,398	132,710	133,746	134,766	135,773	136,767	137,746	138,712	139,667	140,612	141,547	142,473	143,389	144,299	145,203	146,101	146,995
Chula Vista	187,481	189,389	191,281	192,774	194,245	195,696	197,128	198,539	199,931	201,308	202,670	204,018	205,352	206,674	207,985	209,287	210,582	211,871
Coronado	53,715	54,261	54,803	55,231	55,653	56,068	56,479	56,883	57,282	57,676	58,066	58,453	58,835	59,213	59,589	59,962	60,333	60,703
Del Mar	10,388	10,494	10,599	10,681	10,763	10,843	10,923	11,001	11,078	11,154	11,230	11,304	11,378	11,452	11,524	11,596	11,668	11,740
El Cajon	108,421	109,525	110,618	111,482	112,333	113,172	114,000	114,816	115,621	116,417	117,205	117,984	118,756	119,520	120,279	121,032	121,780	122,526
Encinitas	73,765	74,516	75,260	75,848	76,426	76,997	77,561	78,116	78,664	79,205	79,741	80,272	80,797	81,317	81,833	82,345	82,854	83,361
Escondido	168,531	170,245	171,946	173,288	174,610	175,914	177,202	178,471	179,722	180,959	182,183	183,395	184,595	185,783	186,962	188,132	189,296	190,454
Imperial Beach	15,222	15,377	15,530	15,652	15,771	15,889	16,005	16,120	16,233	16,344	16,455	16,564	16,673	16,780	16,887	16,992	17,097	17,202
La Mesa	41,732	42,157	42,578	42,910	43,238	43,561	43,880	44,194	44,504	44,810	45,113	45,413	45,710	46,004	46,296	46,586	46,874	47,161
Lemon Grove	21,899	22,122	22,343	22,517	22,689	22,859	23,026	23,191	23,353	23,514	23,673	23,831	23,987	24,141	24,294	24,446	24,597	24,748
National City	61,464	62,090	62,710	63,199	63,682	64,157	64,627	65,090	65,546	65,997	66,444	66,886	67,323	67,756	68,186	68,613	69,038	69,460
Oceanside	163,149	164,809	166,455	167,754	169,035	170,297	171,543	172,772	173,983	175,181	176,366	177,539	178,700	179,850	180,991	182,125	183,251	184,373
Poway	62,860	63,500	64,134	64,635	65,128	65,615	66,095	66,568	67,035	67,496	67,953	68,405	68,852	69,295	69,735	70,172	70,606	71,038
San Diego	1,749,150	1,766,948	1,784,594	1,798,525	1,812,250	1,825,787	1,839,145	1,852,316	1,865,302	1,878,143	1,890,850	1,903,427	1,915,880	1,928,206	1,940,442	1,952,593	1,964,672	1,976,694
San Diego-Unincorporated	560,995	566,704	572,363	576,831	581,233	585,575	589,859	594,083	598,248	602,366	606,442	610,476	614,470	618,423	622,347	626,244	630,118	633,974
San Marcos	96,451	97,432	98,406	99,174	99,930	100,677	101,414	102,140	102,856	103,564	104,265	104,958	105,645	106,325	106,999	107,669	108,335	108,998
Santee	54,276	54,828	55,376	55,808	56,234	56,654	57,068	57,477	57,880	58,278	58,673	59,063	59,449	59,832	60,212	60,589	60,963	61,336
Solana Beach	16,629	16,798	16,966	17,099	17,229	17,358	17,485	17,610	17,734	17,856	17,976	18,096	18,214	18,332	18,448	18,563	18,678	18,793
Vista	109,262	110,374	111,477	112,347	113,204	114,050	114,884	115,707	116,518	117,320	118,114	118,900	119,677	120,447	121,212	121,971	122,725	123,476
TOTAL	3,685,466	3,722,968	3,760,148	3,789,500	3,818,419	3,846,941	3,875,087	3,902,839	3,930,199	3,957,256	3,984,030	4,010,529	4,036,768	4,062,739	4,088,521	4,114,122	4,139,573	4,164,903

TABLE 2-3

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

FY 2009 DISPOSAL TONNAGE TO SAN DIEGO LANDFILLS BY JURISDICTION

Tonnage of Each Jurisdiction's SW in Each Landfill (FY 2009)

Origin of Waste In County (tons for 2009)	Borrego	Otay	Ramona	Sycamore	West Miramar	Sum
Carlsbad	-	111,269	-	3,058	665	114,992
Chula Vista	-	163,190	-	464	2,029	165,683
Coronado	-	22,583	-	226	23,397	46,206
Del Mar	-	323	-	6,674	2,075	9,072
El Cajon	-	87,939	-	5,603	661	94,202
Encinitas	-	25,878	-	38,852	476	65,207
Escondido	-	2,315	507	144,561	469	147,852
Imperial Beach	-	13,235	-	11	205	13,450
La Mesa	-	34,493	-	2,006	385	36,884
Lemon Grove	-	18,862	-	306	187	19,356
National City	-	46,387	-	272	7,292	53,951
Oceanside	-	32,170	-	6,399	281	38,850
Out of State	-	-	-	-	-	-
Poway	-	2,717	17,904	33,731	1,173	55,524
San Diego	-	411,635	-	172,011	911,275	1,494,920
San Diego-Unincorporated	7,728	218,047	47,098	184,980	114	457,968
San Marcos	-	1,700	-	82,420	74	84,194
Santee	-	36,517	-	9,780	316	46,613
Solana Beach	-	9,030	-	5,358	301	14,689
Vista	-	6,823	-	85,056	2,653	94,532
Subtotal (In County)	7,728	1,245,113	65,509	781,767	954,028	3,054,145

Outside County (tons for 2009)	Borrego	Otay	Ramona	Sycamore	West Miramar	Sum
Barona			2,247	1,155		3,402
Campo				233		233
Canyon Lake				112		112
Calameza				68		68
Cherry Valley				23		23
Cathedral City				876		876
Cochella				299		299
Hemet				125		125
Indian Nations (Unspecified)		51	814	6,764		7,629
Indian Wells				197		197
Indio				1,221		1,221
Imperial - Unincorporated				1		1
Golden Acorn		165				165
La Quinta				828		828
Lake Elsinore				275		275
Los Angeles		1,113	52			1,165
Los Angeles County - Unincorporated						-
Mexico		2,931				2,931
Murietta				3		3
Ontario				20		20
Orange County		5,770				5,770
Palm Springs				3		3
Palm Desert				1,618		1,618
Pala		27		207		235
Perris				217		217
Rancho Mirage				519		519
Rincon				236		236
Riverside		17,945		769		18,714
Riverside - Unincorporated						-
San Bernardino		14		3,106		3,120
San Bernardino - Unincorporated						-
San Jacinto				116		116
Sycuan		1,842		598		2,440
Temecula				766		766
29 Palms				175		175
Viejas		2,174		438		2,612
Yucca Valley				225		225
Subtotal (Outside County)	0	32,033	3,112	21,191	-	56,337
TOTAL	7,728	1,277,146	68,621	802,958	954,028	3,110,481

Sources: ☐ CIWMB, Jurisdiction Profile
☐ CIWMB, Origin of Waste by Landfill

TABLE 2-4

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

LANDFILL ACCEPTANCE OF SOLID WASTE BY JURISDICTION

Percentage of Each Jurisdiction's SW by Landfill (FY 2009)						
Origin of Waste In County (tons for 2006)	Borrego	Otay	Ramona	Sycamore Sanitary	West Miramar Sanitary	Sum
Carlsbad		96.76%		2.66%	0.58%	100%
Chula Vista		98.50%		0.28%	1.22%	100%
Coronado		48.87%		0.49%	50.64%	100%
Del Mar		3.56%	0.00%	73.57%	22.87%	100%
El Cajon		93.35%	0.000%	5.95%	0.70%	100%
Encinitas		39.69%	0.000%	59.58%	0.73%	100%
Escondido		1.57%	0.343%	97.77%	0.32%	100%
Imperial Beach		98.40%		0.08%	1.52%	100%
La Mesa		93.52%		5.44%	1.04%	100%
Lemon Grove		97.45%		1.58%	0.97%	100%
National City		85.98%		0.50%	13.52%	100%
Oceanside		82.81%	0.000%	16.47%	0.72%	100%
Poway		4.89%	32.24%	60.75%	2.11%	100%
San Diego		27.54%		11.51%	60.96%	100%
San Diego-Unincorporated	1.69%	47.61%	10.28%	40.39%	0.02%	100%
San Marcos		2.02%		97.89%	0.09%	100%
Santee		78.34%		20.98%	0.68%	100%
Solana Beach		61.48%		36.48%	2.05%	100%
Vista		7.22%		89.98%	2.81%	100%

NOTE: Values Calculated from Table 2-3

TABLE 2-5

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

PERCENTAGE OF LANDFILL ACCEPTANCE OF SOLID WASTE BY JURISDICTION

Percentage of Each Landfill's SW by Jurisdiction (FY 2009)					
Origin of Waste In County (tons for 2009)	Borrego	Otay	Ramona	Sycamore Sanitary	West Miramar Sanitary
Carlsbad		8.71%	0.00%	0.38%	0.07%
Chula Vista		12.78%	0.00%	0.06%	0.21%
Coronado		1.77%	0.00%	0.03%	2.45%
Del Mar		0.03%	0.00%	0.83%	0.22%
El Cajon		6.89%	0.00%	0.70%	0.07%
Encinitas		2.03%	0.00%	4.84%	0.05%
Escondido		0.18%	0.74%	18.00%	0.05%
Imperial Beach		1.04%	0.00%	0.00%	0.02%
La Mesa		2.70%	0.00%	0.25%	0.04%
Lemon Grove		1.48%	0.00%	0.04%	0.02%
National City		3.63%	0.00%	0.03%	0.76%
Oceanside		2.52%	0.00%	0.80%	0.03%
Out of State		0.00%	0.00%	0.00%	
Poway		0.21%	26.09%	4.20%	0.12%
San Diego		32.23%	0.00%	21.42%	95.52%
San Diego-Unincorporated	100.00%	17.07%	68.64%	23.04%	0.01%
San Marcos		0.13%	0.00%	10.26%	0.01%
Santee		2.86%	0.00%	1.22%	0.03%
Solana Beach		0.71%	0.00%	0.67%	0.03%
Vista		0.53%	0.00%	10.59%	0.28%
Outside County (tons for 2009)					
Barona		0.00%	3.27%	0.14%	
Campo		0.00%	0.00%	0.03%	
Canyon Lake		0.00%	0.00%	0.01%	
Calameza		0.00%	0.00%	0.01%	
Cherry Valley		0.00%	0.00%	0.00%	
Cathedral City		0.00%	0.00%	0.11%	
Cochella		0.00%	0.00%	0.04%	
Hemet		0.00%	0.00%	0.02%	
Indian Nations (Unspecified)		0.00%	1.19%	0.84%	
Indian Wells		0.00%	0.00%	0.02%	
Indio		0.00%	0.00%	0.15%	
Imperial - Unincorporated		0.00%	0.00%	0.00%	
Golden Acorn		0.01%	0.00%	0.00%	
La Quinta		0.00%	0.00%	0.10%	
Lake Elsinore		0.00%	0.00%	0.03%	
Los Angeles		0.09%	0.08%	0.00%	
Los Angeles County - Unincorporated		0.00%	0.00%	0.00%	
Mexico		0.23%	0.00%	0.00%	
Murietta		0.00%	0.00%	0.00%	
Ontario		0.00%	0.00%	0.00%	
Orange County		0.45%	0.00%	0.00%	
Palm Springs		0.00%	0.00%	0.00%	
Palm Desert		0.00%	0.00%	0.20%	
Pala		0.00%	0.00%	0.03%	
Perris		0.00%	0.00%	0.03%	
Rancho Mirage		0.00%	0.00%	0.06%	
Rincon		0.00%	0.00%	0.03%	
Riverside		1.41%	0.00%	0.10%	
Riverside - Unincorporated		0.00%	0.00%	0.00%	
San Bernardino		0.00%	0.00%	0.39%	
San Bernardino - Unincorporated		0.00%	0.00%	0.00%	
San Jacinto		0.00%	0.00%	0.01%	
Sycuan		0.14%	0.00%	0.07%	
Temecula		0.00%	0.00%	0.10%	
29 Palms		0.00%	0.00%	0.02%	
Viejas		0.17%	0.00%	0.05%	
Yucca Valley		0.00%	0.00%	0.03%	
TOTAL	100%	100%	100%	100%	100%

TABLE 2-6

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

TRANSFER/PROCESSING FACILITIES

Active Large Volume Transfer/Processing Facilities (100 Tons Per Day or Larger)

Name	Operator	City	Maximum Permitted Throughput (Tons per Day)	Permitted Capacity (Tons per Day)	Annual Total Permitted Capacity	Types of Waste Accepted
EDCO Recovery and Transfer Station	EDCO Disposal Corporation	San Diego	1,500	1,716	535,392	C&D, I, MM
EDCO Construction/Demolition	EDCO Waste and Recycling Svcs.	San Marcos	175	174	54,288	C&D
EDCO Station	EDCO Disposal Corporation	La Mesa	200	462	144,144	C&D, GM, I, MM
EDCO Recycling	EDCO Disposal Corporation	Lemon Grove	516	960	299,520	MM
Escondido Resource Recovery	Jemco Equipment Corporation	Escondido	2,500	3,402	1,061,424	C&D, GM, MM
Fallbrook Recycling Facility	Fallbrook Refuse Service	Fallbrook	500	792	247,104	C&D, MM
Otay CDI MVPF	Otay Landfill, Inc	Chula Vista	174	174	54,288	C&D
Palomar Transfer Station, Inc.	Palomar Transfer Station, Inc.	Carlsbad	800	800	249,600	C&D, GM, I, MM
Ramona MRF & Transfer Station	Jemco Equipment Corporation	Unincorporated	370	405	126,360	C&D, GM, MM
SANCO Recycling	SANCO Services	Escondido	735	960	299,520	MM
SANCO Resource Recovery	SANCO Services	Lemon Grove	1,000	1,000	312,000	C&D
The Allan Company MRF & T/S	Cedar-Young Company, dba Allan Co	San Diego	1,000	1,500	468,000	MM
Universal Refuse Removal	Universal Refuse Removal	El Cajon	1,000	1,000	312,000	MM
			10,470	**13,345**	**4,163,640**	

Planned Large Volume Transfer/Processing Facilities

Name	Operator	City	Maximum Permitted Throughput (Tons per Day)	Permitted Capacity (Tons per Day)	Annual Total Permitted Capacity	Types of Waste Accepted
Miramar Transfer Station	City of San Diego	San Diego	5,000			

Notes:
- Tons-per-year were converted to tons-per-day using a 312-day year (52 weeks x 6 days/week)
- Cubic yards were converted to tons using 500 lbs./cubic yard

Source: CIWMB, Solid Waste Information System

Other Transfer / Processing Facilites

Name	Operator	City	Maximum Permitted Throughput (Tons per Day)	Permitted Capacity (Tons per Day)	
Waste Management of No. County	Waste Management of No. County	Oceanside	4,500	4,500	Sealed container transfer operation of waste

C&D - Construction and Demolition
GM - Green Material
I - Industrial
MM - Mixed Municipal

TABLE 2-7

CITY OF SAN DIEGO
LONG-TERM RESOURCES MANAGEMENT OPTIONS STRATEGIC PLAN

COMPOSTING FACILITIES

Existing Composting Facilities (100 Tons per Day or Larger)				
Name	**Operator**	**City**	**Maximum Permitted Throughput (Tons per Day)**	**Permitted Capacity (Tons per Day)**
Answede Organic Recycling	Answede, Inc.	Chula Vista	200	15
El Corazon Compost Facility	Agri Service	Vista	200	5,000
Evergreen Nursery	Evergreen Distributors, Inc.	San Diego	125	2,500
Oceanside Biosolids	Agri Service	Vista	150	2
Inland Pacific Resource Recovery	Inland Pacific Resource Recovery	Lakeside	450	2,750
Inland Pacific Resource Recovery	Inland Pacific Resource Recovery	Lakeside	400	321
Miramar Greenery	City of San Diego	San Diego	388	192
			1,913	**10,780**

Planned Composting Facilities				
Name	**Operator**	**City**	**Maximum Permitted Throughput (Tons per Day)**	**Permitted Capacity (Tons per Day)**
Starstream Valley Center	Starstream Energy LLC	ValleyCenter	200	234

Notes: § Tons-per-year were converted to tons-per-day using a 312-day year (52 weeks x 6 days/week)
§ Cubic yards were converted to tons using 500 lbs./cubic yard

Source: CalRecycle, Solid Waste Information System as of July, 2011

TABLE 2-8

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

RECYCLABLES PROCESSING CENTERS

	NAME	CITY	MATERIALS	VOLUME
1	Coopers Recycling Center	Alpine		
2	Main Street Recycling	Chula Vista		
3	Mikes Recycling	Chula Vista		
4	EDCO Station Buyback Center	La Mesa	Bottles, cans, plastic bottles	
5	EDCO Recycling	Lemon Grove	Bottles, cans, plastic bottles	
6	A1 Alloys	National City		
7	ABC Metals Inc.	National City		
8	Fibre Resources Unlimited Inc.	Spring Valley	Bottles, cans, plastic bottles, paper, cardboard, metal	
9	Spring Valley Environmental Services Inc.	Spring Valley	Bottles, cans, plastic bottles, copper, brass	
10	Spring Valley Recycling	Spring Valley	Bottles, cans, plastic bottles, brass, copper	
11	Your Neighborhood Recycling Centers	Spring Valley	Cans, plastic, scrap metal	5 tons daily 3600-4200 tons annually
12	Liberty Recycling	Del Mar	Cans, plastic bottles, newspapers, cardboard	
13	American Recycling	El Cajon	Bottles, cans, plastic bottles, copper, scrap aluminum	
14	California Metals Inc. (#1)	El Cajon	Nonferris metals, electronics	
15	California Metals Inc. (#4)	El Cajon	Nonferris metals, electronics	
16	M&M Recycling Center	El Cajon		
17	Universal Refuse and Recycling	El Cajon		
18	All Ways Recycling	El Cajon	Bottles, cans, plastic bottles, scrap metals	
19	Genes Recycling	El Cajon		
20	Skyline Recycling Co.	Escondido	Cans, plastic bottles, brass, copper	
21	Escondido Recycling Yard Inc.	Escondido	Bottles, cans, plastic bottles, brass, copper, stainless steel	
22	Quality Recycling (#1)	Lakeside	Bottles, cans, plastic bottles, copper, cardboard, stainless steel	
23	Quality Recycling (#2)	Lakeside	Bottles, cans, plastic bottles, copper, cardboard, stainless steel	
24	Ben Recycling and Scrap Metal	Oceanside	Bottles, cans, plastic bottles, brass, copper, stainless steel, scrap metal	
25	Recycle America	Oceanside	Bottles, can, plastic bottles	
26	Ramona Recycling	Ramona	Bottles, cans, plastic bottles, newpapers, cardboard	
27	Richardson Recycling	Ramona	Bottles, cans, plastic bottles	
28	Allan Co./Sycamore Landfill	Santee	Bottles, cans, plastic bottles, copper, metal, stainless steel	
29	Lees Iron and Metal	Vista	Bottles, cans, plastic bottles, copper, metal, stainless steel	
30	Quality Recycling	Vista	Brass, copper, aluminum, stainless steel, newspapers, paper, cardboard	
31	54th Recycling Center/Jorges Used Tires	San Diego		
32	AB Recycling	San Diego		
33	American Recycling	San Diego	Bottles, cans, plastic bottles	
34	Southwest Recycling	San Diego		
35	TOMRA Pacific Inc./San Diego	San Diego	Cans, plastic bottles	
36	Ocean Beach Recycling	San Diego		
37	Leroy Recycling/Old Town Recycling	San Diego	Bottles, cans, plastic bottles, copper, scrap metal	
38	Allan Co.	San Diego	Bottles, cans, plastic bottles, copper	
39	Linda Recycling	San Diego	Bottles, cans, plastic bottles	
40	A to Z Auto Inc.	San Diego	Brass, copper, stainless steel, metal, appliances	
41	All Ways Recycling Co.	San Diego	Bottles, cans, plastic bottles, copper, stainless steel	
42	IMS Recycling Services Inc.	San Diego	Bottles, cans, plastic bottles, brass, copper, stainless steel, wiring	
43	J and R Recycling	San Diego	Bottles, cans, plastic bottles, brass, copper, scrap aluminum, stainless steel	
44	Time Recycling Center	San Diego	Bottles, cans, plastic bottles, copper	
45	AmerMex Recycling Inc.	San Diego		
46	Can Depot Recycling Services	San Diego		
47	Regan Recycling Enterprises	San Diego		
48	Can Depot Recycling Services	San Diego		
49	Allan Co.	San Diego	Bottles, cans, plastic bottles, brass, copper, stainless steel	350 tons daily
50	Palm Ave. Recycling Inc.	San Diego	Bottles, cans, plastic bottles	
51	Save the Planet Recycling Center (#1)	San Diego	Bottles, cans, plastic bottles, copper, scrap metals	
52	Save the Planet Recycling Center (#3)	San Diego	Bottles, cans, plastic bottles, copper, scrap metals	

TABLE 2-9

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

PROJECTED CAPACITY WITHOUT SYCAMORE EXPANSION

MSW Declining Capacity Projections by Landfill (2009 Base Volumes)

Landfill	Borrego			Otay			Ramona			Sycamore Sanitary			Miramar			
Total Est. Permitted Capacity (cu yds)	706,745			62,377,974			2,200,000			48,124,462			87,760,000			
Remaining Estimated Capacity (cu yds)	478,836	as of 08/31/09		33,070,879	as of 11/30/06		690,000			47,388,428	as of 09/30/06		19,177,564	as of 6/30/10		
Closure Date	12/31/2040	*Remaining tonnage goes to		4/30/2027	*Remaining tonnage goes to		12/31/2006	*Remaining tonnage goes to		12/31/2031			12/31/2011	*Remaining tonnage goes to		ENDING
Permitted Max Disposal (tons/day)	50	Sycamore		5,830	Sycamore		295	Sycamore		3,965			8,000	Sycamore		CAPACITY
Remaining Capacity (Fiscal Year)	Beginning Capacity	Annual Disposal Tons	Ending Capacity	Beginning Capacity	Annual Disposal Tons	Ending Capacity	Beginning Capacity	Annual Disposal Tons	Ending Capacity	Beginning .Capacity	Annual Disposal Tons	Ending Capacity	Beginning Capacity	Annual Disposal Tons	Ending Capacity	TOTALS
2001	332,792	4,140	328,652	27,216,867	1,088,261	26,128,606	400,200	55,364	344,836	32,879,593	900,502	31,979,091	23,941,514	1,310,118	22,631,396	81,412,580
2002	328,652	4,560	324,091	26,128,606	1,254,892	24,873,714	344,836	70,009	274,827	31,979,091	894,000	31,085,091	22,631,396	1,340,465	21,290,930	77,848,654
2003	324,091	4,705	319,386	24,873,714	1,342,857	23,530,856	274,827	75,944	198,883	31,085,091	889,466	30,195,625	21,290,930	1,381,925	19,909,005	74,153,756
2004	319,386	5,092	314,294	23,530,856	1,420,225	22,110,631	198,883	80,151	118,732	30,195,625	911,356	29,284,269	19,909,005	1,444,695	18,464,310	70,292,236
2005	314,294	5,086	309,208	22,110,631	1,448,166	20,662,466	118,732	74,245	44,488	29,284,269	902,331	28,381,938	18,464,310	1,525,463	16,938,847	66,336,946
2006	309,208	6,632	302,576	20,662,466	1,481,356	19,181,110	44,488	44,488	-	28,381,938	896,650	27,485,288	16,938,847	1,475,919	15,462,928	62,431,901
2007	302,576	8,446	294,130	19,181,110	1,418,691	17,762,419				27,485,288	981,491	26,503,798	15,462,928	1,313,693	14,149,234	58,709,580
2008	294,130	8,677	285,453	17,762,419	1,310,025	16,452,394				26,503,798	988,314	25,515,484	14,149,234	1,160,219	12,989,015	55,242,346
2009	285,453	7,728	277,725	16,452,394	1,277,154	15,175,240				25,515,484	877,828	24,637,656	12,989,015	954,028	12,034,987	52,125,608
2010	277,725	7,388	270,337	15,175,240	1,220,891	13,954,349				24,637,656	839,156	23,798,500	12,034,987	912,000	11,122,987	49,146,173
2011	270,337	7,494	262,843	13,954,349	1,238,476	12,715,873				23,798,500	851,243	22,947,257	11,122,987	986,000	10,136,987	46,062,960
2012	262,843	7,631	255,212	12,715,873	1,261,085	11,454,788				22,947,257	866,783	22,080,474	10,136,987	1,004,000	9,132,987	42,923,461
2013	255,212	7,722	247,490	11,454,788	1,276,158	10,178,630				22,080,474	877,143	21,203,332	9,132,987	1,016,000	8,116,987	39,746,439
2014	247,490	7,730	239,760	10,178,630	1,277,414	8,901,216				21,203,332	878,006	20,325,325	8,116,987	1,017,000	7,099,987	36,566,289
2015	239,760	7,616	232,144	8,901,216	1,258,573	7,642,643				20,325,325	865,056	19,460,269	7,099,987	1,002,000	6,097,987	33,433,044
2016	232,144	7,695	224,449	7,642,643	1,271,648	6,370,995				19,460,269	874,043	18,586,226	6,097,987	1,160,214	4,937,773	30,119,443
2017	224,449	7,774	216,675	6,370,995	1,284,763	5,086,232				18,586,226	883,058	17,703,168	4,937,773	1,170,795	3,766,978	26,773,054
2018	216,675	7,854	208,821	5,086,232	1,297,917	3,788,315				17,703,168	892,098	16,811,070	3,766,978	1,181,379	2,585,599	23,393,805
2019	208,821	7,934	200,888	3,788,315	1,311,089	2,477,226				16,811,070	901,152	15,909,918	2,585,599	1,191,966	1,393,632	19,981,664
2020	200,888	8,013	192,874	2,477,226	1,324,271	1,152,955				15,909,918	910,213	14,999,705	1,393,632	1,203,555	190,078	16,535,612
2021	192,874	8,104	184,770	1,152,955	1,152,955	-				14,999,705	2,132,213	12,867,493	190,078	190,078	-	13,052,263
2022	184,770	8,195	176,575							12,867,493	3,514,280	9,353,212				9,529,787
2023	176,575	8,286	168,289							9,353,212	3,553,393	5,799,819				5,968,107
2024	168,289	8,378	159,911							5,799,819	3,553,302	2,246,517				2,406,428
2025	159,911	8,469	151,442							2,246,517	2,246,517	-				151,442
2026	151,442	8,559	142,883													142,883
2027	142,883	8,649	134,233													134,233
2028	134,233	8,739	125,494													125,494
2029	125,494	8,828	116,666													116,666
2030	116,666	8,916	107,750													107,750
2031	107,750	8,986	98,764													98,764
2032	98,764	9,054	89,710													89,710
2033	89,710	9,122	80,588													80,588
2034	80,588	9,189	71,399													71,399
2035	71,399	9,255	62,145													62,145
2036	62,145	9,319	52,826													52,826
2037	52,826	9,384	43,442													43,442
2038	43,442	9,447	33,995													33,995
2039	33,995	9,510	24,485													24,485
2040	24,485	9,572	14,913													14,913
2041	14,913	9,634	5,279													5,279
2042	5,279	5,279	-													0
2043																0
2044																0
2045																0

NOTE: Conversion factor to convert from cubic yards to tons is 1,160. This rate was obtained from the Joint Technical Document (Volume 1 of 2) West Miramar Landfill San Diego California February 2007, revised February 4, 2008 for all landfills.

Sources:
- § CIWMB, Active Landfills Profile
- § Quarterly AB 939 CIWMB reports from the County of San Diego
- § San Diego County, Integrated Waste Management Plan, Countywide Siting Element, 2005
- § CIWMB, Disposal Reporting System, Origin of Waste by Landfill
- § ESD tonnage projections and % growth for 2010 - 2015
- § California State Dept of Finance Growth Projections for 2016 - 2045
- § Permitted daily tonnage maximums at Sycamore are:
  2008-3,965, 2009-6,800, 2010-9,000, 2015-10,000, 2020-11,000, 2025-13,000

TABLE 2-10

CITY OF SAN DIEGO
LONG-TERM MANAGEMENT OPTIONS STRATEGIC PLAN

PROJECTED CAPACITY WITH SYCAMORE EXPANSION
(100% DEPT OF FINANCE)

MSW Declining Capacity Projections by Landfill (2009 Base Volumes)

Landfill	Borrego		Otay		Ramona		Sycamore Sanitary		Miramar		
Total Est. Permitted Capacity (cu yds)	706,745		62,377,974		2,200,000		48,124,462		87,760,000		
Remaining Estimated Capacity (cu yds)	478,836	as of 08/31/09	33,070,879	as of 11/30/06	690,000		47,388,428		19,177,564	as of 6/30/10	
Closure Date	12/31/2040	*Remaining tonnage goes to	4/30/2027	*Remaining tonnage goes to	12/31/2006	*Remaining tonnage goes to	12/31/2031		12/31/2020	*Remaining tonnage goes to	
Permitted Max Disposal (tons/day)	50	Sycamore	5,830	Sycamore	295	Sycamore	3,965		8,000	Sycamore	
Capacity after Expansion (cy yds)							80,000,000	Assume capacity added in 2014	87,760,000		

Remaining Capacity (Fiscal Year)	Borrego Beginning Capacity	Borrego Annual Disposal Tons	Borrego Ending Capacity	Otay Beginning Capacity	Otay Annual Disposal Tons	Otay Ending Capacity	Ramona Beginning Capacity	Ramona Annual Disposal Tons	Ramona Ending Capacity	Sycamore Sanitary Beginning Capacity	Sycamore Sanitary Annual Disposal Tons	Sycamore Sanitary Ending Capacity	Miramar Beginning Capacity	Miramar Annual Disposal Tons	Miramar Ending Capacity	System Capacity Total (after all assumed transfers to Sycamore)
2001	332,792	4,140	328,652	27,216,867	1,088,261	26,128,606	400,200	55,364	344,836	32,879,593	900,502	31,979,091	23,941,514	1,310,118	22,631,396	81,412,580
2002	328,652	4,560	324,091	26,128,606	1,254,892	24,873,714	344,836	70,009	274,827	31,979,091	894,000	31,085,091	22,631,396	1,340,465	21,290,930	77,848,654
2003	324,091	4,705	319,386	24,873,714	1,342,857	23,530,856	274,827	75,944	198,883	31,085,091	889,466	30,195,625	21,290,930	1,381,925	19,909,005	74,153,756
2004	319,386	5,092	314,294	23,530,856	1,420,225	22,110,631	198,883	80,151	118,732	30,195,625	911,356	29,284,269	19,909,005	1,444,695	18,464,310	70,292,236
2005	314,294	5,086	309,208	22,110,631	1,448,166	20,662,466	118,732	74,245	44,488	29,284,269	902,331	28,381,938	18,464,310	1,525,463	16,938,847	66,336,946
2006	309,208	6,632	302,576	20,662,466	1,481,356	19,181,110	44,488	44,488	-	28,381,938	896,650	27,485,288	16,938,847	1,475,919	15,462,928	62,431,901
2007	302,576	8,446	294,130	19,181,110	1,418,691	17,762,419				27,485,288	981,491	26,503,798	15,462,928	1,313,693	14,149,234	58,709,580
2008	294,130	8,677	285,453	17,762,419	1,310,025	16,452,394				26,503,798	988,314	25,515,484	14,149,234	1,160,219	12,989,015	55,242,346
2009	285,453	7,728	277,725	16,452,394	1,277,154	15,175,240				25,515,484	877,828	24,637,656	12,989,015	954,028	12,034,987	52,125,608
2010	277,725	7,388	270,337	15,175,240	1,220,891	13,954,349				24,637,656	839,156	23,798,500	12,034,987	912,000	11,122,987	49,146,173
2011	270,337	7,494	262,843	13,954,349	1,238,476	12,715,873				23,798,500	851,243	22,947,257	11,122,987	986,000	10,136,987	46,062,960
2012	262,843	7,631	255,212	12,715,873	1,261,085	11,454,788				22,947,257	866,783	22,080,474	10,136,987	1,004,000	9,132,987	42,923,461
2013	255,212	7,722	247,490	11,454,788	1,276,158	10,178,630				22,080,474	877,143	21,203,332	9,132,987	1,016,000	8,116,987	39,746,439
2014	247,490	7,730	239,760	10,178,630	1,277,414	8,901,216				67,603,332	878,006	66,725,325	8,116,987	1,017,000	7,099,987	82,966,289
2015	239,760	7,616	232,144	8,901,216	1,258,573	7,642,643				66,725,325	865,056	65,860,269	7,099,987	1,002,000	6,097,987	79,833,044
2016	232,144	7,695	224,449	7,642,643	1,271,648	6,370,995				65,860,269	874,043	64,986,226	6,097,987	1,160,214	4,937,773	76,519,443
2017	224,449	7,774	216,675	6,370,995	1,284,763	5,086,232				64,986,226	883,058	64,103,168	4,937,773	1,170,795	3,766,978	73,173,054
2018	216,675	7,854	208,821	5,086,232	1,297,917	3,788,315				64,103,168	892,098	63,211,070	3,766,978	1,181,379	2,585,599	69,793,805
2019	208,821	7,934	200,888	3,788,315	1,311,089	2,477,226				63,211,070	901,152	62,309,918	2,585,599	1,191,966	1,393,632	66,381,664
2020	200,888	8,013	192,874	2,477,226	1,324,271	1,152,955				62,309,918	910,213	61,399,705	1,393,632	1,203,555	190,078	62,935,612
2021	192,874	8,104	184,770	1,152,955	1,152,955	-				61,399,705	2,132,213	59,267,493	190,078	190,078	-	59,452,263
2022	184,770	8,195	176,575							59,267,493	3,514,280	55,753,212				55,929,787
2023	176,575	8,286	168,289							55,753,212	3,553,393	52,199,819				52,368,107
2024	168,289	8,378	159,911							52,199,819	3,592,513	48,607,306				48,767,217
2025	159,911	8,469	151,442							48,607,306	3,631,562	44,975,744				45,127,186
2026	151,442	8,559	142,883							44,975,744	3,670,422	41,305,322				41,448,205
2027	142,883	8,649	134,233							41,305,322	3,709,090	37,596,232				37,730,465
2028	134,233	8,739	125,494							37,596,232	3,747,508	33,848,724				33,974,218
2029	125,494	8,828	116,666							33,848,724	3,785,641	30,063,083				30,179,750
2030	116,666	8,916	107,750							30,063,083	3,823,447	26,239,636				26,347,386
2031	107,750	8,986	98,764							26,239,636	3,853,293	22,386,343				22,485,107
2032	98,764	9,054	89,710							22,386,343	3,882,698	18,503,644				18,593,355
2033	89,710	9,122	80,588							18,503,644	3,911,701	14,591,944				14,672,532
2034	80,588	9,189	71,399							14,591,944	3,940,321	10,651,623				10,723,023
2035	71,399	9,319	62,080							10,651,623	3,968,475	6,683,148				6,745,228
2036	62,080	9,319	52,761							6,683,148	3,996,361	2,686,788				2,739,548
2037	52,761	9,384	43,377							2,686,788	2,686,788	-				43,377
2038	43,377	9,447	33,930													33,930
2039	33,930	9,510	24,420													24,420
2040	24,420	9,572	14,848													14,848
2041	14,848	9,634	5,214													5,214
2042	5,214	5,214	-													-
2043																
2044																
2045																

NOTE: Conversion factor to convert from cubic yards to tons is 1,160. This rate was obtained from the Joint Technical Document (Volume 1 of 2) West Miramar Landfill San Diego California February 2007, revised February 4, 2008 for all landfills.

Sources:
- § CIWMB, Active Landfills Profile
- § Quarterly AB 939 CIWMB reports from the County of San Diego
- § San Diego County, Integrated Waste Management Plan, Countywide Siting Element, 2005
- § CIWMB, Disposal Reporting System, Origin of Waste by Landfill
- § ESD tonnage projections and % growth for 2010 - 2015
- § California State Dept of Finance Growth Projections for 2016 - 2045
- § Permitted daily tonnage maximums at Sycamore are:
  2008-3,965, 2009-6,800, 2010-9,000, 2015-10,000, 2020-11,000, 2025-13,000

TABLE 2-11

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

PROJECTED CAPACITY WITH SYCAMORE EXPANSION
(50% DEPT OF FINANCE)

MSW Declining Capacity Projections by Landfill (2009 Base Volumes)

Landfill	Borrego			Otay			Ramona			Sycamore			Miramar			
Total Est. Permitted Capacity (cu yds)	706,745			62,377,974			2,200,000			48,124,462			87,760,000			
Remaining Estimated Capacity (cu yds)	478,836	as of 08/31/09		33,070,879	as of 11/30/06		690,000			47,388,428	as of 09/30/06		19,177,564	as of 6/30/10		
Closure Date	12/31/2040	*Remaining tonnage goes to		4/30/2027	*Remaining tonnage goes to		12/31/2006	*Remaining tonnage goes to		12/31/2031			12/31/2012	*Remaining tonnage goes to		ENDING
Permitted Max Disposal (tons/day)	50	Sycamore		5,830	Sycamore		295	Sycamore		3,965			8,000	Sycamore		
Capacity after Expansion (cy yds)										80,000,000	Assume capacity added in 2014		87,760,000			CAPACITY
Remaining Capacity (Fiscal Year)	Beginning Capacity	Annual Disposal Tons	Ending Capacity	Beginning Capacity	Annual Disposal Tons	Ending Capacity	Beginning Capacity	Annual Disposal Tons	Ending Capacity	Beginning Capacity	Annual Disposal Tons	Ending Capacity	Beginning Capacity	Annual Disposal Tons	Ending Capacity	TOTALS
2001	332,792	4,140	328,652	27,216,867	1,088,261	26,128,606	400,200	55,364	344,836	32,879,593	900,502	31,979,091	23,941,514	1,310,118	22,631,396	81,412,580
2002	328,652	4,560	324,091	26,128,606	1,254,892	24,873,714	344,836	70,009	274,827	31,979,091	894,000	31,085,091	22,631,396	1,340,465	21,290,930	77,848,654
2003	324,091	4,705	319,386	24,873,714	1,342,857	23,530,856	274,827	75,944	198,883	31,085,091	889,466	30,195,625	21,290,930	1,381,925	19,909,005	74,153,756
2004	319,386	5,092	314,294	23,530,856	1,420,225	22,110,631	198,883	80,151	118,732	30,195,625	911,356	29,284,269	19,909,005	1,444,695	18,464,310	70,292,236
2005	314,294	5,086	309,208	22,110,631	1,448,166	20,662,466	118,732	74,245	44,488	29,284,269	902,331	28,381,938	18,464,310	1,525,463	16,938,847	66,336,946
2006	309,208	6,632	302,576	20,662,466	1,481,356	19,181,110	44,488	44,488	-	28,381,938	896,650	27,485,288	16,938,847	1,475,919	15,462,928	62,431,901
2007	302,576	8,446	294,130	19,181,110	1,418,691	17,762,419				27,485,288	981,491	26,503,798	15,462,928	1,313,693	14,149,234	58,709,580
2008	294,130	8,677	285,453	17,762,419	1,310,025	16,452,394				26,503,798	988,314	25,515,484	14,149,234	1,160,219	12,989,015	55,242,346
2009	285,453	7,728	277,725	16,452,394	1,277,154	15,175,240				25,515,484	877,828	24,637,656	12,989,015	954,028	12,034,987	52,125,608
2010	277,725	7,388	270,337	15,175,240	1,220,891	13,954,349				24,637,656	839,156	23,798,500	12,034,987	905,000	11,129,987	49,153,173
2011	270,337	7,441	262,896	13,954,349	1,229,684	12,724,665				23,798,500	845,200	22,953,300	11,129,987	986,000	10,143,987	46,084,849
2012	262,896	7,509	255,387	12,724,665	1,240,908	11,483,758				22,953,300	852,914	22,100,386	10,143,987	995,000	9,148,987	42,988,518
2013	255,387	7,554	247,833	11,483,758	1,248,324	10235434				22,100,386	858,012	21,242,375	9,148,987	1,000,946	8,148,041	39,873,683
2014	247,833	7,557	240,276	10,235,434	1,248,938	8986496				67,642,375	858,434	66,783,941	8,148,041	1,001,439	7,146,602	83,157,315
2015	240,276	7,502	232,774	8,986,496	1,239,727	7,746,768				66,783,941	852,103	65,931,838	7,146,602	994,054	6,152,549	80,063,929
2016	232,774	7,541	225,234	7,746,768	1,246,167	6,500,601				65,931,838	856,529	65,075,308	6,152,549	1,145,067	5,007,481	76,808,624
2017	225,234	7,580	217,654	6,500,601	1,252,593	5,248,008				65,075,308	860,946	64,214,362	5,007,481	1,150,972	3,856,509	73,536,533
2018	217,654	7,618	210,036	5,248,008	1,259,005	3,989,002				64,214,362	865,353	63,349,009	3,856,509	1,156,864	2,699,645	70,247,692
2019	210,036	7,657	202,378	3,989,002	1,265,394	2,723,608				63,349,009	869,745	62,479,264	2,699,645	1,162,734	1,536,911	66,942,162
2020	202,378	7,696	194,683	2,723,608	1,271,755	1,451,853				62,479,264	874,117	61,605,147	1,536,911	1,168,580	368,331	63,620,014
2021	194,683	7,739	186,944	1,451,853	1,278,962	172,891				61,605,147	1,685,941	59,919,206	368,331	368,331	-	60,279,040
2022	186,944	7,783	179,161	172,891	172,891	-				59,919,206	3,179,066	56,740,140				56,919,301
2023	179,161	7,826	171,335							56,740,140	3,370,610	53,369,530				53,540,866
2024	171,335	7,869	163,466							53,369,530	3,389,163	49,980,367				50,143,833
2025	163,466	7,912	155,554							49,980,367	3,407,583	46,572,784				46,728,339
2026	155,554	7,954	147,600							46,572,784	3,425,815	43,146,970				43,294,570
2027	147,600	7,996	139,604							43,146,970	3,443,860	39,703,110				39,842,714
2028	139,604	8,037	131,567							39,703,110	3,461,695	36,241,415				36,372,982
2029	131,567	8,078	123,489							36,241,415	3,479,308	32,762,107				32,885,596
2030	123,489	8,119	115,370							32,762,107	3,496,681	29,265,426				29,380,796
2031	115,370	8,150	107,220							29,265,426	3,510,329	25,755,097				25,862,317
2032	107,220	8,181	99,038							25,755,097	3,523,723	22,231,374				22,330,413
2033	99,038	8,212	90,826							22,231,374	3,536,883	18,694,491				18,785,317
2034	90,826	8,242	82,584							18,694,491	3,549,822	15,144,669				15,227,253
2035	82,584	8,272	74,313							15,144,669	3,562,533	11,582,136				11,656,449
2036	74,313	8,301	66,012							11,582,136	3,575,021	8,007,115				8,073,127
2037	66,012	8,329	57,683							8,007,115	3,587,326	4,419,789				4,477,472
2038	57,683	8,357	49,326							4,419,789	3,599,462	820,327				869,653
2039	49,326	8,385	40,940							820,327	820,327	-				40,940
2040	40,940	8,413	32,528													32,528
2041	32,528	8,440	24,088													24,088
2042	24,088	8,466	15,622													15,622
2043	15,622	8,493	7,129													7,129
2044	7,129	7,129	-													-
2045																

NOTE: Conversion factor to convert from cubic yards to tons is 1,160. This rate was obtained from the Joint Technical Document (Volume 1 of 2) West Miramar Landfill San Diego California February 2007, revised February 4, 2008 for all landfills.

TABLE 2-12

CITY OF SAN DIEGO
LONG-TERM MANAGEMENT OPTIONS STRATEGIC PLAN

PROJECTED CAPACITY WITH SYCAMORE EXPANSION
(150% DEPT OF FINANCE)

MSW Declining Capacity Projections by Landfill (2009 Base Volumes)

Landfill	Borrego			Otay			Ramona			Sycamore Sanitary			Miramar			
Total Est. Permitted Capacity (cu yds)	706,745			62,377,974			2,200,000			48,124,462			87,760,000			
Remaining Estimated Capacity (cu yds)	478,836	as of 08/31/09		33,070,879	as of 11/30/06		690,000			47,388,428			19,177,564	as of 6/30/10		
Closure Date	12/31/2040	*Remaining tonnage goes to		4/30/2027	*Remaining tonnage goes to		12/31/2006	*Remaining tonnage goes to		12/31/2031			12/31/2012	*Remaining tonnage goes to		ENDING
Permitted Max Disposal (tons/day)	50	Sycamore		5,830	Sycamore		295	Sycamore		3,965			8,000	Sycamore		
Capacity after Expansion (cy yds)										80,000,000	Assume capacity added in 2014		87,760,000			CAPACITY
Remaining Capacity (Fiscal Year)	Beginning Capacity	Annual Disposal Tons	Ending Capacity	Beginning Capacity	Annual Disposal Tons	Ending Capacity	Beginning Capacity	Annual Disposal Tons	Ending Capacity	Beginning Capacity	Annual Disposal Tons	Ending Capacity	Beginning Capacity	Annual Disposal Tons	Ending Capacity	TOTALS
2001	332,792	4,140	328,652	27,216,867	1,088,261	26,128,606	400,200	55,364	344,836	32,879,593	900,502	31,979,091	23,941,514	1,310,118	22,631,396	81,412,580
2002	328,652	4,560	324,091	26,128,606	1,254,892	24,873,714	344,836	70,009	274,827	31,979,091	894,000	31,085,091	22,631,396	1,340,465	21,290,930	77,848,654
2003	324,091	4,705	319,386	24,873,714	1,342,857	23,530,856	274,827	75,944	198,883	31,085,091	889,466	30,195,625	21,290,930	1,381,925	19,909,005	74,153,756
2004	319,386	5,092	314,294	23,530,856	1,420,225	22,110,631	198,883	80,151	118,732	30,195,625	911,356	29,284,269	19,909,005	1,444,695	18,464,310	70,292,236
2005	314,294	5,086	309,208	22,110,631	1,448,166	20,662,466	118,732	74,245	44,488	29,284,269	902,331	28,381,938	18,464,310	1,525,463	16,938,847	66,336,946
2006	309,208	6,632	302,576	20,662,466	1,481,356	19,181,110	44,488	44,488	-	28,381,938	896,650	27,485,288	16,938,847	1,475,919	15,462,928	62,431,901
2007	302,576	8,446	294,130	19,181,110	1,418,691	17,762,419				27,485,288	981,491	26,503,798	15,462,928	1,313,693	14,149,234	58,709,580
2008	294,130	8,677	285,453	17,762,419	1,310,025	16,452,394				26,503,798	988,314	25,515,484	14,149,234	1,160,219	12,989,015	55,242,346
2009	285,453	7,728	277,725	16,452,394	1,277,154	15,175,240				25,515,484	877,828	24,637,656	12,989,015	954,028	12,034,987	52,125,608
2010	277,725	7,388	270,337	15,175,240	1,220,891	13,954,349				24,637,656	839,156	23,798,500	12,034,987	905,000	11,129,987	49,153,173
2011	270,337	7,547	262,790	13,954,349	1,247,268	12,707,081				23,798,500	857,286	22,941,214	11,129,987	986,000	10,143,987	46,055,071
2012	262,790	7,754	255,036	12,707,081	1,281,423	11,425,658				22,941,214	880,762	22,060,452	10,143,987	1,013,000	9,130,987	42,872,133
2013	255,036	7,893	247,143	11,425,658	1,304,397	10,121,261				22,060,452	896,552	21,163,900	9,130,987	1,031,161	8,099,826	39,632,130
2014	247,143	7,905	239,238	10,121,261	1,306,322	8,814,939				67,563,900	897,876	66,666,024	8,099,826	1,032,684	7,067,142	82,787,343
2015	239,238	7,730	231,508	8,814,939	1,277,421	7,537,518				66,666,024	878,011	65,788,013	7,067,142	1,009,837	6,057,305	79,614,344
2016	231,508	7,850	223,658	7,537,518	1,297,328	6,240,190				65,788,013	891,694	64,896,319	6,057,305	1,175,018	4,882,288	76,242,454
2017	223,658	7,972	215,686	6,240,190	1,317,398	4,922,792				64,896,319	905,488	63,990,831	4,882,288	1,193,196	3,689,092	72,818,401
2018	215,686	8,094	207,592	4,922,792	1,337,629	3,585,163				63,990,831	919,394	63,071,437	3,689,092	1,211,520	2,477,572	69,341,764
2019	207,592	8,217	199,374	3,585,163	1,357,992	2,227,170				63,071,437	933,390	62,138,047	2,477,572	1,229,963	1,247,610	65,812,202
2020	199,374	8,341	191,033	2,227,170	1,378,473	848,698				62,138,047	948,370	61,189,677	1,247,610	1,247,610	-	62,229,408
2021	191,033	8,483	182,550	848,698	848,698	-				61,189,677	2,786,523	58,403,154				58,585,704
2022	182,550	8,626	173,924							58,403,154	3,696,475	54,706,680				54,880,604
2023	173,924	8,770	165,154							54,706,680	3,758,185	50,948,494				51,113,648
2024	165,154	8,915	156,239							50,948,494	3,820,246	47,128,248				47,284,487
2025	156,239	9,060	147,179							47,128,248	3,882,534	43,245,714				43,392,892
2026	147,179	9,206	137,973							43,245,714	3,944,853	39,300,861				39,438,834
2027	137,973	9,351	128,622							39,300,861	4,007,190	35,293,671				35,422,292
2028	128,622	9,496	119,126							35,293,671	4,069,449	31,224,222				31,343,347
2029	119,126	9,641	109,484							31,224,222	4,131,562	27,092,659				27,202,144
2030	109,484	9,786	99,698							27,092,659	4,193,454	22,899,206				22,998,904
2031	99,698	9,900	89,798							22,899,206	4,242,555	18,656,650				18,746,448
2032	89,798	10,014	79,784							18,656,650	4,291,119	14,365,532				14,445,316
2033	79,784	10,126	69,658							14,365,532	4,339,198	10,026,334				10,095,992
2034	69,658	10,237	59,421							10,026,334	4,386,820	5,639,514				5,698,935
2035	59,421	10,347	49,074							5,639,514	4,433,945	1,205,568				1,254,643
2036	49,074	10,456	38,618							1,205,568	1,205,568	-				38,618
2037	38,618	10,564	28,055													28,055
2038	28,055	10,671	17,384													17,384
2039	17,384	10,777	6,606													6,606
2040	6,606	6,606	-													-
2041																
2042																
2043																
2044																
2045																

NOTE: Conversion factor to convert from cubic yards to tons is 1,160. This rate was obtained from the Joint Technical Document (Volume 1 of 2) West Miramar Landfill San Diego California February 2007, revised February 4, 2008 for all landfills.

Sources:
- § CIWMB, Active Landfills Profile
- § Quarterly AB 939 CIWMB reports from the County of San Diego
- § San Diego County, Integrated Waste Management Plan, Countywide Siting Element, 2005
- § CIWMB, Disposal Reporting System, Origin of Waste by Landfill
- § ESD tonnage projections and % growth for 2010 - 2015
- § California State Dept of Finance Growth Projections for 2016 - 2045
- § Permitted daily tonnage maximums at Sycamore are:

TABLE 3-1

CITY OF SAN DIEGO
LONG-TERM RESOURCES MANAGEMENT OPTIONS STRATEGIC PLAN

RESOURCE MANAGEMENT OPTIONS RECOMMENDED FOR PHASE II EVALUATION

ZERO WASTE PROGRAMS AND POLICIES		
No.	**Code**	**Description**
1	ZW-SR-2	Implement rigid plastic recycling at curbside*.
2	ZW-SR-3	Ban single use polystyrene food containers*.
3	ZW-SR-9	Extended Producer/Manufacturer Responsibility.
4	ZW-RU-3	Recycle plastic bags using blue bins.
5	ZW-RY-2	Establish future "MRF First" - MSW to be processed through a MRF if available.
6	ZW-OD-1	Increase greenwaste pickup from bi-weekly to weekly.
7	ZW-OD-2	Create a cost incentive for business participation in a food disgards program as markets become available.
8	ZW-OD-4	Establish restaurant food waste collection and composting requirements as markets become available*.
9	ZW-SR-5	Provide business tax credits/incentives for certified Green Businesses.
10	ZW-SR-7	City Procurement Policy - Return usable shipping containers*.
11	ZW-RY-7	Establish on-call bulky item pick-up for single, multi-family, and businesses.
12	ZW-ED-1	Develop/promote e-newsletters to schools*.
13	ZW-ED-2	Educate Restaurants about source reduction.
14	ZW-ED-5	Establish Re-Create Art Contest and Exhibition for youth*.
15	ZW-RY-4	Coordinate large retailer drop-off locations for specific wastes.
16	ZW-OD-9	Allow inclusion of certain residential food waste in the green can (bi-weekly).
* City already implementing or has piloted.		

TABLE 3-1
(CONTINUED)

CITY OF SAN DIEGO
LONG-TERM RESOURCES MANAGEMENT OPTIONS STRATEGIC PLAN

RESOURCE MANAGEMENT OPTIONS RECOMMENDED FOR PHASE II EVALUATION

INFRASTRUCTURE		
No.	**Code**	**Description**
1	ZWI-1	Household Hazardous Waste Collection Center*
2	ZWI-2	Material Recovery Facilities – Curbside*
3	LO1	Compaction*
4	LO2	Alternative Daily Cover – Tarp-o-matic*
5	DIN1	Miramar Height Increase* (0 miles)
6	DIN2	Sycamore Landfill (8 miles)
7	ZWI-4	Greenwaste Facilities*
8	ZWI-5	Construction & Demolition Facilities
9	CT1	Gasification & Pyrolysis
10	LO3	Landfill Reclamation of North Miramar
11	DIN3	Otay Landfill (20 miles)
12	ZWI-3	Material Recovery Facilities - Commercial
13	ZWI-6	Transfer Facilities
14	ZWI-7	Resource Recovery Parks (RRP) - Industrial
15	ZWI-8	Resource Recovery Parks - Community (Convenience drop-off)
16	CT2	Anaerobic Digestion
17	LO4	Alternative Daily Cover-Computer Aided Earth Moving System
18	DOUT1	El Sobrante Landfill (82 miles)
19	CT3	Hydrolysis
20	CT4	Mechanical Processing (Autoclave)
21	CT5	Chemical Processing (Depolymerization)
22	WTE1	500-tpd or less Mass-Burn Municipal Waste Combustor
23	DOUT2	Prima Deshecha Landfill (62 miles)
24	DOUT3	Frank R. Bowerman Landfill (78 miles)
* City already implementing or has piloted.		

TABLE 3-2

CITY OF SAN DIEGO
LONG-TERM RESOURCES MANAGEMENT OPTIONS STRATEGIC PLAN

ZERO WASTE PROGRAMS/IDEAS

No.	* ID #	ZERO WASTE PROGRAM	EXPECTED DIVERSION (Tons/Year)	CAPITAL COST ($)/START DATE (YEAR)	PROGRAM COST ($/Year)
1	ZW-SR-2	Implement Rigid Plastic Recycling at Curbside.	1,500 to 2,500		No Cost to City
2	ZW-SR-3	Ban Single Use Polystyrene Food Containers.	Unknown		No Cost City
3	ZW-SR-9	Extended Producer/Manufacturer Responsibility.	Unknown		Unknown
4	ZW-RU-3	Recycle Plastic Bags Using Blue Bins.	2,000 to 3,000		75,000 to 150,000
5	ZW-RY-2	Establish Future "MRF First" – MSW To Be Processed Through a MRF if Available.	Low-Diversion	High Cost	High Cost
6*	ZW-OD-1	Increase Green Waste Pickup From Bi-Weekly to Weekly.	31,000 Not Included in Financial Model	3,500,000 Not Included in Financial Model	5,600,000 Not Included in Financial Model
		Expansion of Green Waste Collection Services and Conversion from Manual Collection to Automated Collection	16,800	14,800,000 (18,300,000 assumed in Financial Model)	450,000
7	ZW-OD-2	Create a Cost Incentive for Business Participation in a Food Discards Program as Markets Become Available.	40,000		Fees charged will cover cost
8	ZW-OD-4	Establish Restaurant Food Waste Collection and Composting Requirements as Markets Become Available.	See No. 7		See No. 7
9	ZW-SR-5	Provide Business Tax Credits/Incentives for Certified Green Businesses.	Unknown		Unknown
10	ZW-SR-7	City Procurement Policy – Return Usable Shipping Containers.	Unknown		Unknown
11	ZW-RY-7	Establish On-Call Bulky Item Pick-Up for Single, Multi-Family, and Businesses.	Unknown		Unknown
12	ZW-ED-1	Develop/Promote E-Newsletters to Schools. (Education)	Unknown		Unknown
13	ZW-ED-2	Educate Restaurants About Source Reduction. (Education)	Unknown		Unknown
14	ZW-ED-5	Establish Re-Create Art Contest and Exhibition for Youth.	Unknown		$1,800
15	ZW-RY-4	Coordinate Large Retailer Drop-Off Locations for Specific Wastes.	Unknown		Unknown
16	ZW-OD-9	Allow Inclusion of Certain Residential Food Waste in the Green Can (Bi-Weekly).	Unknown		Unknown

TABLE 3-2

CITY OF SAN DIEGO
LONG-TERM RESOURCES MANAGEMENT OPTIONS STRATEGIC PLAN

ZERO WASTE PROGRAMS/IDEAS

ESD ONGOING PROGRAMS AND PROPOSED INITIATIVES

No.	ID #	ZERO WASTE PROGRAM AND PROPOSED INITIATIVES	EXPECTED DIVERSION (Tons/Year)	CAPITAL COST ($)/START DATE (YEAR)	PROGRAM COST ($/Year)
		"Stand for Less"*	Unknown		Unknown
		Miramar Resource Recovery Center	50,000	6.1 Million	960,000

* ID# Legend:

ZW = Zero Waste
SR = Source Reduction
RU = ReUse
RY = Recycling
OD = Organic Diversion
ED = Education

TABLE 3-3

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

THROUGHPUT ANALYSIS
FOR THE
MIRAMAR TRANSFER STATION
at 5,000 Tons Per Day (tpd) Peak

The purpose of the following calculations is to determine the design capacity of the facility taking into account the number of unloading and loading bays, truck capacities, and storage pile volumes.

HOURS OF OPERATION

Assumption: Monday through Sunday: 7:00 a.m. to 5:00 p.m.
10 hours per day

INCOMING

Municipal Solid Waste (MSW) – (5,400) tpd Peak Incoming (@ 10 hours/day)

Assumption: Average tons per load: 6 tons
Average unloading time: 10 minutes
Number of tipping bays: 15 Total

1 bays x 6 loads/hr x 6 tons/ld = 36 tons/hour

36 tons/hour x 10 hours = 360 tpd/per bay

15 bays x 360 tons/day= 5,400 tpd

Total MSW Material Throughput: 5,400 tpd

INCOMING TIPPING AREA STORAGE PILE

Municipal Solid Waste (MSW)

Storage capacity = 13,500 yd^3 - From CADD software calculations using contours denoted on floor plan (see Table 1)
Weight = .18 tons/yd^3
13,000 x .18 = **2,500 tons of storage**

OUTGOING

Municipal Solid Waste (MSW) – (5,280) TPD Peak Outgoing (@ 10 hours/day)

Assumption: Average tons per load: 22 tons
Average loading time: 10 minutes
Number of load-out tunnels: 1 Total
1 load-out tunnel x 6 loads/hr x 22 tons/ld = 132 tons/hour

132 tons/hour x 10 hours = 1,320 tons/day (per load-out tunnel)

4 load-out tunnels x 1,320 tons/day= 5,280 tons/day

TRAFFIC VOLUMES

Incoming MSW – (5,000) TPD

Assumption: Average tons per load: 6 tons

Number of incoming trucks: 835 trucks per day

Outgoing MSW

Assumption: Average tons per load: 22 tons

Number of incoming trucks: 227 trucks per day

Total Traffic Volume: 1,062 truck per day

STORAGE REQUIRED

The storage required at maximum incoming throughput would be the total incoming waste and recyclable materials in 10 hours, less the total outgoing waste and recyclable materials in 10 hours; 5,400 tons – 5,280 tons = 120 tons.

There is a storage capacity of approximately 2,500 tons; more than enough to store materials and provide area for maneuverability. The storage space provides a safeguard for unforeseen breakdowns in any of the other parts of the system.

CONCLUSION

From the calculations listed above, the conceptual Transfer Station can operate at **5,000** tpd peak of MSW materials. An increase in throughput at the facility can be achieved by extending the hours of operation.

TABLE 3-4

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

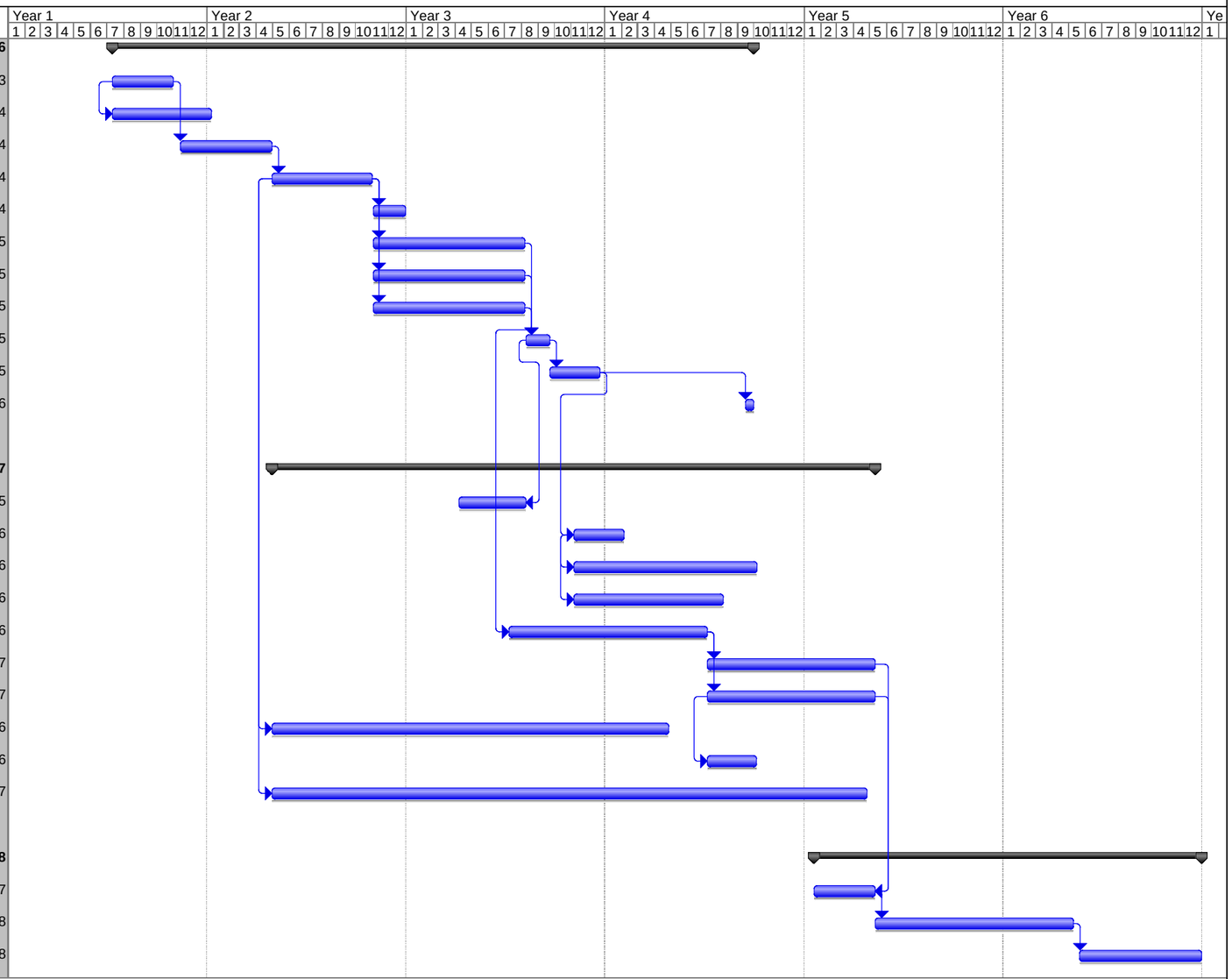
MIRAMAR TRANSFER STATION
PRELIMINARY CONSTRUCTION COST ESTIMATE

Item	Unit	Quantity		Unit Cost		Estimated Cost	Upper Range +10%
I. Design Phase							
Legal / Planning Documents	L.S.	1	$	100,000.00	$	100,000	
Architectural / Engineering	L.S.	1	$	1,652,825.00	$	1,652,825	
Solid Waste Facilities Permitting	L.S.	1	$	300,000.00	$	300,000	
Geotechnical	L.S.	1	$	100,000.00	$	100,000	
Project Management	L.S.	1	$	120,000.00	$	120,000	
				Total Design Phase		**$2,272,825**	
II. Construction Phase							
Off-site improvements	L.S.	1	$	150,000.00	$	150,000	
Landscaping	S.F.	30,000	$	5.00	$	150,000	
Drainage Improvements	L.S.	1	$	150,000.00	$	150,000	
Sewer Improvements	L.S.	1	$	50,000.00	$	50,000	
Water Improvements	L.S.	1	$	150,000.00	$	150,000	
Grading / Pavements	S.F.	375,000	$	8.00	$	3,000,000	
				Sub-total		**$3,650,000**	
Facility Building Costs (installed)							
Transfer Building included Mechanical / Electrical[1]	S.F.	75,000	$	135.00	$	10,125,000	
Administration/Employee included Mechanical / Electrical	S.F.	8,000	$	150.00	$	1,200,000	
Maintenance Center included Mechanical / Electrical	S.F.	8,000	$	100.00	$	800,000	
Steel Push-Wall	L.F.	200	$	500.00	$	100,000	
Roll-up Doors (Assume 5)	S.F.	2,000	$	20.00	$	40,000	
Other (specify) - Contractor's OH & Profit	L.S.	5%	$	12,265,000.00	$	613,250	
				Sub-total		*12,878,250*	
				Total Construction Phase	***$***	**$16,528,250**	
III. Fixed Equipment							
Scalehouse	S.F.	1,500	$	120.00	$	180,000	
Load-out Axle Scales	PR.	4	$	25,000.00	$	100,000	
Scales Systems	L.S.	4	$	50,000.00	$	200,000	
Support Equipment - Software	L.S.	1	$	50,000.00	$	50,000	
				Total Fixed Equipment	***$***	**$530,000**	
IV. Other							
Building Permit & Plan Check Fees	L.S.	1	$	50,000.00	$	50,000	
Local Jurisdiction Inspection	L.S.	1	$	150,000.00	$	150,000	
Developer Fee	L.S.	1	$	200,000.00	$	200,000	
Construction Services (A/E)	L.S.	1	$	750,000.00	$	750,000	
				Total Other	***$***	**1,150,000**	
SUBTOTAL					$	20,481,075	
CONTINGENCY		20%			$	4,096,215	
TOTAL CONSTRUCTION COST ESTIMATE (June 2010)					*$*	24,577,290	
Total Estimated Cost						**$25,000,000**	**$27,500,000**

(1) Does not include space inside the building for alternative technologies.

Table 3-5
Miramar Transfer Station Development Schedule

ID	Task Name	Duration	Start	Finish
1	**PRELIMINARY DESIGN AND NEPA/CEQA PROCESS**	**42.05 mons**	**Fri 7/12/13**	**Fri 9/30/16**
2	Hire Consultant	4 mons	Fri 7/12/13	Thu 10/31/13
3	Determine Regulatory and Environmental Compliance Requirements	6.5 mons	Fri 7/12/13	Thu 1/9/14
4	Prepare Project Description	6 mons	Thu 11/14/13	Wed 4/30/14
5	Pre-Scoping Meetings & Public Outreach Program (e.g. USFWS Consultation)	6.6 mons	Thu 5/1/14	Fri 10/31/14
6	NEPA Notice of Intent to Prepare EIS, CEQA EIR Notice of Preparation	2.15 mons	Mon 11/3/14	Wed 12/31/14
7	NEPA EIS Preparation, CEQA EIR Preparation (1)	10 mons	Mon 11/3/14	Fri 8/7/15
8	Biological Surveys	10 mons	Mon 11/3/14	Fri 8/7/15
9	Environmental Studies (Traffic, Noise, Air Quality) (2)	10 mons	Mon 11/3/14	Fri 8/7/15
10	Draft EIS and EIR Public Review Period	1.6 mons	Mon 8/10/15	Tue 9/22/15
11	Prepare NEPA Record of Decision, CEQA Response to Comments & Final EIR	3.3 mons	Wed 9/23/15	Wed 12/23/15
12	NEPA File Record of Decision, CEQA EIR Certification & File Notice of Determinatio	0.55 mons	Fri 9/16/16	Fri 9/30/16
13				
14	**PERMITS AND APPROVALS**	**39.55 mons**	**Thu 5/1/14**	**Thu 5/11/17**
15	Hire Permitting Consultant	4.35 mons	Thu 4/9/15	Mon 8/10/15
16	Finding of Conformance	3.3 mons	Fri 11/6/15	Fri 2/5/16
17	City of San Diego Site Development Permit	12 mons	Fri 11/6/15	Thu 10/6/16
18	FAA Clearance - Required for Site Development Permit	9.8 mons	Fri 11/6/15	Fri 8/5/16
19	Transfer Processing Report	13 mons	Fri 7/10/15	Thu 7/7/16
20	Solid Waste Facility Permit Approval	11 mons	Fri 7/8/16	Thu 5/11/17
21	Waste Discharge Requirements Approval	11 mons	Fri 7/8/16	Thu 5/11/17
22	Resource Agency Permit Approvals (as necessary)	26 mons	Thu 5/1/14	Wed 4/27/16
23	NPDES Industrial General Permit	3.2 mons	Fri 7/8/16	Wed 10/5/16
24	Title V Permit	39 mons	Thu 5/1/14	Wed 4/26/17
25				
26	**FINAL DESIGN AND CONSTRUCTION**	**25.35 mons**	**Fri 1/20/17**	**Mon 12/31/18**
27	Hire Design Consultant	4 mons	Fri 1/20/17	Thu 5/11/17
28	Design/Bid	13 mons	Fri 5/12/17	Thu 5/10/18
29	Construction	8 mons	Tue 5/22/18	Mon 12/31/18



Project: Miramar Exp
Date: Fri 9/7/12

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

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BRYAN A. STIRRAT & ASSOCIATES

TABLE 3-6

CITY OF SAN DIEGO
LONG-TERM RESOURCES MANAGEMENT OPTIONS STRATEGIC PLAN

NORTH MIRAMAR LANDFILL VERTICAL INCREASE
VOLUME/SITE LIFE CALCULATIONS

Description	Volume – Fill to Permitted Elevation (485 feet AMSL)	Volume – Fill to 40 feet Above Permitted Elevation (525 feet AMSL)
Gross Airspace (CY)[1]	5,790,000	12,910,000
Liner Volume (CY) [3]	-1,010,000	-1,010,000
Final Cover Volume (CY) [4]	-980,000	-990,000
Totals with 6 million CY stockpile		
Existing Stockpiles (CY) [2]	6,000,000.00	6,000,000
Totals with Subtitle D Liner		
Total Net Airspace Available (CY)	**9,470,000**	**16,580,000**
Total Net Tons (Assume 0.58 tons/CY)[5]	**5,490,000**	**9,620,000**
Total Site Life (years)[6]	**4.6**	**8.0**
Totals With Interim Cover		
Total Net Airspace Available (CY)	**10,490,000 [7]**	**17,600,000**
Total Net Tons[5]	**6,080,000**	**10,210,000**
Total Site Life (years)[6]	**5.1**	**8.5**
Totals with 2.8 million CY stockpile		
Existing Stockpiles (CY) [2]	2,800,000.00	2,800,000
Totals with Subtitle D Liner		
Total Net Airspace Available (CY)	**6,270,000**	**13,380,000**
Total Net Tons (Assume 0.58 tons/CY)[5]	**3,640,000**	**7,760,000**
Total Site Life (years)[6]	**3.0**	**6.5**
Totals With Interim Cover		
Total Net Airspace Available (CY)	**7,290,000**	**14,400,000**
Total Net Tons[5]	**4,230,000**	**8,350,000**
Total Site Life (years)[6]	**3.5**	**7.0**

[1] Gross Airspace was calculated by comparing the proposed final grading to the existing topography (2004) using a grid method in AutoCAD.
[2] 6 million cubic yards estimated volume from e-mail by Rory Clay dated February 7, 2006. 2.8 million cubic yards estimated volume from previous memorandum dated June 24, 2010.[1]
[3] Estimate based on 5-foot thick intermediate liner.
[4] Estimate based on 4-foot thick final cover.
[5] An airspace utilization factor of 0.58 tons per cubic yard of airspace was used to convert cubic yards to tons based on the Joint Technical Document (Volume 1 of 2) West Miramar Landfill San Diego, California February 2007, revised February 4, 2008.
[6] Assumes average of 1.2 million tons per year at 2021 based on Hilton, Farnkopf's and Hobson's demand analysis projections.
[7] The highlighted cell is the assumption used for the financial models.

[1] June 24, 2010, memo Re. City of San Diego, Long-Term Resource Management Options Strategic Plan, North Miramar Landfill Reclamation, to Chris Gonaver, from Christine Arbogast and Burril McCoy.

TABLE 3-7

CITY OF SAN DIEGO
LONG-TERM RESOURCES MANAGEMENT OPTIONS STRATEGIC PLAN

NORTH MIRAMAR LANDFILL VERTICAL INCREASE
SOIL BALANCE

	Fill to Permitted Elevation (485 Feet AMSL)		Fill to 40 Feet Above Permitted Elevation (525 Feet AMSL)	
Waste-to-Cover Ratio [1]	4:1		4:1	
Soil Generated from Excavation of Existing Stockpiles (CY)	6,000,000	2,800,000	6,000,000	2,800,000
Soil Balance With Subtitle D Liner				
Total Net Airspace (CY)	9,470,000	6,270,000	16,580,000	13,380,000
Daily and Intermediate Soil Cover (CY)	1,890,000	1,250,000	3,320,000	2,680,000
Soil Required for Landfill Development (CY) (Liner + Final Cover)	2,320,000	2,320,000	2,330,000	2,330,000
Soil Balance With Liner (CY)	**1,790,000**	**-770,000**	**350,000**	**-2,210,000**
Soil Balance with Interim Cover				
Total Net Airspace (CY)	10,490,000	7,290,000	17,600,000	14,400,000
Daily and Intermediate Soil Cover (CY)	2,100,000	1,460,000	3,520,000	2,880,000
Soil Required for Landfill Development (CY) (1-Foot Thick Interim Liner + Final Cover)	1,300,000	1,300,000	1,310,000	1,310,000
Soil Balance With Interim Cover (CY)	**2,600,000**	**40,000**	**1,170,000**	**-1,390,000**

[1] From West Miramar Landfill Joint Technical Document, February 4, 2008, page 3-6.

TABLE 3-8

CITY OF SAN DIEGO
LONG-TERM RESOURCES MANAGEMENT OPTIONS STRATEGIC PLAN

NORTH MIRAMAR LANDFILL VERTICAL INCREASE
SOIL BALANCE

Fill up to the Permitted Elevation of 485 feet				Cost (Interim Cover)		Cost (liner)	
Description	Quantity	Unit	Unit Cost	(2.8 MCY Stockpile)	(6.0 MCY Stockpile)	(2.8 MCY Stockpile)	(6.0 MCY Stockpile)
Permitting [1], [7]	1	lump sum (LS)		$8,420,000	$8,420,000	$8,420,000	$8,420,000
Excavation of Overburden Soil [2]	2.8 MCY to 6 MCY	CY	$2.17	$6,080,000	$13,020,000	$6,080,000	$13,020,000
Gas Collection and Conveyance System [3]	6.2 MCY to 10.5 MCY	CY of airspace	$0.12	$870,000	$1,260,000	$750,000	$1,140,000
Design, Construction Management, and Construction Quality Assurance [4]	1	LS	See (4)	$130,000	$220,000	$1,190,000	$1,280,000
Liner and Miscellaneous Construction[5]	151	acre (ac)	$160,000	–	–	$24,190,000	$24,190,000
Contingency 20%				$3,100,000	$4,580,000	$6,610,000	$9,610,000
Total Development Cost				**$18,600,000**	**$27,500,000**	**$39,660,000**	**$57,660,000**
Total Development Cost Per Ton				**$4**	**$5**	**$11**	**$11**
Closure Cost [6]	153	ac	$105,000	$19,280,000	$19,280,000	$19,280,000	$19,280,000
Total Cost [8]				**$37,880,000**	**$46,780,000**	**$58,940,000**	**$76,940,000**
Total Cost Per Ton				**$9**	**$8**	**$16**	**$14**

Fill an Additional 40 feet Above Permitted Elevation of 485 feet				Cost (Interim Cover)		Cost (liner)	
Description	Quantity	Unit	Unit Cost	(2.8 MCY Stockpile)	(6.0 MCY Stockpile)	(2.8 MCY Stockpile)	(6.0 MCY Stockpile)
Permitting [1], [7]	1	lump sum (LS)		$8,420,000	$8,420,000	$8,420,000	$8,420,000
Excavation of Overburden Soil [2]	2.8 MCY to 6 MCY	CY	$2.17	$6,080,000	$13,020,000	$6,080,000	$13,020,000
Gas Collection and Conveyance System [3]	13.4 MCY to 17.6 MCY	CY of airspace	$0.12	$1,730,000	$2,110,000	$1,610,000	$1,990,000
Design, Construction Management, and Construction Quality Assurance [4]	1	LS	See (4)	$130,000	$220,000	$1,190,000	$1,280,000
Liner and Miscellaneous Construction[5]	151	acre (ac)	$160,000	–	–	$24,190,000	$24,190,000
Contingency 20%				$3,270,000	$4,750,000	$6,780,000	$9,780,000
Total Development Cost				**$19,630,000**	**$28,520,000**	$40,690,000	$58,680,000
Total Development Cost Per Ton				**$2**	**$3**	**$5**	**$6**
Closure Cost [6]	154	ac	$105,000	$19,390,000	$19,390,000	$19,390,000	$19,390,000
Total Cost				**$39,020,000**	**$47,910,000**	**$60,080,000**	**$78,070,000**
Total Cost Per Ton				**$5**	**$5**	**$8**	**$8**

[1] The expansion permitting costs are based on California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA) documentation ($500,000), JTD ($150,000) and permitting ($250,000) assumed for a vertical expansion.

[2] Excavation of overburden soil cost is from the average of bids for Construction of West Miramar Phase II - Module E, excluding the high and low bid.

[3] Costs for expansion of the gas collection and conveyance system are based on BAS's experience with designing and constructing systems at other facilities. The cost for WML expansion Alternative A ($530,000) was converted to a cost per unit of airspace (divided by 4,280,000 CY for WML) then multiplied by the estimated airspace for the NML vertical increase scenarios.

[4] The cost for a vertical expansion design is assumed at $50,000 without a liner and $100,000 with a liner. Liner construction management is assumed to cost $450,000, and construction quality assurance is assumed to cost $560,000 with a construction duration of 257 days. Construction management would also be needed for stockpile movement. For a 2.8 MCY stockpile this is estimated to span 70 days and for a 6 MCY stockpile this is estimated to span 150 days. The daily cost is estimated at approximately $1,120 per day. Stockpile relocation can occur during design if a subtitle D compliant liner were necessary.

[5] Liner and miscellaneous costs are from the average of bids for Construction of West Miramar Phase II - Module E costs with the excavation costs subtracted.

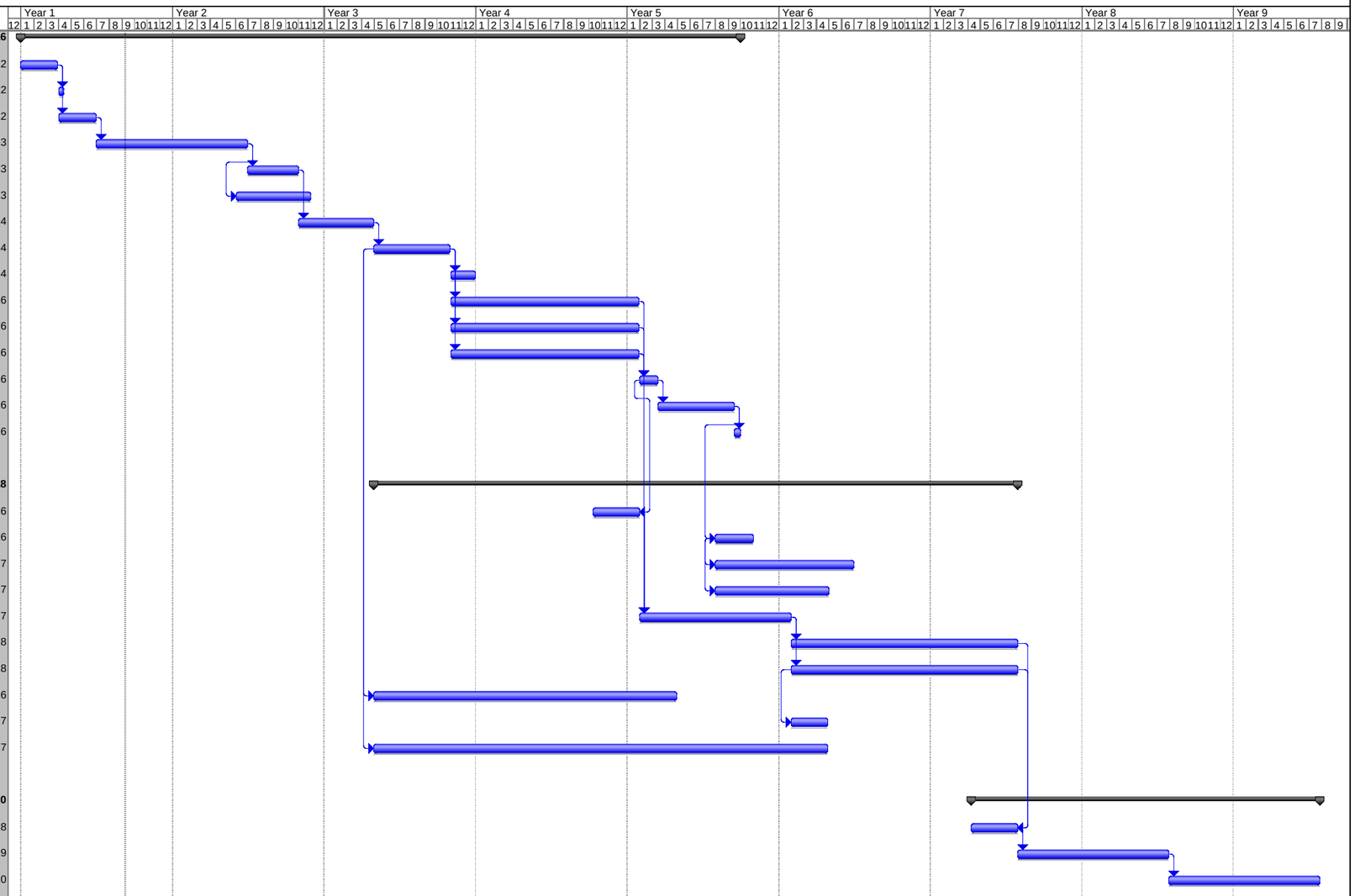
[6] Closure costs are based on a cost per acre of final cover. This unit cost originates from Alternative A for WML expansion divided by the final cover area for that option. This cost is based on BAS's experience in preparing closure cost estimates, closure designs and closure construction. A 20 percent contingency was added to these costs.

[7] Environmental mitigation costs are assumed to include gnatcatcher habitat mitigation costs estimated at $30,000 per acre for the entire site (250 acres) + $50,000 per acre for a 2-foot wide "ditch" along the northern and eastern perimeter (7,000 feet) that may be considered a vernal pool. These costs do not include annual gnatcatcher habitat maintenance, which is estimated at $25,000 ($100 per acre).

[8] The amount of $27,500,000 for development cost and $20,300,000 for Closure cost were the assumptions used for the financial models.

Table 3-9
North Miramar Landfill Vertical Expansion and West Miramar Lateral Expansion - Alternative A

ID	Task Name	Duration	Start	Finish
1	**PRELIMINARY DESIGN AND NEPA/CEQA PROCESS**	**62.2 mons**	**Sun 1/1/12**	**Fri 9/30/16**
2	Develop Alternatives for MCAS Consideration	3.25 mons	Sun 1/1/12	Thu 3/29/12
3	Meeting with MCAS	0.5 mons	Mon 4/2/12	Fri 4/13/12
4	Submit Supporting Documentation Required to MCAS	3.3 mons	Mon 4/2/12	Sat 6/30/12
5	MCAS to Consider Option to Pursue	13.1 mons	Sun 7/1/12	Sun 6/30/13
6	Hire Consultant	4.45 mons	Mon 7/1/13	Thu 10/31/13
7	Determine Regulatory and Environmental Compliance Requirements	6.5 mons	Tue 6/4/13	Fri 11/29/13
8	Prepare Project Description	6.45 mons	Fri 11/1/13	Wed 4/30/14
9	Pre-Scoping Meetings & Public Outreach Program (e.g. USFWS Consultation)	6.6 mons	Thu 5/1/14	Fri 10/31/14
10	NEPA Notice of Intent to Prepare EIS, CEQA EIR Notice of Preparation	2.15 mons	Mon 11/3/14	Wed 12/31/14
11	NEPA EIS Preparation, CEQA EIR Preparation (1)	16.25 mons	Mon 11/3/14	Fri 1/29/16
12	Biological Surveys	16.25 mons	Mon 11/3/14	Fri 1/29/16
13	Environmental Studies (Traffic, Noise, Air Quality) (2)	16.25 mons	Mon 11/3/14	Fri 1/29/16
14	Draft EIS and EIR Public Review Period	1.6 mons	Mon 2/1/16	Tue 3/15/16
15	Prepare NEPA Record of Decision, CEQA Response to Comments & Final EIR	6.6 mons	Wed 3/16/16	Thu 9/15/16
16	NEPA File Record of Decision, CEQA EIR Certification & File Notice of Determinat	0.55 mons	Fri 9/16/16	Fri 9/30/16
17				
18	**PERMITS AND APPROVALS**	**55.4 mons**	**Thu 5/1/14**	**Mon 7/30/18**
19	Hire Permitting Consultant	4 mons	Mon 10/12/15	Mon 2/1/16
20	Finding of Conformance	3.3 mons	Mon 8/1/16	Mon 10/31/16
21	City of San Diego Site Development Permit	12 mons	Mon 8/1/16	Fri 6/30/17
22	FAA Clearance - Required for Site Development Permit	9.8 mons	Mon 8/1/16	Mon 5/1/17
23	Joint Technical Document, Preliminary Closure & Post-Closure Plans Preparation	13.05 mons	Mon 2/1/16	Mon 1/30/17
24	Solid Waste Facility Permit Approval	19.5 mons	Tue 1/31/17	Mon 7/30/18
25	Waste Discharge Requirements Approval	19.5 mons	Tue 1/31/17	Mon 7/30/18
26	Resource Agency Permit Approvals (as necessary)	26.1 mons	Thu 5/1/14	Fri 4/29/16
27	NPDES Industrial General Permit	3.2 mons	Tue 1/31/17	Fri 4/28/17
28	Title V Permit	39.1 mons	Thu 5/1/14	Fri 4/28/17
29				
30	**FINAL DESIGN AND CONSTRUCTION**	**30 mons**	**Tue 4/10/18**	**Mon 7/27/20**
31	Hire Design Consultant	4 mons	Tue 4/10/18	Mon 7/30/18
32	Design/Bid	13 mons	Tue 7/31/18	Mon 7/29/19
33	Construction	13 mons	Tue 7/30/19	Mon 7/27/20



Project: Miramar Exp
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Task — Progress — Summary — External Tasks — Deadline
Split — Milestone — Project Summary — External Milestone

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BRYAN A. STIRRAT & ASSOCIATES

TABLE 3-10

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

WEST MIRAMAR LANDFILL LATERAL EXPANSION ALTERNATIVES
SOIL BALANCE

Description	Alternative A	Alternative B
Area (acres)	26.0	77.7
Gross Air Space (cy)	4,541,512	21,080,252
Base Liner Volume (cy)	87,702	262,498
Final Cover Volume (cy)	171,187	512,294
Net Airspace (MSW & Daily Cover) (cy)	4,282,622	20,305,460
Waste to Cover Ratio (X:1)	3.0	3.0
Soil Required for Daily Cover (cy)	1,070,656	5,076,365
Soil Required for Landfill Development (cy)	258,890	774,792
Soil Generated from Excavation (cy)	1,018,368	4,844,443
Soil Balance (cy)	(311,177)	(1,006,714)

NOTES

1) Area is plan area.

2) Gross Airspace calculated by comparing propsed final grading and subgrade grading plans.

3) Base Liner volumes were calculated assuming a 2 ft. thick layer placed over the entire base. The area was corrected as needed for the slopes.

4) Final Cover volumes were calculated assuming a 4 thick layer placed over the entire final cover area. The area was corrected as needed for the slopes.

5) Net Airspace is equal to Gross Airspace minus Base Liner and Final Cover volumes.

TABLE 3-11
CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

WEST MIRAMAR LANDFILL LATERAL EXPANSION
EXPANSION ALTERNATIVES DEVELOPMENT COSTS

Description	Development Costs	
	Alternative A	Alternative B
Net Airspace (cy)	4,282,622	20,305,460
Airspace Utilization Factor (t/cy)	0.55	0.55
Net Airspace (tons)	2,355,442	11,168,003
Development Cost	$ 6,830,000	$ 24,340,000
Permitting	$ 2,300,000	$ 2,300,000
Infrastructure	$ 100,000	$ 100,000
GCCS	$ 530,000	$ 1,380,000
Environmental Mitigation	$ 2,000,000	$ 3,000,000
Power Line Relocation	$ -	$ 5,358,823
Gas Line Relocation	$ -	$ -
Miscellaneous	$ -	$ -
TOTAL DEVELOPMENT COST	$ 11,760,000	$ 36,480,000
Development Amortized Cost ($/ton)	$ 4.99	$ 3.27
Closure Cost	$ 2,720,000	$ 8,140,000
SUBTOTAL	$ 14,480,000	$ 44,620,000
Contingency 20%	$ 2,900,000	$ 8,920,000
TOTAL COST	$ 17,380,000	$ 53,540,000
Total Amortized Cost ($/ton)	$ 7.38	$ 4.79

NOTES

1) Development Cost based on Module E costs. The per acre cost for Alternative A was $251,426 and that for Alternative B was $299,249. The respective unit costs includes design, permitting, CQA, earthworks, liner and miscellaneous work specific to each alternative.

2) Expansion permitting costs were assumed to be nearly the same between the two alternatives and are based on estimates provided by ESD in email dated May 20, 2010. The permitting costs do not include CEQA/ NEPA, which is included in the Environmental Mitigation costs.

3) Infrastructure costs are assumed to be minimal and include relocation of the existing leachate storage facilities.

4) Costs for expansion of the gas collection and conveyance system (GCCS) are based on BAS' experience with designing and constructing GCCS at other facilities.

5) Environmental Mitigation costs provided by ESD in an email dated May 20, 2010.

6) SDG&E Power Line Relocation costs based on a spreadsheet provided by the California Independent System Operator (CAISO) website.

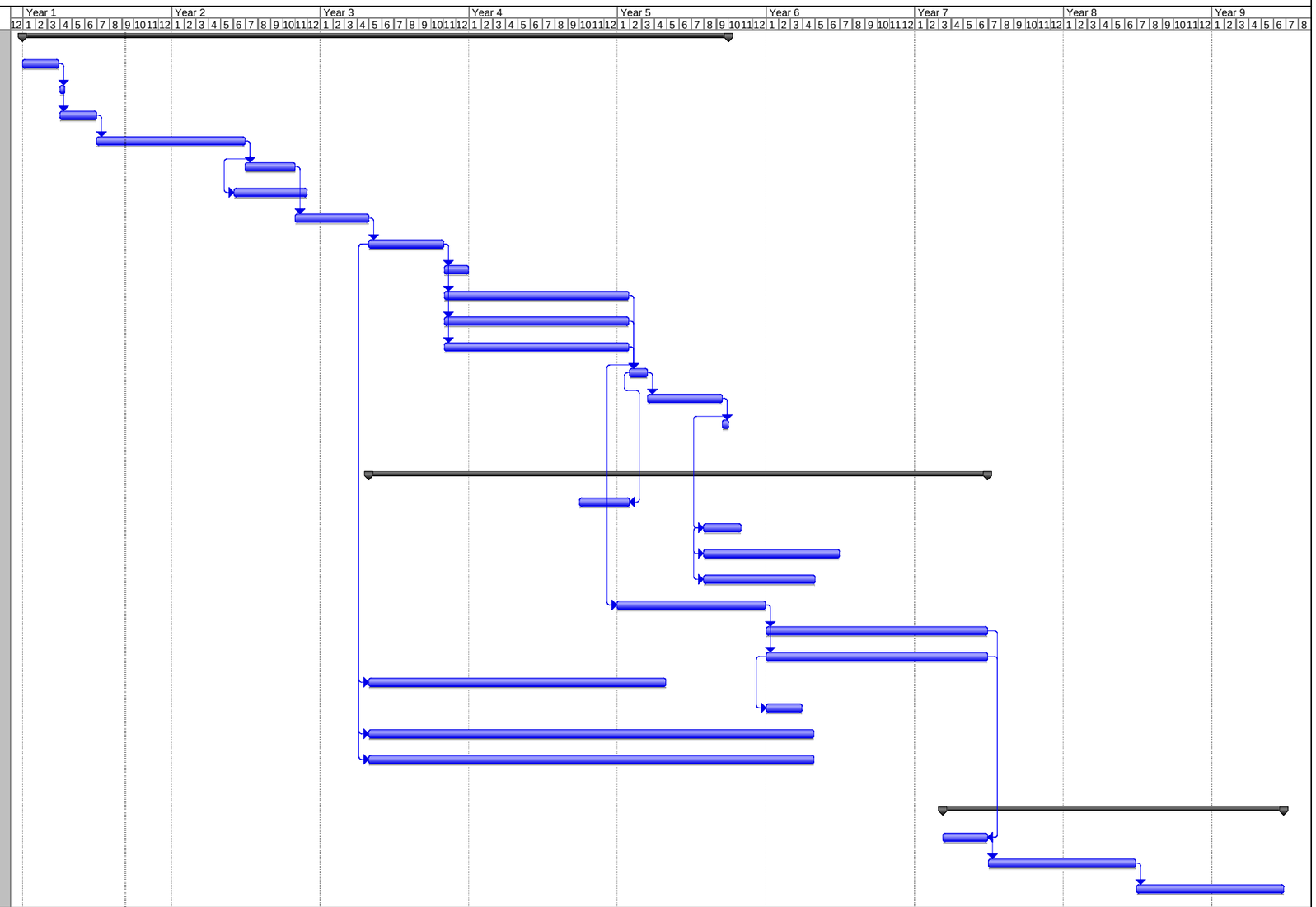
7) Gas Line Relocation costs based on unit costs from Oil&Gas Journal Data Book. 2008 Edition, PennWell, and includes abandoning existing pipelines. Assumed abandonment costs were 25% of new construction costs.

8) Closure Costs based on BAS' experience with preparing closure cost estimates, closure designs, and closure construction.

9) The AUF was provided by ESD in meeting on May 21, 2010.

Table 3-12
West Miramar Landfill Lateral Expansion - Alternative B

ID	Task Name	Duration	Start	Finish	Predecessors
1	**PRELIMINARY DESIGN AND NEPA/CEQA PROCESS**	**62.2 mons**	**Sun 1/1/12**	**Fri 9/30/16**	
2	Develop Alternatives for MCAS Consideration	3.25 mons	Sun 1/1/12	Thu 3/29/12	
3	Meeting with MCAS	0.5 mons	Mon 4/2/12	Fri 4/13/12	2
4	Submit Supporting Documentation Required to MCAS	3.3 mons	Mon 4/2/12	Sat 6/30/12	2
5	MCAS to Consider Option to Pursue	13.1 mons	Sun 7/1/12	Sun 6/30/13	4
6	Hire Consultant	4.45 mons	Mon 7/1/13	Thu 10/31/13	5
7	Determine Regulatory and Environmental Compliance Requiren	6.5 mons	Tue 6/4/13	Fri 11/29/13	5FS-1 mon
8	Prepare Project Description	6.45 mons	Fri 11/1/13	Wed 4/30/14	6
9	Pre-Scoping Meetings & Public Outreach Program (e.g. USFWS	6.6 mons	Thu 5/1/14	Fri 10/31/14	8
10	NEPA Notice of Intent to Prepare EIS, CEQA EIR Notice of Pre	2.15 mons	Mon 11/3/14	Wed 12/31/14	9
11	NEPA EIS Preparation, CEQA EIR Preparation (1)	16.25 mons	Mon 11/3/14	Fri 1/29/16	9
12	Biological Surveys	16.25 mons	Mon 11/3/14	Fri 1/29/16	9
13	Environmental Studies (Traffic, Noise, Air Quality) (2)	16.25 mons	Mon 11/3/14	Fri 1/29/16	9
14	Draft EIS and EIR Public Review Period	1.6 mons	Mon 2/1/16	Tue 3/15/16	11,12,13
15	Prepare NEPA Record of Decision, CEQA Response to Comme	6.6 mons	Wed 3/16/16	Thu 9/15/16	14
16	NEPA File Record of Decision, CEQA EIR Certification & File N	0.55 mons	Fri 9/16/16	Fri 9/30/16	15
17					
18	**PERMITS AND APPROVALS**	**54.35 mons**	**Thu 5/1/14**	**Fri 6/29/18**	
19	Hire Permitting Consultant	4.35 mons	Thu 10/1/15	Mon 2/1/16	14SF
20	Finding of Conformance	3.3 mons	Mon 8/1/16	Mon 10/31/16	15FS-1.7 mons
21	City of San Diego Site Development Permit	12 mons	Mon 8/1/16	Fri 6/30/17	20SS
22	FAA Clearance - Required for Site Development Permit	9.8 mons	Mon 8/1/16	Mon 5/1/17	20SS
23	Joint Technical Document, Preliminary Closure & Post-Closure	13.05 mons	Fri 1/1/16	Fri 12/30/16	13FS-1.05 mons
24	Solid Waste Facility Permit Approval	19.5 mons	Mon 1/2/17	Fri 6/29/18	23
25	Waste Discharge Requirements Approval	19.5 mons	Mon 1/2/17	Fri 6/29/18	23
26	Resource Agency Permit Approvals (as necessary)	26.1 mons	Thu 5/1/14	Fri 4/29/16	9SS
27	NPDES Industrial General Permit	3.2 mons	Mon 1/2/17	Thu 3/30/17	25SS
28	Title V Permit	39.1 mons	Thu 5/1/14	Fri 4/28/17	9SS
29	Relocate Utilities (Power & Gas Lines)	39.1 mons	Thu 5/1/14	Fri 4/28/17	9SS
30					
31	**Final Design and Construction**	**30 mons**	**Mon 3/12/18**	**Fri 6/26/20**	
32	Hire Design Consultant	4 mons	Mon 3/12/18	Fri 6/29/18	24FF,25FF
33	Design/Bid	13 mons	Mon 7/2/18	Fri 6/28/19	32
34	Construction	13 mons	Mon 7/1/19	Fri 6/26/20	33



Project: Miramar Exp
Date: Fri 9/7/12

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

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BRYAN A. STIRRAT & ASSOCIATES

TABLE 3-13

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

FINAL OPTIONS IDENTIFIED IN PHASE II

No.	Code	Description
1	(ZW) - Zero Waste Programs and Policies	1. 16 Zero Waste Strategies
2	(ZWI) - Zero Waste Infrastructure	1. Resource Recovery Center (Convenience drop-off) 2. Conversion Technology Facility Development Evaluation
3	(T) - Transport	1. Transfer Station 2. In-County o Otay Landfill o Sycamore Landfill 3. Out-of-County o El Sobrante Landfill
4	(MLCO) - Miramar Landfill Capacity Optimization	1. North Miramar Vertical or West Miramar Vertical 2. West Miramar Lateral (2 Alternatives) 3. Environmental Management Program 4. Comprehensive Operational Review (CORE)

TABLE 4-1

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

EXISTING SYSTEM BASELINE[1]
BACKDROP FOR SYSTEM CONFIGURATIONS

Existing City Zero Waste Programs – Over 36 programs

a. Council Ordinances / Policies / Administrative Regulations
   - Construction and Demolition (C&D) recycling ordinance
   - City recycling ordinance for commercial, multi-family and single-family sectors
   - Recycled Products Procurement (Council Policy 100-14) – Purchase of recycled content products
   - Sustainable Building (Council Policy 900-14) – LEED Silver Certification for new City facilities and fast track permitting for private LEED projects
   - Energy Efficient Products Policy (Council Policy 900-18) – Purchase of Energy Star equipment
   - Energy Conservation and Management (Council Policy 900-02) – Adherence to energy conservation guidelines
   - Environmentally Preferable Purchasing Policy (EP3) – Administrative Regulation

b. Recycling and Resource Recovery
   - Economic Incentive of $18 to $19 per ton for source-separated recycling
   - Operation of Miramar Recycling Center
   - Partnership with Goodwill adjacent to recycling center
   - Salvage operation
   - Non-Profit / Charity Oversight – to encourage reuse, charities allowed free disposal of residue, but must have at least 50 percent diversion

c. Composting and Expanded Organics Diversion
   - Doubled size of Miramar Greenery composting facility and upgraded permit
   - Effort with commercial sector to maintain food waste composting and partner in zero waste events
   - Foodwaste partnership with Sea World, Petco Park, SDSU, PLNU, Del Mar Fair
   - Backyard Composting bin events
   - Compost Bin Demonstration Gardens in partnership with Zoo, Wild Animal Park, and SeaWorld, and own site at Ridgehaven Green Building

[1] From Phase I LRMOSP report dated December 2008.

- Backyard Composting workshops and informational booths at community events
- Vermicomposting in schools partnership with Solana Center (siting vermicomposting bins in schools)
- Master Composter training
- Christmas tree recycling
- Bagged compost sales

d. Outreach and Education
   - Waste reduction guide
   - Unwanted mail reduction
   - Holiday Waste Reduction
   - Recycle or Else
   - Other educational initiatives such as environmental workshops, tours, etc.
   - Commercial and multi-family technical assistance and annual award recognition for top waste reduces
   - Commercial and multi-family waste audits
   - Zero Waste Earth Day Event in Balboa Park
   - Support of Zero Waste at San Diego County Fair and Del Mar Fairgrounds
   - Ridgehaven Green Building / Xeriscape Demonstration Project

e. Legislative Initiatives (actively supported at State level)
   - Curbside recycling funding
   - E-waste
   - Clopyralid
   - Other initiatives

<u>Processing Facilities –Zero Waste Infrastructure</u>

- Nine (9) Transfer/Material Recovery/C&D Facilities
- Seven (7) Composting Facilities
- 52 Recycling Centers

<u>Disposal Facilities</u>

- Miramar Landfill to 2021
- Sycamore Landfill Expansion
- Otay Landfill
- Gregory Canyon opens 2012
- Orange County ends importation of out-of-county waste in 2015

- Riverside County El Sobrante Landfill permitted for up to 42,000 tons per week of imported waste.

Regulatory /Policy Issues

a. State
   - California Integrated Waste Management Act, 1989 (AB 939); and
   - AB 737 – Increase Diversion (75% by 2020) – Vetoed by Governor Arnold Schwarzenegger but likely to come back in the near future.

b. Regional
   - County of San Diego, Integrated Waste Management Plan, Countywide Siting Element; and

c. Local
   - Peoples Ordinance of 1919;
   - Proposition H;
   - Recycling Ordinance of 2008;
   - Construction & Demolition Debris Diversion Deposit Program of 2008;
   - City of San Diego Non-Disposal Facility Element (NDFE);
   - Miramar Ground Lease between City of San Diego and U.S.A., Department of the Navy; end 2045.
   - Miramar Landfill General Development Plan (1993);
   - Facilities Franchise Agreement with EDCO Recovery & Transfer Station;
   - Facilities Franchise Agreement with San Diego Landfill Systems, Inc., for Sycamore Landfill;
   - Non-Exclusive Solid Waste Collection Franchise Agreements; and the
   - Fortistar's landfill gas agreement.

TABLE 4-2

CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

CRITERIA RANKING OF IMPORTANCE
RMAC & ESD STAFF

Name	EVALUATION CRITERIA						Total Score
	Financial Viability	Technical Viability	Regional Viability	Environmental Viability	Capacity Optimization	Sustainability	
RMAC Member 1	15	15	20	20	15	15	100
RMAC Member 2	10	10	0	30	0	50	100
RMAC Member 3	25	30	5	5	15	20	100
RMAC Member 4	10	10	10	20	10	40	100
RMAC Member 5	25	20	10	15	10	20	100
RMAC Member 6	5	5	10	30	20	30	100
RMAC Member 7	18	14	18	18	16	16	100
RMAC Member 8	20	10	10	20	10	30	100
RMAC Member 9	25	20	20	10	5	20	100
RMAC Member 10	10	10	10	30	10	30	100
RMAC Member 11	30	15	15	10	20	10	100
RMAC Member 12	25	25	15	15	10	10	100
ESD Staff 1	20	20	5	15	25	15	100
ESD Staff 2	15	15	0	30	25	15	100
ESD Staff 3	30	10	5	30	20	5	100
AVERAGE	**18.867**	**15.267**	**10.200**	**19.867**	**14.067**	**21.733**	**100**
ROUNDED	**19**	**15**	**10**	**20**	**14**	**22**	
RANK	**3**	**4**	**6**	**2**	**5**	**1**	
	Financial Viability	Technical Viability	Regional Viability	Environmental Viability	Capacity Optimization	Sustainability	

RANKING

1 Sustainability
2 Environmental
3 Financial
4 Technical
5 Capacity Optimization
6 Regional

Table 5.1
Miramar Landfill Disposal Fees
(Weighed Loads: $/Ton)

Hauler Type	Waste Material Point of Origin	Refuse Disposal Tipping Fee[1]	Construction and Demolition Tipping Fee[2]	Refuse Collector Business Tax[3]	Franchise Fee[4]	AB 939 Fee[5]	Total Refuse Disposal Fee[6]	Total Construction and Demolition Disposal Fee[7]
Residents (less than 2 tons)	City of San Diego	$30	$83	–	–	$10	$40	$93
Residents (2 tons or more)	City of San Diego	$30	$83	$8	–	$10	$48	$101
Businesses	City of San Diego	$30	$83	$8	–	$10	$48	$101
Businesses	Outside City Limits	$36	$99	$8	–	$10	$54	$117
City of San Diego	City of San Diego	$21	$58	–	–	$10	$31	$68
City of San Diego	Outside City Limits	$31	$85	$8	–	$10	$49	$103
Other Govt. Organizations	City of San Diego	$26	$72	–	–	$10	$36	$82
Other Govt. Organizations	Outside City Limits	$36	$99	$8	–	$10	$54	$117
Franchise Hauler (Class I)	City of San Diego	$26	$72	–	$15	$10	$51	$97
Franchise Hauler (Class I)	Outside City Limits	$36	$99	$8	–	$10	$54	$117
Franchise Hauler (Class II)	City of San Diego	$26	$72	–	$16	$10	$52	$98
Franchise Hauler (Class II)	Outside City Limits	$36	$99	$8	–	$10	$54	$117
Flat Rate Transactions[8]	All	Varies	Varies	$0 or $8	–	$10	Varies	Varies

Table 5.1 Notes:

[1] The Refuse Disposal Tipping Fee is the component of the Total Refuse Disposal Fee that is associated with burying refuse in Miramar Landfill. Revenues from Refuse Disposal Tipping Fees support Refuse Disposal Fund operations.

[2] The Construction and Demolition (C&D) Tipping Fee is 2.75 x the Refuse Disposal Tipping Fee, and is assessed on all loads designated as C&D loads. Revenues from the C&D Tipping Fee support Refuse Disposal Fund operations.

[3] The Refuse Collector Business Tax (RCBT) is a tax assessed on all disposal transactions at Miramar Landfill involving a business (excluding Franchised Haulers with City origin loads), all residential transactions greater than 2 tons, and all transactions involving loads originating outside of City limits. Revenues from the RCBT support General Fund operations.

[4] The Franchise Fee is the component of the Total Refuse Disposal Fee that is associated with loads hauled by the City's non-exclusive refuse collection franchisees. Revenues from the Franchise Fee support General Fund operations.

[5] The AB 939 Fee is assessed on all tracked tonnage collected within the City of San Diego, regardless of final disposal destination. It is also assessed on all non-City origin transactions at Miramar Landfill. The revenue from this fee supports Recycling Fund operations.

[6] Customers hauling refuse loads are assessed the Total Refuse Disposal Fee.

[7] Customers hauling C&D loads are assessed the Total Construction and Demolition Disposal Fee.

[8] Flat Rate Transactions are typically associated with smaller loads, such as pickup trucks or vehicles with small trailers, which are not weighed. The fee components of a given Flat Rate Transaction vary depending on the type of vehicle, the point of origin of the material, and whether a given load is being disposed of by a resident, a small business, City forces, or a Franchised Hauler.

Table 5.2 Financial Analysis Model Key Assumptions						
Assumptions	System Configuration					
	1	2	3	4a	4b	5
1. Miramar Landfill weight based Refuse and Construction & Demolition Tipping fees for Franchise, City Department and Non-Franchise tons remain at current rates through the projected closure date	✓	✓	✓	✓	✓	✓
2. The Flat Rate Refuse Disposal Tipping Fee for Pick-up Trucks increased by $1 per year through 2045	✓	✓	✓	✓	✓	✓
3. Refuse transaction to ton conversion rate remains at .69 through 2045	✓	✓	✓	✓	✓	✓
4. Used California Department of Finance Population projections for disposed tonnage growth starting in 2016	✓	✓	✓	✓	✓	✓
5. $1,710,00 in greenery fees beginning in 2010 and adjusted by CPI through 2045	✓	✓	✓	✓	✓	✓
6. $1,320,000 in interest income. Phased out over 5 years with $260,000 per year beginning in:	2020	2021	2021	2021	2021	2021
7. Other Revenue – adjusted greenery commodity revenue and city department charges by CPI, remaining revenues stayed constant	✓	✓	✓	✓	✓	✓
8. Revised FY2010 – FY2015 ESD projections to ESD forecast prepared on 08/31/10	✓	✓	✓	✓	✓	✓
9. Annual Inflation Factor of 2.36% for 2016-2045	✓	✓	✓	✓	✓	✓
10. Savings for discontinued landfill operations of $21M (2010 dollars – adjusted for inflation) beginning in:	2022	2022	2027	2024	2032	2037
11. Waste Management Inc. tonnage continues to come to Miramar through 2045	✓	✓	✓	✓	✓	✓
12. When Miramar closes, assume tonnage taken to Sycamore Landfill and then to El Sobrante (after closure of Sycamore)	✓	✓	✓	✓	✓	✓
13. Fiscal impact of the closure of Miramar to the General Fund is not included in projections	✓	✓	✓	✓	✓	✓
14. Post Closure Fund Balance – Alternative Funding Mechanism – left at $6,000,000 per year through 2045	✓	✓	✓	✓	✓	✓
15. North County tons to Miramar beginning in 2016, and then to Sycamore when Miramar closes. When Sycamore closes, North County tons are no longer included in the projections	✓	✓	✓	✓	✓	✓
16. Expected start date of Resource Recovery Center	N/A	2014	2014	2014	2014	2014
17. Expected start date of commercial food waste collection	N/A	2014	2014	2014	2014	2014
18. Expected start date of automated green trimmings collection	N/A	2017	2017	2017	2017	2017
19. Expected start date of beginning transfer station permitting process	N/A	2015	2020	2017	2022	2027
20. Expected start date of transfer station operations	N/A	2022	2027	2024	2032	2037
21. Expected start date of N Miramar height expansion	N/A	N/A	2013	N/A	N/A	2013
22. Expected start date of tonnage into N Miramar expansion	N/A	N/A	2022	N/A	N/A	2022
23. Expected start date of W Miramar lateral expansion	N/A	N/A	N/A	2013	2013	2018
24. Expected state date of tonnage into W Miramar lateral expansion	N/A	N/A	N/A	2022	2022	2027
25. Used current tip fees at Sycamore Landfill and El Sobrante Landfill adjusted for inflation	N/A	✓	✓	✓	✓	✓
26. Used the transfer and transport rates per ton determined in Phase I, adjusted for inflation	N/A	✓	✓	✓	✓	✓
27. Adjusted projected RDF and RF savings for inflation through 2045	✓	✓	✓	✓	✓	✓
28. Updated CIP program costs per ESD's schedules	✓	✓	✓	✓	✓	✓
29. Used ESD's estimated costs for automated green trimmings collection, adjusted for inflation	N/A	✓	✓	✓	✓	✓

Table 5.3 Refuse Disposal Fund Summary of Key Financial Information						
Refuse Disposal Fund	Configuration 1	Configuration 2	Configuration 3	Configuration 4a	Configuration 4b	Configuration 5
Total Expenditures[1] Cumulative from present through:						
2020	394.4M	$409.6M	$422.7M	$413.0M	$453.8M	$440.0M
2030	$561.3M	$1.2B	$1.1B	$1.2B	$971.0M	$1.0B
2045	$982.8M	$3.0B	$3.7B	$3.9B	$3.3B	$3.0B
Total Revenues[2] Cumulative from present through:						
2020	$334.6M	$323.3M	$321.5M	$321.5M	$321.5M	$321.5M
2030	$374.1M	$997.2M	$816.6M	$939.0M	$687.0M	$690.2M
2045	$454.1M	$2.4B	$3.0B	$3.3B	$2.7B	$2.3B
Total Net Revenue/(Expenditures)[2,3] Cumulative from present through:						
2020	$(59.8 M)	$(86.3M)	$(101.2M)	$(91.5M)	$(132.4M)	$(118.5M)
2030	$(187.2M)	$(232.4M)	$(294.2M)	$(238.4M)	$(284.0M)	$(324.9M)
2045	$(528.7M)	$(622.9M)	$(684.7M)	$(628.9M)	$(676.2M)	$(731.9M)
Estimated Miramar Closure Date	2021	2021	2027	2023	2031	2036
Estimated Export Out of County Date	2026	2039	2040	2039	2042	2043

Table 5.3 Notes:

[1] Represents all operating and capital costs currently included in the system configuration projections. Also included are the new RDF capital costs associated with anticipated new Zero Waste Programs, which includes a Resource Recovery Center and a commercial food discard program. The majority of the costs are upfront construction/implementation costs so the costs per diverted ton diminish over time. No future replacement costs for the Resource Recovery Center have been included.

[2] Revenues equal to the cost to process material in a transfer station, and then transport and dispose of the material out of the county have been included in Configurations 2 – 5. These costs and revenues are not applicable to Configuration 1, given the transfer station is not a component of Configuration I.

[3] Represents the cumulative net revenues and expenditures for the Refuse Disposal Fund. Included are capital and other expenditures for related operations off-site of Miramar Landfill, such as illegal dump abatements, community clean-ups, street litter container collections, closed landfill/burn sites, department management and administration, etc.

Table 5.4 Refuse Disposal Fund Summary of Key Tonnage Information						
Refuse Disposal Fund	Configuration 1	Configuration 2	Configuration 3	Configuration 4a	Configuration 4b	Configuration 5
Waste Quantity (Tons)[1]						
Cumulative from present through:						
Disposed						
2020	10,900,000	10,231,000	10,231,000	10,231,000	10,231,000	10,231,000
2030	15,000,000	20,350,000	21,180,000	20,670,000	21,879,000	21,879,000
2045	21,800,000	36,881,000	37,711,000	37,201,000	38,590,000	39,500,000
Diverted (New Programs)						
2020	N/A	720,000	720,000	720,000	720,000	720,000
2030	N/A	2,350,000	2,030,000	2,030,000	2,030,000	2,030,000
2045	N/A	3,900,000	3,900,000	3,900,000	3,900,000	3,900,000
Total Expenditures per Disposed and Diverted Ton						
Cumulative from present through:						
2020	$ 36	$ 37	$ 39	$ 38	$ 41	$ 40
2030	$ 37	$ 55	$ 48	$ 52	$ 41	$ 43
2045	$ 45	$ 75	$ 89	$ 95	$ 78	$ 70
Total Revenue per Disposed and Diverted Ton						
Cumulative from present through:						
2020						
2030	$ 31	$ 30	$ 29	$ 29	$ 29	$ 29
2045	$ 25	$ 45	$ 35	$ 41	$ 29	$ 29
	$ 21	$ 59	$ 73	$ 79	$ 62	$ 53
Net Deficit per Disposed & Diverted Ton						
Cumulative from present through:						
2020	$ 5	$ 8	$ 9	$ 8	$ 12	$ 11
2030	$ 12	$ 10	$ 13	$ 11	$ 12	$ 14
2045	$ 24	$ 15	$ 16	$ 15	$ 16	$ 17
Estimated Miramar Closure Date	2021	2021	2027	2023	2031	2036
Estimated Export Out of County Date	2026	2039	2040	2039	2042	2043

Table 5.4 Notes:

[1] The waste quantity for Configuration 1 includes all tonnages currently directed to Miramar Landfill through the year it is projected to reach full capacity (2021). Thereafter, only the tons disposed of by City departments are included. For Configurations 2 – 5, waste quantities include all tonnages currently directed to West Miramar and those that would continue to go to Miramar Landfill while capacity remains available. Waste material from northern San Diego County that is currently disposed of in Orange County (OC) is assumed to be disposed at Miramar in Configurations 2 – 5 beginning in 2016 when exportation to OC ceases. It is assumed the North County tonnages will be direct hauled via an Oceanside transfer station to Sycamore Landfill once Miramar achieves full capacity. Once Sycamore reaches full capacity, it is assumed the North County tons will be taken to another landfill site out of the county and will not use the proposed Miramar Transfer Station.

Table 5.5 Recycling Fund Summary of Key Financial Information						
Recycling Fund	Configuration 1	Configuration 2	Configuration 3	Configuration 4a	Configuration 4b	Configuration 5
Total Expenditures[1] Cumulative from present through:						
2020	$192.8M	$210.3M	$210.3M	$210.3M	$210.3M	$210.3M
2035	$430.3M	$463.7M	$463.7M	$463.7M	$463.7M	$463.7M
2045	$934.6M	$1.0B	$1.0B	$1.0B	$1.0B	$1.0B
Total Revenues Cumulative from present through:						
2020	$215.3M	$215.3M	$215.0M	$215.0M	$215.0M	$215.0M
2035	$385.7M	$423.0M	$439.9M	$438.0M	$464.1M	$462.4M
2045	$705.1M	$761.7M	$789.5M	$787.3M	$817.0M	$832.3M
Total Net Revenue/(Expenditures) Cumulative from present through:						
2020	$22.5M	$4.7M	$4.7M	$4.7M	$4.7M	$4.7M
2035	$(44.6M)	$(40.7M)	$(23.8M)	$(26.0M)	$0.4M	$(1.3M)
2045	$(229.5M)	$(247.5M)	$(219.7M)	$(221.9M)	$(192.2M)	$(176.9M)

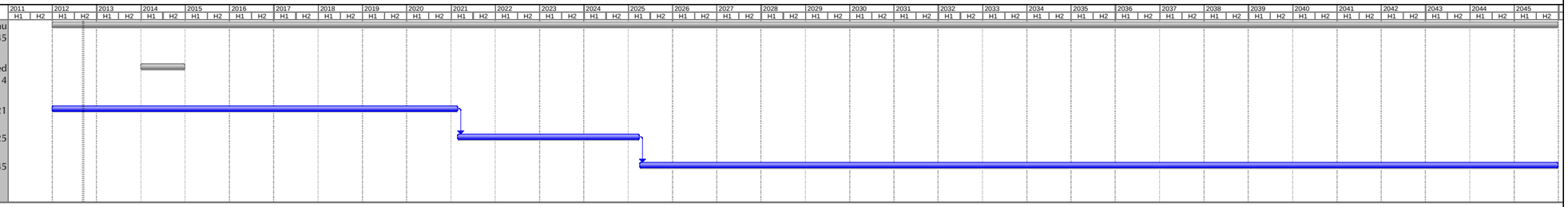
Table 5.5 Notes:

[1] Represents all operating and capital costs currently included in the configuration projections. Also included are the new RF capital costs associated with anticipated new Zero Waste Programs. The new program with the greatest potential fiscal impact is the automation and expansion of green waste collection. It is assumed the green waste collection trucks will be replaced twice and related containers once through 2045. The majority of the costs are upfront implementation costs so the cost per diverted ton diminishes over time.

TABLE 6-1
CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

CONFIGURATION 1 - BASELINE, STATUS QUO

ID	Task Name	Duration	Start	Finish
1	Existing Zero Waste Programs	8870 days	Sun 1/1/12	Thu 12/28/45
2	Resource Recovery Center at Miramar	13.05 mons	Wed 1/1/14	Wed 12/31/14
3	Existing West Miramar LF	2390 days	Sun 1/1/12	Thu 2/25/21
4	Direct Transport to Sycamore Landfill	53.5 mons	Fri 2/26/21	Thu 4/3/25
5	Direct Transport to Out-of-County El Sobrante Landfill	270.5 mons	Mon 4/7/25	Fri 12/29/45



Project: Config 2
Date: Fri 9/7/12

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

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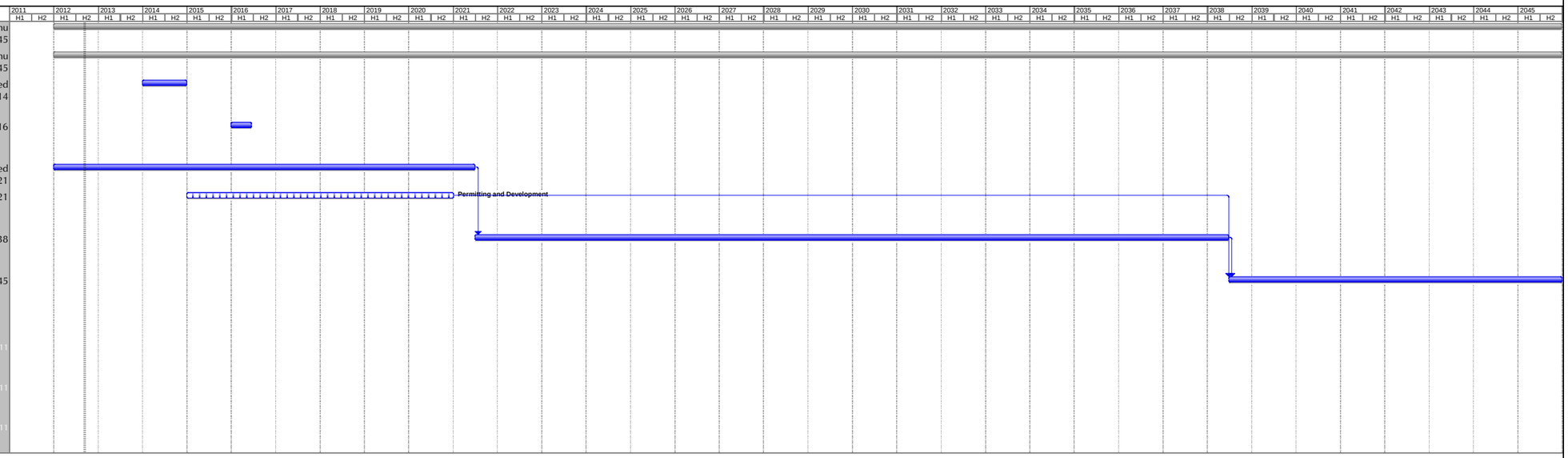
TABLE 6-2
CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

CONFIGURATION 2 - ZERO WASTE

ID	Task Name	Duration	Start	Finish
1	Existing Zero Waste Programs	8870 days	Sun 1/1/12	Thu 12/28/45
2	New Zero Waste Programs	8870 days	Sun 1/1/12	Thu 12/28/45
3	Resource Recovery Center at Miramar	13.05 mons	Wed 1/1/14	Wed 12/31/14
4	Conversion Technology Facility Evaluation	6 mons	Fri 1/1/16	Thu 6/16/16
5	Existing West Miramar LF (1)	2479 days	Sun 1/1/12	Wed 6/30/21
6	Develop Transfer Station at Miramar (2) (3)	78.35 mons	Fri 1/2/15	Mon 1/4/21
7	Transfer and Transport to Sycamore Landfill	4432 days	Thu 7/1/21	Fri 6/25/38
8	Transfer and Transport to Out of County El Sobrante Landfill	98 mons	Mon 6/28/38	Fri 12/29/45
9				
10				
11				
12				
13	(1) Existing West Miramar Landfill gains four months of additional capacity due to New Zero Waste Programs.	0 mons	Fri 3/18/11	Fri 3/18/11
14	(2) Includes Preliminary Design; CEQA/NEPA Documentation; Permitting/Approvals; Final Design/Construction (See Table 3-5)	0 mons	Fri 3/18/11	Fri 3/18/11
15	(3) Assumes completion or buffer of six months prior to capacity being reached.	0 mons	Fri 3/18/11	Fri 3/18/11



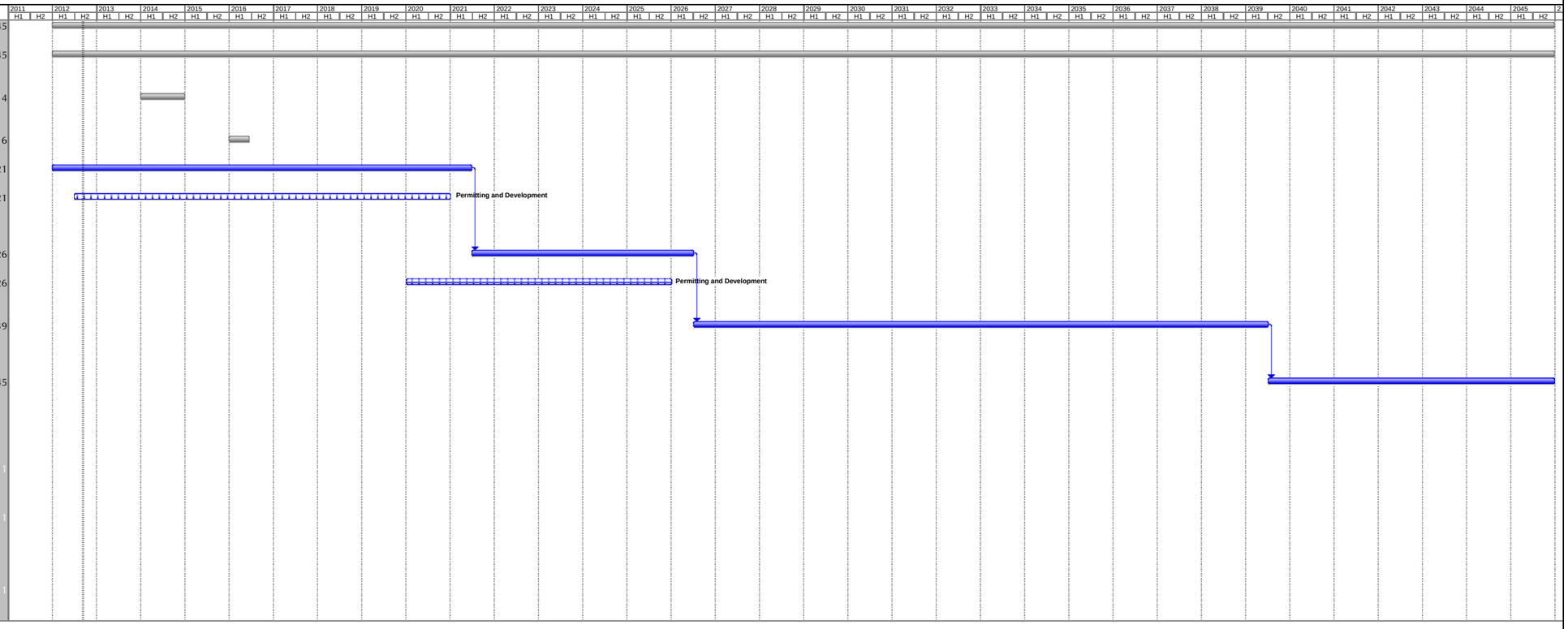
Project: Config 2
Date: Fri 9/7/12

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

TABLE 6-3
CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

CONFIGURATION 3 - ZERO WASTE AND NORTH MIRAMAR LANDFILL VERTICAL EXPANSION

ID	Task Name	Duration	Start	Finish
1	Existing Zero Waste Programs	8870 days	Sun 1/1/12	Thu 12/28/45
2	New Zero Waste Programs	8870 days	Sun 1/1/12	Thu 12/28/45
3	Resource Recovery Park at Miramar	13.05 mons	Wed 1/1/14	Wed 12/31/14
4	Conversion Technology Facility Development	6 mons	Fri 1/1/16	Thu 6/16/16
5	Existing West Miramar LF (1)	2478 days	Sun 1/1/12	Tue 6/29/21
6	North Miramar Vertical Expansion Dev./Permitting (2) (3)	2221 days	Mon 7/2/12	Mon 1/4/21
7	North Miramar Vertical Expansion	65.4 mons?	Thu 7/1/21	Mon 7/6/26
8	Develop Transfer Station at Miramar (3)	1567 days	Tue 1/7/20	Wed 1/7/26
9	Transfer and Transport to Sycamore Landfill	3393 days	Tue 7/7/26	Thu 7/7/39
10	Transfer and Transport to Out of County Landfill or El Sobrante	84.55 mons	Fri 7/8/39	Fri 12/29/45
11				
12				
13				
14	(1) Existing West Miramar Landfill gains four months of additional capacity due to New Zero Waste Programs.	0 mons	Fri 3/18/11	Fri 3/18/11
15	(2) Includes Preliminary Design; CEQA/NEPA documentation; Permitting / Approvals; Final Design / Construction - Potential WML vertical expansion wouild have a shorter life of approximately 2.85 years. (See Table 3-9)	0 mons	Fri 3/18/11	Fri 3/18/11
16	(3) Assumes completion or buffer of six months prior to capacity being reached.	0 mons	Fri 3/18/11	Fri 3/18/11



Project: Config 2
Date: Fri 9/7/12 / 2:15 PM

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

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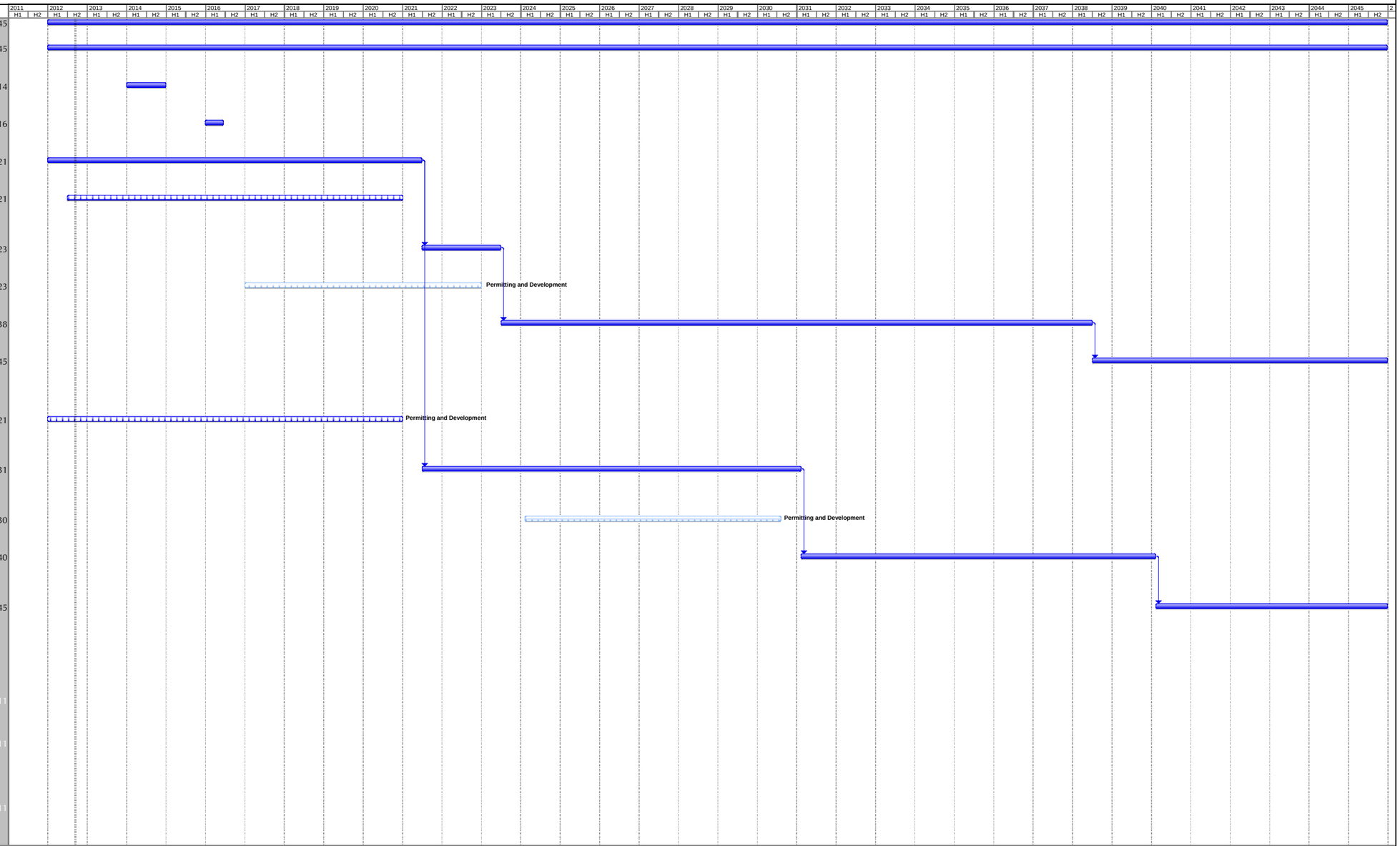
BRYAN A. STIRRAT & ASSOCIATES

TABLE 6-4
CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

CONFIGURATION 4 - ZERO WASTE AND MAXIMIZE WEST MIRAMAR LANDFILL LATERAL EXPANSION

ID	Task Name	Duration	Start	Finish
1	Existing Zero Waste Programs	443.55 mons	Sun 1/1/12	Wed 12/27/45
2	New Zero Waste Programs	8871 days	Sun 1/1/12	Wed 12/27/45
3	Resource Recovery Center at Miramar	13.05 mons	Wed 1/1/14	Wed 12/31/14
4	Conversion Technology Facility Evaluation	120 days	Fri 1/1/16	Thu 6/16/16
5	Existing West Miramar LF (1)	2478 days	Sun 1/1/12	Tue 6/29/21
6	West Miramar Lateral Expansion Alternative A Dev./Permitting (2) (3)	2221 days	Mon 7/2/12	Mon 1/4/21
7	West Miramar Lateral Expansion Alternative A	523 days	Thu 7/1/21	Fri 6/30/23
8	Develop Transfer Station at Miramar (A)	1567 days	Mon 1/2/17	Mon 1/2/23
9	Transfer and Transport to Sycamore Landfill (A)	3915 days	Tue 7/4/23	Fri 7/2/38
10	Transfer and Transport to Out of County El Sobrante Landfill	97.75 mons	Mon 7/5/38	Fri 12/29/45
11				
12	West Miramar Lateral Expansion Alternative B Dev./Permitting (2) (3)	2351 days	Sun 1/1/12	Fri 1/1/21
13	West Miramar Lateral Expansion Alternative B	2510 days	Fri 7/2/21	Tue 2/11/31
14	Develop Transfer Station at Miramar (B) (2) (3)	1695 days	Sun 2/11/24	Thu 8/8/30
15	Transfer and Transport to Sycamore Landfill	2348 days	Wed 2/12/31	Fri 2/10/40
16	Transfer and Transport to El Sobrante Landfill	76.75 mons	Mon 2/13/40	Fri 12/29/45
17				
18				
19				
20				
21				
22	(1) Existing West Miramar Landfill gains four months of additional capacity due to New Zero Waste Programs.	0 mons	Fri 3/18/11	Fri 3/18/11
23	(2) Includes Preliminary Design; CEQA/NEPA documentation; Permitting / Approvals; Final Design / Construction - Potential WML vertical expansion would have a shorter life of approximately 2.85 years. (See Table 3-5, 3-9, and 3-12)	0 mons	Fri 3/18/11	Fri 3/18/11
24	(3) Assumes completion or buffer of six months prior to capacity being reached.	0 mons	Fri 3/18/11	Fri 3/18/11



Project: Config 2
Date: Fri 9/7/12

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

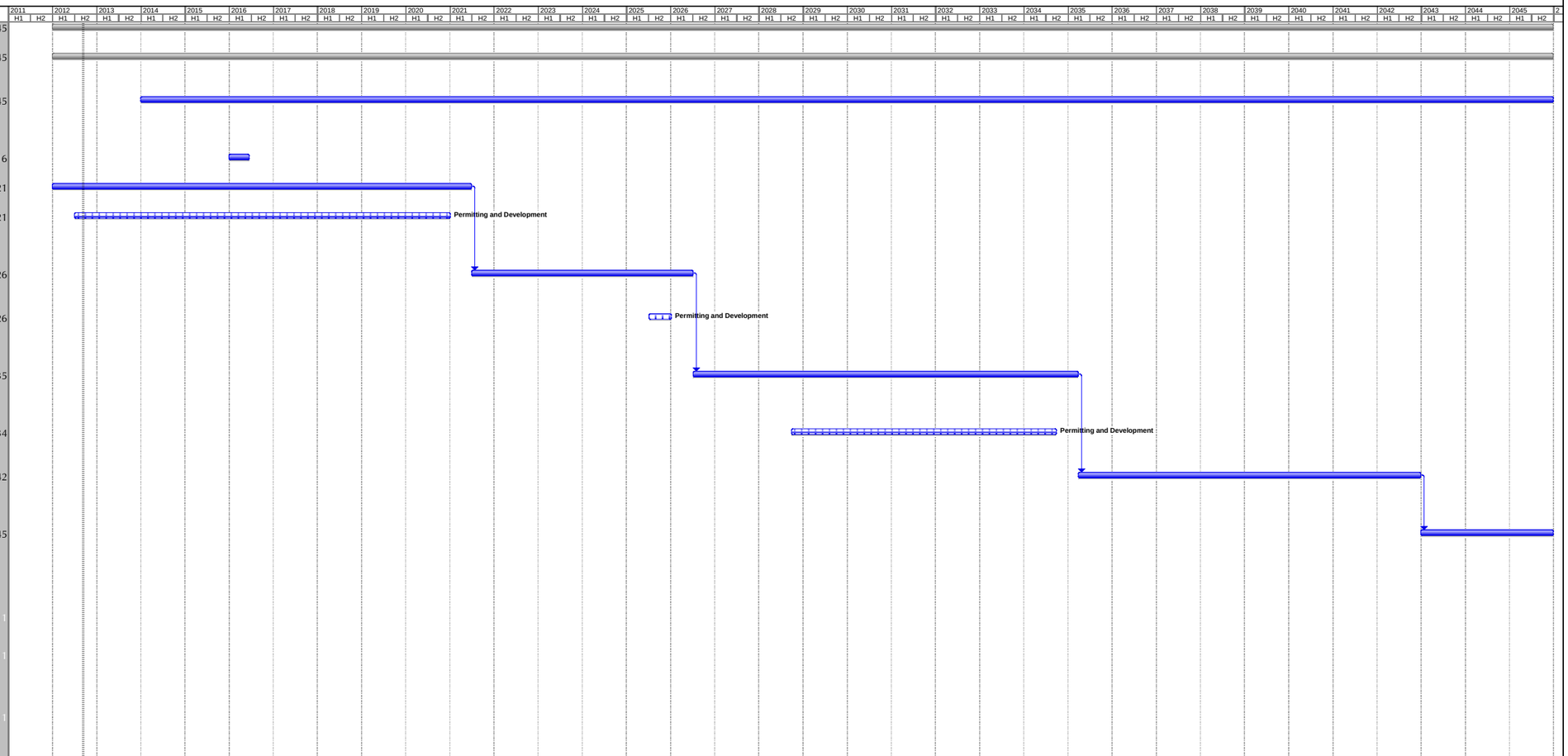
\\BASDBRS-FS1\client_data\San Diego (City)\2007.0069 LRMOSP\Phase II\Report\Tables\Table 6-4 Config 4.mpp

BRYAN A. STIRRAT & ASSOCIATES

TABLE 6-5
CITY OF SAN DIEGO
LONG-TERM RESOURCE MANAGEMENT OPTIONS STRATEGIC PLAN

CONFIGURATION 5 - COMBINATION OF OPTIONS 3 AND 4

ID	Task Name	Duration	Start	Finish
1	Existing Zero Waste Programs	8870 days	Sun 1/1/12	Thu 12/28/45
2	New Zero Waste Programs	8870 days	Sun 1/1/12	Thu 12/28/45
3	Resource Recovery Center at Miramar	417.4 mons	Wed 1/1/14	Fri 12/29/45
4	Conversion Technology Facility Evaluation	120 days	Fri 1/1/16	Thu 6/16/16
5	Existing West Miramar LF (1)	2478 days	Sun 1/1/12	Tue 6/29/21
6	North Miramar Vertical Expansion Dev./Permitting (2) (3)	2221 days	Mon 7/2/12	Mon 1/4/21
7	North Miramar Vertical Expansion	1308 days	Thu 7/1/21	Mon 7/6/26
8	West Miramar Lateral Expansion (B) Development/Permitting (2) (3)	133 days	Mon 7/7/25	Wed 1/7/26
9	West Miramar Lateral Expansion Alternative B	2277 days	Tue 7/7/26	Wed 3/28/35
10	Develop Transfer Station at Miramar	1566 days	Thu 9/28/28	Thu 9/28/34
11	Transfer and Transport to Sycamore Landfill	2023 days	Thu 3/29/35	Mon 12/29/42
12	Transfer and Transport to Out of County Landfill or El Sobrante	39.2 mons	Tue 12/30/42	Fri 12/29/45
13				
14				
15				
16				
17	(1) Existing West Miramar Landfill gains four months of additional capacity due to New Zero Waste Programs.	0 mons	Fri 3/18/11	Fri 3/18/11
18	(2) Includes Preliminary Design; CEQA/NEPA documentation; Permitting / Approvals; Final Design / Construction - Potential WML vertical expansion wouild have a shorter life of approximately 2.85 years. (See Table 3-5, 3-9, and 3-12)	0 mons	Fri 3/18/11	Fri 3/18/11
19	(3) Assumes completion or buffer of six months prior to capacity being reached.	0 mons	Fri 3/18/11	Fri 3/18/11
20				



Project: Config 2
Date: Fri 9/7/12

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

FIGURES

N

GRAPHIC SCALE

80 40 0 80 160

(IN FEET)

ADMINISTRATION BUILDING

PARKING AREA

MAINTENANCE FACILITY

BYPASS

REFUSE DELIVERIES

FLR. EL. +412

SLAB EL. +396

RAMP DOWN

RAMP UP

1.0%

EOD

MI-0005 JET/DIESEL TANK

MI-0004 JET/DIESEL TANK

MI-0003 JET/DIESEL TANK

MI-0002 JET/DIESEL TANK

SCATTERED BRUSH

HWY 52

DRAINAGE PLAN

LEGEND

PROPERTY BOUNDARY

INCOMING MSW

OUTBOUND MSW/TRANSFER

NO.	REVISION DESCRIPTION	BY:

BAS

BRYAN A. STIRRAT & ASSOCIATES
CONSULTING CIVIL & ENVIRONMENTAL ENGINEERS
1360 E. VALLEY VISTA DRIVE
DIAMOND BAR, CALIFORNIA 91765
(909) 860-7777

MIRAMAR TRANSFER STATION

PRELIMINARY SITE PLAN

DESIGNED BY : CAL	SCALE : AS SHOWN	
DRAWN BY : CAL	DATE : 7-2011	FILE NO.: FIGURE 1.DWG
CHECKED BY : PW/CMA	DATE : 7-2011	**FIGURE 3-1**
APPROVED BY : CMA	DATE : 7-2011	

G:\DWG\SANDIEGO\LRMO REPORT\TS REDESIGN\FIGURE 1.DWG 9/7/2012 2:02 PM

N

GRAPHIC SCALE

500 250 0 500 1000

(IN FEET)

LEGEND

APPROXIMATE LIMITS OF FILL

NO.	REVISION DESCRIPTION	BY:

BAS
BRYAN A. STIRRAT & ASSOCIATES
CONSULTING CIVIL & ENVIRONMENTAL ENGINEERS
1360 E. VALLEY VISTA DRIVE
DIAMOND BAR, CALIFORNIA 91765
(909) 860-7777

MIRAMAR TRANSFER STATION

MIRAMAR LANDFILLS

DESIGNED BY : CAL	SCALE : AS SHOWN	
DRAWN BY : CAL	DATE : 7-2011	FILE NO.: 30-0242FIG.DWG
CHECKED BY : PW/CMA	DATE : 7-2011	**FIGURE 3-2**
APPROVED BY : CMA	DATE : 7-2011	

G:\DWG\SANDIEGO\LRMO REPORT\TS REDESIGN\30-0242FIG.DWG 9/7/2012 2:02 PM

N

GRAPHIC SCALE

100 50 0 100 200

(IN FEET)

SITE VOLUME TABLE: UNADJUSTED

SITE:	----
STRATUM:	VERTICAL INCREASE TO 485' (PERMITTED ELEV.)
SURF1:	2004 TOPO
SURF2:	485' FINAL GRADING
CUT:	417 cu.yds
FILL:	5,789,705 cu.yds
NET:	5,789,288 cu.yds (F)
METHOD:	GRID

NO.	REVISION DESCRIPTION	BY:

BAS
BRYAN A. STIRRAT & ASSOCIATES
CONSULTING CIVIL & ENVIRONMENTAL ENGINEERS
1360 VALLEY VISTA DRIVE
DIAMOND BAR, CALIFORNIA 91765
(909) 860-7777

NORTH MIRAMAR LANDFILL

VERTICAL INCREASE TO 485' (PERMITTED ELEV.)

DESIGNED BY : L.T.	SCALE : AS SHOWN		
DRAWN BY : J.M.L.	DATE : 7-2011	FILE NO.: 30-0076FIG	
CHECKED BY : C.M.A.	DATE : 7-2011		FIGURE 3-3
APPROVED BY : C.M.A.	DATE : 7-2011		

G:\DWG\SANDIEGO\LRMOSP PHASE I\30-0076FIG

N

GRAPHIC SCALE

100 50 0 100 200

(IN FEET)

SITE VOLUME TABLE: UNADJUSTED

SITE:	----
STRATUM:	40' VERTICAL INCREASE FROM 485' (PERMITTED) TO 525'
SURF1:	2004 TOPO
SURF2:	525' FINAL GRADING
CUT:	0 cu.yds
FILL:	7,117,624 cu.yds
NET:	7,117,624 cu.yds (F)
METHOD:	GRID

NO.	REVISION DESCRIPTION	BY:

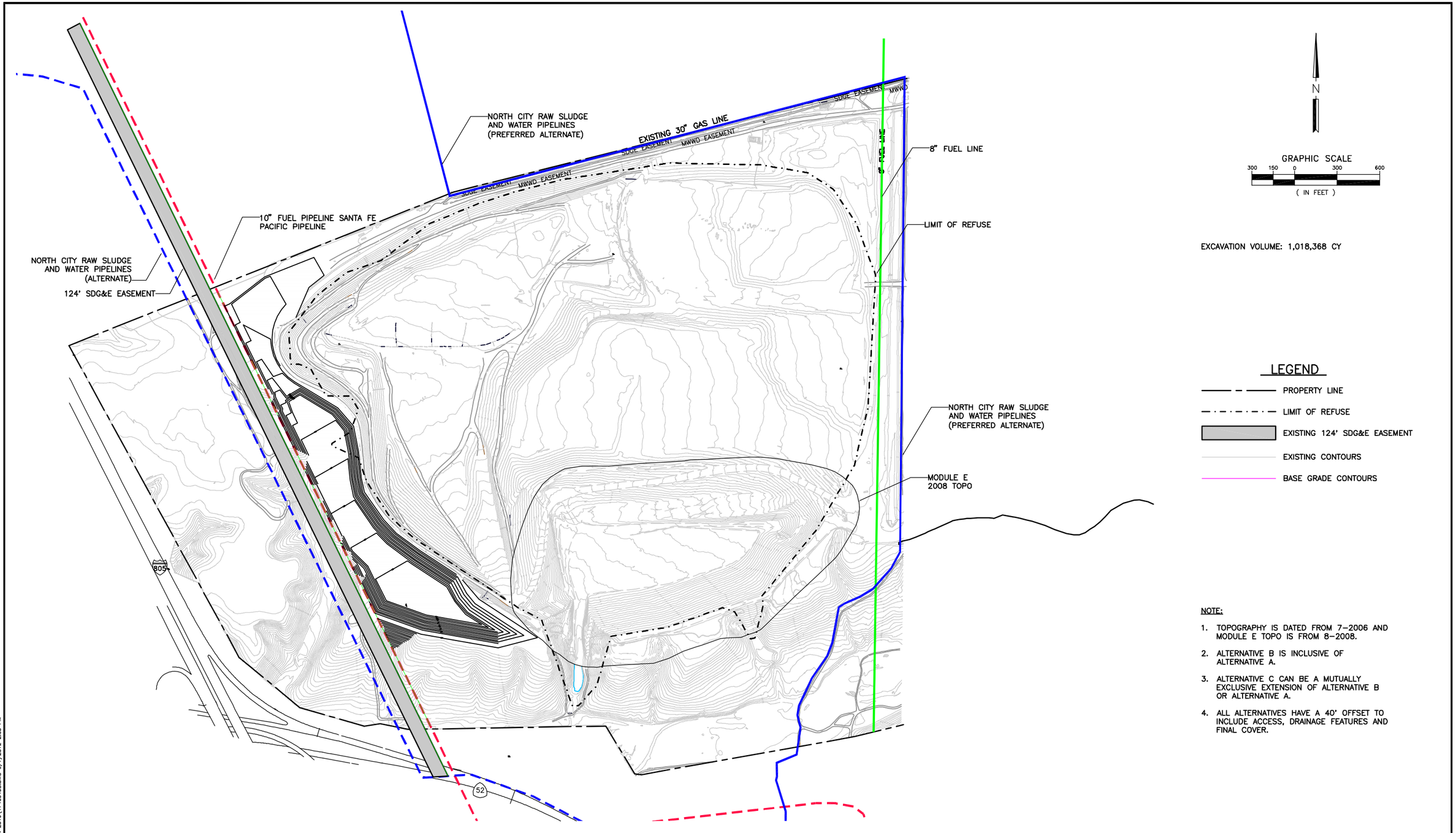
BAS
BRYAN A. STIRRAT & ASSOCIATES
CONSULTING CIVIL & ENVIRONMENTAL ENGINEERS
1360 VALLEY VISTA DRIVE
DIAMOND BAR, CALIFORNIA 91765
(909) 860-7777

NORTH MIRAMAR LANDFILL

40' VERTICAL INCREASE FROM 485' (PERMITTED) TO 525'

DESIGNED BY : L.T.	SCALE : AS SHOWN	
DRAWN BY : J.M.L.	DATE : 7-2011	FILE NO.: 30-0077FIG
CHECKED BY : C.M.A.	DATE : 7-2011	**FIGURE 3-4**
APPROVED BY : C.M.A.	DATE : 7-2011	

G:\DWG\SANDIEGO\LRMOSP PHASE I\30-0077FIG



NOTE:

1. TOPOGRAPHY IS DATED FROM 7-2006 AND MODULE E TOPO IS FROM 8-2008.
2. ALTERNATIVE B IS INCLUSIVE OF ALTERNATIVE A.
3. ALTERNATIVE C CAN BE A MUTUALLY EXCLUSIVE EXTENSION OF ALTERNATIVE B OR ALTERNATIVE A.
4. ALL ALTERNATIVES HAVE A 40' OFFSET TO INCLUDE ACCESS, DRAINAGE FEATURES AND FINAL COVER.

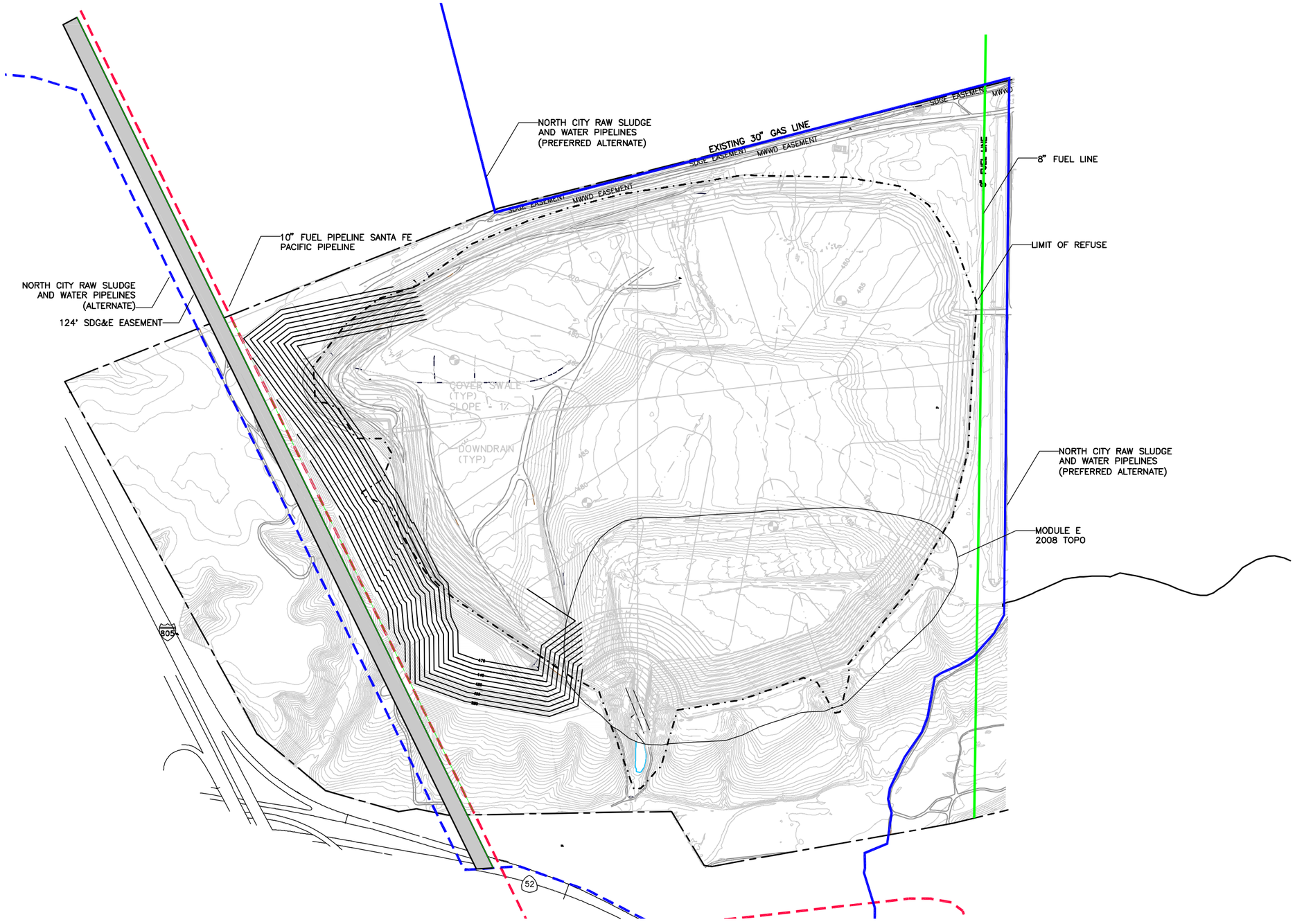
NO.	REVISION DESCRIPTION	BY:

BAS
BRYAN A. STIRRAT & ASSOCIATES
CONSULTING CIVIL & ENVIRONMENTAL ENGINEERS
1360 E. VALLEY VISTA DRIVE
DIAMOND BAR, CALIFORNIA 91765
(909) 860-7777

WEST MIRAMAR LANDFILL

ALTERNATIVE A BASE GRADING PLAN

DESIGNED BY :	SCALE : AS SHOWN	
DRAWN BY : J.D.W./D.C.R.	DATE : 7-2011	FILE NO.: 174054DB.DWG
CHECKED BY :	DATE : 7-2011	FIGURE 3-5
APPROVED BY :	DATE : 7-2011	



N

GRAPHIC SCALE

300 150 0 300 600

(IN FEET)

GROSS AIRSPACE: 4,541,512 CY

LEGEND

- PROPERTY LINE
- LIMIT OF REFUSE
- EXISTING 124' SDG&E EASEMENT
- EXISTING CONTOURS
- FILL GRADE CONTOURS

NOTE:

1. TOPOGRAPHY IS DATED FROM 7-2006 AND MODULE E TOPO IS FROM 8-2008.
2. ALTERNATIVE B IS INCLUSIVE OF ALTERNATIVE A.
3. ALTERNATIVE C CAN BE A MUTUALLY EXCLUSIVE EXTENSION OF ALTERNATIVE B OR ALTERNATIVE A.
4. ALL ALTERNATIVES HAVE A 40' OFFSET TO INCLUDE ACCESS, DRAINAGE FEATURES AND FINAL COVER.

NO.	REVISION DESCRIPTION	BY:

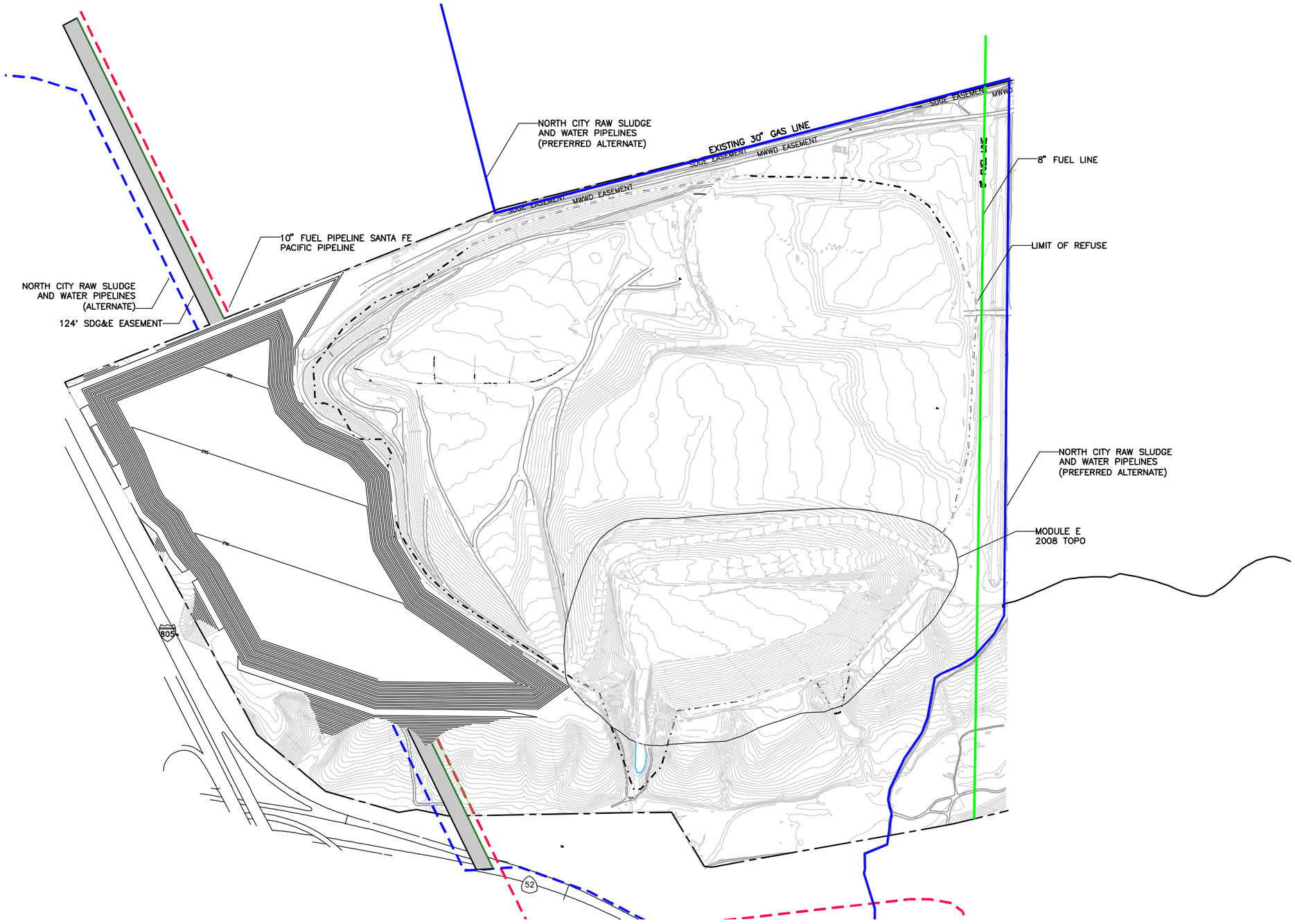
BAS
BRYAN A. STIRRAT & ASSOCIATES
CONSULTING CIVIL & ENVIRONMENTAL ENGINEERS
1360 E. VALLEY VISTA DRIVE
DIAMOND BAR, CALIFORNIA 91765
(909) 860-7777

WEST MIRAMAR LANDFILL

ALTERNATIVE A FINAL FILL PLAN

DESIGNED BY :	SCALE : AS SHOWN	
DRAWN BY : J.D.W./D.C.R.	DATE : 7-2011	FILE NO.: 174055DB.DWG
CHECKED BY :	DATE : 7-2011	FIGURE 3-6
APPROVED BY :	DATE : 7-2011	

G:\DWG\MIRAMAR\W MIRAMAR EXPANSION 2010\174055DB.DWG 9/7/2012 2:04 PM



N

GRAPHIC SCALE

300 150 0 300 600

(IN FEET)

EXCAVATION VOLUME: 4,844,443 CY

LEGEND

- PROPERTY LINE
- LIMIT OF REFUSE
- EXISTING 124' SDG&E EASEMENT
- EXISTING CONTOURS
- BASE GRADE CONTOURS

NOTE:

1. TOPOGRAPHY IS DATED FROM 7-2006 AND MODULE E TOPO IS FROM 8-2008.
2. ALTERNATIVE B IS INCLUSIVE OF ALTERNATIVE A.
3. ALTERNATIVE C CAN BE A MUTUALLY EXCLUSIVE EXTENSION OF ALTERNATIVE B OR ALTERNATIVE A.
4. ALL ALTERNATIVES HAVE A 40' OFFSET TO INCLUDE ACCESS, DRAINAGE FEATURES AND FINAL COVER.

NO.	REVISION DESCRIPTION	BY:

BAS
BRYAN A. STIRRAT & ASSOCIATES
CONSULTING CIVIL & ENVIRONMENTAL ENGINEERS
1360 E. VALLEY VISTA DRIVE
DIAMOND BAR, CALIFORNIA 91765
(909) 860-7777

WEST MIRAMAR LANDFILL

ALTERNATIVE B BASE GRADING PLAN

DESIGNED BY :	SCALE : AS SHOWN	
DRAWN BY : J.D.W./D.C.R.	DATE : 7-2011	FILE NO.: 174056DB.DWG
CHECKED BY :	DATE : 7-2011	FIGURE 3-7
APPROVED BY :	DATE : 7-2011	

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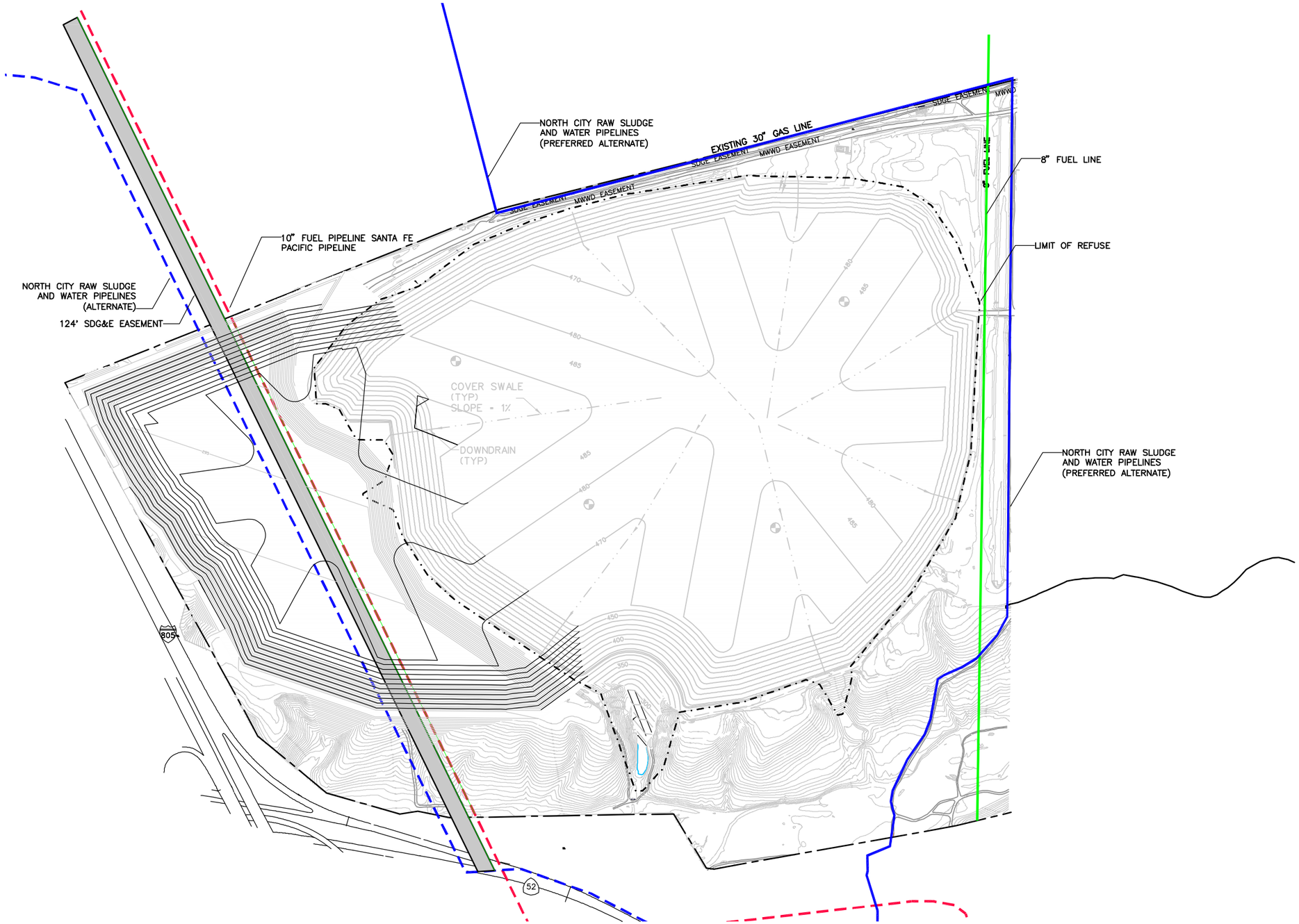

N

GRAPHIC SCALE

300 150 0 300 600

(IN FEET)

GROSS AIRSPACE: 21,080,252 CY

LEGEND

- PROPERTY LINE
- LIMIT OF REFUSE
- EXISTING 124' SDG&E EASEMENT
- EXISTING CONTOURS
- FILL GRADE CONTOURS

NOTE:

1. TOPOGRAPHY IS DATED FROM 7-2006 AND MODULE E TOPO IS FROM 8-2008.
2. ALTERNATIVE B IS INCLUSIVE OF ALTERNATIVE A.
3. ALTERNATIVE C CAN BE A MUTUALLY EXCLUSIVE EXTENSION OF ALTERNATIVE B OR ALTERNATIVE A.
4. ALL ALTERNATIVES HAVE A 40' OFFSET TO INCLUDE ACCESS, DRAINAGE FEATURES AND FINAL COVER.

NO.	REVISION DESCRIPTION	BY:

WEST MIRAMAR LANDFILL

ALTERNATIVE B FINAL FILL PLAN

DESIGNED BY :	SCALE : AS SHOWN	
DRAWN BY :	DATE : 7-2011	FILE NO.:
CHECKED BY :	DATE : 7-2011	FIGURE 3-8
APPROVED BY :	DATE : 7-2011	

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APPENDICIES

APPENDIX A

RMAC Meeting Summary
November 4, 2009

Bryan A. Stirrat & Associates
Civil And Environmental Engineers

CITY OF SAN DIEGO - LONG-TERM RESOURCE MANAGEMENT OPTIONS (LRMO) STRATEGIC PLAN

http://www.sandiego.gov/environmental-services/geninfo/lrmo.html

RESOURCE MANAGEMENT ADVISORY COMMITTEE (RMAC)

PHASE II First Meeting

(Note: New location)
City of San Diego - Environmental Services Dept., 2nd Floor
9601 Ridgehaven Court, San Diego CA 92123

Wednesday, November 4, 2009
2:30 to 5:00 PM

AGENDA

I. Welcome/Introductions

II. City/ Environmental Services Department Update
   a. Franchise Haulers Meetings
   b. Recycle/Zero Waste Program Updates
   c. What Private Companies are doing in the region

III. Phase I Report Summary
   (Presentation to Natural Resources & Culture Committee)

IV. Phase II
   - Why modified?
   - What the Scope of Work involves.

V. Phase II Evaluation Criteria and System Configuration Discussion

VI. Q & A

City of San Diego Long-term Resource Management Options (LRMO)
Strategic Plan - Phase II
Resource Management Advisory Committee
Environmental Services Department, Ridgehaven Court, San Diego, CA 92123
2nd Floor
Wednesday, November 4, 2009, 2:30 – 5:00 pm

Meeting Summary

RMAC Members Present:
Richard Anthony, San Diego County Integrated Waste Management/Citizens Advisory Committee
Mike McDade, San Diego County Disposal Assocation
Sylvia Castillo, City of San Diego Environmental Services Department (ESD)
Andrea Eaton, City of San Diego Council District 7
Robert Epler, Environmental Services Department
Beryl Flom, League of Women Voters San Diego
Barbara Lamb, City of San Diego, CEO/Business Office
Amy Harris on behalf of Lani Lutar, San Diego County Taxpayers Association
Leslie McLaughlin, Navy Base San Diego
Brian Henry on behalf of Rochelle Monroe, ESD
Alan Pentico, San Diego County Apartment Association
Jacquie Adams on behalf of William Prinz, City of San Diego Solid Waste Local Enforcement Agency

RMAC Members Absent
Faith Buyuksonmez, San Diego State University, Dept of Civil and Envr Studies
Jamie Fox-Rice, City of San Diego, Council District 3
Lynn France, City of Chula Vista, Public Works Dept

Project Team Members Present:
Lewis Michaelson, Katz and Associates
Sonia Nasser, Bryan A. Stirrat and Associates, a Tetra Tech Company (BAS)
Cesar Leon, BAS
Chris Gonaver, ESD
Steven Grealy, ESD
Kip Sturdevan, ESD

Public
Keith Battle, Public Policy Partners
Renee Robertson, ESD
Lawrence Chapman, Taman
Carlie Peck, Solana Center

Introduction:
Lewis Michaelson introduced himself as the neutral facilitator for the Resource Management Advisory Committee (RMAC) process. Each RMAC member and the remaining audience were asked to introduce

themselves and the organization they represented. Mr. Michaelson then reviewed the agenda for the meeting and introduced Chris Gonaver.

Environmental Services Department Update:
Chris Gonaver, Director of ESD, thanked the committee members for attending and began by providing a brief update. Mr. Gonaver discussed the subcommittees that had been formed with the Franchise Haulers to share and exchange information on Collection Services Equipment, Maintenance and Purchasing costs and Collection Services Operational Practices.

Stephen Grealy provided an update on several aspects of disposal and diversion, including the decline of waste volume disposed at Miramar Landfill, the effects of the City's Recycling and Construction & Demolition (C&D) Ordinances, AB939 fee revenue and curbside recycling commodities sales revenues. He also discussed the new C&D processing facility in El Cajon, a pilot asphalt processing facility and the expanded area for greenery at Miramar. Stephen also mentioned the new recycling bag developed for apartment residents in conjunction with the San Diego County Apartment Association. Alan Pentico mentioned that as apartment units come on-line they look for every press opportunity to highlight and showcase the new program. Stephen later brought down and showed what the colorful, heavy duty recycling bag looks like.

Q. How much food waste is being composted along with the green waste at Miramar?
A: Current 2500 tons per year are being composted and the source of the material is from Sea World, Petco Park and other restaurants.

Q: What caused such large dip in the curbside recycling commodities in earlier years?
A: The graph reflects net revenue and that particular year accounted for program costs such as bin expenses and the equipment to collect the recyclables?
Q: Can the use of recycling bin colors be standardized across the region?
A: Yes, the City and the other hauler's did not coordinate the color of the recycling bins, however it is not currently possible to make all haulers have the same color RECYCLING BIN, more education on the use of the recycling bins however is possible.

Q: What is the status of the ESD Business Process Reengineering (BPR) effort?
A: The ESD BPR has been implemented and resulted in a 16% full time employee (FTE) reduction which helped ESD improve its efficiency and effectiveness.

Q: How much additional composting will the City be able to do with the expanded Miramar Greenery facility?
A: The facility processes approximately 2,000 – 2,500 tons currently and with the expansion may be able to double its output.

Phase I Report Overview:
Sylvia Castillo provided a brief overview of the work completed in Phase I of the LRMO Strategic Plan. Phase I found that the West Miramar Landfill would reach capacity in 2019. The RMAC proposed 39 options to be carried forward to Phase II of the project, to be considered as possible components of a future system for resource management.

Q: Won't the economy impact the tonnage received at Miramar which would impact the predicted closure date of the landfill?

A: Yes, projecting disposal demand and the date the landfill will reach capacity will be a moving target. Phase II of the effort will consider economic factors used by the City to appropriately project tonnage and financial impacts.

Q: Why is the regional capacity listed as 2030 while Phase I points out a capacity of 2019?
A: The regional capacity is projected to be to year 2030 while the City-owned, Miramar Landfill is projected to have a capacity to year 2019. The regional capacity takes into account landfills outside of the City's system (e.g. Sycamore and Otay)

Q: Will there be a paradigm shift in financing following the shift from landfilling to zero-waste?
A: Funding allocations will most likely not strictly be allocated per the paradigm shift. Costs of financing infrastructure facilities (material recovery facilities, landfills) are substantially higher that funding programs such as education.

Q: Were the 39 options listed the RMAC's suggestions? Are they ranked in order?
A: Yes, the list was developed based on RMAC's input and no, the list does not rank the options. Any option that received a screening value of 3 or higher by the RMAC and the project team was included in the list of options that should be carried forward into Phase II. However their screening values did not carry forward, in Phase II those options would be evaluated anew as part of system configurations, not stand alone options

Q: Can we add to the list of options?
A: If a significant option was missed or is needed those can be considered. For example in Phase I the expansion of West Miramar was not anticipated, however it is now of the options that will be evaluated in Phase II.

Phase II Scope of Work Revised
:
Barbara Lamb from the Mayor's Business Office provided an overview of why the Phase II Scope of Work which has been modified to provide a greater focus on financial analysis and the cost of options available to pursue various resource management strategies. The RMAC will continue to provide valuable input and feedback during Phase II of the LRMO strategic planning process.

Q: Does the City and ESD specifically have the budget for implementing the strategies suggested by the RMAC?
A: ESD is not planning on receiving any new dollars for implementation, but different financing options will be explored in Phase II of this effort.

Q: Has the City looked at new concepts such as 'pay as you throw'?
A: A committee formed by Council will be looking into new revenues options for the City. Phase II of this effort will be looking at different financing options for different strategies. It will be focused on the big picture questions on how we move forward in investing, building, hauling, etc.

Phase II Scope of Work Elements

Sonia Nasser provided an overview of the various tasks the Project Team will be undertaking during Phase II, such as updating the demand and capacity models, costing and providing timing for various infrastructure options. Then the team will develop various system configurations for which financial

plans to 2045 will be modeled. The year 2045 was selected because that is the year the land lease for Miramar expires.

Evaluation Criteria & System Configurations:
Lewis Michaelson provided an overview of evaluation criteria and system configurations. A system configuration will include different resource management options, programs, and policies designed to meet the City's waste management needs. The evaluation criteria will be used to rank each system configuration and to aid in the decision making process. It is important to note that the highest ranked configuration will not always be the best choice moving forward. Other externalities will play a role in the decision making process. In order to develop a weighted score for each criterion, each RMAC member was asked to distribute 100 points across six different evaluation criteria (financial, technical, environmental, capacity optimization, and sustainability). The results were collected and will be tabulated and shared with the RMAC as a follow up to this meeting.

Q: Who developed the list of criteria? Do the criteria make sense and are they comparable?
A: The RMAC developed the evaluation criteria in Phase I of this effort. Individual criteria are not meant to be comparable; they are intended to take into account and reflect varying perspectives and preferences.

After the criteria weighting exercise was completed, RMAC members were asked for their feedback on what types of system configurations they thought should be formulated and evaluated in Phase II. The RMAC provided a number of suggestions on various combinations of policies, programs and facilities. Some suggestions emphasized zero waste programs, additional organics collection, some expanding capacity at Miramar, and some emphasized diversion and other more traditional approaches. Based on this feedback, ESD and the consultant team will generate representative system configurations and share with the RMAC for their review and feedback, before beginning their technical and financial analysis.

Q: What other models (system configurations) are being used currently? Can we examine what other regions are doing?
A: Phase I of the effort looked into best practices in resource management implemented in other regions. Phase II will look at the options the RMAC developed and group them into different system configurations to ultimately develop a preferred strategy. Yes there are other entities developing or that have zero waste programs however the City of San Diego is unique because of its constraints from the People's Ordinance (single family residents do not pay for trash collection) and Proposition H (limitation on incineration of waste to 500 tons per day and siting criteria restrictions).

Q: There are two main issues that the City has to deal with. One being the People's Ordinance and the other is Proposition H. Should we develop configurations with these limitations in mind?
A: The system configurations will consider constraints such as these and the analysis will allow the RMAC to evaluate whether it would be worth the effort to pursue changes in such ordinances. For example, the comparison of system configurations would enable us to understand if the benefits to the system would be great enough to warrant pursuing the difficult political challenge of seeking change to the People's Ordinance or Proposition H. Options should not be thrown out based on restrictions but evaluated to determine if the options are feasible and worthwhile.

Q: How will externalities in the future impact our decision making now? More specifically, how will certain federal fiscal and regulatory policies impact the way things are done in the future?

A: Phase II of the project will consider projections that the City currently uses in its financial reports to ensure consistency. To a certain extent, the model that is developed for the City can be modified to revise projections based on future policies, programs, and procedures.

Conclusion:
Lewis Michaelson thanked everyone for attending and providing input. He also stated that the next meeting has not been scheduled, but would not occur before the end of the year. In the meantime, ESD and the consultant team would be compiling the criteria weighting exercise and system configuration inputs from the RMAC and providing them in draft form to the RMAC for feedback. Also, from this point forward,,Barbara Lamb from the Business Office will be the primary contact for RMAC members if they have questions or comments during Phase II. Barbara's e-mail address is: BLamb@sandiego.gov.

APPENDIX B

NORTH MIRAMAR LANDFILL RECLAMATION EVALUATION

APPENDIX B

LRMOSP PHASE II
NORTH MIRAMAR LANDFILL RECLAMATION EVALUATION

1.1 NORTH MIRAMAR LANDFILL RECLAMATION

The purpose of this appendix is to present the results of Bryan A. Stirrat & Associates' (BAS) technical and economic evaluation of the North Miramar Landfill (NML) reclamation project. This work was completed as part of Phase II of the City of San Diego's (City) Long-term Resource Management Options Strategic Planning (LRMOSP) process.

The scope of the Phase II technical and economic evaluation for the NML reclamation project was to:

- Prepare conceptual development plans for the reclamation of the NML.
- Prepare a range of preliminary cost estimates and timelines to complete the permitting, design, pilot-study and full-scale implementation of the reclamation of the NML.
- Provide timing and costs for the reclamation project to be used in the financial analysis.

BAS prepared the "Reclamation Options Study, North Miramar Landfill, dated July 2008" as part of Phase I of the City's LRMOSP process. This report

- Characterized the type and estimated the quantity of waste to be reclaimed based on available data;
- Summarized existing and emerging technologies or methods for landfill reclamation;
- Narrowed the list of options using established criteria that is general and specific to the North Miramar site and City goals.
- Provided options to City's Environmental Services Department (ESD) for a future pilot project;
- Provided recommendations for the location of a pilot project on the landfill; and

- Provided draft performance criteria for the pilot project to be used in determining feasibility.

BAS' recommendations in the reclamation study were the genesis for this technical and economic evaluation of the NML reclamation.

1.1.1 NORTH MIRAMAR LANDFILL DESCRIPTION

The NML is bound to the north by the Miramar Naval Air Station, Highway 163 to the east, the active West Miramar Landfill (WML) to the west and State Route 52 to the south. The active WML operated by the City has a projected closure date of 2022 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 approximately 285 acres of federal land leased from the United States Navy on the Marine Corps Air Station (MCAS).

The site was operated from 1973 to 1982 and the material permitted for disposal at the site included residential, commercial, construction and demolition waste and tires.

The NML is unlined, does not have a leachate collection system, and has a landfill gas (LFG) collection system. The Miramar Landfills in total (West, South and North Miramar) have approximately 200 extraction wells, 73,000 feet of piping, automatic condensate handling system, 3 blowers, 2 flares and a gas-to-energy plant operated by Fortistar Methane.

There are no known impacts to ground water beneath the landfill site based on the site's ongoing groundwater monitoring program results. The final cover has not yet been placed over the NML surface.

1.1.2 GOALS OF RECLAMATION PROJECT

The goals of the reclamation project for the NML include, but are not limited to, the following:

1. Recover soil for developmental and operational use at the Miramar landfills;

2. Recover and sell marketable materials (i.e., ferrous and non-ferrous metals, glass, electronic goods, etc.);
3. Utilize a conversion technology (i.e., plasma gasification) to generate energy from the excavated wastes that are not otherwise marketable; and
4. Reclaim valuable land for re-use as a potential new landfill, in portions or in its entirety, by excavating the bottom of the existing landfill to gain valuable cover soil and additional capacity and line the landfill for renewed refuse disposal.

1.1.3 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 and its Waste Discharge Identification Number is 9 000 000 727. The site was issued Waste Discharge Requirements for post-closure maintenance and a Monitoring and Reporting Program (M&RP) from the California Regional Water Quality Control Board – San Diego Region (SDRWQCB) under Order No. 96-15 which is still active.

The NML is currently classified as an inactive landfill and is monitored and maintained by ESD. 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.

A certified, approved final cover has not been constructed at the NML.

1.1.4 SITE OPERATIONS

The NML was developed by filling two southwest trending tributaries to San Clemente Canyon. Landfill operations were described in the 1977 Solid Waste Facility Permit as follows:

"Normally, all the cells of one lift are completed prior to beginning the next higher lift. The lift height may vary from eight to twelve feet. Minimum daily

cover for each cell is six inches. However, this cover is usually increased to about eighteen inches when the next higher lift is started to ensure a stable surface for the operation of heavy collection vehicles. The slope of the front working face is about 4:1. Compaction of the refuse is achieved by spreading it up the slope in layers about twelve inches thick and running the tractors over each layer a number of times. The final earth cover over the landfill is a minimum of two feet for the top surface and three feet for the 3:1 final slopes. "

1.1.5 WASTE CHARACTERIZATION

The CIWMB completed a composition study of the refuse disposed at the NML in 1977 and included the information in the Solid Waste Facility Permit. The composition study characterized the incoming waste as consisting of approximately 47% greenwaste (i.e., yard trimmings, wood, etc.), 34% paper products, 4% metals, 3.5% glass, 2% plastics and rubber, and the remainder was mixed waste, garbage, clothing, etc.

Additionally, general waste characterization data for the NML was obtained from a report entitled, "Privatization/Miramar Cogeneration & LFG Project, SCS Engineers, 1996". The reported waste characterization was based on information gathered during the installation of landfill gas wells at the NML. During that project, 67 borings were drilled by San Diego Drilling and logged by SCS Engineers for a landfill gas control system that was installed at that time.

The following types of materials were found in the borings: paper, yard waste, plastic, wood, cardboard, soil, newsprint, glass, metal, textile, rubber tires, food waste, fiberglass, plywood, brick, Styrofoam, foam rubber, car batteries, and demolition debris. There was no description regarding relative quantities of waste encountered.

The refuse was overall found to be very dry, however, in some locations was slightly moist. No known hazardous materials, other than in household quantities, are suspected to have been disposed of at the site.

1.1.6 WASTE VOLUMES

The NML was developed by filling two southwest trending tributary canyons of the San Clemente Canyon. BAS assumed that the canyons were not modified prior to filling and thus were filled from their base elevation of approximately 340 feet above mean sea level (AMSL) to a maximum elevation of 420 feet AMSL. Subsequently, the City placed approximately 1.5 to 48 feet of additional soil on the landfill deck to an elevation of 465 feet AMSL. The site was closed for disposal operations in 1982.

Based on the depth of refuse for each of the 67 gas borings that were drilled in 1996, refuse depths vary from 12 to 90 feet below ground surface. Using this data, BAS estimates a total in-place volume of refuse, daily cover and intermediate cover soil of approximately 11.8 million cubic yards (mcy). Based on the boring logs, approximately 2.8 million cy of soil cover overlies the waste. The cover soil consists primarily of silty sand and sand with gravel and cobbles.

1.1.7 PREVIOUS RECLAMATION PROJECTS

BAS reviewed published literature on previous reclamation projects completed across the country during the past 20 years. The most comprehensive discussion is presented by Innovative Waste Consulting Services, LLC who prepared a study entitled "Landfill Reclamation Demonstration Project, Perdido Landfill, Escambia County, dated June 2009" for the Florida Department of Environmental Protection as part of a landfill reclamation project for the Perdido Landfill.

The report provides an overview of twelve (12) previous reclamation projects ranging in size from 40,000 cy to over 2.1 million cy. BAS identified select projects that span a range of sizes, costs, production rates, and reclamation goals which are presented below.

To date, one of the largest landfill reclamation projects completed is the Clovis Landfill which relocated approximately 2.5 million cy of waste. The reclamation of the NML would be approximately 3.7 times larger, however, the experiences

at even the smallest reclamation projects are useful in evaluating feasibility for the NML reclamation project.

LARGER PROJECTS

Clovis Landfill - Clovis, California

The Clovis Landfill reclamation project involved excavating and processing over 2.3 million cy of waste from the unlined landfill. The goals of the project were to address groundwater contamination, recover airspace and soil for cover needs. The City originally planned on a production rate of approximately 4,500 cy/day, however, over the life of the project a sustainable rate of only 1,300 cy/day was realized. The annual excavation rate was only 200,000 cy per year since the waste was only excavated during 60% of the working days. Most of the down time was associated with processing wet waste during the winter months during which most of the annual rainfall occurs. Towards the end of the rainy season, waste excavation would be delayed 2 weeks following rain events. The 12-acre working face and no daily cover requirements contributed to this situation. The processing operation recovers approximately 60% of the excavated volume as soil, the remaining volume is waste and disposed of in a lined cell. The unit cost for their current operation is reported at $5.10/cy.

Wynadot County Environmental Sanitary Landfill - Carey, Ohio

The Wyandot County Environmental Sanitary Landfill has a permitted disposal area of approximately 188 acres and consists of lined and unlined units. Contaminated groundwater was detected in the vicinity of the landfill and the Ohio Environmental Protection Agency mandated that the site owner relocate the waste from the unlined units to the lined units. At the time of preparation of the Perdido report, approximately 1.4 million cy of waste was relocated at a rate of approximately 300,000 cy per year (an average of approximately 1000 cy/day assuming a 300 day per year operation) cost of approximately $4 per cy. The waste was not processed following excavation.

Dean Forest Landfill – Savannah, Georgia

The Dean Forest Landfill located in the City of Savannah, Georgia relocated approximately 650,000 cy of waste as part of a landfill expansion and corrective action for the unlined portion of the landfill. The facility was listed under the State of Georgia's Hazardous Site Response Act for cadmium impacted groundwater. The City decided to relocate the waste as part of their corrective action and received a $2 million grant to implement the corrective action. The waste was only relocated (no screening) at a maximum rate of up to 7,000 cy/day. However, this rate was not sustained as the project took approximately 9 years to complete.

Pike Station Landfill – Waverly, Ohio

The Pike Sanitation Landfill reclamation involved the relocation (no processing) of between 700,000 to 800,000 cy of waste from a 40-acre unlined unit at a rate of approximately 40,000 cy per month. The unlined unit was in the middle of a 125-acre lined expansion. The waste was excavated from the months of November to March to minimize odors. The project commenced in 1996 and was completed in 2000.

Shawano County Landfill – Shawano County, Wisconsin

The Shawano County Landfill reclamation project relocated (no processing) between 300,000 to 400,000 cy waste at an approximate cost of $3/cy. The waste was relocated during the winter months to minimize odor, however, they were unable to process frozen waste. The waste was relocated to reduce off-site leachate treatment costs.

Frey Farm Landfill

The Frey Farm Landfill reclamation project excavated and processed between 300,000 to 400,000 cy of waste from a lined cell to supplement the feedstock of an existing waste-to-energy plant. Approximately 41% of the excavated volume

was soil. At the end of the project in 1996, the project provided a net revenue of over $13 per ton of excavated waste to the County.

Central Disposal Systems Landfill – Lake Mills, Iowa

The Central Disposal Systems Landfill reclamation relocated (no processing) approximately 250,000 cy of waste from a 10-acre unlined cell at a rate between 1000 to 1500 cy/day. The landfill was reclaimed to recover the airspace and avoid potential future environmental liabilities associated with the unlined cell.

Naples Landfill – Collier County, Florida

The Naples Landfill reclamation project was for a 33-acre unlined cell that posed a groundwater contamination threat. The project was originally intended to decrease closure costs, reduce the risk of groundwater contamination, burn recovered combustible waste in a proposed waste-to-energy plant, recover soil for daily cover needs, and recover recyclable materials. Unfortunately, the waste-to-energy plant was never built and the recovered recyclables required extensive processing following excavation to upgrade the quality for sale and was abandoned. The project was only successful in recovering soil (40 to 60% by weight). Ultimately, the County only excavated and processed the waste when daily cover was needed as it was less expensive than importing cover materials.

Former Cal-Compact Landfill – being developed as Boulevards at South Bay Project, Carson, California

BAS/Tetra Tech are engineers for a 152-acre commercial/residential development on the former Cal-Compact Landfill. As part of that project large amounts of previously disposed waste required excavation and re-disposal on site (in 2009) to achieve the needed grading for the development. Because the Cal-Compact Landfill is a former hazardous waste site on the California Superfund List, the waste excavation/relocation elements are subject to extensive regulatory review and permitting. Although this project does not involve sorting and recycling of waste, it is valuable to include this project in this

review to reflect the operational, regulatory, and monitoring elements of a large waste excavation/re-disposal operation, as follows:

- Tetra Tech obtained an AQMD Rule 1150 permit obtained for multiple waste excavation locations on site, each with a maximum open area of 500 sf each. Careful staging of the work allows the open working face in both the excavation and disposal areas to be maintained within this limit, with adjacent areas covered by temporary soil, plastic, or foam cover.
- As of June 2010, approximately 250,000 cubic yards of waste has been excavated and re-disposed, since the beginning of 2009 write the majority of excavation occurring over four months in early 2009.
- Daily rates of waste excavation and relocation were typically 3,000 cy per day per operational area (2 areas), using one CAT excavator and three CAT 657 scrapers in the excavation area and a bulldozer and compactor in the re-disposal area. Water trucks are also used and a foam machine is standing by. Two types of foam are on hand: Type AC645 water-based foam that is effective for approximately two hours, and Type AC904 latex-based foam that is effective for approximately three days.
- The operation is conducted as follows: The waste is excavated by the excavator and top-loaded into the scrapers. The scrapers drop the waste in one of three waste re-disposal areas by bottom dump in a tightly controlled area, where it is re-shaped by the bulldozer and compacted with the compactor. Water trucks wet the waste at both the excavation and re-disposal sites and along the scraper route for dust, emissions, and odor control. The waste in the re-disposal area is immediately covered with 6 inches of soil to control emissions. On a few occasions, the foam rig was employed to control emissions at the excavation site.
- The operation is monitored for air emissions and dust emissions by both manned and un-manned instrumentation. Weather stations provide wind speed and direction.

1.1.8 SUMMARY

A summary of the various landfill reclamation projects discussed above as well as others presented in the Perdido report are outlined in tables prepared and

submitted to ESD. As can be seen, the daily production rates are very similar and range between 1000 to 1500 cy per day with the exception of the project in Savannah, Georgia which achieved a rate of up to 7,000 cy per day (with no screening). However, as discussed in the Clovis Landfill reclamation case study, the actual annual production rates vary considerably and when evaluated on a daily basis are less than the actual reported daily rate. This is due to operational inefficiencies, down time due to equipment break downs, maintenance, and weather.

The common equipment spread for these projects consisted of an excavator or two (e.g., CAT 345s), a trommel screen if the material was to be processed, and off-road (e.g., CAT 740) haul trucks. It appears that only one trommel screen was used at a time. Higher production rates would be expected if multiple equipment spreads were used. For instance, two equipment spreads (i.e, 4 excavators, 2 trommel screens, and accompanying off-road trucks) should double the production rate without increasing the unit cost.

The unit costs for most all of the reclamation projects are also remarkably similar, varying from approximately $3.00 per cy to over $5.00 per cy. The unit costs for those projects that did not process the excavated waste are, as expected, lower than those that did process the waste. However, none of the projects were able to recover recyclables to offset the reclamation costs. One project, Frey Farm, actually provided a net revenue of over $13 per ton of waste material excavated, however, the material was being used as a supplemental feedstock for and existing waste-to-energy facility.

It should be noted that the unit costs in the Perdido report span a period from the early to late 1990's. Adjusting the average reclamation excavation unit cost of $4 per cy to 2010 dollars, assuming a 10 year adjustment period, a 2010 reclamation excavation unit cost would be approximately $5.40 per cy. The unit cost for the CalCompact hazardous waste site excavation was about twice the average reclamation unit cost for the other projects due to the extensive regulatory and monitoring requirements for the refuse excavation.

All of the projects reviewed by BAS only screened the excavated waste for soil recovery if it was processed at all. Nearly half of the projects reviewed did not

process the material at all. The Naples Landfill attempted to recover the recyclables in the waste, however, it became cost prohibitive due to the process required to upgrade the quality of the recyclables for sale. The only product produced during the screening operations was soil, whether clean or contaminated, and constituted between 25% to over 50% of the excavated volume. The remaining refuse was typically disposed of in an adjacent lined landfill cell.

BAS used the results of this literature search for performing the technical evaluation of the NML reclamation project. The recovered airspace percentages, range of reclamation rates, and unit costs are based on the previous reclamation projects discussed above.

1.1.9 ALTERNATIVES EVALUATED

As discussed earlier, Phase II of the LRMOSP was to include an evaluation of the technical feasibility and costs of the North Miramar Landfill reclamation project. The intent of this draft memorandum is to present the technical feasibilioty prior to developing costs assumptions for the Phase II financial model.

The NML Reclamation Options Study (BAS, 2008) presented a schedule that indicated a start date for the NML reclamation project of August 2008 and a period of 5 years before full-scale implementation of the program, which would have been August 2013, the year the WML was scheduled, at that time, to be at capacity. This dictated an aggressive design, permitting and construction schedule of 5 years. At the writing of this memorandum, June 2010; if the schedule were to be adjusted accordingly then the start date for a full-scale implementation would be approximately August 2015.

However, during the preparation of the NML Reclamation Options Study, the City ESD was permitting a vertical expansion that would increase its airspace capacity by 12.55 million cy. In April 2008 the vertical expansion was approved in a revised SWFP granted to the site. Current projections for WML site life in Phase II of the LRMOSP under the permitted capacity is 2022. Given the

increase in airspace and extension of site life, the first step of this evaluation was to evaluate the feasibility of the project with regards to timing.

ASSUMPTIONS

The key assumption to the technical evaluation for reclamation of the NML was that it could only occur while the WML still has airspace. Processing the waste stream can produce multiple products; however, one product that will always be produced is the residual unuseable, unmarketable waste that must be disposed. The lowest-cost alternative is to dispose of this material in the adjacent WML. In addition, while the NML is being reclaimed, the WML will continue to receive incoming waste. The incoming waste stream for the WML is based on Hilton, Farnkopf & Hobson's tonnage projections for Phase II of the LRMOSP.

The volume of soil and waste in-place at the NML were assumed to be 2.8 million cy and 9.0 = 11.8 million cy yards, respectively, and were based on preliminary grading plans included at the back of this appendix, developed by BAS for the Reclamation Options Study (BAS, 2008). The 2.8 million cy of soil does not include the daily and intermediate cover; it is the material that presently overlies the waste in the NML at a thickness ranging between 1.5 ft to over 48 ft as described earlier.

BAS modeled the reclamation of the NML using varying reclamation excavation rates and recyclables recovery percentages. Reclamation excavation rates of 2500, 3500, and 7000 cy/day were selected as they reflect the range of reported rates in previous reclamation projects as well as result in the complete excavation of the NML before the WML's airspace is depleted under the scenarios evaluated. Following is a brief discussion regarding the selections:

- An excavation rate of 2500 cy/day results in a reclamation duration of approximately 14 years.
- An excavation rate of 3500 cy/day results in a 10 year reclamation period.
- An excavation rate of 7000 cy/day rate completes the reclamation in 5 years. This excavation rate is also the maximum rate reported in the literature search and very similar to BAS' experience at the Carson Landfill redevelopment project described above, with no screening of material (direct relocation).

A plot of reclamation excavation rate versus time is shown on Figure 3.

The recyclable percentages evaluated were 0%, 25%, 50% and 75% (by volume) and reflect the range of recovery possibilities. The material that is not recycled was assumed to be disposed of in the WML, resulting in a secondary waste stream of 100%, 75%, 50% and 25%, respectively, of the reclamation excavation rates.

The material to be recycled would include, but not be limited to, ferrous and non-ferrous metals, electronic goods, glass, soil, and waste fines. The soil and waste fines would be stockpiled and used as daily cover in either the WML or future NML. Clean soil, if encountered, would be stockpiled separately for use outside of the lined areas if needed. The other recovered materials would be cleaned and transferred off-site for sale.

The recyclable percentages discussed above could also include feedstock for a conversion technology to generate energy from the excavated waste. For instance, a recyclables recovery percentage of 50% could consist of 30% soil, 15% feedstock, and 5% marketable products.

In an effort to provide additional time for implementation of the NML reclamation project, the model also incorporated an option for diversion of the current incoming waste stream to the WML. This diversion could be achieved by either direct diversion of the waste stream to by-pass the WML, construction of a transfer station at the Miramar Landfill facility, increased source-separation, or utilizing a conversion technology with the incoming waste stream, etc. Two diversion rates were evaluated, 20% and 40%, with the latter reflecting the diversion scenario of the City collected waste going to the Sycamore Landfill under its contract with Republic. No diversion is the default case for each combination of reclamation excavation and recyclable percentage.

BAS also recognized and incorporated into the model, the excavation of the NML, creating airspace that would be available for filling if the WML ran out of airspace prior to completing reclamation. It was assumed that the available airspace in the NML would be immediately available as soon as the WML

reached capacity. This assumption would require intricate phasing and lining of the NML development.

The evaluation model is based on the range of potential reclamation excavation rates of waste in the NML only. The model does not include excavation of native material underlying the waste which has been estimated at 20 million cy based on the NML Reclamation Options Study (BAS, 2008).

As stated earlier, the reclamation of the NML can only occur while the WML has airspace available. The reclamation project would accelerate the consumption of airspace in the WML. Therefore, two expansion alternatives for the WML (addressed in a separate memorandum) were included in the NML evaluation model, at 4.0 million cy (Alternative A) and 20.0 million cy (Alternative B).

The impact on WML's airspace was determined for the range of recyclable percentages for each reclamation excavation rate evaluated. The impacts on West Miramar's airspace stemming from waste diversion and the airspace created in North Miramar are additive to the secondary airspace provided by the reclamation recycling.

RESULTS

The results of the evaluations were presented in tables prepared and submitted to ESD which present the results for WML permitted airspace, WML Alternative A, WML alternative B with an option of 20% diversion of the incoming waste stream to the WML and results for WML permitted airspace, WML Alternative A, and WML alternative B with an option of 40% diversion for that component of the range of assumptions for airspace volumes available at the WML.

The reclamation project was considered feasible if the WML had at least 4 years of life remaining following the excavation of waste in the NML. The period of 4 years would provide time for the excavation of the underlying native materials and construction and permitting of the base liner and leachate collection systems. As discussed below, the project was considered viable only if it could be accomplished under a reasonable combination of reclamation excavation rates and recyclable recovery percentages.

As reflected in tables prepared and submitted to ESD, reclamation of the NML is not possible without an airspace expansion at the WML. For each reclamation rate and recyclables percentage, West Miramar's airspace is depleted before North Miramar is excavated.

Tables prepared and submitted to ESD present the results with a 4.0 million cy airspace expansion at the WML. Tables prepared and submitted to ESD show that an airspace expansion at West Miramar must be of sufficient volume to provide the necessary time to not only complete the excavation of North Miramar but also the construction of the first lined cell. As can be seen, the reclamation of the NML only works for the most aggressive scenarios. For instance, the reclamation appears to be viable at an excavation rate of 3500 cy/day, however, the recyclables percentage of the waste must average at least 75%, the incoming waste stream to the WML must be diverted by at least 20%, and all of the available airspace in the NML must be utilized. At first glance, a reclamation rate of 7000 cy/day and at a recyclable percentage of 0% appears to be more viable than the preceding scenario, however, it too requires a diversion rate of at least 20% and utilization of the available airspace in the NML.

Tables prepared and submitted to ESD present the results with a 20 million cy airspace expansion at the WML. An expansion of this size provides sufficient airspace to complete the reclamation of all of the waste in the NML under all but the least aggressive scenarios. The reclamation of the NML is still not feasible with a 20 million cy expansion at the WML at a reclamation excavation rate of 2500 cy/day unless more aggressive measures are employed such as diversion of waste from WML and/or utilization of the airspace in the NML.

In the NML Reclamation Options Study prepared by BAS (July 2008), the goal of the reclamation project was not only the recovery of airspace in the NML by recycling the waste but to also deepen the landfill by excavating approximately 20.0 million cy of native material currently overlain by the waste. It can be inferred by inspection of tables prepared and submitted to ESD that this excavation is also possible under the same range of scenarios as the reclamation of the NML. It should be noted, however, that due to timing it would not be possible to have an aggregate contractor perform the excavation as has been

done in the past to off-set costs so excavation costs would be similar to recent mass excavation costs at the WML. Aggregate production and sales is dependent on the economy and the market for their product. Aggregate contractors typically operate as a lean production and only produce material when required. Even if the market is there for the material, the typical production rates for a small processing operation (one adjustable screen) is approximately 3,000 cy/day. Thus, a 20 million cy excavation would require 24 years, which is beyond the time frame needed for excavation and is too long a time frame to assume market consistency.

In order for the NML reclamation project to be feasible, a reasonable combination of reclamation rates and material recovery percentages with an airspace expansion at WML is necessary. BAS defines a reasonable combination of excavation and recovery rates as that which can be consistently reproducible and would be considered the average achieved rates during the course of the project. Based on our literature search of previous reclamation projects as well as extensive construction experience, reasonable combinations would be as follows: for 2500 and 3500 cy/day, the recovery percentage would be 25% for planning purposes; for 7000 cy/day, a recovery percentage of 0%.

Figure 4 shows the remaining site life in the WML following the complete exhumation of waste in the NML for a range of expansion capacities at the WML. The figure was prepared assuming excavation rates of 3500 cy/day and recyclable percentages of 25% and 50%, as well as 7000 cy/day and a recyclable percentages 0%. As can be seen in Figure 4, if 4 years of life are required to remain in the WML following the excavation of waste in the NML, the following expansion capacities at the WML are necessary:

- 21.8 million cy WML expansion for 3500 cy/day excavation and 25% recovery at the NML;
- 19.5 million cy WML expansion for 3500 cy/day excavation and 50% recovery at the NML; and
- 14.5 million cy WML expansion for 7000 cy/day excavation and 0% recovery at the NML.

It is clear from Figure 4 that a reclamation excavation rate of 3500 cy/day and 25% recovery is not feasible as it would require an expansion larger than 20

million cy at the WML. The technical memorandum discussing the two expansion alternatives for the WML identified community opposition, as well as environmental and aesthetic impacts associated with the 20 million cy expansion alternative. Mitigation measures would almost certainly impact the optimal expansion airspace available. Therefore, the NML reclamation scenario of 3500 cy/day excavation and 50% recovery requiring a 19.5 million cy expansion at WML is also not likely feasible.

The scenario of 7000 cy/day excavation rate with 0% recovery, while technically feasible, would not achieve ESD's primary goal for the project of material recovery and additional airspace capacity.

1.1.10 CONCLUSIONS AND RECOMMENDATIONS

As initially defined earlier, 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 an airspace expansion of the NML by excavating the underlying native materials.

Based on the model developed with varying assumptions for reclamation excavation, material recovery (soil and/or recyclables), airspace expansion at the WML, the first two goals cannot be achieved for the NML reclamation project due to timing.

In order to achieve the third goal of the NML reclamation project, the results of our detailed technical evaluation indicate that the project could not proceed without a high rate of reclamation excavation (7000 cy per day) and a significant expansion of airspace at the WML. The expansion at the WML must provide sufficient capacity and site life to not only exhume all of the waste in the NML, but also provide time to excavate the underlying native materials and construct the new cell in the NML. As discussed earlier, the expansion at the WML must provide at least 14.5 million cy of airspace that is available for refuse and daily cover which would provide 4 years to complete the excavation of the underlying materials and construct the new cell in the NML.

Larger expansions than 14.5 million cy would allow flexibility in the excavation rate of the waste in the NML (assumed at 7,000 cy/day), excavation and processing alternatives (aggregate sales) for the native soil underlying the NML, or a longer permitting duration. For example, as can be inferred from Figure 4, an approximate 16.6 million cy expansion would allow the permitting to slip by approximately 1 year (January 2017).

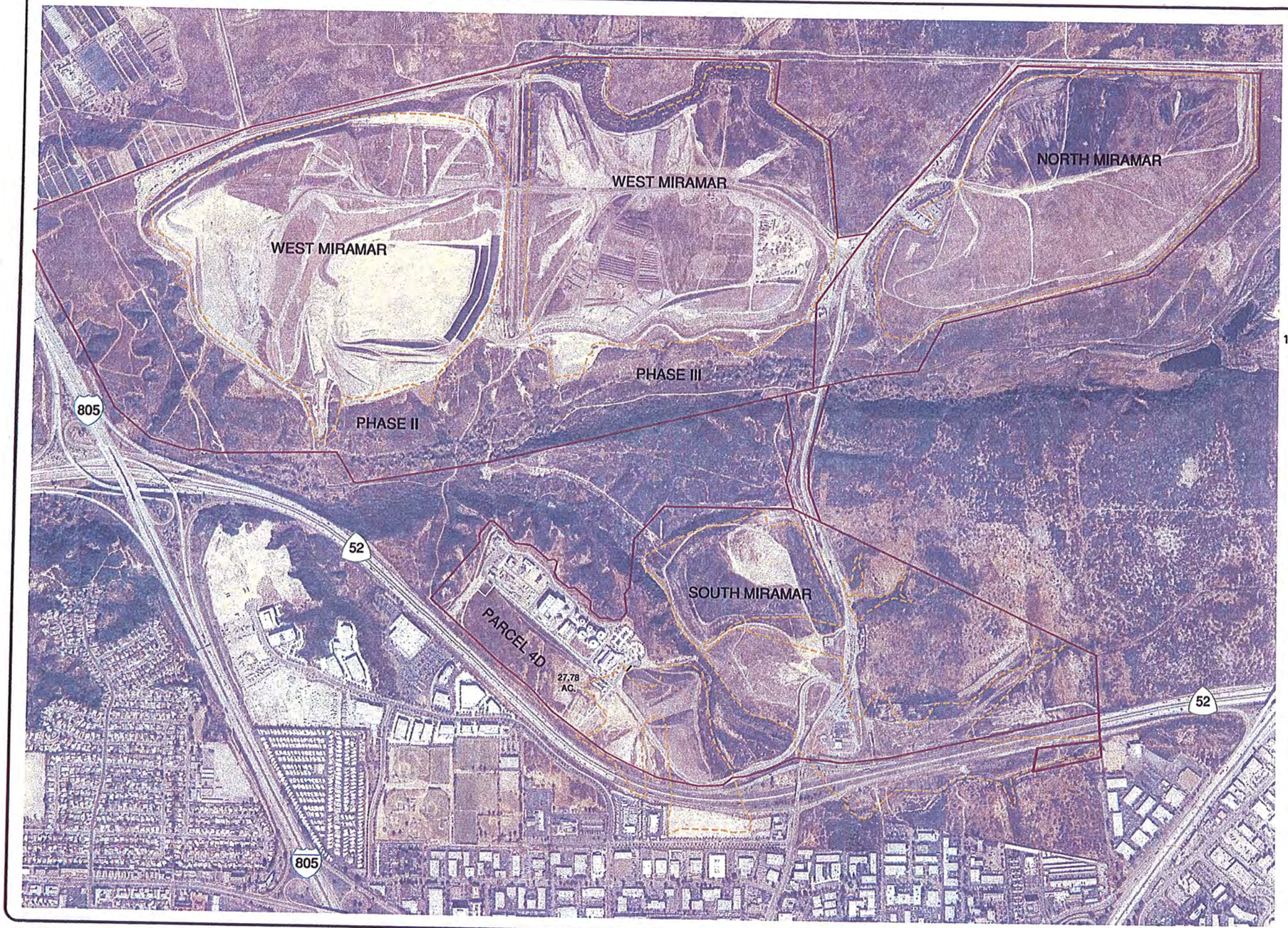
BAS concludes, then, that the reclamation of the NML is only viable if the waste is excavated at a rate of 7000 cy/day and the material is not processed (i.e., direct relocation). A pilot study can still be completed to determine if material can be processed at this rate and if successful, implemented. If the rate proves to be unsustainable, the assumption for processing can be eliminated and the waste would have to be directly relocated. For planning and costing purposes, BAS recommends assuming that the waste not be processed at this excavation rate.

Given that the NML reclamation project is not feasible without a substantial expansion at the WML (of at least 14.5 million cy), a decision needs to be made that ESD wants to pusue both projects at the same time which includes permitting and implementation. Costs for the expansion alternatives at the WML have been provided in a separate memorandum. The "ballpark" costs for reclamation of the NML as presented herein approach $100 million as summarized below (without consideration of the liner/LCRS/infrastructure development costs):

- 9.0 million cy for reclamation excavation at $5.00/cy = $45 million
- 2.8 million cy for cover soil excavation at $2.20/cy (Module E avg. exc. unit cost) = $6.2 million
- 20 million cy for subgrade soil excavation at $2.20/cy = $44 million

These are order of magnitude costs for the NML reclamation project and can be further developed if ESD wishes to pursue both expansion projects.

FIGURES 1 – 3



N

GRAPHIC SCALE

1200 600 0 1200 2400

(IN FEET)

LEGEND

- MIRAMAR LANDFILL GROUND LEASE
- APPROXIMATE LIMITS OF FILL

FIGURE 1

BAS (909) 860-7777

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MIRAMAR LANDFILLS

SITE CONTEXT

JOB NO.	2007.0069
DATE	03-2008
DRAWN BY	B.R.A.
FILE NAME:	173279DB.DWG

Figure 2 - Reclamation Rate versus Completion Time

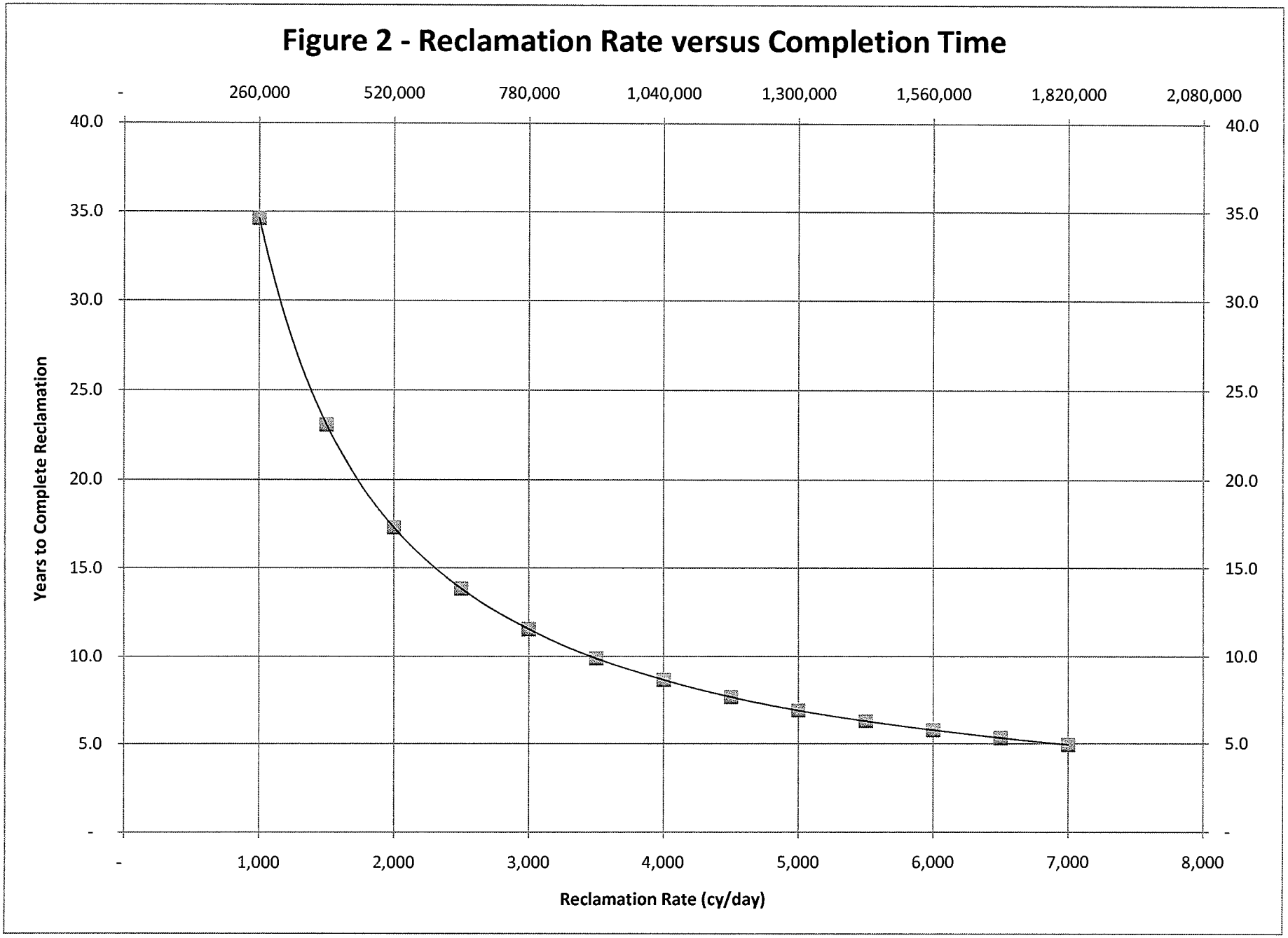
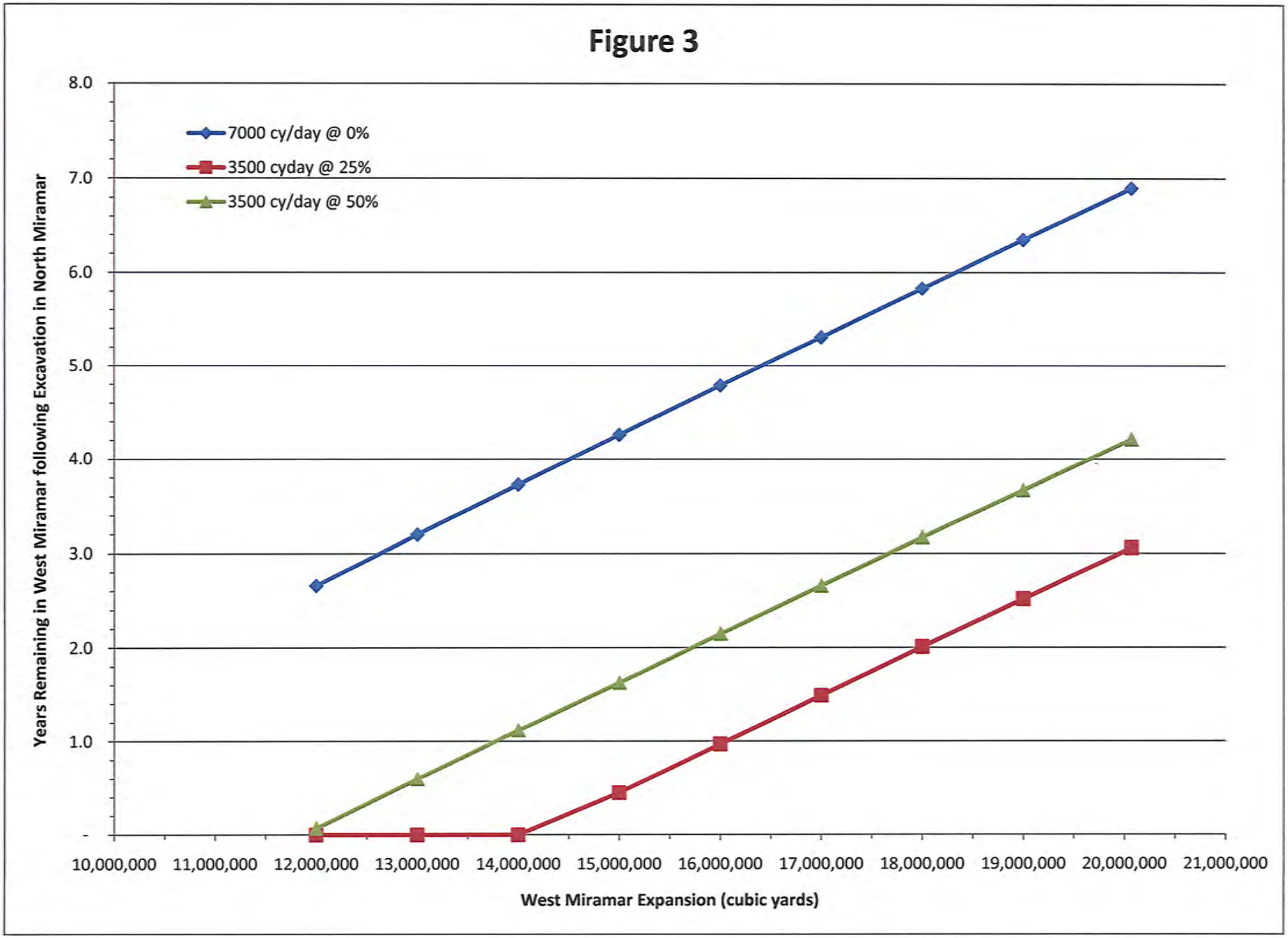


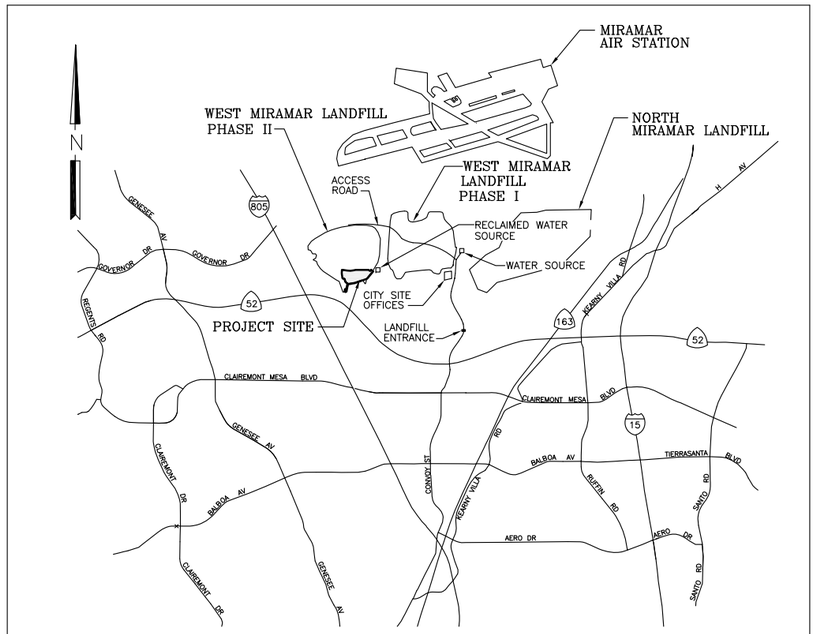
Figure 3


8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
-
7000 cy/day @ 0%
3500 cyday @ 25%
3500 cy/day @ 50%
Years Remaining in West Miramar following Excavation in North Miramar
10,000,000
11,000,000
12,000,000
13,000,000
14,000,000
15,000,000
16,000,000
17,000,000
18,000,000
19,000,000
20,000,000
21,000,000
West Miramar Expansion (cubic yards)

NORTH MIRAMAR RECLAMATION PROJECT

PRELIMINARY CONCEPT DRAWINGS

CITY OF SAN DIEGO
ENVIRONMENTAL SERVICES DIVISION
CHRIS GOVAVER, DIRECTOR



VICINITY MAP
N.T.S.

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3	EXCAVATION PLAN
4	GRADING PLAN
5	CROSS-SECTIONS
6	CROSS-SECTIONS
7	CROSS-SECTIONS
8	CROSS-SECTIONS

NORTH MIRAMAR LANDFILL

No	Revisions	By	DATE

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NORTH MIRAMAR LANDFILL

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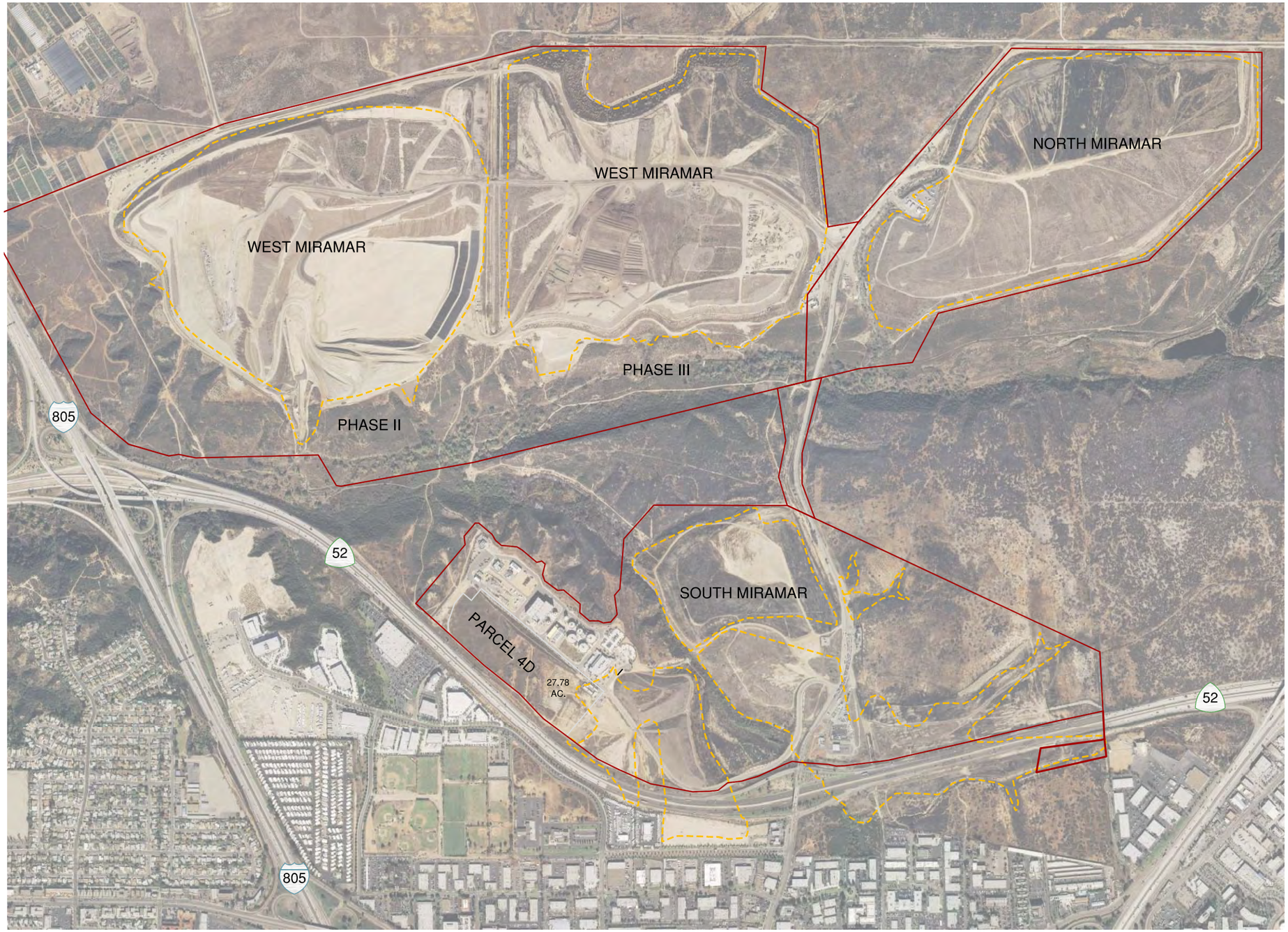

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GRAPHIC SCALE

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(IN FEET)

LEGEND

- MIRAMAR LANDFILL GROUND LEASE
- APPROXIMATE LIMITS OF FILL

DRAWING 2 OF 8

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MIRAMAR LANDFILLS

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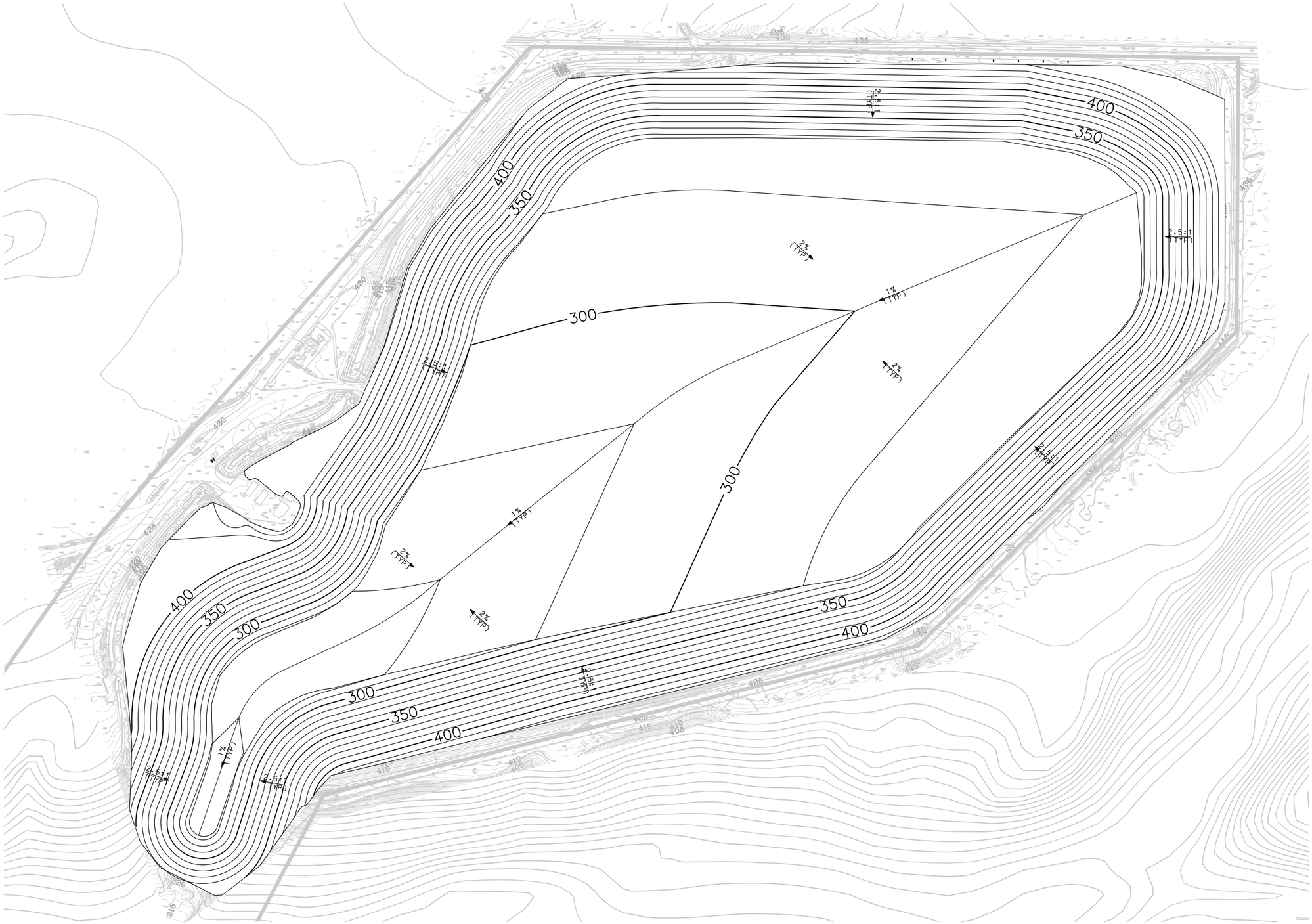
FILE NAME:	173279DB.DWG



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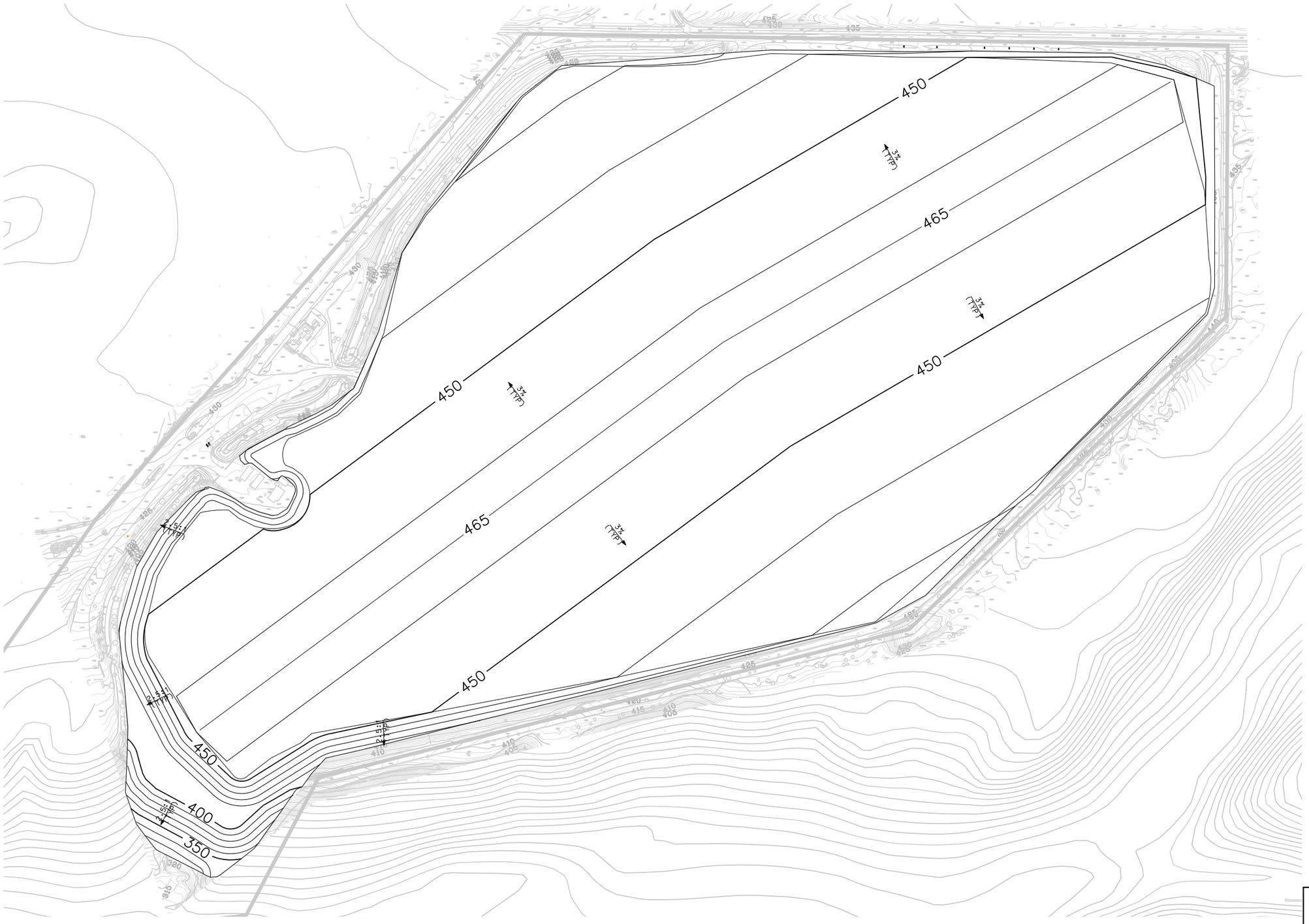

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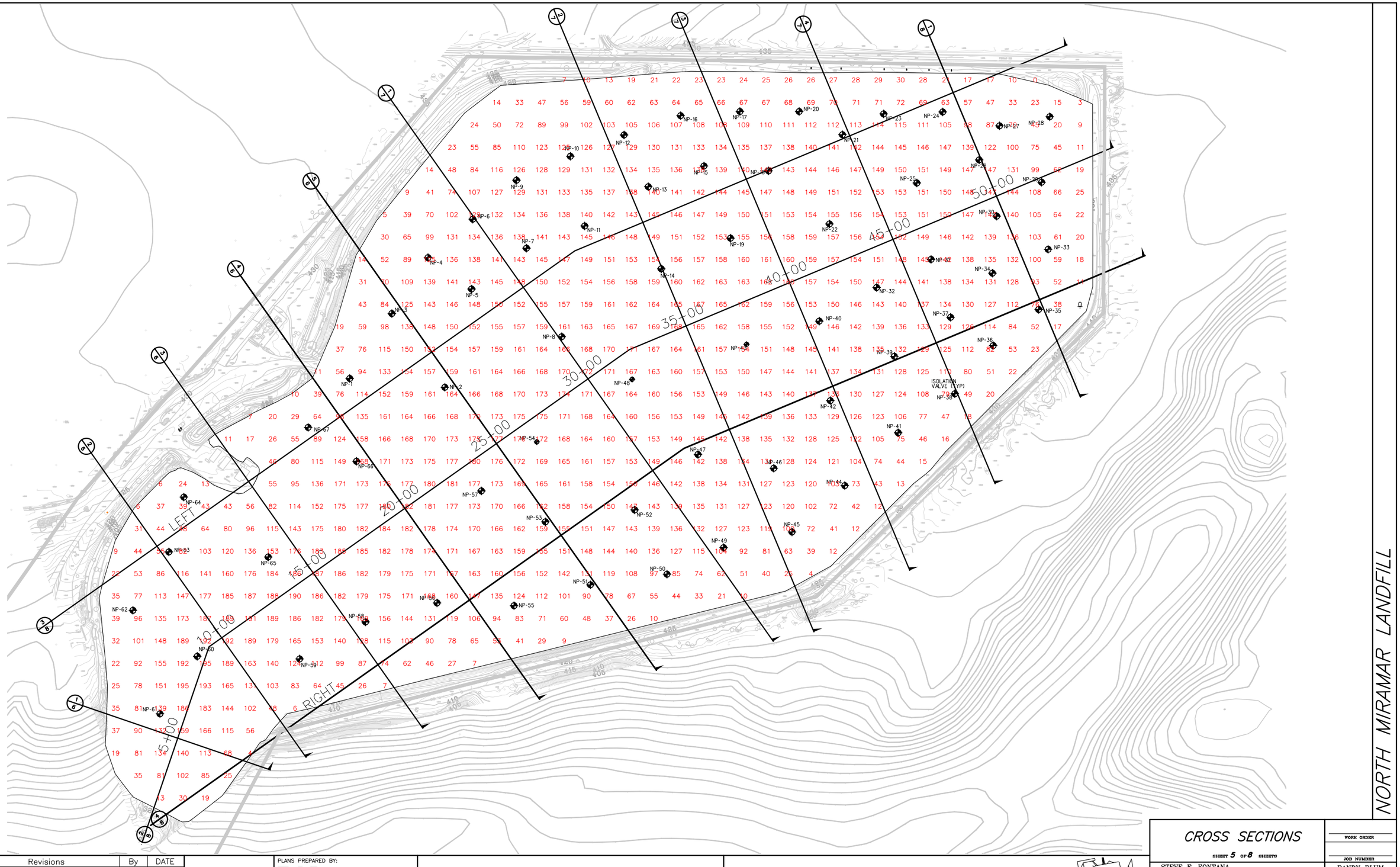

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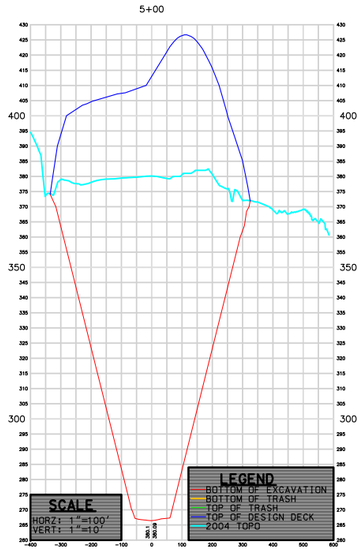

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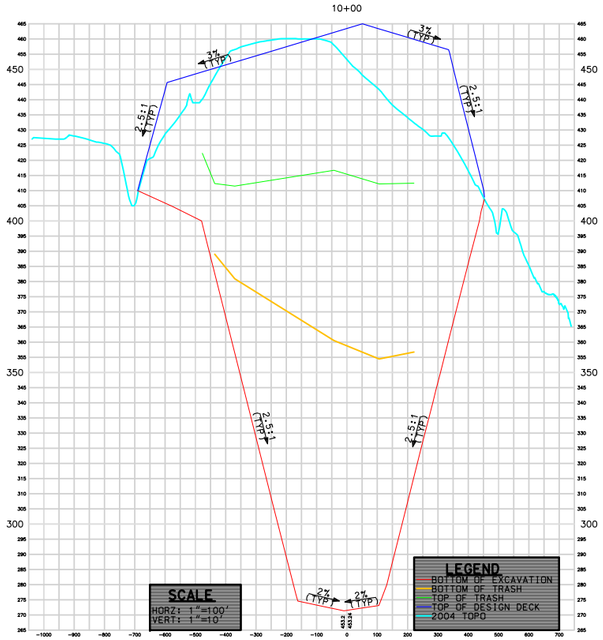

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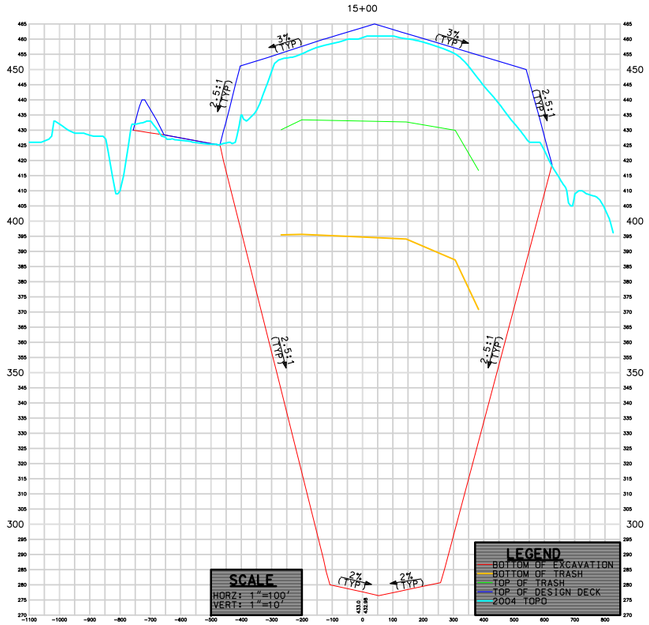

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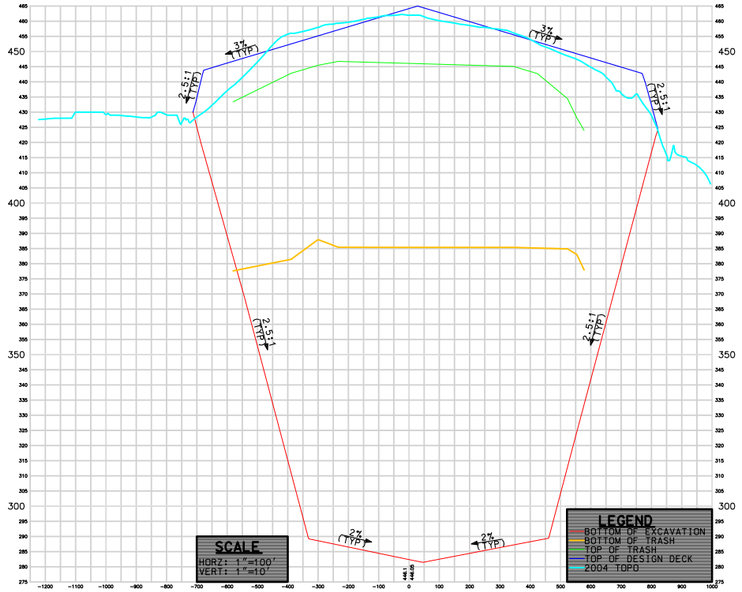

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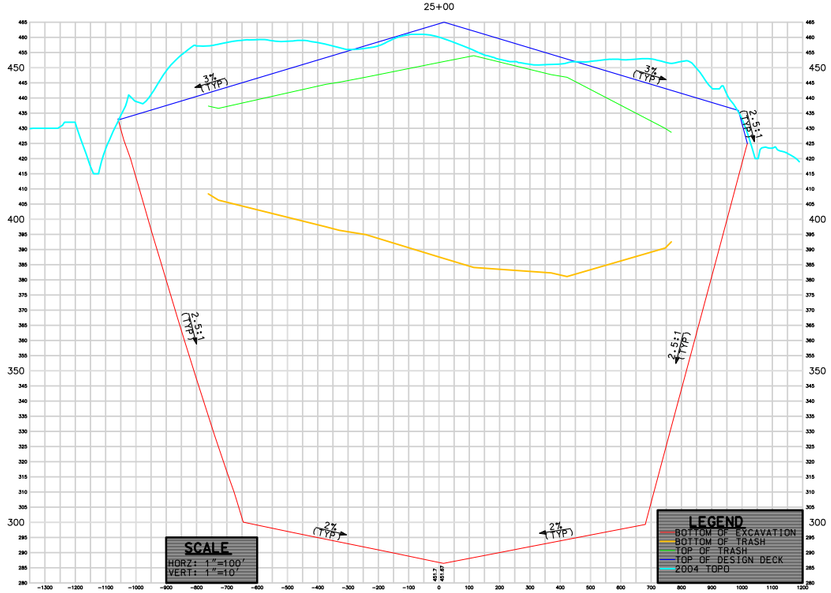

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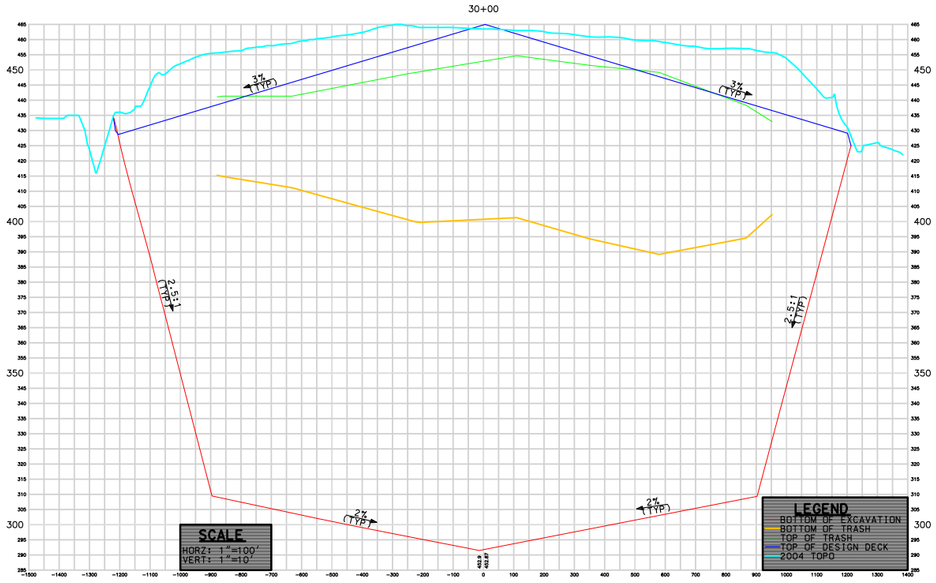

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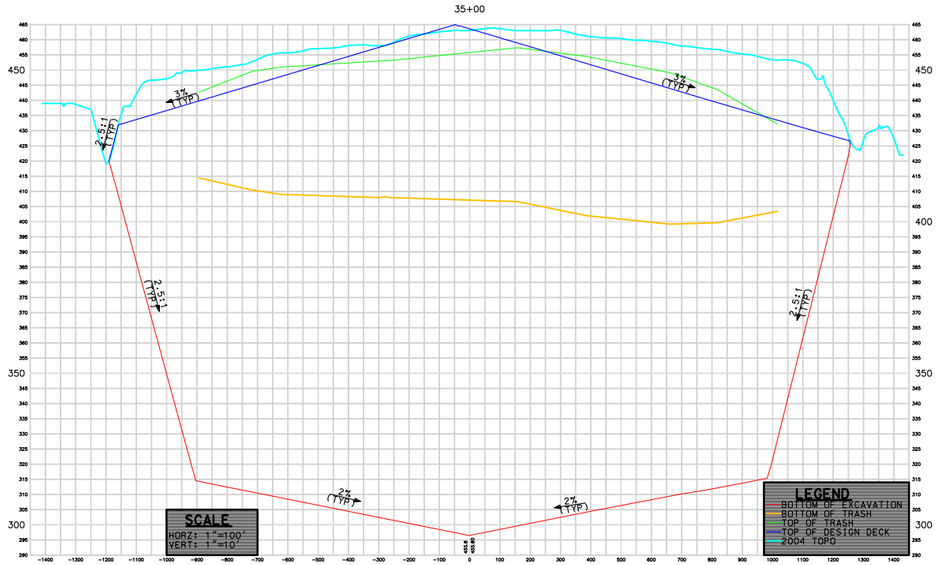

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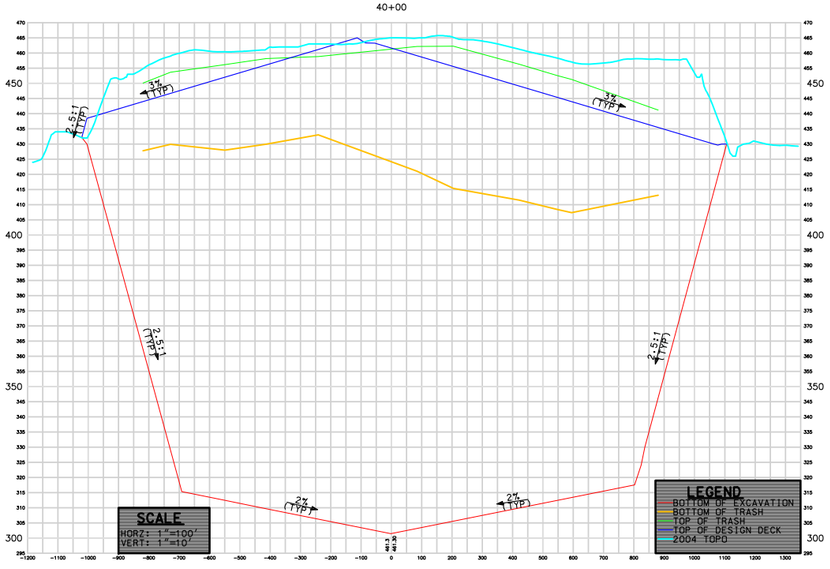

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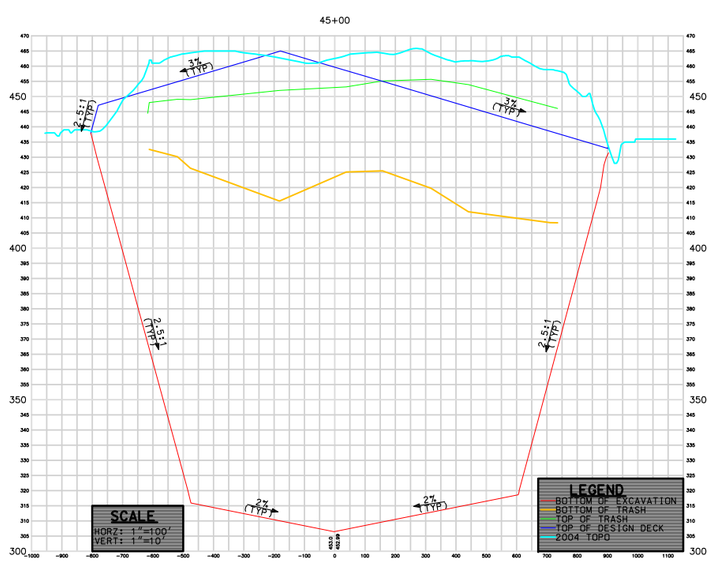

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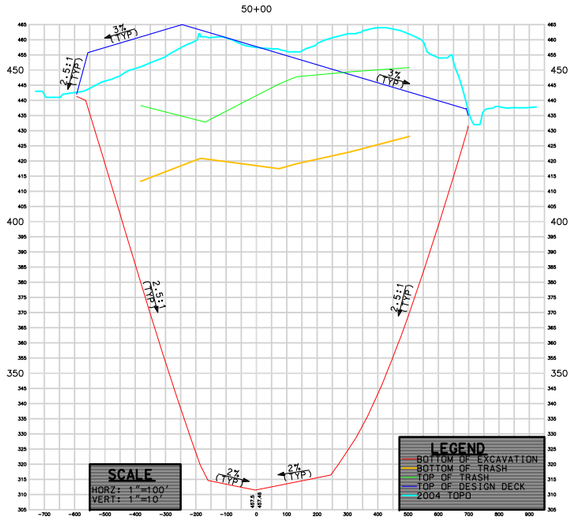

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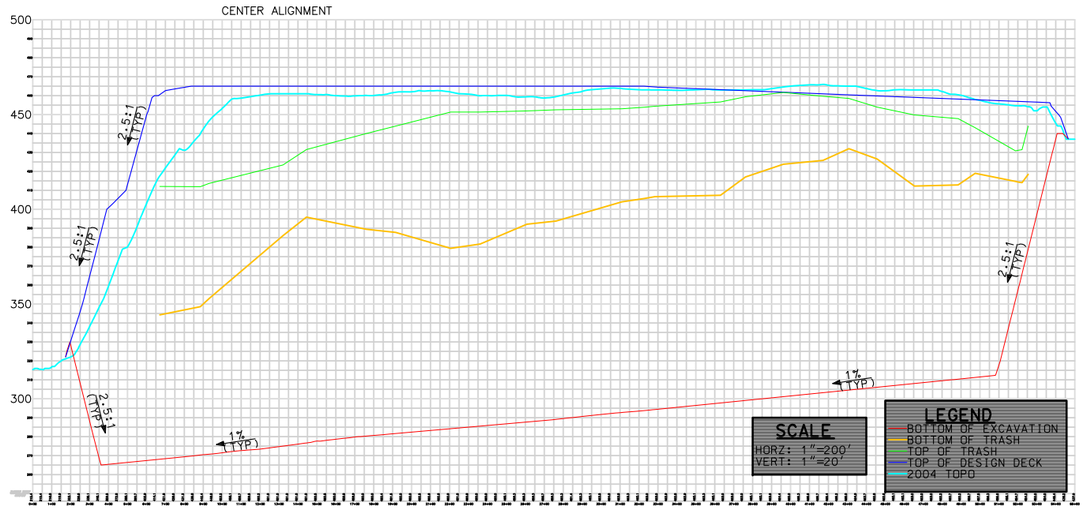

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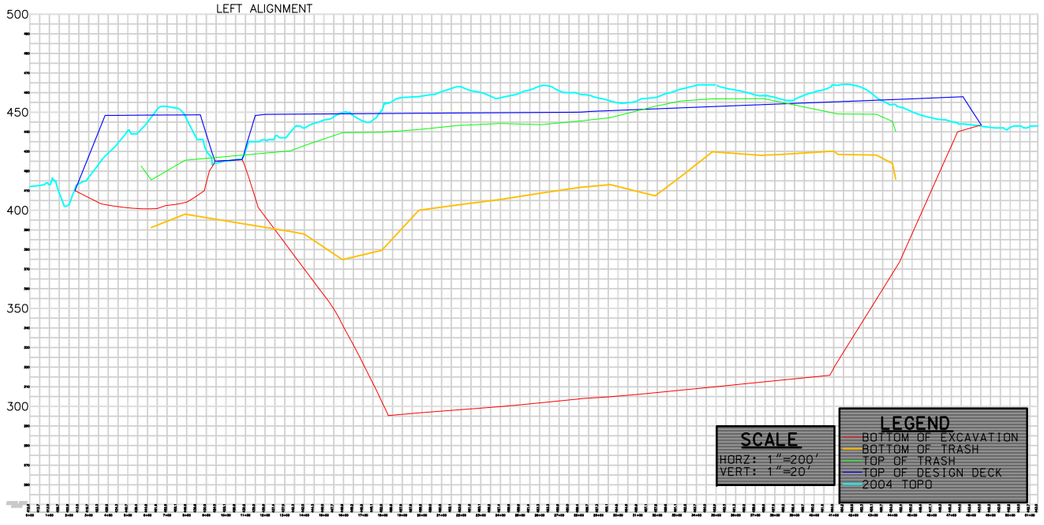

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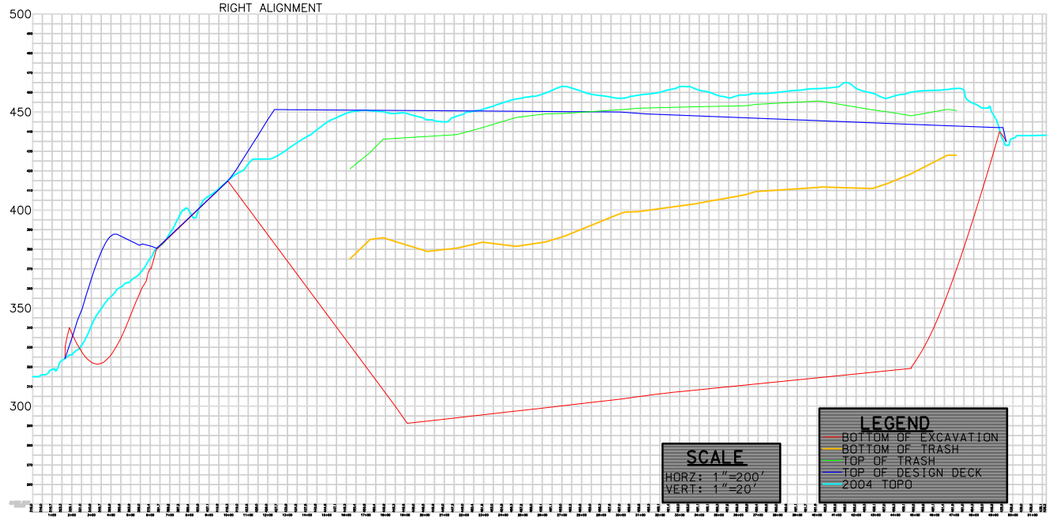

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APPENDIX C

CONVERSION TECHNOLOGY PROJECTS AND INITIATIVES - PROGRESS REPORT

CONVERSION TECHNOLOGY PROJECTS AND INITIATIVES

PROGRESS REPORT

Submitted to:

Bryan A. Stirrat & Assoc.
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Diamond Bar, CA 91765
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Prepared by:

Clements Environmental Corporation
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January 2011

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1.0 INTRODUCTION

This report 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, providing greater than 80 percent diversion from landfill disposal.

CTs are successfully used to manage solid waste in Europe, Israel, Japan, and some 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.

The information presented herein is based on available, published information, and consulting team knowledge.

2.0 SUMMARY OF CONVERSION TECHNOLOGY INITIATIVES IN CALIFORNIA

Several jurisdictions in California are in the process of developing CT projects. The following sections contain brief summaries.

2.1 Los Angeles County

Since 2004, the Los Angeles County Department of Public Works (LADPW) has been evaluating and pursuing the development of conversion technologies to reduce landfill disposal of municipal solid waste (MSW). To date, the County has followed a deliberate multi-phased approach to accomplish this task. Phase I included a preliminary evaluation, screening and ranking of CT companies and identification of material recovery facilities and transfer stations (MRF/TS) that could potentially host a CT facility. Phase II consisted of a detailed evaluation of selected technologies and MRF/TS sites, followed by a Request for Offers that was issued to recommended companies and sites. Three companies were selected to participate in development of demonstration facilities, and a Memorandum of Understanding was negotiated with each. These companies are:

- International Environmental Solutions (IES)
- Ntech
- Arrowbio

The purpose of the Phase III projects is to demonstrate the technical, economic, and environmental viability of such facilities in Southern California, and also to establish pathways for permitting and financing commercial scale CT projects in the County. These three demonstration projects are at various stages of development and include both thermal and biological conversion processes.

In 2010, the County initiated Phase IV activities, which focus on establishing larger, commercial-scale CT facilities in Los Angeles County for the purpose of providing alternatives to landfill disposal of post-recycled MSW. The County envisions one or more commercial CT facilities, ranging in size, being developed throughout the County as a means to provide long term solid

waste management capacity, to reduce dependence on exporting waste to remote landfill sites outside of the County, and to stabilize waste disposal rates. Such facilities would process primarily post-recycled MSW, but could potentially process other materials such as food and yard waste, biosolids, non-recycled construction and demolition (C&D) materials, and other non-hazardous wastestreams.

A Siting Feasibility Analysis is being prepared by Alternative Resources, Inc. (ARI) and Clements Environmental Corporation pursuant to the following motion by the Los Angeles County Board of Supervisors on April 20, 2010:

"Instruct the Director of Public Works to:

a) In coordination with appropriate stakeholders, including the County Sanitation Districts and other appropriate County departments, assess the feasibility of developing a conversion technology facility at one or more County Landfills; and

b) Report back to the Board within six months, with its findings regarding the development of a conversion technology facility at a County landfill, and identifying other potentially suitable sites within Los Angeles County."

LADPW staff has been directly involved in the coordination with appropriate stakeholders, including conducting outreach, attending meetings, developing evaluation criteria, and assisting in the gathering of information necessary for the feasibility assessment. Los Angeles County has organized a Conversion Technology Sub-committee as part of their Local Task Force in order to further evaluate sites that have been identified for possible CT projects. Six (6) sites, including three (3) local landfills, have been rated as high priority from the original sixteen (16) sites assessed. Efforts are ongoing to gather more information on high priority sites to determine their potential for hosting a CT facility.

2.2 City of Los Angeles – Bureau of Sanitation

In 2004, at the direction of the Mayor of Los Angeles, City Council, and the City's blue print policy the RENEW LA report, the Los Angeles Bureau of Sanitation (BOS) initiated a study to consider Alternative Technologies (Alt Tech - including CTs and combustion Waste-to-Energy (WTE) technologies) for converting MSW to renewable energy and reducing reliance on landfills. Various phases of the study have been led by URS Corporation and HDR. The study's objective was to identify clean new methods that are environmentally friendly, energy efficient, socially acceptable and economical. This study determined that several technologies do exist to process MSW into a renewable energy sources and are commonly used in other countries. In 2005, City staff and elected officials visited some of these facilities in Europe to determine the viability of incorporating such technologies in the City of Los Angeles. This resulted in the next phase of the Alt Tech study moving forward in early 2006 with consultants hired to refine the technology selection process and screen potential development partners.

The BOS released a request for proposal (RFP) in February 2007 to select a technology and development partner to site and construct a conversion facility. As part of this effort technical consultants and public outreach consultants have been hired to support BOS staff and provide public education and information. RFP responses were received by August 22, 2007 and a total

of 12 technology suppliers submitted applications. The BOS is currently reviewing the submissions.

The proposals were divided into an "emerging" track for smaller scale technologies and a "commercial" track for larger capacity and more developed technologies. ArrowBio was selected as the preferred technology for the emerging track and three potential vendors have been shortlisted for further evaluation for the commercial track; these being:

- Wheelabrator Technologies Inc.
- Urbaser & Keppel Seghers
- Green Conversion Systems

The ArrowBio team is in contract negotiations with the BOS to build a 150 TPD Anaerobic Digestion (AD) project, expandable to 300 TPD.

2.3 Santa Barbara County

The County of Santa Barbara and the Cities of Santa Barbara, Goleta, Solvang and Buellton have joined together to identify and evaluate the feasibility of various CTs that provide alternatives to landfilling of solid waste in southern Santa Barbara County.

The County and cities produced a feasibility report in April 2008 and issued a Request for Information. Of the responses, eight vendors were identified that could possibly provide a CT facility at the Tajiguas Landfill. A Request for Proposals (RFP) was then released in October of 2009 and proposals were received April 2010. In response to the RFP, four companies submitted formal proposals. These proposals have been reviewed and a preferred vendor(s) is to be selected in February 2011. Although the prospective technologies are varied, each would convert the material they process by 90% to 100%, significantly reducing the area's dependence on landfilling. The four finalists are all thermal technologies and include:

- Plasco Energy Group
- NRG
- Mustang Power
- IES

2.4 Salinas Valley Solid Waste Authority

The Board of Directors of the Salinas Valley Solid Waste Authority (SVSWA) began investigating alternatives to landfill disposal of solid waste in February 2005 with a series of study sessions. Due to the 2005 approval of a goal to achieve 75% diversion from landfills by 2015, the focus of these studies shifted to researching emerging technologies. This goal was reaffirmed by the Board as one of the Strategic Objectives adopted in August 2010. One of the primary components of this process was the completion of a Waste Composition Study in 2007 which defines the SVSWA waste stream and allows for the implementation of diversion programs specific to the types of waste that can be effectively recycled. Only the waste which cannot be separated or reclaimed is proposed as feedstock for a conversion technology.

A four-member Conversion Technology Commission (CTC) was formed after the SVSWA determined that a non-combustion based technology was preferred. Also further investigation on

the properties identified for a future landfill site for the SVSWA waste stream were suspended. The goal of the Commission is to identify the best and most effective conversion technology(ies) applicable to the Salinas Valley.

The Commission visited both aerobic and anaerobic composting facilities, materials recovery facilities, the UC Davis biodigester, autoclave facilities, gasification plants in California and Japan, a methane to electricity generation plant, waste to energy plants, and a plasma arc gasification facility in Canada.

A Statement of Qualifications and Requests for Proposals were initiated in January 2008. Three (3) proposals were extensively reviewed and ranked based on goals and objectives outlined by the SVSWA. Since November 2009, staff has been in discussion with the two top ranked vendors, PlascoEnergy and Urbaser S.A. to define the projects proposed as the cornerstone of the SVSWA transition of the Johnson Canyon Landfill into a Resource Management Park. It is anticipated that a vendor will be chosen in January 2011 to begin detailed contract negotiations and to start the permitting process.

2.5 City of Glendale

In September 2007, The City of Glendale Public Works Department, in cooperation with the Los Angeles County Department of Public Works (LADPW), presented the City Council with an overview of the current state of waste conversion/waste to energy technology. At the direction of the City Council, the Public Works Department has continued to coordinate with the County on their efforts and to look at opportunities to develop a project within the City of Glendale. Additionally, the Public Works Department is in the process of developing a Zero Waste Policy for consideration by the City Council. It is anticipated that conversion technologies will play a major role in achieving a zero waste goal.

On April 20, 2010, the City Council adopted a motion authorizing the city manager to assemble a project team to research, analyze, report and recommend a waste conversion project for the City of Glendale. The motion also provides funding of $200,000 to research emerging technologies to help meet the City's long-term waste reduction goals. At this time, the City has selected a consultant and is prepared to move forward with a more extensive review of various CTs and the potential energy production capabilities of a facility to be located at the City's Scholl Canyon Landfill.

The City of Glendale is currently pursuing opportunities to partner with the LADPW on the development of a project in Glendale. The following is a summary of City Council Action Items established in April 2010:

- Continue to coordinate with the Los Angeles County Department of Public Works;
- Proceed with efforts to develop a Zero Waste Policy;
- Actively engage Scholl Canyon Wasteshed Cities in efforts to develop a CT project at Scholl Canyon Landfill;
- Actively pursue and support critical legislation aimed at enabling the implementation of conversion projects, clean energy production, and emissions reductions;
- Establish a working group of key City staff and outside specialists to review all aspects of implementing a conversion project.

2.6 San Bernardino County

In response to AB 939, which established increased solid waste diversion goals, San Bernardino County formed the Solid Waste Advisory Task Force (SWAT). Within SWAT, a Strategic Planning Sub-Committee was formed to look at alternative reduction, recycling, composting and energy technologies and report back to the SWAT. The County is utilizing a three-step process to investigate the availability, suitability, and economics of municipal solid waste conversion technologies.

In January 2010, the County released a Request for Qualifications (RFQ) which will provide a list of technologies to be assessed by the County's consultant. All qualifications were due to the County in March 2010.

Currently, the Strategic Planning Sub-Committee is compiling a draft Alternative Reduction, Recycling, Composting and Energy Technology Report that will describe existing CT infrastructure, materials available, capacity for each facility and the differences between the facilities to handle various materials. A draft of this report is expected to be completed before the next SWAT meeting in April 2011. After evaluating CT company qualifications and existing projects, a Request for Proposals (RFP) will be prepared and released to assess the viability of siting a project(s) in the County and entering into an agreement for development.

3.0 STATUS OF NOTABLE CONVERSION TECHNOLOGY PROJECTS IN NORTH AMERICA

The following sections contain brief summaries of several of the most notable CT projects in various stages of development throughout North America.

3.1 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). As part of the agreement, the City of Edmonton will supply a minimum of 100,000 dry tons of sorted MSW per year to the facility. The sorted MSW to be used is the resulting material after recovering recyclables and compostables, which have been diverted.

The project met all required regulatory environmental standards (Alberta Environment), including air emissions, and was granted a permit to begin construction and operation of the commercial facility. Construction started during the summer 2010 and the facility is expected to begin commercial operations by the end of 2011.

Enerkem partnered with the City of Edmonton and Alberta Innovates – Energy and Environment Solutions to secure funding for the project. In addition, the project has been selected by Alberta Energy to receive $3.35 million in funding, as part of the Biorefining Commercialization and Market Development Program. This program is designed to stimulate investment in Alberta's bio-energy sector.

In partnership with the City of Edmonton and Alberta Innovates, this facility will enable the City of Edmonton to increase its residential waste diversion rate to 90 percent.

TABLE 3-1
PROJECT SUMMARY FOR ENERKEM ETHANOL PLANT
EDMONTON, ALBERTA, CANADA

Developer	Enerkem, as part of Enerkem Alberta Biofuels
Location	Alberta Waste Management Center Edmonton, Alberta, Canada
Participants	Enerkem, City of Edmonton, Alberta Energy, Alberta Innovates, Government of Alberta
Capacity	270 TPD
Feedstock	Presorted, non-recyclable and non-compostable municipal solid waste (MSW)
Technology Description	
Front-End Processing	Drying, sorting, and shredding of MSW
Primary Conversion Technology	Gasification
Back-End Conversion	Clean syngas and catalytic synthesis of syngas to liquid fuel,
Demonstration Plants	Pilot Plant, Sherbrooke, Quebec, Canada Advanced Energy Research Facility, Edmonton
Products	
Primary	Ethanol
Secondary	Methanol, acetic acid, acetates, renewable electricity, aggregates
Timing	Received permit in 2009 Construction began in 2010 Production expected at the end of 2011
Economics	
Capital Cost	$80 Million
Tipping Fee	$66/ton
Interesting Attributes	Expected to increase waste diversion by 90%, constructed in scalable modules with capacity of 10 million gal/yr each of ethanol.

FIGURE 3-1
AERIAL OF EXISTING ALBERTA WASTE MANAGEMENT CENTER

FIGURE 3-2
RENDERING OF ENERKEM ETHANOL PLANT
EDMONTON, ALBERTA, CANADA

3.2 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. The waste stream will be comprised of MSW and industrial, commercial, and institutional (ICI) waste from the neighboring nine (9) communities. The Central Waste Management Commission (CWMC) was formed in 2007 to provide solid waste management services to these communities. More than 98% of the waste processed by Plasco will be diverted from landfill disposal.

Plasco will finance, build, own and operate the facility. Additional funding for the project has been provided by grants, including $10 million from the Climate Change and Emissions Management Corporation of Alberta. The project is in the permitting phase and construction of the facility is expected to be completed in 2012, with the facility operational by 2013. The facility is being built on land provided by Red Deer County. For the past three years, Plasco has operated a full-scale demonstration plant of 100 TPD capacity in Ottawa, Ontario, Canada. The plant is comprised of one complete Plasco "module".

TABLE 3-2
PROJECT SUMMARY FOR PLASCO CONVERSION FACILITY
RED DEER, ALBERTA, CANADA

Developer	Plasco Energy Group
Location	Red Deer County, Alberta, Canada
Participants	Central Waste Management Commission, Climate Change & Emissions Management Corporation
Capacity	300 TPD
Feedstock	Post-recycled MSW and ICI waste
Technology Description	
Front-End Processing	Separation of materials with high reclamation value, MSW shredded
Primary Conversion Technology	Gasification (Plasma)
Back-End Conversion	Sulfur, acid gases, and heavy metals removed from syngas Inert residue converted to aggregate product with plasma torch
Demonstration Plants	Ottawa, Ontario, Canada
Products	
Primary	Electricity, Syngas
Secondary	Recyclables, potable water, aggregate
Timing	Signed contract in 2008, Construction to be completed in 2012, Operational in 2013

Economics	
Capital Cost	$90 Million
Tipping Fee	$65-75/ton
Interesting Attributes	>98% of waste is diverted, constructed in 3 module format, Environmental Interpretation Center

FIGURE 3-3
RENDERING OF PLASCO CONVERSION FACILITY
RED DEER, ALBERTA, CANADA

FIGURE 3-4
PLASCO TRAIL ROAD DEMONSTRATION PLANT
OTTAWA, ONTARIO, CANADA

3.3 BIOFerm™ Energy Systems

In September 2010, The University of Wisconsin – Oshkosh began construction of a commercial dry fermentation anaerobic digester. The renewable energy facility will 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 MWh per year. The 8,000 tons per year feedstock for the facility will consist of organic waste provided primarily by campus and community sources, including leftover food and yard waste. The organic material will be loaded into four 70-foot chambers, each one 23 feet wide and 17 feet high. As the material decays, the biogas given off will be collected and burned in a generator that makes electricity. Excess heat can be piped into nearby campus buildings.

The project was developed in collaboration with the UW Oshkosh foundation, which purchased the land, and is partially funded with a grand of over $230,000 from Wisconsin Focus on Energy and a $500,000 grand from the federal government. The University is working with Boldt construction and BIOFerm Energy Systems to develop the fermentation facility. The facility will begin operations in April 2011, and will be the first AD facility taking source-separated MSW organics in the United States.

TABLE 3-3
PROJECT SUMMARY FOR BIOFERM™ ENERGY SYSTEMS
OSHKOSH, WISCONSIN

Developer	BIOFerm™ Energy Systems/Boldt Construction
Location	University of Wisconsin - Oshkosh
Participants	University of Wisconsin – Oshkosh, UW Oshkosh Foundation
Capacity	22 TPD (8,000 tons/year)
Feedstock	Source separated organic waste (yard and food waste)
Technology Description	
Front-End Processing	None
Primary Conversion Technology	Anaerobic digestion (dry fermentation)
Back-End Conversion	Biogas is cleaned and fired in internal combustion engine generators
Demonstration Plants	Several facilities throughout Europe
Products	
Primary	Electricity and heat
Secondary	Compost

Timing	Plans approved February 2010 Construction began September 2010 Operational April 2011
Economics	
Capital Cost	$2 Million
Tipping Fee	Unknown
Interesting Attributes	Modular construction, first AD plant in US receiving MSW organics

FIGURE 3-5
START OF CONSTRUCTION OF BIOFERM™ FACILITY
(UNIVERSITY OF WISCONSIN – OSHKOSH)

FIGURE 3-6
RECENT CONSTRUCTION PHOTO FROM BIOFERM™
(UNIVERSITY OF WISCONSIN – OSHKOSH)

FIGURE 3-7
RENDERING OF BIOFERM™ FACILITY
(OSHKOSH, WISCONSIN)

"Dry fermentation" refers to the fermentation of organic solids that can be tipped with up to 60% dry matter in airtight sealed digesters.

print

(1) Biomass (2) Mixing station (3) Digester (4) Gas cylinder (5) Heating technology
(6) Combined heat and power unit (7) Cooling/heat utilisation (8) Power feed into the grid

3.4 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 operation 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.

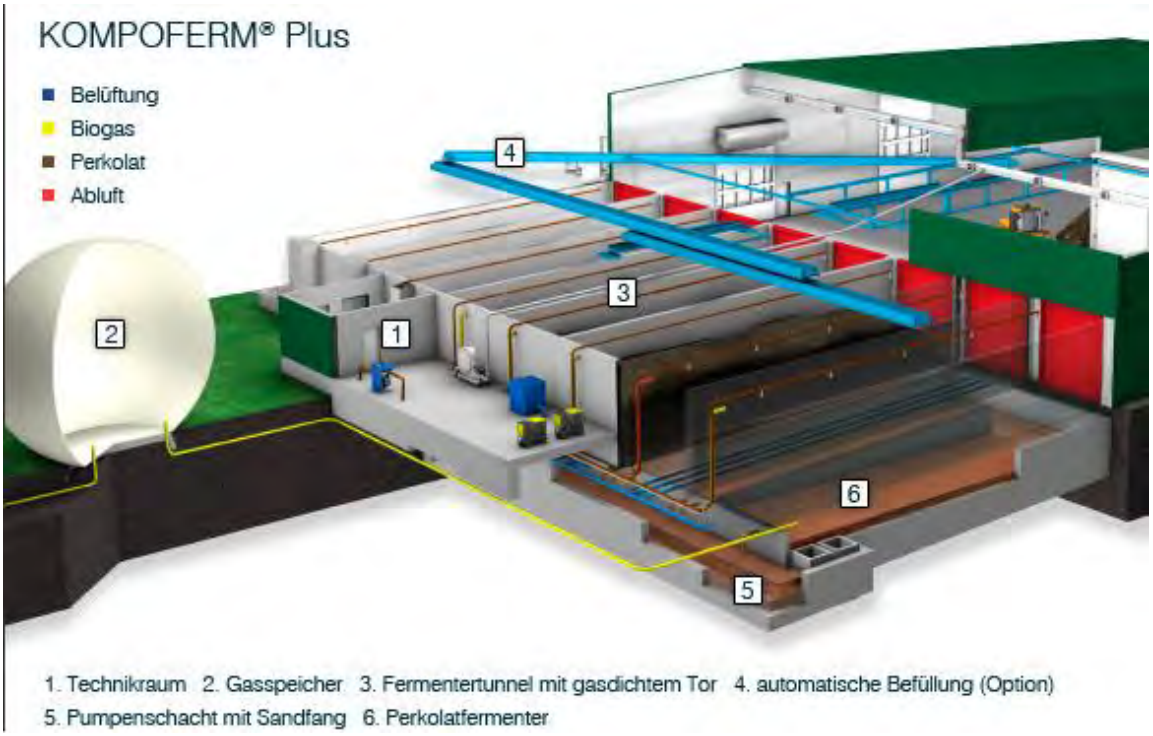
Once this three phase project is complete, the facility will process 150,000 tons per year of organic waste that would otherwise be disposed in a landfill. This increase in landfill diversion and production of renewable energy will help the City of San Jose to meet its economic development goals and reduce its per capita energy use. Biogas will be collected as a result of the fermentation process. This biogas may be used to make electricity for the utility power grid or compressed natural gas for fuel. The plans are being finalized and the facility will be under construction starting in 2011.

TABLE 3-4
PROJECT SUMMARY FOR ZERO WASTE ENERGY
SAN JOSE, CALIFORNIA

Developer	Zero Waste Energy/Bulk Handling Systems
Location	San Jose, California
Participants	GreenWaste Recovery, Zanker Road Resource Management, KOMPOFERM®
Capacity	410 TPD (150,000 tons/year)
Feedstock	Organic MSW fraction, source separated food waste
Technology Description	
Front-End Processing	MSW is separated at GreenWaste dirty MRF
Primary Conversion Technology	Anaerobic digestion (dry fermentation)
Back-End Conversion	Aerobic composting of remaining solids, biogas cleaned
Demonstration Plants	Several facilities throughout Europe (Germany)
Products	
Primary	Biogas (energy, CNG)
Secondary	Compost
Timing	Construction to begin in 2011 Operational late 2011

Economics	
Capital Cost	$20 Million
Tipping Fee	Unknown
Interesting Attributes	Will start at capacity of 50,000 tons/year and increase by 50,000 tons the following years, no financial commitment from city required

FIGURE 3-8
RENDERING OF KOMPOFERM® FACILITY
SAN JOSE, CALIFORNIA



3.5 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. First, organic materials recovered from post-recycled MSW are gasified in a partial ozidation gasifier followed by a plasma arc. This step produces synthesis gas that is catalytically converted to ethanol in the second step, in a process developed by Fulcrum BioEnergy, Inc. Electricity will be produced as a secondary product and used at the facility.

The facility will process 300 tons per day waste material to produce approximately 10.5 million gallons of ethanol per year. Sierra BioFuels is expected to begin operating in late 2012 and has secured feedstock from Waste Connections in El Dorado County, California.

Additionally, Sierra BioFuels has recently entered the final phase of the U.S. Department of Energy's (DOE) loan guarantee program to secure funding for construction.

TABLE 3-5
PROJECT SUMMARY FOR FULCRUM SIERRA BIOFUELS
McCARRAN, NEVADA

Developer	Fulcrum BioEnergy Incorporated
Location	McCarran, Storey County, Nevada
Participants	Nipawin Biomass Ethanol New Generation Co-operative Ltd., Saskatchewan Research Council, Waste Connections Inc.
Capacity	300 TPD 10.5 million gal/year ethanol
Feedstock	Post-recycled MSW
Technology Description	
Front-End Processing	None
Primary Conversion Technology	Gasification and alcohol synthesis
Back-End Conversion	Separate and purify ethanol
Demonstration Plants	TurningPoint Ethanol Demonstration Plant, Durham, North Carolina
Products	
Primary	Ethanol
Secondary	Electricity
Timing	Construction to begin first quarter of 2011 Operational in late 2012

Economics	
Capital Cost	$120 Million
Tipping Fee	Unknown
Interesting Attributes	Cost for ethanol production is <$1 per gallon, feedstock contracted a fixed price

FIGURE 3-9
RENDERING OF FULCRUM SIERRA BIOFUELS PLANT
McCARRAN, NEVADA

3.6 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) MW of electricity will be produced, a third of which will be sold to the utility grid. Incoming waste will be dried and sent to a gasifier where it is converted to synthesis gas with the use of oxygen. The hot synthesis gas will pass through a heat recovery system to generate steam. The cooled synthesis gas is cleaned and sent to a fermentation system where it is converted to ethanol via bacterial metabolic action.

The project met all required regulatory environmental standards (Florida Department of Environmental Protection), including air emissions, and was granted a permit to begin construction of the commercial facility. The company began construction in November 2010 and is expected to be complete in early 2012 and operational in the second quarter. This project is partially funded by the U.S. DOE, which has selected INEOS Bioenergy to receive a cost-matching grant of $50 million.

TABLE 3-6
PROJECT SUMMARY FOR INDIAN RIVER BIOENERGY CENTER
VERO BEACH, FLORIDA

Developer	INEOS New Planet BioEnergy
Location	Vero Beach, Indian River County, Florida
Participants	INEOS Bio, New Planet Energy LLC, AMEC
Capacity	410 TPD (150,000 tons/year) 8 million gal/year bioethanol
Feedstock	Forestry and agricultural waste, vegetative yard waste and land clearing debris, and post-recycled MSW on a trial basis
Technology Description	
Front-End Processing	Drying
Primary Conversion Technology	Gasification and fermentation
Back-End Conversion	Syngas is quenched and cleaned and bioethanol is separated
Demonstration Plants	Research and Development Center, Fayetteville, Arkansas
Products	
Primary	Bioethanol
Secondary	Electricity
Timing	Site development began in November 2010 Construction to begin May 2011 Operational in 2012

Economics	
Capital Cost	>$100 million
Tipping Fee	Unknown
Interesting Attributes	U.S. Department of Energy selected facility for 50:50 cost-matching grant, facility located on a redeveloped closed industrial site.

FIGURE 3-10
RENDERING OF INEOS INDIAN RIVER BIOENERGY CENTER
VERO BEACH, FLORIDA

3.7 Grand Central Anaerobic Digestion

The Grand Central Recycling & Transfer Station is planning to site an AD project on their property using the 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.

Other partners include the Southern California Gas Company who will process and upgrade the biogas for injection into their gas distribution pipeline.

The project is in the early phases of site plan development and permitting.

TABLE 3-7
PROJECT SUMMARY FOR GRAND CENTRAL ANAEROBIC DIGESTION
CITY OF INDUSTRY, CALIFORNIA

Developer	Onsite Power Systems, Inc./Valley Vista Services
Location	City of Industry, California
Participants	Grand Central Recyling & Transfer Station, UC Davis, Onsite Power, Southern California Gas Co.
Capacity	250 TPD
Feedstock	Food waste and green waste
Technology Description	
Front-End Processing	Existing MRF
Primary Conversion Technology	Anaerobic digestion
Back-End Conversion	Biogas is cleaned for injection into distribution pipeline
Demonstration Plants	UC Davis
Products	
Primary	Biogas
Secondary	Compost feedstock
Timing	Estimated construction completion in 2012/2013
Economics	
Capital Cost	$5 million
Tipping Fee	Unknown
Interesting Attributes	Utilizes Anaerobic Phased Solids (APS) Digester system developed at UC Davis

FIGURE 3-11
ONSITE POWER SYSTEMS, INC. DEMONSTRATION FACILITY
DAVIS, CALIFORNIA

FIGURE 3-12
RENDERING OF ONSITE POWER SYSTEMS, INC. FACILITY

4.0 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.

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 Energy Portfolio (RPS) Guidebook to state that with a positive ruling from CalReycle 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 2011 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.

5.0 TIPPING FEES

Tipping fees depend on many factors including the type of technology, the type and value of end projects (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 the public competitions 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

Over the next year, once final contracts have been signed on several more projects, the tipping fee picture will become clearer.

6.0 CONCLUSION

CT projects continue to move forward in North America. Of most importance is the start of construction of three projects: Enerkem (Edmonton), BIOFerm™ (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 barriers have been overcome.