APPENDIX A

ABBREVIATIONS, ACRONYMS, AND DEFINITIONS

APPENDIX A

ABBREVIATIONS, ACRONYMS AND DEFINITIONS

AB 939	Assembly Bill 939; the California Integrated Solid Waste Management Act of 1989.
ABAG	Association of Bay Area Governments.
ADC	Alternative daily cover; a material other than soil used to cover garbage in a landfill.
Agency	See SCWMA.
Agricultural wastes	Solid wastes of plant and animal origin, which result from the production and processing of farm or agricultural products, including manures, orchard and vineyard prunings, and crop residues, which are removed from the site of generation for solid waste management.
Aluminum can or aluminum container	Any food or beverage container that is composed of at least 94% aluminum.
ANCOR	Association of North Coast Organic Recyclers.
ARF	Advance recycling fees; an identified sum of money charged to the manufacturer or distributor of a product representing the waste management costs of that product including disposal costs and/or processing/recycling costs.
Asbestos	A hazardous waste made of fibrous forms of various hydrated minerals, including chrysotile (fibrous serpentine), crocidolite (fibrous reibecktite), amosite (fibrous cummingtonite-grunerite), fibrous tremolite, fibrous actinolite, and fibrous anthophyllite.
Ash	Residue from the combustion of any solid or liquid material.
BAAQMD	Bay Area Air Quality Management District.
Bi-metal container	Any metal container composed of at least two different types of metals, such as a steel container with an aluminum top.
Biomass conversion	The controlled combustion, when separated from other solid waste and used for producing electricity or heat, of the following materials: (1) Agricultural crop residues. (2) Bark, lawn, yard, and garden clippings. (3) Leaves, silvicultural residue, and tree and brush pruning. (4) Wood, wood chips, and wood waste. (5) Nonrecyclable pulp or nonrecyclable paper materials. Biomass conversion does not include the controlled combustion of recyclable pulp or recyclable paper materials, or materials that contain sewage sludge, industrial sludge, medical waste, hazardous waste, or either high-level or low-level radioactive waste.
BOE	California State Board of Equalization.
BOP	Batteries, Oil, Paint refers to recycling centers that accept batteries oil and paint for recycling.

BOS	County of Sonoma Board of Supervisors.
Brown goods	raditionally known as brown appliances; includes furniture, televisions, stereo equipment, musical instruments, and electronic equipment of all kinds (i.e., computers, printers, copiers, VCRs, and compact disc players). See E-Waste.
Buy-back	A recycling facility which pays a fee for the delivery and transfer of ownership to the facility of source separated materials, for the purpose of recycling or composting.
CALMAX	California Materials Exchange; a waste exchange program operated by the CIWMB.
CASC	Compost Agriculture Steering Committee.
Capital costs	Direct costs incurred in order to acquire real property assets such as land, buildings and building additions, site improvements, machinery, and equipment.
CCQC	California Compost Quality Council.
CDF	California Department of Finance.
CEQA	California Environmental Quality Act of 1970; requires environmental reviews to be conducted on development and planning documents that will create development.
CESQG	Conditionally Exempt Small Quantity Generator refers to a commercial generator of hazardous waste that generates less than 100 Kilograms (27 gallons or 220 pounds) of hazardous waste per month. CESQG is a definition in federal regulations CFR 40 and only applies to RCRA hazardous wastes.
C&D	Construction and demolition waste; solid wastes, such as building materials, packaging and rubble resulting from construction, remodeling, and repair and demolition operations on pavements, houses, commercial buildings, and other structures.
CFCs	Chlorofluorocarbons; a chemical that adversely effects the atmospheric ozone layer.
CFD	Community Facilities District; a special financing district through which a local government may levy special taxes and issue bonds if authorized by a two-thirds vote of the citizens in such a district (sometimes called Mello-Roos districts).
City	The government agency associated with a particular city within Sonoma County.
city	The geographical area of a particular city within Sonoma County.
CIWMB	California Integrated Waste Management Board; State agency that oversees and regulates solid waste management.
CoIWMP	Countywide Integrated Waste Management Plan, as defined in Section 41750 of the Public Resources Code initiated by AB 939.
Commercial solid wastes	Solid waste originating from stores; business offices; commercial warehouses; hospitals; educational, health care, military, and correctional institutions; non-profit research organizations; and government offices. Commercial solid wastes do not include construction and demolition waste.

Commercial unit	A site zoned for a commercial business and which generates commercial solid wastes.
Compost	The product resulting from the controlled biological decomposition of organic wastes that are source separated from the municipal solid waste stream, or which are separated at a centralized facility. Compost includes vegetable, yard, and wood wastes which are not hazardous waste.
Composting	A method of waste treatment which produces a product meeting the definition of compost.
Composting facility	A permitted solid waste facility at which composting is conducted and which produces a product meeting the definition of compost.
COPs	Certificates of Participation, primarily general fund obligations supplementally supported by net revenues of facilities that are financed with revenue bond proceeds.
Conversion technology	Method of processing solid waste in a manner that recovers energy from the organic portion of the waste and produces a relatively inert waste for final disposal. May include anaerobic digestion or biorefining. Operations typically include grinding, mixing solid waste with water in a closed container, extraction of a clean fuel in the form of methane and/or ethanol, and disposal of the residual waste.
Corrugated container	A paperboard container fabricated from two layers of kraft linerboard sandwiched around a corrugating medium. Kraft linerboard means paperboard made from wood pulp produced by a modified sulfate pulping process, with basis weight ranging from 18 to 200 pounds, manufactured for use as facing material for corrugated or solid fiber containers. Linerboard also may mean that material which is made from reclaimed paper stock. Corrugating medium means paperboard made from chemical or semi-chemical wood pulps, straw or reclaimed paper stock, and folded to form permanent corrugations.
CoSWMP	County Solid Waste Management Plan; the solid waste management plan used prior to the CoIWMP.
County	The government agency associated with Sonoma County.
county	The geographical area designated as Sonoma County.
CPCFA	California Pollution Control Financing Authority.
CRT	Cathode Ray Tube, the glass funnel in a TV and computer monitor, which contains lead. CRTs are designated as Universal Waste.
CRV	California Redemption Value or California Refund Value; the amount of cash for beverage containers (2 ½ cents for 24 ounces and less and 5 cents for more than 24 ounces) designated by the California Beverage Container Recycling and Litter Reduction Act.
cy	Cubic yards.
DHS	County of Sonoma, Department of Health Services
Disposal	The management of solid waste through landfilling or transformation at permitted solid waste facilities.

Disposal capacity	The capacity, expressed in either weight in tons or its volumetric equivalent in cubic yards, which is either currently available at a permitted solid waste landfill or will be needed for the disposal of solid waste generated within the jurisdiction over a specified period of time.
Diversion	Activities which reduce or eliminate the amount of solid waste from solid waste disposal.
Diversion alternative	Any activity, existing or occurring in the future, which has been, is, or will be implemented by a jurisdiction which could result in or promote the diversion of solid waste, through source reduction, recycling or composting, from solid waste landfills and transformation facilities.
DOC	California State Department of Conservation
Drop-off recycling center	A facility which accepts delivery or transfer of ownership of source separated materials for the purpose of recycling or composting, without paying a fee. Donation of materials to collection organizations, such as charitable groups, is included in this definition.
DTPW	Department of Transportation and Public Works; refers to the Sonoma County Department of Transportation and Public Works.
Eco-Desk	A hotline, intended to serve as a clearinghouse for information on waste reduction efforts in Sonoma County, providing general information on waste management issues.
EPR	Extended Producer Responsibility is where the manufacturer accepts responsibility for the lifecycle costs of the products it manufactures. For purposes of this document, EPR refers to design for recycling and end of life disposal and/or recycling.
E-Waste	E-Waste is electronic waste such as TVs, computers, phones, printers, scanners, radios, etc. Some electronic wastes are considered hazardous waste due to heavy metals used in their components.
EWM	Empire Waste Management, a commercial waste hauler operating in Sonoma County.
FEMA	Federal Emergency Management Act; provides disaster relief for federally declared disasters.
Ferrous metals	Any iron or steel scrap which has an iron content sufficient for magnetic separation.
Flow control	A formal agreement between jurisdictions that would direct waste to a specific facility thereby guaranteeing a revenue source for necessary financing.
Food waste	All animal and vegetable solid wastes generated by food facilities, as defined in California Health and Safety Code section 27521, or from residences, that result from the storage, preparation, cooking, or handling of food.
GRI	Garbage Reincarnation, Inc.; a recycler operating in Sonoma County.
HDPE	High density polyethylene; a recyclable plastic.
HHW	Household hazardous waste; wastes resulting from products purchased by the general public for household use which, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may pose a substantial known or potential hazard to human health or the environment when improperly treated, disposed, or otherwise managed.

HHWE	Household Hazardous Waste Element; an element of the CoIWMP that addresses the management of HHW.
HTR	Household Toxics Roundups; periodic collection held by the SCWMA from 1993 through 2002 to collect HHW from residents.
Inert solids or inert waste	A non-liquid solid waste including, but not limited to, soil and concrete, that does not contain hazardous waste or soluble pollutants at concentrations in excess of water-quality objectives established by a regional water board pursuant to Division 7 (commencing with section 13000) of the California Water Code and does not contain significant quantities of decomposable solid waste.
IPM	Integrated Pest Management is the practice of reducing the use of pesticides by implementing other pest management techniques such as plant selection, soils management, physical removal, non-toxic removal, and use of beneficial insects.
IWMP	Integrated Waste Management Plan. Same document as the CoIWMP.
JPA	Joint Powers Agreement; contract that sets forth the bylaws for a legal California government agency.
LCRS	Leachate collection and recovery system.
LEA	Local Enforcement Agency; the local governmental agency responsible for solid waste facility permits and enforcing solid waste disposal laws; in the case of Sonoma County, this is the Sonoma County Department of Health Services, Environmental Health Division.
Leachate	Any liquid that has run-off of or percolated through garbage.
LFG	Landfill gas; a bi-product of decomposition of wastes buried in a landfill that is required by Federal law to be collected and processed in such a manner that it is not released into the air.
LMAC	Labor Management Advisory Committee.
Load checking	The inspection of solid waste delivered to a disposal site for hazardous wastes and other banned materials.
LTF	Local Task Force; an advisory board to the County of Sonoma Board of Supervisors on solid waste issues.
Medium-term planning period	A period beginning in the year 2006 and ending in the year 2010.
Mixed paper	A waste type which is a mixture, unsegregated by color or quality, of at least two of the following paper wastes: newspaper, corrugated cardboard, office paper, computer paper, white paper, coated paper stock, or other paper wastes.
MOU	Memorandum of Understanding; written agreement between two parties; most commonly used between government agencies.
MRF	Materials recovery facility; a facility where solid wastes or recyclable materials are sorted or separated, by hand or by use of machinery, for the purposes of recycling or composting.

MSW	Municipal solid waste; all solid wastes generated by residential, commercial, and industrial sources, and all solid waste generated at construction and demolition sites, at food-processing facilities, and at treatment works for water and waste water, which are collected and transported under the authorization of a jurisdiction or are self-hauled. Municipal solid waste does not include agricultural crop residues, animal manures, mining waste and fuel extraction waste, forestry wastes, and ash from industrial boilers, furnaces and incinerators.
NBAAQMD	North Bay Area Air Quality Management District.
NDFE	Non-Disposal Facility Element; identifies new and expanded diversion facilities that will assist Sonoma County Waste Management Agency's member jurisdictions in achieving their AB 939 goals and objectives.
NEPSI	National Electronic Product Stewardship Initiative.
Non-disposal facility	Any solid waste facility required to obtain a permit pursuant, except a disposal facility or a transformation facility.
Non-ferrous metals	Any metal scraps that have value, and that are derived from metals other than iron and its alloys in steel, such as aluminum, copper, brass, bronze, lead, zinc and other metals, and to which a magnet will not adhere.
Non-recyclable paper	Discarded paper which has no market value because of its physical or chemical or biological characteristics or properties.
Non-renewable resource	A resource which cannot be replenished, such as those resources derived from fossil fuels.
Normally disposed of	Waste categories and waste types which: (a) have been demonstrated by waste characterization studies to constitute at least 0.001% of the total weight of solid wastes disposed in a solid waste stream attributed to the jurisdiction as of January 1, 1990; (b) which are deposited at permitted solid waste landfills or transformation facilities subsequent to any recycling or composting activities at those solid waste facilities; and (c) which are allowed to be considered in the establishment of the base amount of solid waste from which source reduction, recycling, and composting levels are calculated.
OCC	Old corrugated cardboard; a recyclable material.
ONP	Old newspaper; any newsprint which is separated from other types of solid waste or collected separately from other types of solid waste and made available for reuse and which may be used as a raw material in the manufacture of a new paper product.
OPF	Organics Processing Facility; see Composting Facility.
Operational costs	Direct costs incurred in maintaining the ongoing operation of a program or facility. Operational costs do not include capital costs.

Organic waste	Solid wastes originated from living organisms and their metabolic waste products, and from petroleum, which contain naturally produced organic compounds, and which are biologically decomposable by microbial and fungal action into the constituent compounds of water, carbon dioxide, and other simpler organic compounds.
Other plastics	Waste plastics except polyethylene terephthalate (PET) containers, film plastics, and high density polyethylene (HDPE) containers.
PCBs	Polychlorinated biphenyls; a hazardous substance.
Permitted capacity	Volume in cubic yards or weight in tons which a solid waste facility is allowed to receive, on a periodic basis, under the terms and conditions of that solid waste facility's current Solid Waste Facilities Permit issued by the local enforcement agency and concurred in by the California Integrated Waste Management Board.
Permitted landfill	A solid waste landfill for which there exists a current Solid Waste Facilities Permit issued by the local enforcement agency and concurred in by the California Integrated Waste Management Board, or which is permitted under the regulatory scheme of another state.
Permitted solid waste facility	A solid waste facility for which there exists a Solid Waste Facilities Permit issued by the local enforcement agency and concurred in by the California Integrated Waste Management Board, or which is permitted under the regulatory scheme of another state.
PET or PETE	Polyethylene terephthalate; a recyclable plastic.
PHHWCF	Permanent Household Hazardous Waste Collection Facility.
Precautionary principal	The principle that action should be taken to correct a problem as soon as there is evidence that harm may occur, not after the harm has already occurred.
PRMD	County of Sonoma Permit and Resource Management Department.
RBRC	Rechargeable Battery Recycling Corporation.
RCRA	Federal Resource Conservation and Recovery Act; law that governs solid and hazardous waste management nationally.
RCSI	Report of Compost Site Information.
RDSI	Report of Disposal Site Information.
Recovered material	Material retrieved or diverted from disposal or transformation for the purpose of recycling, re-use or composting. Recovered material does not include those materials generated from and reused on site for manufacturing purposes.
Recycle or recycling	The process of collecting, sorting, cleansing, treating, and reconstituting materials that would otherwise become solid waste, and returning them to the economic mainstream in the form of raw material for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace. Recycling does not include transformation.
Residential solid waste	Solid waste originating from single-family or multiple family dwellings.

Residential unit	A site occupied by a building which is zoned for residential occupation and whose occupants generate residential solid wastes.
Re-use	The use, in the same form as it was produced, of a material which might otherwise be discarded.
RFP	Request for Proposals.
RMDZ	Recycling Market Development Zone.
RMF	Resource Management Facility; a diversion facility that handles materials such as municipal solid waste, biosolids, food waste, non-recyclable paper, manures, waste straw, sawdust, lees, pomace and dairy wash water that has not been recycled or diverted by other programs. Operations may include preliminary waste sorting and processing, organic waste composting and on-site energy generation.
RWQCB	Regional Water Quality Control Board.
SCWMA	Sonoma County Waste Management Agency; a regional government agency responsible for recycling education, household hazardous waste and composting in Sonoma County.
Short-term planning period	A period beginning in the year 2000 and ending in the year 2005.
Siting element	Element of the CoIWMP that addresses solid waste facility siting.
Sludge	Residual solids and semi-solids resulting from the treatment of water, waste water, and/or other liquids. Sludge includes sewage sludge and sludge derived from industrial processes, but does not include effluent discharged from such treatment processes.
Solid waste	All putrescible and nonputrescible solid and semisolid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, manure, vegetable or animal solid or semisolid wastes, and other discarded solid and semisolid wastes. Solid waste does not include hazardous waste, radioactive wastes, or medical wastes.
Solid waste facility	Includes a solid waste transfer or processing station, a composting facility, a gasification facility, a transformation facility, and a disposal facility.
Sonoma County	The geographical area designated as Sonoma County; also, the government associated with Sonoma County.
SonoMax	Sonoma County Materials Exchange; the material exchange program operated by the SCWMA.
Source reduction	Any action which causes a net reduction in the generation of solid waste. Source reduction includes, but is not limited to, reducing the use of nonrecyclable materials, replacing disposable materials and products with reusable materials and products, reducing packaging, reducing the amount of yard wastes generated, establishing garbage rate structures with incentives to reduce the amount of wastes that generators produce, and increasing the efficiency of the use of paper, cardboard, glass, metal, plastic, and other materials. Source reduction does not include steps taken after the material

	becomes solid waste or actions which would impact air or water resources in lieu of land, including, but not limited to, transformation.
Source separated	The segregation, by the generator, of materials designated for separate collection for some form of materials recovery or special handling.
Special waste	Any hazardous waste listed in section 66740 of Title 22 of the California Code of Regulations, or any waste which has been classified as a special waste pursuant to section 66744 of Title 22 of the California Code of Regulations, or which has been granted a variance for the purpose of storage, transportation, treatment, or disposal by the Department of Health Services pursuant to section 66310 of Title 22 of the California Code of Regulations. Special waste also includes any solid waste which, because of its source of generation, physical, chemical or biological characteristics or unique disposal practices, is specifically conditioned in a solid waste facilities permit for handling and/or disposal.
SQG	See CESQG.
SRRE	Source Reduction and Recycling Element; an element of the CoIWMP that addresses diversion activities and capacity of existing disposal facilities.
SWGS	Solid Waste Generation Study; the study undertaken by Sonoma County in 1992 to characterize its solid waste stream.
SWIS	Solid Waste Information System; a system used by the CIWMB to inventory solid waste facilities.
SWMAA	Solid Waste Management Alternatives Analysis: long term strategy planning document for solid waste management in Sonoma County through the year 2015.
Tin can or tin container	Any food or beverage container that is composed of steel with a tin coating.
tpd	Tons per day.
tpy	Tons per year.
Transformation	Incineration, pyrolysis, distillation, or biological conversion other than composting. Transformation does not include composting, gasification, or biomass conversion.
Transformation facility	A facility whose principal function is to convert, combust, or otherwise process solid waste by incineration, pyrolysis, destructive distillation, or gasification, or to chemically or biologically process solid wastes, for the purpose of volume reduction, synthetic fuel production, or energy recovery. Transformation facility does not include a composting facility.
UGB	Urban growth boundary.
UCCE	University of California Cooperative Extension.
US EPA	United States Environmental Protection Agency; the Federal agency responsible for solid waste and hazardous waste disposal.
Waste prevention	See Source Reduction.

WEPSI	Western Electronic Product Stewardship Initiative.
White goods	Discarded, enamel-coated major appliances, such as washing machines, clothes dryers, hot water heaters, stoves and refrigerators.
WMI	Waste Management, Inc., a commercial waste hauler operating in Sonoma County.
Wood waste	Solid waste consisting of wood pieces or particles which are generated from the manufacturing or production of wood products, harvesting, processing or storage of raw wood materials, or construction and demolition activities.
WRAP	Waste Reduction Awards Program; operated by the CIWMB to recognize businesses and nonprofits for implementing exemplary programs in resource efficiency.
WSCD	West Sonoma County Disposal, a commercial waste hauler operating in Sonoma County.
www.recyclenow.org	The web site operated by the SCWMA intended to provide general information on solid waste management issues.
Yard waste	Any wastes generated from the maintenance or alteration of public, commercial or residential landscapes including, but not limited to, yard clippings, leaves, tree trimmings, prunings, brush, and weeds.

APPENDIX B

SONOMA COUNTY SOLID WASTE MANAGEMENT ALTERNATIVES ANALYSIS PROJECT FINAL REPORT

SONOMA COUNTY SOLID WASTE MANAGEMENT ALTERNATIVES ANALYSIS PROJECT FINAL REPORT

Prepared for:
Sonoma County Department of Transportation and Public Works

Prepared by:
SCS Engineers

December 29, 2000

SONOMA COUNTY SOLID WASTE MANAGEMENT ALTERNATIVES ANALYSIS PROJECT

FINAL REPORT

Prepared for:

Sonoma County
Department of Transportation and Public Works
575 Administration Drive, Room 117A
Santa Rosa, California 95403

Prepared by:

SCS Engineers
6850 Regional Street
Suite 240
Dublin, California 94568
(925) 829-0661

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ACKNOWLEDGEMENTS

SCS Engineers, as principal authors of this study, would like to acknowledge the dedication and input to the project from the staff of the County Department of Transportation and Public Works, the members of the Sonoma County AB 939 Local Task Force.

LTF Members and Alternates

Alan Anderson (Sonoma County Environmental Forum)
Roger Bassett (Sonoma County Recycling Association)
Alan Belsardi (Garbage Reincarnation)
Chris Benziger (1st District Representative)
Pavitra Crimmel (Garbage Reincarnation)
Mike Dittmore (Sonoma County Manufacturing Group)
Angela Fogle (Rohnert Park)
Ken Foley (Commercial Garbage Assoc. - Urban)
Hallie Fraser (Chamber of Commerce)
Lisa Hardin (SC Recycling Association)
George Horwedel (Windsor)
Barbara Jason-White (Healdsburg)
Richard Johnson (Commercial Garbage Assoc. - Rural)
Marian Jones (League of Women Voters)
Dennis Judd (2nd District Representative)
Richard Kaiser (Sierra Club)
Susan Kelly (Sebastopol)
Scott Kirkpatrick (Cotati)
Eric Koenigshofer (Commercial Garbage Assoc. - Rural)
Marsha Sue Lustig (Cotati)
Maureen Middlebrook (3rd District Representative)
Sammy Nasr (5th District Representative)
Doug Newton (Cloverdale)
Linda Peterson (4th District Representative)
William Pier, Jr. (Sonoma)
David Powers (Education Representative))
Marc Richardson (Santa Rosa)
Joe Rogoff (Chamber of Commerce)
Jim Ryan (Petaluma)
Don Sanders (Sierra Club)
Christine Scheib (Scientific Representative)
Alan Siegle (Agriculture Industry)
Bob Swift (Sonoma County Environmental Health)
Natalie Timm (Marketing Representative)
Peter Vilms (Sonoma County Environmental Forum)
Ken Wells (SC Trans. and Public Works)

County Staff

Ken Wells
Joanna Kiesel
Donna Caldwell
David Knight

SCS Engineers

Joe Miller
Michelle Leonard
Michelle Mulet
Richard Hertzberg

C2 Alternative Services

Connie Cloak
Chris Carrieri

Rifer Environmental

Wayne Rifer

This report is dedicated to the memory of Carol Chase, City of Cloverdale.

EXECUTIVE SUMMARY

INTRODUCTION

The purpose of the Solid Waste Management Alternatives Analysis is to produce a long-term, integrated waste management strategy for Sonoma County to assure adequate future capacity for the disposed portion of the waste stream. SCS Engineers (SCS) was retained by the Sonoma County Department of Transportation and Public Works to define and evaluate options for the County's Solid Waste Management System for the years 2015 through 2050. This planning period was selected based on a number of assumptions as defined below:

- The existing, permitted capacity of the Central Landfill will expire in 2015.
- The countywide diversion rate will reach 50% by the year 2005, and although it may increase, at a worse case it will remain at that level through the planning period. Diversion programs and policies currently under development and consideration by the LTF will contribute to the 50% diversion rate by 2005.
- New solid waste management policies and programs will be implemented between 2000 and 2015, prior to the beginning of the Alternatives Project planning period. This will further impact the types of programs and policies evaluated and selected as part of this project.
- Large-scale facilities require longer lead time for design, permitting, and construction; therefore, the impact of timing must be considered in the evaluation and selection process.

From its inception through completion, the Solid Waste Management Alternatives Analysis Project was a collaborative process between the Department of Transportation and Public Works and the Sonoma County AB 939 Local Task Force (LTF). The monthly LTF meetings provided the forum for review and discussion of project data, and a consensus was sought for each milestone decision. The public was informed of the project through mailings and announcements at City Council meetings. A special evening meeting of the LTF was held in September 2000 to present the prospective management scenarios to the public.

At the conclusion of the 13-month project, the LTF reached a consensus on a strategy to meet Sonoma County's solid waste management goals and needs for the planning period 2015 to 2050. The strategy consists of the following four (4) key elements:

1. Formal agreement among all cities and the County to direct flow of refuse and green waste to a new integrated resource management facility.

2. Mandatory source separation of recyclables from waste for residential, commercial, industrial, and institutional waste generators.

3. Expansion of Central Landfill beyond its current permitted capacity.

4. Siting of an integrated resource management facility to include organics processing (anaerobic digestion or biorefining), green waste composting, and landfilling.

This report presents the process, steps and data analysis that was used to arrive at the recommended strategy. The next step in the process is consideration of the recommended strategy by the County Board of Supervisors. If approved, County staff will be directed to proceed with implementation of the strategy. Implementation would begin with incorporation of the strategy into the Countywide Integrated Waste Management Plan, and adoption of the mandatory policies for flow control and recycling. Subsequent steps would then lead to expansion of Central Landfill and development of the Integrated Resource Management Facility.

A brief overview of the major project tasks, results and conclusions is provided in this Executive Summary. Detailed data on all aspects of the project is included in the sections that follow.

EXISTING SOLID WASTE SYSTEM

The first step in the project was to define the existing solid waste management conditions in the County. By knowing what infrastructure exists to collect and dispose of solid waste, options for the future could be selected that would integrate more readily into the existing system. It was also important to identify the types and quantities of wastes that are presently generated. This includes wastes that are disposed and recycled.

The existing system is made up of a mix of public and private collection, recycling and disposal facilities. Collection in the County is provided by private haulers, through a system of franchise agreements in the incorporated cities, and licenses in the County unincorporated areas. The County owns five transfer stations and one landfill, which includes a power plant, a green waste composting facility, and a recycling/reuse center. There are also recycling and reuse operations at the transfer stations.

Of the total disposed waste, 60% is taken directly to Central Landfill; the remaining tonnage passes through the transfer stations. Presently, the County transfer stations adequately serve the existing waste management system. The majority of the disposed waste stream is comprised of organic materials. Although much of the yard wastes are composted at the County's green waste composting operation at Central Landfill, approximately 40% of the waste stream disposed in the landfill consists of organic materials such as food, wood, textiles and paper.

Processing infrastructure in the County for recyclables includes several intermediate facilities for pre-processing and secondary processing of recyclable materials. However, there is no end-use processing in the County, except for the organics portion of the waste stream.

FUTURE CONDITIONS

In order to identify the types and capacities of facilities that will be necessary to handle the County's future disposal needs, it was necessary to determine the quantity of materials that would be generated and require disposal during the planning period. Therefore, assumptions regarding population growth and diversion were adopted. The waste generation projections highlight the inter-relationship between three critical factors: population growth, diversion rate, and disposed tonnage.

A model was developed to quantify waste generation based on these critical factors. Two population estimates were selected--the County General Plan, with extrapolation out to the 2050 planning period, and the State Department of Finance data. For each population estimate, two different diversion rates were assumed, thus producing two scenarios of waste disposal, diversion, and generation per population estimate. The first scenario assumed that diversion would remain constant at the 1998 rate of 39%. The second scenario assumed that diversion increased to 50% by the year 2005, and remained constant after that. For both, generation increased in relation to the projected population growth. The model did not assume an increase in the per capita waste generation rate. In order to account for adopted urban growth limits and other measures that may impact the quantity of wastes generated in the County, the population projections were adjusted downwards. Therefore, beginning in 2011 and through the end of the project planning period (2050), the population growth rates were reduced by 50%. Based on discussion, the LTF agreed to incorporate a range of population growth estimates and a 50% diversion rate by 2005. The results identified that by 2050, the quantity of material requiring disposal through landfilling and/or an alternative disposal technology or facility will range from 568,000 tons to 573,000 tons in 2050, which is approximately 16% greater than the 1998 disposal tonnage.

IDENTIFICATION OF ALTERNATIVES

The next step of the project was to identify and analyze waste management alternatives that are appropriate to the future projections of solid waste anticipated in the County. The alternatives are designed to contribute to long-term stability and flexibility, and provide cost-effective and efficient services and programs, environmental protection, and improvements to the waste management infrastructure.

The proposed alternatives were grouped under three general headings: Policies and Programs; Alternative Technologies; and Landfills. Program and policy options to implement the selected alternatives that were analyzed included mandatory recycling, mandatory collection service, strategies to support end-users of recyclables, flow control, and requirements to process all waste prior to disposal. The alternative technologies included such options as municipal solid waste (MSW) composting, MSW combustion, thermal transformation, anaerobic digestion, biorefining, and different types of material recovery facilities (MRFs). The Landfill Alternatives included both in-County and out-of-County options, and expansion of Central Landfill. A complete description of each of the proposed alternatives was prepared, including the major features and characteristics, target material types and quantities (as applicable), and other relevant characteristics.

EVALUATION AND SELECTION CRITERIA

Since the pool of alternatives was large, decisions had to be made about which ones to include and exclude in developing a preferred waste management strategy. To insure a thorough alternatives review, a two-step evaluation process was developed, similar to the one used in the County's AB 939 Siting Element (1996). The process combines quantitative information and qualitative analysis to yield a coherent strategy consisting of a logical arrangement of the priority alternatives. Evaluation criteria that encompass a range of perspectives (environmental, financial, political, institutional, and technical) provided guidance and rationale for selecting alternatives that would constitute the overall strategy.

The first step, the preliminary screening criteria stage, eliminated options that were clearly not feasible or effective for the County, given current and anticipated solid waste management conditions. This was accomplished through the application of ten preliminary screening criteria, and a scoring system that was used to rank the alternatives for acceptance or rejection. The second evaluation step was a more rigorously detailed and analytic examination of the comparative features, advantages/disadvantages, and impacts of the remaining options.

SELECTION OF ALTERNATIVES

Each of the technology and landfill alternatives was reviewed by the LTF, and following these discussions, the policy and program options were evaluated for integration with the management alternatives. The analysis concluded with LTF recommendations and supporting rationale regarding which alternatives were determined to be the priority selections for combining into the long-term, integrated waste management strategy. The selected alternatives included:

- Policies and Programs - Flow control, mandatory recycling, processing of all waste, and wet/dry collection.

- Processing technologies - MRFs and organics processing technologies (biorefining or anaerobic digestion).

- Disposal - Expansion of Central Landfill, out-of-county landfill, and a new in-county landfill.

This step of the analysis also resulted in the elimination of alternatives that were considered not feasible or politically acceptable. These included thermal transformation, MSW combustion, and MSW composting. Although eliminated from further consideration in this process, both thermal transformation and MSW composting will be kept on a "watch list" for possible future consideration, if these technologies are further refined and improved.

MANAGEMENT SCENARIOS

The remaining disposal and processing technology alternatives, and supportive policies and programs, were then combined in different ways to produce a variety of comprehensive scenarios for managing the County's waste stream during the period 2015 to 2050. A total of nine

scenarios were derived that configured the alternatives into strategies ranging from simple solutions (use of existing transfer stations, and disposal of all waste at an out-of-county landfill) to more complex (expansion of Central Landfill, construction of a new landfill, and development of organics processing technologies with policies to support diversion and control over the waste stream). The scenarios varied considerably in key areas:

- The magnitude and types of changes to the current waste management system.
- The relative emphasis on generator source separation versus material processing technologies for recyclables.
- The level of control exercised by the County and the cities.
- The use of special technologies for processing the organic portion of the waste stream.
- The use of a new facility (or facilities), in addition to current private operations, for processing recyclables.

A cost model was also developed that incorporated the relative costs associated with each of the alternatives included in the nine scenarios. The model produced a cost projection for each scenario expressed in cost per ton. The projected costs ranged from a low of $30 per ton for the scenario that used existing or new transfer stations, with all wastes disposed at a new in-county landfill, to a high of over $60 per ton for the scenario that incorporated a MRF to process all waste, an organics processing facility, and disposal at an expanded Central Landfill.

SCENARIO EVALUATION PROCESS

The final stage of the analysis involved evaluation of the nine scenarios for relative risk (technological, environmental and economic), cost per ton, impacts on diversion and disposal quantities, local control, and resource efficiency. The objective was to narrow down the selection to three preferred scenarios. This element of the process involved a vote by the LTF members, and each member selected three top scenarios. The process resulted in three scenarios receiving a majority of the votes, with the remaining scenarios each receiving two or less votes.

The three scenarios all contained flow control policy and organics processing technologies, and eliminated the option to send waste out of the County. The decision to not send wastes out of the County for disposal emphasized the commitment to be responsible for the wastes generated/disposed in the County. The scenarios differed in terms of requirements for processing all waste versus mandatory source separation of recyclables, which emphasizes generator responsibility versus reliance on technologies for diversion. There were also differences in selection of expanding Central Landfill versus development of a new in-county landfill. This again reemphasized the County's commitment to final disposition of the waste, but indicated some differences in whether the disposal should be at the existing site, or a new location.

SELECTION OF PREFERRED SCENARIO

Following the selection of the three final scenarios, the LTF was tasked with identifying the preferred scenario to be recommended to the County Board of Supervisors (BOS). On October 12, 2000, the LTF reached a consensus on a strategy to meet Sonoma County's solid waste management goals and needs for the planning period 2015 to 2050. The key elements of the strategy, as detailed on page one of this summary, consist of policies to direct the flow and separation of the wastes; expansion of the existing landfill to provide short to medium-term disposal capacity; and siting and development of a new facility that will combine in one location the existing green waste composting operation, a new organics processing facility, and a new landfill for long-term disposal needs.

These four elements are designed to support each other in achieving a countywide, integrated materials management strategy for the 35-year planning period that begins when the current permitted capacity of Central Landfill is reached.

The strategy elements fulfill priorities established by the LTF, as explained below:

- Fully utilize existing waste management resources and infrastructure in both the public and private sectors. This maintains local control over the costs and environmental impacts of disposal, and facilitates further development of in-county recycling collection/processing capabilities. Relevant strategy elements are Central Landfill expansion, flow control policy, and mandatory recycling policy.

- Maximize waste diversion/resource utilization at a reasonable cost on the principle of generator responsibility. This will extend the useful life of an expanded Central Landfill, while minimizing the size a new landfill in the County or need to contract with an out-of-county landfill operator for waste disposal. Relevant strategy elements are mandatory recycling and the integrated resource management facility incorporating organics processing and green waste composting.

- Complement existing and planned private sector operations for collection/processing of both refuse and recyclables. This recognizes and enhances the historically accepted role in the County that the private sector has fulfilled in providing waste management services under municipal/County licenses or franchises. Relevant strategy elements are Central Landfill expansion, flow control policy, and mandatory recycling policy.

On October 16, the Policy Advisory Committee (PAC) approved this strategy for recommendation to the Board of Supervisors.

IMPLEMENTATION TIMELINE AND GUIDELINES

The final step in the strategy development process was to prepare an implementation timeline and set of guidelines for the selected strategy. The implementation period was established as 2001 to 2014. The implementation schedule for each strategy element consists of the activities, milestones, and decision points related to securing the resources, permits, agreements and

associated actions required for strategy implementation. The parties involved in implementation activities, and their role/responsibility in the process, were also identified. For each element of the selected strategy, a description of the decision steps and activities, milestones and involved parties was prepared, along with the estimated time frame for each step. A schedule showing the interrelationships of the different scenario elements was developed to aid in short-term and long-term planning. The timeline established a total timeframe of approximately 12 years from inception to completion. This incorporates adoption of the selected policies, review and analysis by County and other agencies, and initial development of the integrated resource management facility.

CONCLUSIONS

The Solid Waste Management Alternatives Analysis Project encompassed a 13-month process that addressed scientific, economic, and political issues while integrating a diverse range of interests and concerns. The results of the study was the recommendation to implement a strategy that builds on the existing solid waste infrastructure, while recognizing that new emerging technologies can play an important role in the future solid waste management system.

Historically, solid waste management in the County has been a balanced partnership arrangement where private, for-profit firms deliver services that in part, are a response to regulatory and legislative requirements that public agencies and entities are responsible for meeting. Assuming that maintaining this partnership is necessary and desirable, commitment to maintaining County ownership and operation of landfill capacity is an important factor in the long-term strategy recommended for the County. In examining the feasibility of out-of-county disposal alternatives, the LTF balanced the issue of reduced liability and favorable long-term rates through "put or pay" arrangements versus the impact of reduced responsibility and potential disincentives for waste reduction. Ultimately, the decision was made to maintain in-county disposal capacity while upgrading the County's diversion programs and infrastructure, and thereby maintaining control over the County's waste management system. The incorporation of a County flow control policy will enable the County and cities to have control over the destination of the waste steam. This allows the County to plan for facilities to handle these wastes.

The scenario recommended by the LTF represents a long-term, integrated waste management strategy for Sonoma County. The strategy consists of a coherent combination of the most feasible and effective alternatives to assure adequate future capacity of the disposed portion of the waste stream.

SECTION 1

EXISTING SOLID WASTE CONDITIONS

WASTE MANAGEMENT INFRASTRUCTURE

The existing solid waste management system in Sonoma County includes a mix of public and private sector haulers, facilities, and facility operators. Solid waste transfer and disposal facilities are owned by the County, and serve the cities and unincorporated portions of the County. These include five transfer stations, the Central Disposal Site, and the Sonoma Compost Facility, which is located at the Central Disposal Site. The County system is managed by the Sonoma County Integrated Waste Division of the Department of Transportation and Public Works. The locations of the existing solid waste facilities in the County are indicated on Exhibit 1. A brief description of the landfill and compost operation is provided below, and data on the transfer stations are included in Table 1.

Central Landfill

The Central Landfill, within the Central Disposal Site, is the only operating landfill within Sonoma County. The landfill is owned by the County, and is permitted to accept up to 2,500 tons per day (tpd) of non-hazardous municipal solid waste, including residential and commercial wastes, agricultural and demolition wastes, and wastewater treatment plant sludge. Presently, only wastes from within the County are disposed at the facility. In 1999, the average daily tonnage was 1,300 tons, and the landfill accepted a total of 480,000 tons. The Disposal Site also includes the recycling facility operated by Garbage Reincarnation, Inc. Known as Recycletown, this facility collects and stores recyclables and reusable items for resale to the general public.

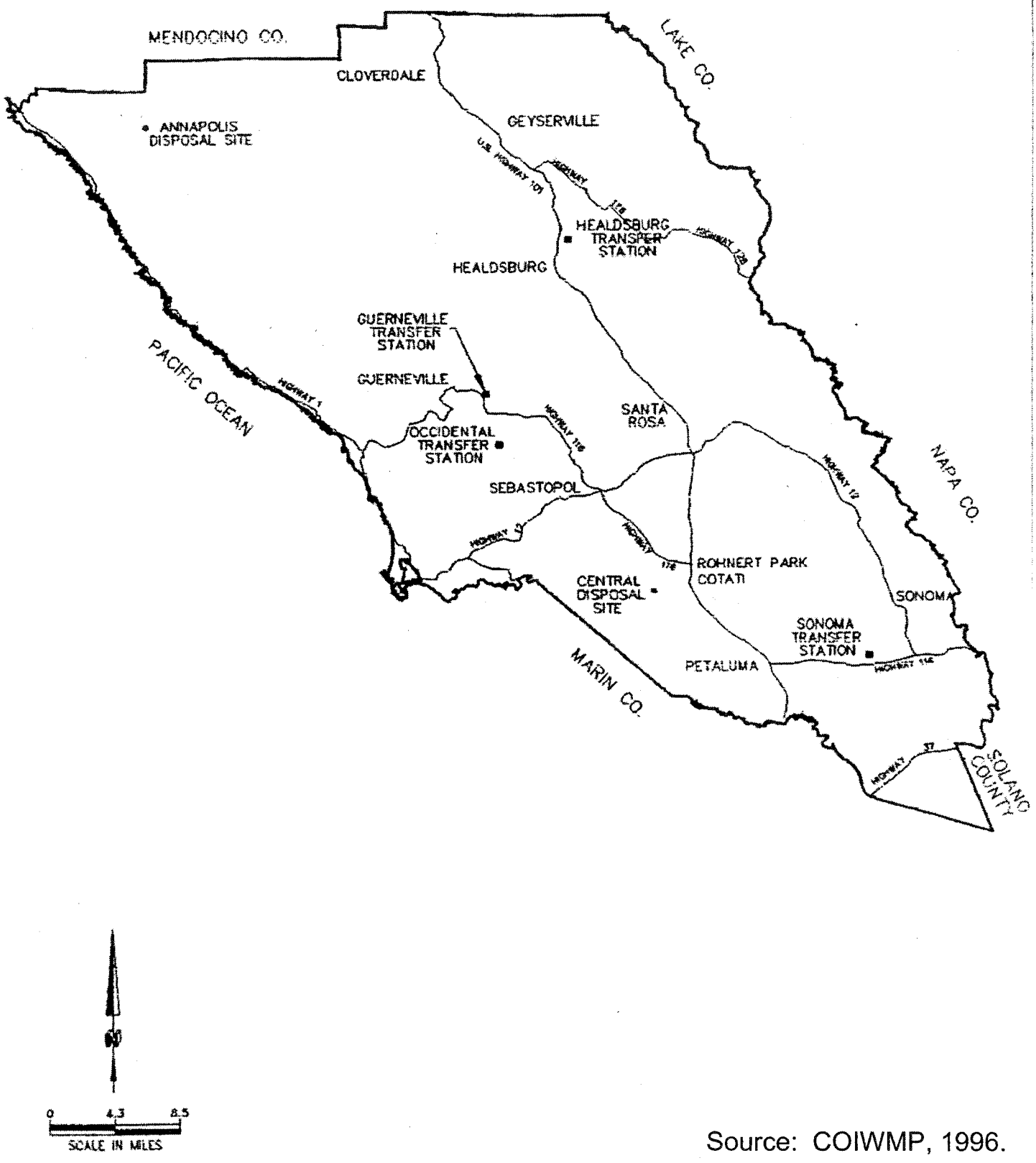
In 1998, the County approved an expansion plan for the landfill, which includes over 3,000,000 tons of additional capacity. This additional capacity will allow the landfill to remain open until 2015. The expansion plan includes reconfiguration of the recycling and self-haul drop-off areas. At the present rate of use, the site is scheduled to reach capacity in 2015.

Sonoma Compost Facility

The Sonoma Compost Facility is located at the Central Disposal Site. The facility is operated by Sonoma Compost Company on land owned by the County. The facility is permitted to take in 300 tpd. In 1999, 55,300 tons were delivered to the compost site for diversion. Incoming green material and wood are accepted from commercial haulers and self-haulers. There are four products sold at the site: path mulch (wood only), compost, screened mulch, and unscreened mulch (all from yard waste). The finished product is sold directly to the public.

Transfer Stations

All five transfer stations are owned by the County and operated by West Sonoma County Disposal, Inc. A brief description of each facility is provided in Table 1.



Source: COIWMP, 1996.

Exhibit 1. Sonoma County Landfill and Transfer Stations.

Table 1. Sonoma County Transfer Facilities

FACILITY NAME	CAPACITY/THROUGHPUT			SERVICE AREA	FEATURES
	PERMITTED (TONS PER DAY)	1998 AVERAGE (TONS PER DAY)	1998 TOTAL (TONS)		
Annapolis	50 tons per day	10.1 tons	2,300 tons	• Northwest Unincorporated County • Community of Annapolis • Community of Sea Ranch	• Recycle area • Yard debris/wood waste processing area
Guerneville	85 tons per day	53.8 tons	19,300 tons	• Russian River Area Unincorporated County • Community of Guerneville • Community of Monte Rio	• Recycle area • Yard debris/wood waste processing area
Healdsburg	450 tons per day	199.2 tons	71,500 tons	• Northern Unincorporated County • City of Cloverdale • City of Healdsburg • Town of Windsor • Community of Geyserville	• Recycle area • Yard debris/wood waste processing area
Occidental	60 tons per day	10.6 tons	2,700 tons	• Limited Western Unincorporated County • Community of Occidental	• Limited recycle area
Sonoma	380 tons per day	209.8 tons	75,330 tons	• Southeast Unincorporated County • City of Sonoma	• Recycle area • Yard debris/wood waste processing area

PUBLIC AND PRIVATE SECTOR ROLES/RESPONSIBILITIES

As discussed earlier, the County owns all of the existing solid waste transfer and disposal facilities. The County manages the unincorporated County portion of the solid waste stream through licensed haulers who collect and dispose of solid waste in the unincorporated areas of the County. Through an ordinance adopted in February 1999, the County required the licensed haulers serving the unincorporated areas to commit to deliver refuse and yard debris to the County disposal sites. The County has licensed eight haulers, which are assigned specific territories within the unincorporated areas. The collector service areas and the license expiration dates are indicated in Table 2.

All of the incorporated cities have agreements with private companies for exclusive collection of residential refuse. A summary of franchise agreements in the incorporated cities is included in Table 3. The terms of the service agreements between individual cities and haulers vary. Only Windsor, Healdsburg, and Santa Rosa include contractual arrangements to control waste disposal. Cotati has an informal agreement with its hauler, Larry's Sanitary Service, owned by Waste Management, Inc. (WMI), to deliver wastes to the County's facilities. Commercial refuse is collected through exclusive and non-exclusive agreements between the individual city and their collector, depending on the jurisdiction.

WASTE GENERATION AND FLOW

Solid waste is generated from a mix of residential, commercial, and industrial sources in the County. It is estimated that, in 1999, approximately 790,000 tons of solid waste were generated in the County. Thirty-nine percent of the solid waste generated in the County was diverted from landfilling through recycling, composting, and other waste diversion methods. Nearly all of the remainder of the wastestream was disposed at the Central Landfill, with a small portion disposed out of the County.

The County transfer facilities and Central Landfill receive wastes from the unincorporated areas and incorporated cities via franchised haulers, via licensed haulers serving the unincorporated and commercial areas of the County, and by self-haul. The amount of wastes received at each facility, and relative percent of the total waste disposed during 1998, is indicated in Table 4.

The flow of waste in the County is dependent for the most part on geographical considerations. A graphical depiction of where wastes originate and the transfer/disposal facilities to which they are taken is included as Exhibit 2. Recent factors have affected the flow of waste within and, to a small extent, out of the County. The traffic conditions on Highway 101 have caused some haulers to use facilities that are not necessarily the closest in terms of mileage, but require shorter driving times. For example, a portion of waste collected in Petaluma is now taken to the Sonoma Transfer Station, instead of directly to the Central Landfill. Similarly, some waste in areas north of Highway 12 are being transferred north to Healdsburg Transfer Station, instead of being transported south along the 101 corridor.

Table 2. Unincorporated County Area Licensed Haulers Service Areas and Terms

SERVICE AREA	HAULER	EXPIRATION DATES	FLOW CONTROL
North Central County	Cloverdale Disposal	May 19, 2004	Yes
East County	Empire Waste Management (WMI)	June 17, 2008	Yes
North West-Central County	Industrial Carting	August 26, 2006	Yes
South West County	Larry's Sanitary Disposal (WMI)	December 20, 2006	Yes
North Coastal County	Pacific Coast Disposal	April 22, 2007	Yes
Near City of Sonoma	Sonoma Garbage Collector	June 24, 2008	Yes
West Central County	Sunrise Garbage Service	April 22, 2007	Yes
West South-Central County	West Sonoma County Disposal	April 22, 2007	Yes

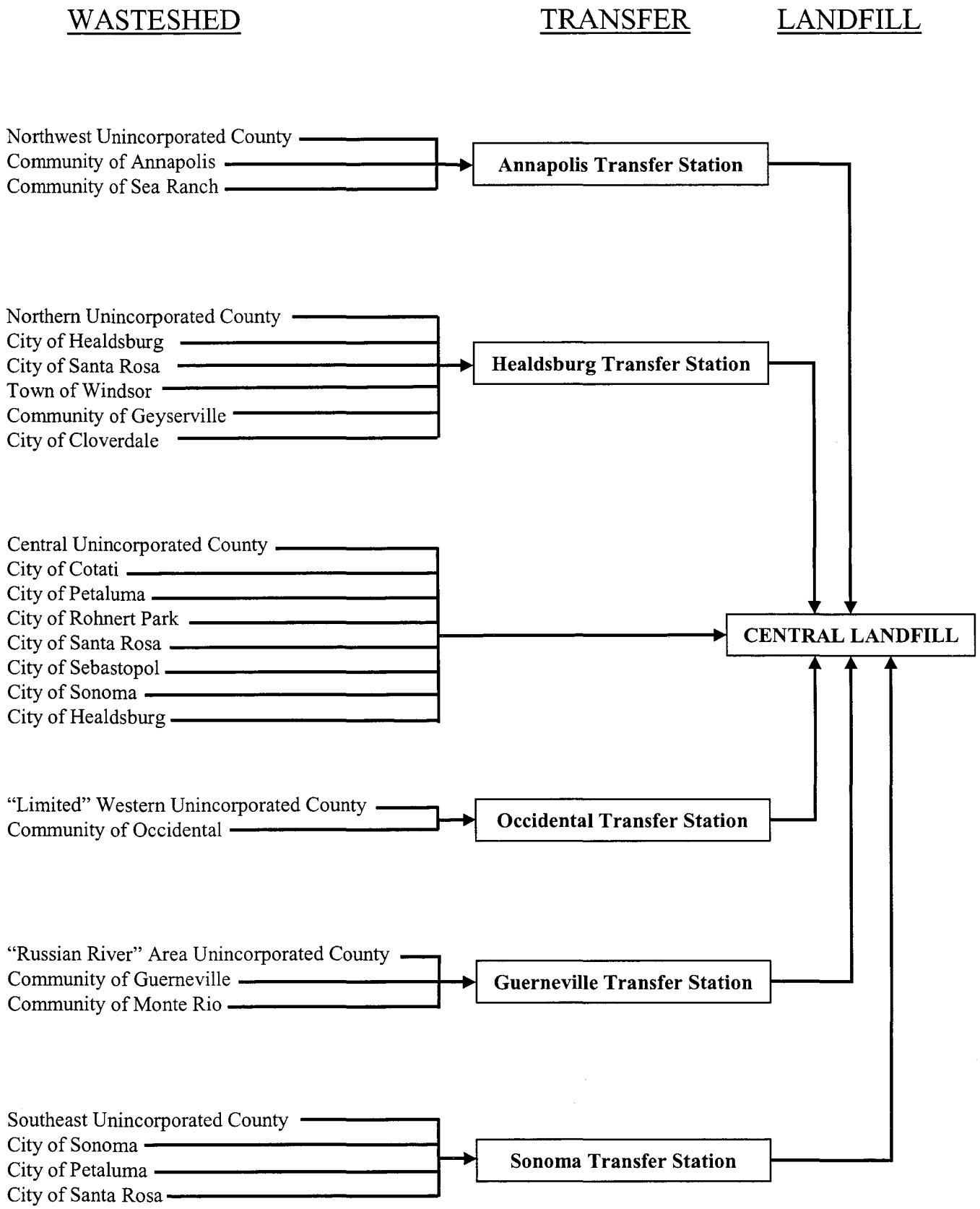
Table 3. Incorporated City Franchise Agreements

CITY	HAULER	EXPIRATION DATE	FLOW CONTROL
Healdsburg	Empire Waste Management (WMI)	July 2000	Yes
Rohnert Park	Empire Waste Management (WMI)	June 2001	No
Sebastopol	Larry's Sanitary Service	November, 2008	No
Town of Windsor	West Sonoma County Disposal	December 2008	Yes
Santa Rosa	Empire Waste Management (WMI)	February 2006	Yes
Cloverdale	Cloverdale Disposal	November 1998 (10 year evergreen)	No
Cotati	Larry's Sanitary Service	June 2005	Yes (informal agreement)
Petaluma	Empire Waste Management (WMI)	June 2004	No
Sonoma	Sonoma Garbage Collector	May 2007	Yes

Table 4. Geographical Distribution of In-County Waste Disposal

DISPOSAL LOCATION	1998 TONNAGE	% OF TOTAL
Annapolis Transfer Station	2,300	0.5%
Guerneville Transfer Station	19,300	4.2%
Healdsburg Transfer Station	71,500	15.6%
Sonoma Transfer Station	75,330	16.4%
Occidental Transfer Station	2,700	0.6%
Transferred Total	*171,130*	37.3%
Central Landfill - Direct Haul	287,470	62.7%
Total Disposed at Central LF	**458,600**	**100%**

Exhibit 2. Current Waste Stream Configuration



Source: 1998 Source Tonnage Report, Refuse Disposal Information System, Sonoma County

The consolidation of hauling companies is another factor affecting not only the flow of waste, but service options and choices for the cities. In the case of Petaluma, a portion of this waste is now being transported outside the County for disposal at the Redwood Landfill in Marin County, which is owned and operated by WMI. Empire Waste, Petaluma's franchised hauler, is a subsidiary of WMI.

The five transfer stations and Central Landfill receive waste generated from within the County only. No municipal solid waste (MSW) is presently imported from outside Sonoma County to these sites. As indicated above, a small portion of MSW was disposed out of the County at the Redwood Landfill in Marin County.

The amount of waste that is brought to the facilities for disposal is not tracked by the jurisdiction of origin on a regular basis. Therefore, in order to estimate the quantity of wastes disposed by each jurisdiction, an estimate was made based on the percent of the County population in each jurisdiction, and in the unincorporated County areas. These data are included in Exhibit 2. As indicated, the unincorporated areas account for the largest percentage of disposed waste (34.7%), and the City of Santa Rosa accounts for the largest percentage of the incorporated cities.

Waste Generation by Sector

Waste generated in the County comes from the residential, commercial, or mixed residential/commercial sectors. According to the 1996 Waste Characterization Study (conducted by Cascadia Consulting Group in May 1996), the residential sector accounts for the largest single percentage of waste in the county (39%). A breakdown of the sectors and their respective percentages of wastes is included as Exhibit 3. As indicated in Exhibit 3, the self-haul portion of the waste stream represents over 20% of the waste stream. It is also a large portion of the incoming wastes at Central Landfill. This attribute of the existing solid waste system is important in terms of future planning for disposal and transfer capacities, and policies regarding voluntary or mandatory collection service, particularly in the unincorporated areas.

Material Types and Quantities

The quantities and types of materials disposed in the County are an important aspect of planning for future disposal needs. By knowing what types and quantities of materials are presently disposed, the County can identify and plan the appropriate facilities and programs to divert and dispose of these materials. The countywide waste characterization information is presented in Exhibit 4.

According to the most recent waste characterization study of disposed waste in the County, organic materials accounted for approximately 40% of the disposed waste stream. Although a greenwaste composting program operates throughout the County, the organic category includes materials other than green waste for which disposal or diversion alternatives must be identified in the long-term planning period.

Exhibit 3. Solid Waste Disposal Quantities by Sector

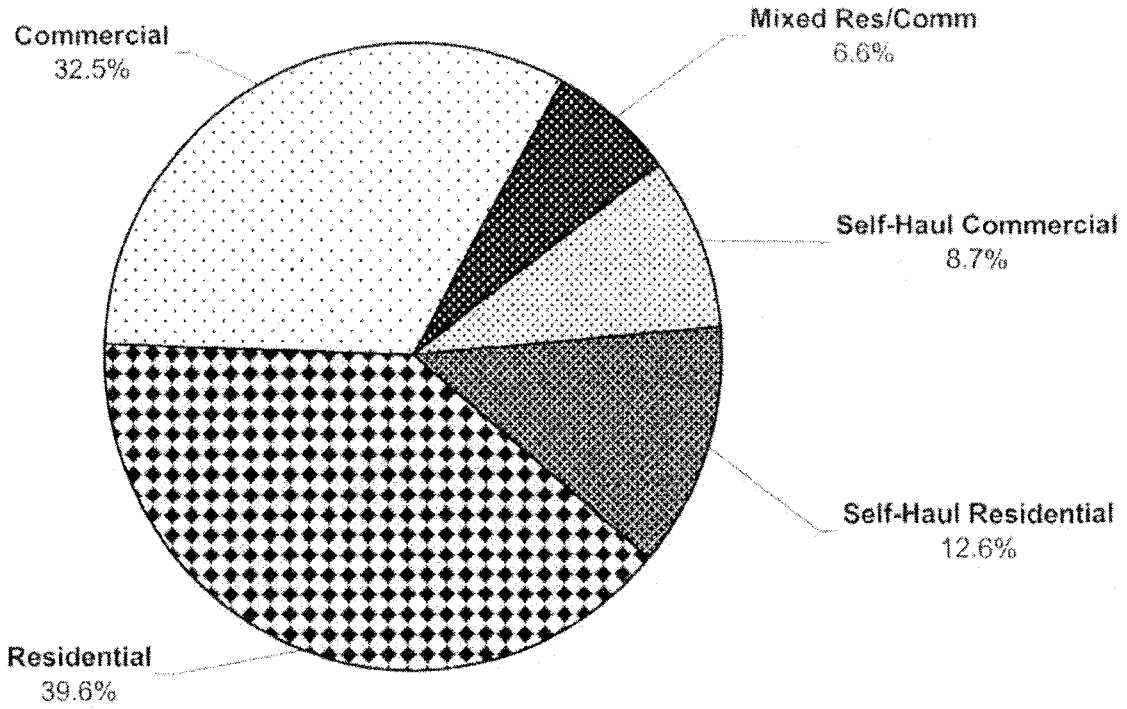
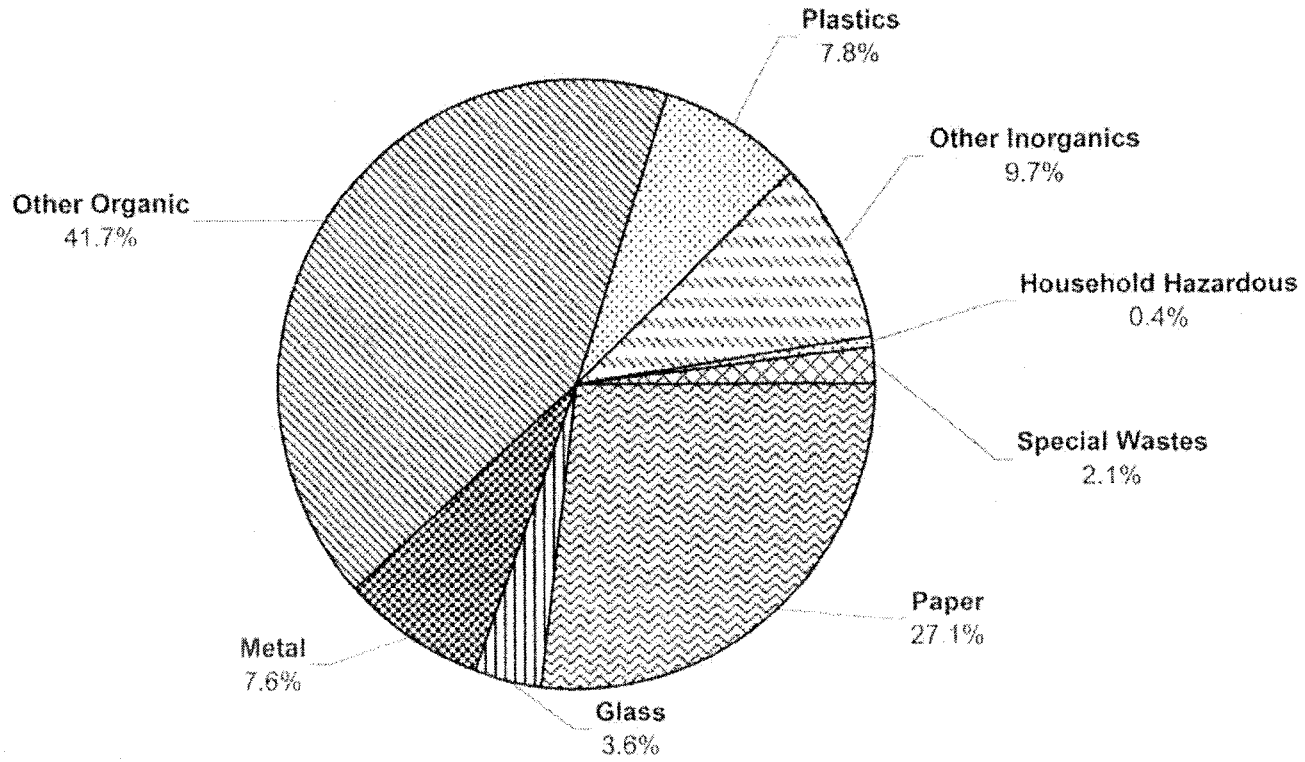


Exhibit 4. County Disposal Waste Characterization



RECYCLING PROGRAMS AND WASTE DIVERSION FACILITIES

For the public sector, Sonoma County and the incorporated jurisdictions have implemented many programs and policies for recycling, composting, and other diversion efforts. Countywide, according to the 1999 AB 939 Annual Report prepared by the Sonoma County Waste Management Agency, these efforts have resulted in a 39% diversion rate. This rate is calculated based on the quantity of material disposed in 1990 compared to the amount disposed in 1999. The County and jurisdictions continue to identify and implement diversion programs, and are working together on the LTF Diversion Program Recommendations, which has established a list of program recommendations and assigns responsibilities and schedules for implementation.

In the private sector, recyclables are collected by local haulers, drop-off/buy-back operations, and material reuse/recovery programs. Garbage Reincarnation, Inc., operates recycling facilities at the Healdsburg Transfer Station and at Central Landfill. Both facilities are used for collection and re-sale of recyclables and reusables to the general public. The existing Healdsburg operation is at capacity, and there is little, if any, room for expansion.

West Sonoma County Disposal operates small recyclables processing facilities in Petaluma and Santa Rosa. The facilities process approximately 4,000 tons per month (75% at the Santa Rosa location), or an estimated 48,000 tons per year. Empire Waste Management, Larry's Sanitary Service, and Cloverdale Disposal Service (WMI) operate residential and commercial recycling programs, and process the recyclable materials at WMI's Intermediate Processing Center in Santa Rosa. In 1998, the programs operated by WMI collected approximately 46,000 tons of recyclables in the County. Sonoma Garbage Collector collects recyclables from the residential and commercial sectors. In 1998, Sonoma Garbage collected approximately 2,000 tons of recyclables. The company also conducts recycling activities at the Sonoma Transfer Station.

A few companies, including Industrial Carting and West Coast Metals, conduct other commercial recycling. Recyclables collected in the County are transported to larger facilities outside the County, and are sold to both domestic and overseas end-use markets.

REGIONAL CONSIDERATIONS

As part of the background information for this Solid Waste Management Alternatives Analysis Project, SCS conducted a general assessment of the solid waste systems in the surrounding counties. This information was gathered to assess the existing regional solid waste disposal, transfer, and recycling facilities. The information will be used in identifying potential options outside of Sonoma County for future solid waste disposal and diversion.

The counties that impact, or are impacted by, Sonoma County in relation to solid waste management include Napa, Marin, Mendocino, Solano, and San Francisco. A list of the disposal facilities in these counties is included as Table 5, along with their expected closure date and permitted daily capacity. The data in this table suggest that the surrounding counties have, or have arranged for, adequate disposal capacity for the next 30 to 40 years. Both Napa and San Francisco Counties export all of their waste out of the county. Although previously Napa's waste was rail hauled out of state, the Napa-Vallejo Waste Management Authority voted to

Table 5. Regional Solid Waste Disposal Facilities

DISPOSAL FACILITY	DISPOSAL SITE LOCATION	CLOSURE DATE	PERMIT (TPD)	CURRENT DISPOSAL (TPD)
Altamont Landfill	Alameda County	2029	11,150	7,000
Keller Canyon Landfill	Contra Costa County	2040-2070	2,750	2,150
Potrero Hills Landfill	Solano County	2015-2063	4,330	1,500
Redwood Sanitary Landfill	Marin County	2039	1,290	1,280
Roosevelt Regional Landfill	Roosevelt, WA	2034	10,000	4,110
East Carbon Landfill	Carbon, UT	2040	25,000	3,200

curtail rail haul to Roosevelt Landfill in Washington, and starting in March 2000, wastes were to be trucked to Keller Canyon Landfill in Contra Costa County. San Francisco City/County does not have any active landfills, and nearly all of the waste is disposed at the Altamont Landfill in Alameda County. This landfill obtained approval in 2000 for a scaled-back expansion, which will extend the life of the facility to approximately 2029.

Also important in terms of regional considerations are transfer stations/MRFs and composting facilities in the surrounding counties. A list of the major existing and proposed facilities is included in Table 6.

In examining the feasibility of out-of-county disposal alternatives, the County is likely to assess privately owned and operated landfills. Typically, such landfills may offer favorable rates over the long term if there is an ability or willingness to deliver tonnage within a specified range, or to pay for such tonnage even if the actual quantities are less. Such "put or pay" arrangements offer the landfill operator a reliable cash flow. For the generator, though, these arrangements can act as a disincentive for waste reduction. Indeed, from the County's perspective, decreasing the amount of refuse transported out-of-county may be viewed favorably, because it would decrease disposal costs and maximize diversion. Thus, maintaining in-county disposal capacity, and upgrading the County's diversion programs and infrastructure, is closely linked to maintaining some measure of control over the County's waste management system.

The existence of flow control arrangements in franchised hauling waste agreements in the incorporated cities, along with provisions for licensed haulers operating in the unincorporated County areas, enables the cities and County to have some control over the destination of the waste steam. Assuming that these arrangements will be maintained throughout the planning period, as well as future similar arrangements in other incorporated cities, the County can plan for facilities to handle these wastes. Without such arrangements, and the coordination and understandings that support them, facility planning on a countywide level becomes difficult, because the County and jurisdictions would not be cooperating in directing the flow of waste generated in the County. Instead, each jurisdiction, as well as the County, could conceivably undertake contractual agreements with haulers that would direct waste to several disposal sites, thus undermining the effort to plan for the integrated management of the County's total waste stream.

Table 6. Regional Recycling and Composting Facilities (outside Sonoma County)

FACILITY	LOCATION	TYPE	REGULATORY STATUS	OPERATIONAL STATUS	PERMITTED THROUGHPUT (TPD)	CURRENT THROUGHPUT (TPD)
Marin Sanitary Service Transfer Station	Marin County	MRF	Permitted	Active	2,640	500-600
Redwood L.F., Biosolids Co-Composting		Composting Facility (Other)	Permitted	Active	1,000	200
Redwood Sanitary Landfill		Composting Facility (GW)	Permitted	Active	10,000 yd^3 *	5,000 yd^3*
Cold Creek Compost, Inc.	Mendocino County	Composting Facility (Mixed)	Permitted	Active	200	100
Devlin Road TS	Napa County	Lg. Vol. Transfer/Proc. Fac.	Permitted	Active	1,440	600
Napa Garbage Service MRF		MRF	Permitted	Active	360	64
Napa Garbage Service Composting Facility		Composting Facility (GW)	Permitted	Active	200	50 - 100
Upper Valley Recycling and Disposal Service		Composting Operation (GW)	Permitted	Active	17,500 tpy**	13,500 tpy**
SF Solid Waste Transfer & Recycling Center	San Francisco County	Lg. Vol. Transfer/Proc. Fac.	Permitted	Active	5,000	2,000
Goodyear Road Compost Facility	Solano County	Composting Facility (GW)	Permitted	Active	30,000 yd^3 *	10,000 yd^3 *
Potrero Hills Compost Facility		Composting Facility (GW)	Permitted	Active	60,000 yd^3 *	7,000 yd^3 *

Notes:

* Total quantity allowed/stored on site at any one time. Quantities are estimates only.

** Facility operates seasonally only during the grape harvest. Amounts are for the entire season.

TS – Transfer Station

MRF – Materials Recovery Facility

GW – Green Waste

SECTION 2

WASTE GENERATION PROJECTIONS

The projection of how much waste will be generated in the County in the planning period 2015 to 2050 is based on two key variables: the assumed population growth rate and the assumed diversion rate.

POPULATION GROWTH RATE

Three different population growth estimates were reviewed for this study: the Sonoma County General Plan; the California State Department of Finance; and the Association of Bay Area Governments (ABAG). The ABAG projection was eliminated from further analysis, as it was felt that this projection did not accurately reflect the anticipated growth in the County. A comparison of the population estimates is shown on Exhibit 5. As indicated, the Department of Finance data show the greatest population growth for the County, while the County General Plan extrapolation shows a slower population growth rate. The population estimates prepared by these agencies are based on historic growth patterns, adopted plans and policies, and infrastructure assumptions, including regional wastewater system capacity and transportation capacity in the Highway 101 corridor. The County General Plan policies are geared toward ensuring that adequate public services and infrastructure are available to serve the projected population. In order to account for adopted urban growth limits and other measures that may impact the quantity of wastes generated in the County, the population projections from both the County General Plan and Department of Finance were adjusted downwards. Therefore, beginning in 2011 and through the end of the project planning period (2050), the population growth rates were reduced by 50%. Comparisons of the original and adjusted population growth projections are shown on Exhibit 5. The resulting population projections are indicated on Table 7, presented in 5-year increments for the project planning period 2015 to 2050.

DIVERSION RATE

Presently, approximately 39% of the County's waste stream is diverted through existing source reduction, recycling, and composting programs. Based on a review of the existing and planned programs, it was determined that the diversion rate will rise over the next 5 years at a rate of approximately 1.5% per year, to a maximum of 50% diversion in the year 2005. For purposes of the project, it was then determined that the diversion rate would remain constant at 50% through the remainder of the planning period. The waste generation projections for the planning period 2015 to 2050 are indicated on Table 7. As indicated, total waste generation increases in relation to the projected population growth. It should be emphasized that the model does not assume an increase in the per capita waste generation rate. Factors that may affect this rate, such as societal trends, changes in packaging and distribution technology, or overall economic growth, are too variable to predict within the scope of this study. The adjustment in the population growth is

EXHIBIT 5. SONOMA COUNTY POPULATION PROJECTIONS: 1997-2050

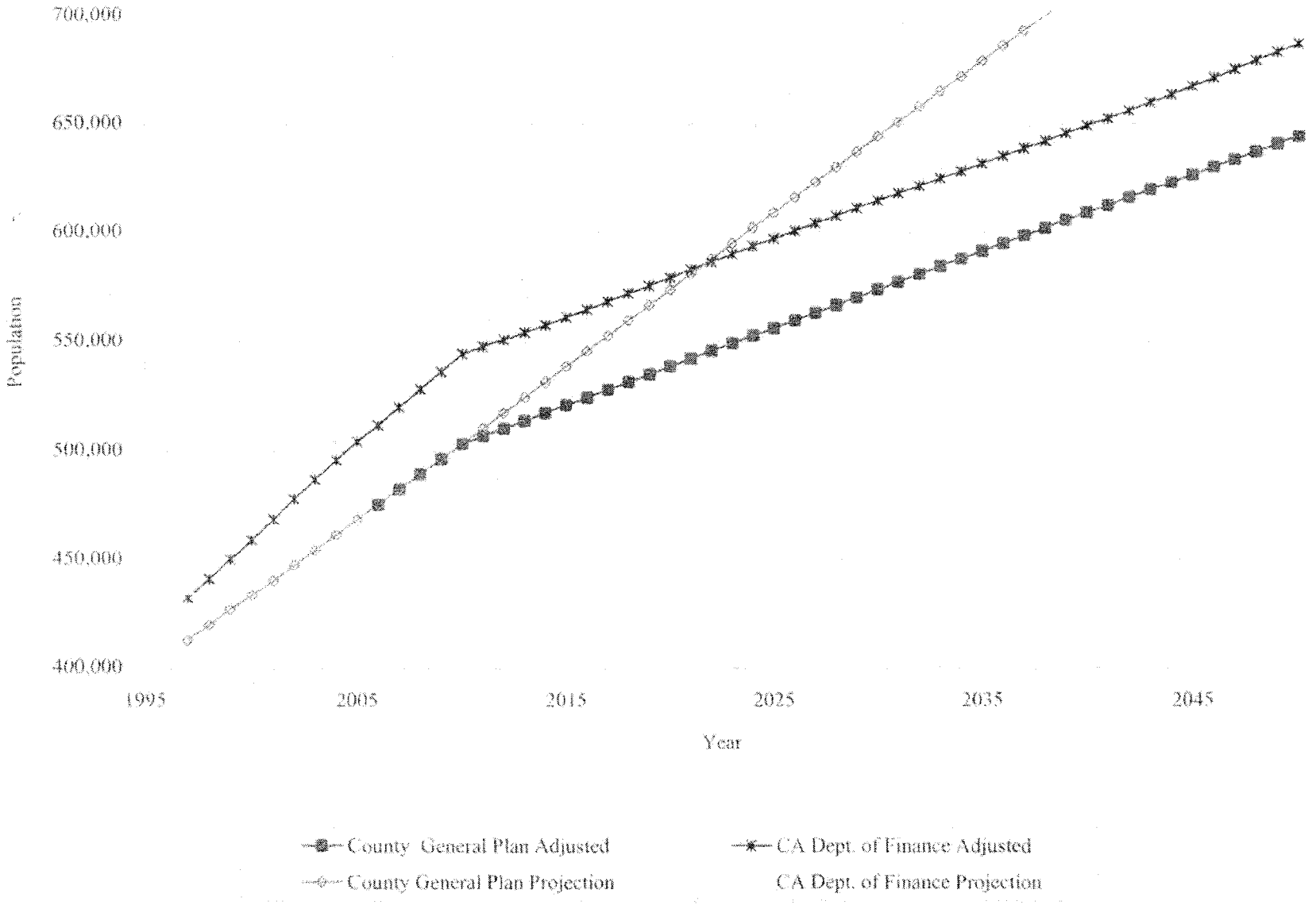


Table 7. Projections of Future Solid Waste Generation (tons per year)

YEAR	POPULATION	ANNUAL WASTE GENERATION (tons)			DAILY DISPOSAL (TONS)
		DISPOSAL	DIVERSION	GENERATION	
1998	437,100	478,849	308,901	787,749	1,250
2000	434,150 - 459,258	440,522	324,406	764,928	1,225
2015	521,190 - 561,416	460,000 - 468,000	458,000 - 467,000	918,000 - 935,000	1,280-1,300
2020	538,740 - 579,343	475,000 - 483,000	474,000 - 482,000	949,000- 965,000	1,320-1,340
2025	556,290 - 597,127	491,000 - 498,000	489,000 - 496,000	980,000 - 994,000	1,365-1,385
2030	573,840 - 614,412	506,000 - 513,000	505,000 - 511,000	1,011,000 - 1,024,000	1,405-1,425
2035	591,390 - 631,537	522,000 - 527,000	520,000 - 525,000	1,042,000 - 1,052,000	1,450-1,465
2040	608,940 - 649,121	537,000- 542,000	535,000 - 540,000	1,072,000 - 1,082,000	1,490-1,505
2045	626,490 - 667,635	553,000 - 557,000	551,000 - 555,000	1,104,000 - 1,112,000	1,540-1,550
2050	644,040 - 687,059	568,000 - 573,000	566,000 - 571,000	1,135,000 - 1,144,000	1,580-1,590

Notes

Actual Population, Disposal and Generation numbers for 1998 taken from AB 939 Annual Report.

Population growth rate projections from Sonoma County General Plan and California Department of Finance adjusted downwards by 50% beginning in 2011.

Numbers rounded for planning purposes.

assumed to provide adequate compensation for any likely increase in the per capita waste generation rate.

From Table 7, it can be concluded that the effect of utilizing a range of population projections does not greatly impact the quantity of waste projected to be generated in the County. In fact, the difference is less than 2%. By 2050, the total quantity of waste generated in the County will range from 30 to 31% higher than the 1998 quantity of waste generated. The quantity of material requiring disposal through landfilling and/or an alternative disposal technology or facility will range from 568,000 tons to 573,000 tons in 2050. This is approximately 90,000 to 94,000 tons, or 16% greater than the 1998 disposal tonnage.

WASTE TYPES

Another critical factor in the development of waste generation projections is the identification of the types of wastes to be generated and, relative to this, the types of wastes to be diverted and disposed. This information is vital for determining what kinds of disposal options will be applicable to the County wastestream in the planning period. At this point, it is assumed the wastestream components identified in the County's waste characterization study will remain constant over the planning period. However, as new information becomes available, it may be necessary to revise the projections of waste stream types and quantities for the planning period.

Based on the projections, the "other organic" portion of the disposed waste stream accounts for the greatest percentage of wastes that will require management in the future planning period. This material type includes food, yard and landscape materials, wood, manures, and textiles. Paper is another major portion of the waste stream.

One effect of an increase in population will be increases in employment opportunities to meet the needs of a larger population. Accompanying this may be a shift in the employment type. Some projections indicate a shift from resource production to "new technology" industries, retail trade, and service jobs. Despite this statistical trend towards new technology employment, the existing agricultural industries in the County are projected to continue to be a major factor in the County's economy. Recent local waste characterization studies conducted in the Silicon Valley area and national studies conducted by the U.S. EPA do not indicate a dramatic change in waste types as a result of shifts in employment. Therefore, employment trends are not anticipated to significantly impact the waste stream characteristics in the County.

WASTE GENERATION BY SECTOR

Waste generated in the County comes from the residential, commercial, or mixed residential/commercial sectors. According to the County's 1996 Waste Characterization Study, the residential sector accounts for the largest single percentage of waste in the County (39 %). It is assumed that this breakdown will remain the same during the planning period. This assumption is based on the General Plan projection that additional job opportunities will be provided in the County to meet the needs of a larger population. Similarly, some residents will continue to work elsewhere in the Bay Area.

The projected sources of solid waste are important in terms of future planning for disposal and transfer capacities, the location and size of facilities, and policies regarding voluntary or mandatory collection service, particularly in the unincorporated areas. The County General Plan projects an increase in the percentage of the population that lives in the incorporated cities. According to the General Plan, the nine cities will contain approximately 68 percent of the population by 2005. This factor will significantly affect the quantity of waste that is controlled by franchised agreements in the incorporated cities. As discussed in Section 1, some franchise agreements include arrangements for flow control. This enables the cities to designate where the waste will be disposed. The quantity of wastes that are controlled through these types of arrangements is important when planning for future, long-term disposal options. Typically, a decision whether to site a new facility, expand an existing one, or enter into contractual arrangement for disposal includes estimates of the quantity of material to be handled or contracted. Therefore, it is imperative to accurately account for the quantity of wastes that will be included in the long-range planning process.

SOLID WASTE FACILITIES

Sonoma County Facilities

The Central Landfill will reach its permitted capacity in 2015. At that time, the County will have the opportunity to either expand or terminate the operations at the site, including the compost operation and Recycletown. Another possibility for continuing use of the site may be the siting of a large regional transfer station/materials recovery facility (MRF).

Presently, the County transfer stations adequately serve the existing waste management system. Two of the transfer stations, Healdsburg and Sonoma, receive 86% of the total disposed tonnage that moves through the transfer station system. This suggests that any growth in either the residential or commercial sectors in the areas served by those facilities may require upgrading or expansion of the transfer or recycling opportunities at these transfer stations. Similarly, changes in transportation access, particularly along the Highway 101 corridor, will affect the potential use of individual transfer stations. Furthermore, continued operations at the other County transfer stations will be evaluated, in light of decisions made regarding disposal options.

Regional Facilities

As part of the background information for this Solid Waste Management Alternatives Analysis Project, information was gathered on the future capacities and plans for regional solid waste disposal, transfer, and recycling facilities. This information was used to identify potential options outside of Sonoma County for future solid waste disposal and diversion. Disposal facilities in these counties that may be considered for use by the County in the alternatives analysis are listed on Table 5. Data in this table include the expected closure date and permitted daily capacity, suggesting that there is available disposal capacity in the region surrounding Sonoma County for the next 30 to 40 years.

Also important in terms of regional considerations are transfer stations/MRFs and composting facilities in the surrounding counties. A list of the major existing and proposed facilities that have potential capacity to handle a portion of the Sonoma County wastestream in the future planning period is included in Table 6. Again, capacity may be available at these facilities for consideration by the County in the alternatives analysis.

SECTION 3

IDENTIFICATION AND REVIEW OF ALTERNATIVES

The alternatives that are selected for implementation in the County are designed to contribute to long-term stability and flexibility, and to provide cost-effective and efficient services and programs, environmental protection, and improvements to the waste management infrastructure.

Because the integrated waste management strategy being developed through the Solid Waste Management Alternatives Analysis project will be implemented in the planning period from 2015 to 2050, a number of inherent assumptions in developing and evaluating the proposed alternatives were established, as outlined below:

- Large-scale facilities require longer lead time for design, permitting, and construction; therefore, the impact of timing must be considered in the evaluation and selection process.

- The countywide diversion rate will reach a maximum of 50% by the year 2005. Diversion programs and policies currently under development and consideration by the LTF will contribute to the 50% diversion rate by 2005.

- New solid waste management policies and programs will be implemented between 2000 and 2015, prior to the beginning of the Alternatives Project planning period. This will further impact the types of programs and policies evaluated and selected as part of this project.

The proposed alternatives were grouped under the general headings of:

- Program and Policy Options.
- Alternative Technologies.
- Landfill Alternatives.

Each of the proposed alternatives, including the major features and characteristics, target material types and quantities (as applicable), and other relevant comments, is described on the following pages.

CATEGORY: Supporting Program and Policies

TITLE: Mandatory refuse/recycling service for single-family residences in County unincorporated areas.

MAJOR FEATURES AND CHARACTERISTICS: Designated households currently not receiving regular, weekly refuse/recycling service, including separate yard waste collection, would have such service through exclusive franchise agreements arranged by the County's Transportation and Public Works Department.

The targeted households would be charged for the service regardless of whether or not it is used. Franchise agreements for the County unincorporated areas could use jurisdictional agreements as models for appropriate language, terms, conditions, service standards, payment formulas, and other relevant content.

The alternative could also include not accepting normally generated quantities of residential refuse, recyclables, or yard waste at the five transfer stations or Central Landfill. Larger quantities of refuse or yard waste would continue to be accepted at Central Landfill, along with wood waste, appliances, tires, and items typically directed to Recycletown, such as toilets, furniture, clothing, mattresses, and books.

TARGETED MATERIALS: Residential refuse, yard waste, newspapers, cardboard, magazines, office paper (white and colored), scrap paper, glass containers, tin cans, aluminum cans, scrap metals.

COMMENTS: Presently, about one half of the 55,000 households in the County unincorporated areas do not have regular, weekly curbside collection of refuse, recyclables, or yard waste. These households transport materials to one of the six disposal sites in the County. The alternative is intended to provide more direct management of the targeted wastestream, particularly for purposes of waste diversion. The alternative would extend the basic waste collection and diversion program options found in the jurisdictions to the County unincorporated areas, thus promoting consistency in service standards and levels for the single-family residential sector throughout the County.

CATEGORY: Supporting Program and Policies

TITLE: Mandatory source separation of recyclables from residential, commercial, industrial, and institutional waste generators.

MAJOR FEATURES AND CHARACTERISTICS: Residential, commercial, industrial, and institutional generators would be required to keep all recyclables out of the waste stream. The requirement could come through enactment of ordinances by the cities and County, prohibiting recyclables to be mixed with disposed wastes.

TARGETED MATERIALS: Residential, commercial, industrial, and institutional recyclables, including yard waste, newspapers, cardboard, magazines, office paper (white and colored), scrap paper, glass containers, tin cans, aluminum cans, scrap metals.

COMMENTS: The alternative places an emphasis on recycling any secondary material that can be easily and economically recycled. The alternative could also include penalties for placement of recyclables in disposed wastes.

CATEGORY: Supporting Program and Policies

TITLE: Processing of all generated waste prior to disposal.

MAJOR FEATURES AND CHARACTERISTICS: This policy is intended to be a primary principle for waste management activities in the County conducted by both the public and private sectors. The purpose is to take advantage of current and emerging technologies for recovering reusable or recyclable materials to minimize the quantity/volume of refuse to be disposed. There may be one or more facilities located in and/or out of the County to accomplish the above-stated purpose. Regardless, all waste generated in-county would be directed through different processing operations, depending on the nature of the waste materials. Some of these operations may be ongoing, while others would have to be identified or constructed. From a planning perspective, the wastestream may be divided into sub-wastestream components to insure that processing capability is available.

TARGETED MATERIALS: All waste generated in the County.

COMMENTS: The operational requirements of this policy necessitate a review of current and anticipated private sector materials processing infrastructure to determine what portions of the wastestream can be handled through existing processing sites, and what needs there are for expanded or additional processing capability (for example, see MRF alternative).

CATEGORY: Supporting Program and Policies

TITLE: Common waste service contractual language and flow control authority for the Sonoma County Waste Management Agency (SCWMA).

MAJOR FEATURES AND CHARACTERISTICS: To cost effectively increase waste diversion and undertake the most economically beneficial waste disposal alternative(s), the County and jurisdictions must be in the strongest "bargaining position" possible. This is accomplished by cooperative control over the flow of waste within the County, as is now achieved in part with "flow control" provisions in franchise agreements.

This alternative proposes adoption by the County and jurisdictions of common terms and stipulations for all new, renewed, or extended refuse service franchises/contracts. Such terms and stipulations would direct the flow of disposed waste to one or more disposal sites as cooperatively designated by the County and jurisdictions.

TARGETED MATERIALS: All disposed waste.

COMMENTS: This alternative may require an amendment to the Joint Powers Authority between the County and jurisdictions to direct the flow of disposed waste as deemed appropriate and desirable. The amendment would also empower the JPA to enter into a contractual arrangement with a public or private entity for the disposal of waste generated in the County.

CATEGORY: Supporting Program and Policies

TITLE: Strategy to support end-users of recyclables in the County.

MAJOR FEATURES AND CHARACTERISTICS: A mixture of economic and institutional incentives can be formulated to facilitate the location of one or more businesses/industries that utilize recyclable materials. Incentives that could comprise a locally based market development strategy include provision of public land for siting a manufacturing/production plant, low-interest or no-interest loans, tax abatements, shared risk financing arrangements, zoning and permitting assistance, and other similar instruments.

Potential end-use industry targets could be a major facility such as a paper mill or a group of smaller scale entrepreneurial reuse and remanufacturing operations clustered together in close proximity to create a "business park" environment similar to the one being developed in Berkeley, California. Part of the end-user support strategy could be to expand in-county utilization of materials that already have some markets, such as the agricultural application of compost and other products derived from the processing of yard or wood waste.

TARGETED MATERIALS: To be determined.

COMMENTS: Determining which materials to target for market development may be based on the waste generation forecasts covering the period 2015 through 2050.

CATEGORY: Alternative Technology

TITLE: MSW composting.

MAJOR FEATURES AND CHARACTERISTICS: MSW composting involves the decomposition of large organic molecules through the action of microorganisms and higher order invertebrates. The two major approaches are aerobic, which uses oxygen, and anaerobic, which does not.

The essential operational characteristics for effective composting include:

- Achieving and maintaining elevated temperatures so that the proper microorganisms can thrive and accomplish decomposition.
- Aeration (for aerobic systems) of the material to prevent growth of anaerobic organisms.
- Adequate residence time to achieve compost maturity as measured by stabilization of the compost process and the proper carbon/nitrogen ratio.

The primary objective is to produce an evenly and thoroughly composted material, and to assure complete destruction of weed seeds and pathogens.

Composting includes both enclosed (in-vessel) and open systems. Open systems commonly use windrows that can either be static piles with forced aeration, or piles that are turned to expose the material to air. In-vessel systems, though higher capital cost, provide the best physical and biological control of the composting process.

Another form of composting, called vermicomposting, uses worms to digest organic materials. Organic material is converted into worm biomass and feces, which can be readily separated from inert residue. An advantage of vermicomposting is that the worms will not ingest inert or contaminated material, so that the final compost product is very fine and high quality.

TARGET MATERIALS: Composting systems receive and process the organic fraction of MSW. This fraction can be delivered in different forms:

- Unsegregated MSW, without any previous source separation of recyclable or undesirable (e.g., household hazardous wastes) materials.
- After source separation of recyclable or undesirable materials.
- The wet (organic) fraction from a wet-dry collection system.
- Source-separated organics.

The most compatible materials for MSW composting are food waste, greenwaste, woody material, paper, and other organics. Approximately 59% of the generated wastestream would be compatible feedstock for MSW composting.

COMMENTS: Products include primarily soil amendments used in agriculture or landscaping. The quality of the compost is sensitive to both the process and the degree to which undesirable material has been excluded from the waste. A wastestream with an industrial component, or one in which household hazardous wastes have not been separated, can result in contaminated compost. MSW composting is fully commercialized and widely implemented, especially in Europe.

A primary problem faced by compost facilities is odor. Decomposition always generates odor, and many facilities have been shut down due to odor problems. It has been demonstrated that compost facilities can be operated with a minimum of off-site odor, but this requires good implementation of both technology and management. With in-vessel systems, the exhaust air can be more easily cleaned, thus eliminating odors.

Composting is a net consumer of energy, since it produces no energy in a usable form to offset the process energy. Also, if the feedstock includes hazardous materials, they could end up as contaminants in the final compost, although this concern is reduced if the composting system is anaerobic.

Different sources conflict over comparative emissions of carbon from composting versus anaerobic digestion. Composting is thought to generate somewhat less global warming gases than landfilling due to the avoidance of methane emissions; however, this is offset by the fact that woody material does not degrade fully in a landfill, thereby sequestering carbon. Greenhouse gas emissions from composting are approximately the same as incineration. An additional benefit of diverting organic materials is the reduction in landfill gas and leachate caused when they are landfilled.

Programs needed to support this alternative may include front-end separation and increased support and use of household hazardous waste collection programs.

CATEGORY: Alternative Technologies

TYPE: Anaerobic digestion.

MAJOR FEATURES AND CHARACTERISTICS: Digestion entails the breakdown of large organic molecules through the action of microorganisms. The process occurs in the absence of oxygen facilitated by containing it in an airtight vessel, called a reactor or digester. A different set of microorganisms is involved than occurs in aerobic composting.

Several different digester technologies have been implemented. Most common are cylindrical vessels with a vertical or horizontal turbine to mix and move the material. Following the anaerobic process, the solids may be cured in standard composting type systems.

The digestion process occurs through the combined action of a consortium of various microorganisms, which attack organic molecules at different stages in the breakdown, and under different environmental conditions.

TARGET MATERIALS: Anaerobic digestion targets the same materials as MSW composting. Approximately 59% of the generated wastestream would be compatible feedstock for digestion.

COMMENTS: The useful products of anaerobic digestion include biogas-methane (between 50% and 60% of the product) and carbon dioxide. It can also produce a stabilized compost product.

Anaerobic digestion has several advantages over aerobic digestion, or composting:

- A high degree of reduction of organic matter is achieved with a relatively small amount of bacterial biomass.
- The biogas produced can be used as an energy source.
- Reduction of xenobiotic compounds by direct or co-metabolic processes.

Also, the solid end product of anaerobic digestion (digestate) can be matured into a compost product, which is reported to have higher nitrogen content than compost, since ammonia is not consumed in the process. However, more thorough testing is required.

Anaerobic digestion of wastes entails creating and managing a microbial ecological system. As such, it is highly sensitive to the feedstock and a variety of environmental factors. Mixed solid wastes can be difficult to digest, due to their heterogeneity and toxic chemicals (xenobiotics).

The process is fully commercialized in use for sewage sludge, livestock or agricultural waste, and, less commonly, for food waste. A substantially greater capital investment is required than for composting, but the net costs per ton are approximately the same, and about half those of incineration.

Treatment of MSW is a relatively new application of the technology, and poses special considerations. There are over 115 full-scale plants digesting MSW worldwide in operation or under construction, with 5 million tons of installed capacity. In the United States, new firms are arising with the intent to commercialize anaerobic systems.

From an environmental perspective, since all gases are contained in anaerobic digestion, they are available for use and are not emitted into the atmosphere. In addition, biogas can reduce society's dependency on fossil fuels. The biomass contained in MSW was, for the most part, originally produced by photosynthesis of carbon dioxide from the atmosphere. Its return to the atmosphere from the combustion of MSW-generated biogas does not therefore add a net atmospheric carbon load.

CATEGORY: Alternative Technology

TITLE: Biorefining.

MAJOR FEATURES AND CHARACTERISTICS: Biorefining involves the breakdown of large organic molecules in waste through hydrolysis by acids, enzymes, or steam. Biorefining is used here to distinguish processes that utilize physical and/or chemical reactions for the initial decomposition of waste, as distinct from composting and anaerobic digestion, which use microorganisms.

In application, biorefineries may also use microorganisms for fermentation of sugars after the initial decomposition. The most common process is:

- To hydrolyze cellulose into glucose.
- Then, to ferment the glucose into alcohol.

Biorefining is being used increasingly on organic wastestreams, especially agricultural wastes, to produce ethanol. However, cheap fossil fuels, combined with efforts by the fossil fuel and automobile industries, have prevented its wide-scale development. Processes are now emerging for producing ethanol from MSW.

TARGET MATERIALS: Biorefineries receive and process the same fraction of MSW as composting and anaerobic digestion. Approximately 59% of the generated wastestream would be compatible feedstock for biorefining.

COMMENTS: Biorefineries produce a wide range of commodities, such as food ingredients, pharmaceuticals, and industrial fibers, adhesives, and other chemicals. The primary products from MSW would be ethanol as an energy source. Alternatively, biodiesel is generally produced from waste cooking oil.

The technology is currently in pre-commercialization or early-commercialization stage for MSW. A plant has been built in New York to process 230,000 tons/year of MSW, and 49,000 tons/year of sewage sludge. The process includes co-collection of recyclables and garbage (in separate bags) and claims 90% landfill reduction. It includes a MRF on the front end to separate recyclables, and an acid hydrolysis/fermentation digester to produce a market-grade ethanol. Methane is also produced, which is used on site for process energy.

Acid hydrolysis is closest to commercialization, though enzymatic hydrolysis, if it can overcome the high cost of purchasing cellulose-decomposing enzymes, also has its proponents. From an environmental perspective, ethanol has definite benefits as a replacement for fossil fuel, from the perspectives of both resource conservation and global climate change. Ethanol can be used as a fuel, or as an anti-knock additive to gasoline to replace lead and MTBE. The biorefining process is reported to be environmentally benign.

CATEGORY: Alternative Technology

TITLE: MSW combustion.

MAJOR FEATURES AND CHARACTERISTICS: There are two basic technologies within MSW combustion:

- Mass burn, in which MSW is burned as it is received.
- Refuse-derived fuel (RDF), in which MSW is size-reduced before burning and processed into a "fluff" or pellets.

Either of the systems may include a pre-burn MRF that separates recyclable and unburnable materials. RDF systems may separate some recyclable or non-burnable materials mechanically after shredding.

There are three main types of incineration technologies for MSW:

- Mass burn stokers use moving grates to move and agitate the waste.
- Rotary kiln incinerators use a revolving, slightly inclined cylinder to tumble the waste during combustion.
- Fluidized bed incinerators use a heated bed of sand-like material within which RDF is suspended (fluidized) by a rising column of air.

Fluidized bed combustion is considered an improvement for high-moisture content fuels, such as MSW. The scrubbing action of the bed material, which may include lime, increases the rate of combustion and thermal efficiency, minimizes char, and reduces emissions. MSW combustion can reduce waste-to-landfill by up to 90%. Most systems generate hot water and steam, which can drive an electricity-generating turbine. Air pollution control is critical for MSW combustion and can amount to 30% of the system cost. Dust particles are typically trapped in filters and other pollutants are removed in scrubbing units.

TARGET MATERIALS: Incinerators can receive the full MSW stream, though problem materials, such as large appliances, are commonly removed. Attempts may also be made to remove toxic materials, such as occur in electronic equipment, through disposal bans or other means.

COMMENTS: Energy is the primary product of MSW combustion, though some systems recover ferrous and other metals from the ash.

From an environmental perspective, combustion systems produce several pollutants of concern, especially dioxins, furans, carbon monoxide, acid gases, metals, volatile organic compounds and polycyclic aromatic hydrocarbons, and oxides of nitrogen and sulfur. These result from incomplete combustion or characteristics of the combustion environment. They can be cleaned from the combustion air, though this is expensive. Especially for dioxins and furans, which are considered highly toxic in trace quantities, this process may not be complete.

Combustion can also concentrate metals in the ash, possibly requiring disposal as a hazardous waste. Combustion emits large amounts of carbon into the atmosphere. However, except for plastics, most of the carbon in MSW was drawn from the atmosphere by photosynthesis, resulting in only a small net contribution to global warming. If incineration produces energy that replaces fossil fuel consumption, it should result in a net reduction of atmospheric carbon.

CATEGORY: Alternative Technology

TITLE: Thermal transformation.

MAJOR FEATURES AND CHARACTERISTICS: Waste is heated in a controlled oxygen environment to drive off reduced or only partly oxidized gases. A variety of different technologies, all of which drive off biogas from the waste, fall within this group, including:

- Pyrolysis, which heats the waste in the absence of oxygen.
- Gasification, which heats the waste and reacts it with a controlled input of oxygen.
- Plasma arc, which runs high-voltage electricity through the waste, in the absence of oxygen.

Some of the technologies may include vitrification of the residue, in which the residue is transformed into a stable, low-leachability, glassy material. There are many vendors developing somewhat different technologies, but all generate a biogas fuel that is either burned on site or purified and sold. Potentially, these technologies could convert the synthetic gas to hydrogen for utilization in a fuel cell. Some sources claim that these emerging technologies are the advent of a new age in waste processing. Termed "molecular recycling," these technologies are seen as a major alternative to fossil fuel dependency.

TARGET MATERIALS: Thermal transformation processes the organic fraction similar to mass burn, but in some cases the residue may be vitrified. The waste is generally first processed to an RDF. Pyrolysis and other thermal transformation technologies may also be used for tires, auto shredder residues, and sewage sludge.

COMMENTS: The products of thermal transformation are a biogas fuel, and can include energy and a compost product. Plasma arc technology, which is used for hazardous materials and medical waste, has the added advantage that its process results in an inert, vitrified mass, with low leachability of contaminants. Proponents claim that the residue can even be used as a construction material. If so, this would be the only technology that could potentially not require a landfill for residues.

These technologies have certain advantages over combustion:

- The energy conversion efficiencies are higher.
- Less air is used, requiring less pollution problems.
- The synthetic gas can be either used on site or transported.

At present, these technologies are not fully commercialized for MSW in the United States, though some plants are operational in Europe. However, prototypes for MSW are in pre-commercialization or early-commercialization stage. Several of these technologies have been demonstrated at the rate of several tons per hour. It is expected that a number of plants will be

constructed in Europe over the next several years. Capital and operating costs for gasification technologies are generally similar to owner-operated mass burn facilities.

From an environmental perspective, many of the same benefits claimed for anaerobic digestion apply also to thermal processing. Also, they are net producers of energy and operate within a controlled environment that can control potential pollution problems.

CATEGORY: Alternative Technologies

TITLE: Materials recovery facility (MRF).

MAJOR FEATURES AND CHARACTERISTICS: The MRF would perform recyclables processing operations that are not being done at the present time by the private sector. This could include, but is not limited to, processing mixed commercial refuse, mixed residential refuse, commingled commercial or residential recyclables, source-separated commercial or residential recyclables, yard waste, wood waste, construction and demolition debris, and other waste streams or materials to be determined.

The MRF could incorporate some of the diversion functions/operations now located at Central Landfill, such as the drop-off of tires and appliances and the recycling/reuse areas known as Recycletown. It could also provide land for composting processed yard waste, wood waste, and other organic materials, and serve as an outlet for the finished product(s) resulting from composting. The MRF could be located adjacent to or near an existing or future transfer station, or incorporate a transfer station operation to achieve efficiencies in material transport.

A variety of public/private scenarios for MRF construction/ownership/operation are possible. These include fully public, fully private, and different combinations of public/private such as public construction/ownership on land owned by the County or a jurisdiction with private operation; public construction on public land with joint venture ownership and private operation; and private construction on public land with public ownership/operation.

TARGETED MATERIALS: Residential refuse, commercial refuse, yard waste, newspapers, cardboard, magazines, office paper (white and colored), scrap paper, glass containers, tin cans, aluminum cans, and scrap metals.

COMMENTS: Private sector materials processing operations, in combination with the proposed multi-functional MRF, or some variation of it, would assist the County to implement the overall policy of processing (for reduction, reuse, or recycling) all waste generated in the County prior to disposal.

CATEGORY: Landfill

TITLE: Site, permit, and develop a new MSW landfill in Sonoma County.

The County would elect to site, permit, and develop a new Class III landfill in Sonoma County. The facility would be sited, designed, constructed, operated, and closed under guidelines established in the Sonoma County Solid Waste Siting Element, California Environmental Quality Act (CEQA), County land use policy, and regulatory requirements of CCR Title 27 and Subtitle D. The landfill would provide a long-term disposal site for MSW generated in Sonoma County.

MAJOR FEATURES AND CHARACTERISTICS: Site design and operation features would include measures for slope protection and erosion control; hazardous materials exclusion (load-checking); surface and groundwater quality protection and monitoring; and landfill gas (LFG) control. Refuse cells will be sequentially excavated and constructed with engineered base liners and a Leachate Collection and Recovery System (LCRS) prior to waste placement. Ancillary features to be constructed could include storm water detention basins, leachate treatment or recirculation facilities, an entrance facility and scale house, office building, maintenance building, and an LFG extraction system and blower/flare station. Depending on economics, an LFG-to-energy facility would be constructed for electrical power generation, or conversion of LFG to vehicle fuel/pipeline gas.

Daily site operations would include soil excavation and waste placement. Excavated soils would be used for road construction, liner placement, and daily, intermediate, and final cover. Development of the landfill would be phased so that only portions of the site would be disturbed at any one time.

It is expected that site operations will include future landfill management strategies, including the "bioreactor" technology. This is achieved through controlled additions of liquid and leachate recirculation in lined cells. Liquid recirculation enhances biodegradation and waste decomposition processes. By accelerating waste decomposition, filled cells settle more rapidly and can create additional airspace. Long-term water quality and LFG monitoring and maintenance liabilities can also be reduced. Although the bioreactor technology is not currently common practice in California, it is receiving increasing attention and support from regulatory agencies and the waste industry.

When landfill operations reach permitted final elevations, the site will be formally closed in accordance with state and federal regulatory standards. Closure activities will generally entail final grading, placement of final cover and drainage systems, revegetation of site surfaces, and decommissioning of ancillary structures. Air, water quality, and LFG environmental monitoring programs would be implemented throughout the landfill post-closure period.

Options for this alternative include public ownership and operation, private ownership and operation, or a combination of public/private ownership/operation.

TARGET MATERIALS: The landfill would be permitted to accept between 460,000 to 575,000 tons per year of MSW (non-recyclable residential, commercial, and industrial wastes, construction and demolition debris, inert materials, agricultural/green waste, and street sweepings). Liquids, medical wastes, radioactive materials, and hazardous wastes would not be permitted for disposal. To provide a minimum 35-year site life, the landfill would be sited/designed for an ultimate capacity of 16 to 20 million tons of MSW.

CATEGORY: Landfill

TITLE: Implement operational alternatives to extend life of Central Landfill.

MAJOR FEATURES AND CHARACTERISTICS: The County would implement various operational alternatives, including expansion of the Central Landfill (beyond the currently permitted fill area and height), to extend site life beyond year 2015. Per the approved County Siting Element, expansion would entail development of a new fill area in the "West Canyon," relocation of existing facilities (LFG-to-energy plant and administrative building), and revision of the maximum fill height to approximately 720 feet MSL. Landfill expansion would be in accordance with the Sonoma County Solid Waste Siting Element, California Environmental Quality Act (CEQA), and regulatory requirements of CCR Title 27 and Subtitle D.

Existing provisions and infrastructure for surface and groundwater quality protection and monitoring, LFG control, and air quality protection and monitoring would be maintained and upgraded, as necessary, to comply with site permits and regulations. Expansion areas would be constructed with an LCRS prior to waste placement. The LFG emissions/migration control system would be expanded into new waste cells. Depending on market conditions, existing LFG-to-energy operations could be enhanced with additional gas generation.

To extend existing permitted site life, day-to-day operational changes could include use of alternative daily cover materials (ADCs), implementation of a bioreactor technology in lined cell areas, dedication of select areas for balefill, or landfill mining for airspace recovery.

TARGET MATERIALS: The Countywide disposal rate is estimated to range between 460,000 to 575,000 tons of MSW per year (non-recyclable residential, commercial and industrial wastes, C&D debris, inert materials, agricultural/green waste, and street sweepings).

CATEGORY: Landfill

TITLE: Secure out-of-County disposal capacity at an existing or planned/proposed landfill.

The County would identify candidate sites and negotiate disposal capacity at one or more existing or proposed private or publicly owned Class III landfill sites located outside of Sonoma County. At a minimum, the landfill operations would employ environmental protection

standards embodied in Subtitle D and CCR Title 27 regulations (or the equivalent of CCR Title 27 for out-of-state facilities).

MAJOR FEATURES AND CHARACTERISTICS: Site operation features would include measures for surface and groundwater quality protection and monitoring; LFG control; and air quality protection and monitoring. At a minimum, these measures would include engineered base liners, an LCRS, and an LFG emissions/migration control system. Favorable consideration would be given to sites employing landfill management strategies such as bioreactor technology and LFG-to-energy recovery.

TARGET MATERIALS: It would be necessary to secure adequate capacity for disposal of 460,000 to 575,000 tons of MSW per year (non-recyclable residential, commercial and industrial wastes, construction and demolition debris, inert materials, agricultural/green waste, and street sweepings).

COMMENTS: This alternative would likely require expansion of existing in-county transfer stations (to accommodate truck and/or rail transfer) and/or siting, permitting, and development of new transfer/MRF sites in Sonoma County.

SECTION 4

ALTERNATIVES EVALUATION AND SELECTION

SCREENING AND EVALUATION CRITERIA

The pool of alternatives identified for possible inclusion in the preferred solid waste management strategy was large and diverse. Therefore, in order to decide which ones to include and exclude, evaluation criteria that encompass a range of perspectives (environmental, financial, political, institutional, and technical) were needed. To insure a thorough alternatives review, a two-step evaluation process was used, similar to the one used in the County's Solid Waste Siting Element (1996).

The first step screened out alternatives that were clearly not relevant or applicable to conditions in Sonoma County. The second evaluation step was a more rigorously detailed and analytic examination of the comparative features, advantages/disadvantages, and impacts of the remaining options.

County staff and LTF members recommended that SCS use the County's Siting Element as a starting point for defining a method to evaluate the variety of disposal and diversion options. The Siting Element deals partly with criteria for identifying additional disposal capacity to meet projected County waste management needs. The criteria reflect and promote basic principles for solid waste management in the County. Among others, the Siting Element notes the following guiding principles:

- The County will maximize the disposal capacity of its solid waste disposal facilities through waste prevention (source reduction), reuse, composting, and recycling.

- The County's solid waste disposal facilities will be sited and operated in a manner to minimize energy use, conserve natural and financial resources, and protect prime agricultural lands and other environmentally sensitive or culturally sensitive areas.

- The County and/or the cities shall put into policy the long-standing practice in the County of permitting only public ownership of solid waste disposal facilities located in the County which accept any segment of the municipal waste stream.

These three guidelines are significant for what they state and for what they imply. First, a close connection between disposal and diversion is proposed. Disposal facilities are viewed as public resources whose long-term utility should be a priority. Diversion programs and measures help to extend the useful life of disposal sites/operations. Second, environmental and cultural values can be reasons for eliminating an otherwise technically sound site or area from being considered as a location for a new disposal facility or expansion of an existing one. Third, it is emphasized that an in-county disposal facility handling self-haul and commercial MSW, as opposed to one that,

for example, accepts only waste from commercial haulers, should be owned by a public entity or agency. This guideline indicates the importance of a strong County role in waste management to balance the historic prevalence of private sector provision of both disposal and diversion services. Such a role is currently embodied in the County's ownership and operation of the Central Landfill.

However, the landfill is scheduled to close in 2015. A basic question, then, is whether County ownership and/or operation are critical criteria for securing future disposal capacity. This possibility becomes more problematic when out-of-county sites are under review because such facilities would typically be owned/operated either by a private company or a public entity other than Sonoma County.

It is likely that the only way to maintain County ownership and/or operation of future disposal capacity is to locate that capacity in the County. If this proves to be politically or environmentally unacceptable, the question changes to identifying the most viable way to maintain a strong County role in waste management which is equivalent to owning/operating a landfill for the County's municipal solid waste. More fundamentally, does closure of the Central Landfill mean that such a role is no longer necessary, or should the County shift from the disposal arena to the diversion arena?

The Siting Element performs an evaluation of several disposal capacity options, and expresses that evaluation in terms of "advantages" and "disadvantages" associated with each option (Table C-1 of the Siting Element is included as Appendix A). Examining how those advantages and disadvantages are stated reveals more specific priorities that act as criteria in evaluating options. The positive features or advantages of a disposal alternative include the following:

- Reduces vulnerability to changes in operating/regulatory requirements.
- Is convenient for self-haulers and private haulers to access.
- Does not withdraw resources from waste reduction/recycling programs.
- Supports the AB 939 integrated waste management hierarchy of waste prevention, recycling, and composting.
- Offers local employment opportunities.

The negative features or disadvantages of a disposal alternative are as follows:

- Reduces revenues to the County.
- Increases environmental impacts due to physical or operational characteristics.
- Acts as a disincentive to the reduce/reuse/recycle ethic.
- Creates an oversupply of disposal capacity, thereby undermining diversion efforts.
- Results in a loss of local control.
- Increases costs.
- Is risky because it relies on an unproven technology.

Preliminary Screening

Each of the alternatives was initially assessed using the ten preliminary screening criteria listed in Table 8. Relevant comments, data, and information were recorded on an evaluation form. In addition, the alternative received a quantitative "point" rating of 3, 2, or 1 on each criterion. A rating of 3 meant that the answer to the question posed by the criteria was "strongly yes," while a rating of 1 meant that the answer was "strongly no." A rating of 2 was reserved for those cases for which there was not a definitively clear "yes" or "no" response. Therefore, the evaluation combined qualitative and quantitative elements. The highest numerical rating an alternative could receive was 30 points, and the lowest rating an alternative could receive was 10 points. Following completion of the ratings, the alternatives were screened for groupings or clustering to determine which alternatives would be subject to further evaluation, and which would be eliminated from further evaluation.

The results of the preliminary screening are presented in Table 9. As indicated, the scoring ranged from a high of 27 points, to a low of 19. From this process, certain alternatives were eliminated from further evaluation. The alternatives that were eliminated, and the reasons for their elimination, are indicated below:

- MSW Combustion - Not considered a part of Sonoma County future solid waste system.
- Thermal Transformation - Considered too risky and not well proven.
- MSW Composting - Existing facilities produce an end-product that was not considered useful or valuable.

Although eliminated from further consideration in this process, the LTF indicated that both thermal transformation and MSW composting should be kept on a "watch list" for future consideration, if these technologies are further refined and improved.

Evaluation and Selection

Once the original list of alternatives was narrowed down, the second assessment compared and contrasted in greater detail the relative characteristics, advantages/disadvantages, and impacts of the remaining alternatives. The analytic categories and selection criteria for the second assessment phase of the overall evaluation methodology included:

- Estimated initial capital costs - Examples are expenses for land, buildings, equipment, infrastructure, and access roads.
- Estimated annual operating costs - Examples are expenses for personnel, fuel, operation and maintenance, administration, and promotion/education.
- Estimated annual cost per ton - Based on the projected quantities of material that the alternative is intended to manage.

Table 8. Preliminary Screening Criteria

NO.	PRELIMINARY SCREENING CRITERIA	DESCRIPTION
1	Operating History	• Does the alternative have a reliable performance record in managing portions of the municipal solid waste stream, or is it reasonable to expect the alternative will establish such a record during the period 2000 to 2015 based on its current status? The alternative should have a reliable performance record, or it should be determined that commercial scale implementation will likely be achieved by 2015 to receive a rating of 3.
2	Siting Element Exclusionary Standards	• Is the site, facility, or technology consistent with the guidelines and standards contained in the exclusionary criteria identified in the Sonoma County Solid Waste Siting Element? The site, facility, or technology should not violate any of the Siting Element's exclusionary criteria to receive a rating of 3.
3	Wastestream Applicability	• Does the alternative dispose of, transform, reuse, reduce, recycle, or otherwise handle, manage and/or divert a quantity of waste that projections indicate will be a substantial amount (measured either by weight or volume) of the total wastestream for the planning period of 2015 to 2050? The alternative should be applicable to the total municipal solid waste stream or a large component of it to receive a rating of 3.
4	Relevance to Solid Waste Management System	• Does the alternative replace an element of the County's solid waste management system that will not be viable by 2015 or that the local conditions research has demonstrated either does not exist or is operating below expectations? The alternative should perform major functions in the solid waste system rather than making minor modifications to programs, sites, or facilities that will, based on the best available information, carry on into the 2015 to 2050 planning period to receive a rating of 3.
5	Consistency with AB 939 Waste Management Hierarchy	Will implementation of the alternative promote consistency between the County's solid waste management priorities and the AB 939 hierarchy of waste management practices? The alternative should not cause the County's priorities to be inconsistent with the AB 939 hierarchy to receive a rating of 3.

Table 8. Preliminary Screening Criteria (continued)

NO.	PRELIMINARY SCREENING CRITERIA	KEY QUESTIONS
6	Distribution of Economic Benefits and Impacts	• Does the alternative have the potential for creating and maintaining employment opportunities for Sonoma County residents or generating growth opportunities for Sonoma County businesses, industries, and entrepreneurs? The alternative should maintain local employment and/or growth opportunities to receive a rating of 3.
7	Environmental Consequences	• On a general level, are the negative environmental impacts associated with the alternative localized, of short duration, and concentrated on one or two factors? Negative environmental impacts should be minimal, short-term, and limited to receive a rating of 3.
8	Role of Public Sector Entities	• Does the option maintain the authority of the County, the jurisdictions, the Sonoma County Waste Management Agency (SCWMA), or other similar public institutions, political units, or governmental bodies over the solid waste management system in the County? The option should provide for continuing public sector control over the County's solid waste management system to receive a rating of 3.
9	Regulatory Liability and Exposure	• If there are regulatory impacts or risks (financial, legal, policy, others) as a result of implementing a proposed site, facility, or program, can they be controlled and managed with the resources and staff expertise of the County, the jurisdictions, the SCWMA, or other public entities? Risk exposure should be minimized to receive a rating of 3.
10	Disposal Needs and Obligations	• Based on the best available information, will the alternative assist the County in meeting its projected disposal needs for the planning period of 2015 to 2050? The alternative must be capable of meeting the County's disposal needs for the entire planning period, based on the best available information, to receive a rating of 3.

Table 9. Preliminary Screening Rating Summary

ALTERNATIVE	CRITERIA										
	Operating History	Siting Element Exclusionary Standards	Wastestream Applicability	Relevance to Solid Waste Management System	Consistency with AB 939 Waste Management Hierarchy	Distribution of Economic Benefits and Impacts	Environmental Consequences	Role of Public Sector Entities	Regulatory Exposure and Liability	Disposal Needs and Obligations	TOTAL *
New Landfill in County	3	3	3	3	2	3	2	3	2	3	27
Mandatory Recycling (NEW)	2	3	3	3	3	3	3	3	2	3	27
Mandatory Service	3	3	3	3	3	3	3	3	3	3	26
Flow Control	2	2	3	3	3	2	3	3	2	3	26
Process All Waste	2	2	3	3	3	3	3	3	2	3	26
Centralized MRF	3	3	3	3	3	3	2	3	3	2	26
Extend Life of Central Landfill	3	3	3	2	2	2	2	3	3	2	25
MSW Composting	2	3	3	3	3	3	2	3	2	2	25
Anaerobic Digestion	2	2	2	3	2	3	3	3	2	2	23
Biorefining	2	2	2	2	2	2	2	3	2	2	22
Out of County Landfill	3	2	3	3	2	1	2	1	2	3	21
Thermal Transformation	2	2	2	2	2	2	2	2	1	2	20
MSW Combustion	2	2	2	2	1	2	1	2	1	2	19

* Calculated average of the totals from the individual ratings.

- Facility siting, design, permitting, and construction requirements - Legal, regulatory, environmental, planning, and decision-making procedures necessary for facility/program/policy approval.

- Ownership/operation responsibilities - Potential public/private sector arrangements for providing the expertise and resources needed to implement the alternative.

- Environmental impacts - The established or probable environmental impacts resulting from implementation of the alternative on such factors as energy production or utilization, resource conservation, waste volume reduction or elimination, toxic air or water emissions, greenhouse gas emissions, particulate emissions, land use, and community/neighborhood aesthetics.

- Implementation considerations and impacts - What roles the different stakeholders and involved parties would perform in developing the proposed facility, program, or policy, and what consequences these activities are likely to have on the various entities.

Each of the technology and landfill alternatives that passed the preliminary screening criteria was evaluated further using the selection criteria and categories listed above. The results of this analysis are presented in Table 10. Following the review and discussion of the technology and landfill alternatives, the policy and program options were evaluated for integration with the management alternatives. The analysis concluded with recommendations and supporting rationale regarding which alternatives were determined to be the priority selections for combining into the long-term, integrated waste management strategy.

It is important to note that the costs indicated for the landfill alternatives and technology alternatives may not be readily comparable. For example, operating costs for landfills typically may include more than the actual landfill operations, such as subsidies for other program costs. True costs may actually be less than the $35 per ton indicated. Similarly, the costs for the emerging technologies are reported costs from a variety of different sources. Also, for two of the technologies, there is only one facility in North America, and since it is not yet operational, the quoted costs may not be reliable. For some, it is difficult to distinguish at this time what is included and what is not included in these costs, such as processing, transfer, investment costs, subsidies, etc. Costs for the landfill and alternative technologies may also not reflect the revenues from gas production or other energy revenues.

Table 10. Evaluation of Alternatives

MANAGEMENT ALTERNATIVE	Capital Costs	Operating Costs (Annual)	Cost Per Ton	Siting, Design, Permitting and Construction Requirements
ANAEROBIC DIGESTION .	Generic Costs One source cites $260 - $280 per one-ton per year capacity, but said to be rapidly dropping Capital costs are 20% to 50% higher than for aerobic composting. However, net cost per ton are comparable to aerobic composting due to energy revenue. .	Not Available	Generic Cost $35 - $40/ton All tipping fees are very project specific, including consideration of scale, land costs, labor rates, specific feedstock received, financing methods, etc. Larger scale facilities, above 100,000 tpy are reported to potentially have lower tipping fees in the range of $30/ton.	A comprehensive siting study to identify a preferred location could be conducted by either County or vendor. Permit requirements include: Solid waste facility permit Local building and construction permits Land use permit and/or conditional use permit Regional air quality permits Fire, health and business permits and licenses May require a CA composting permit (a tiered permit depending on feedstock processed).
Case Example: CCI organic waste processing facility in Newmarket, Ontario[1]	*$18 - $20 million for 150,000 tpy capacity* *$120 - $133 per one-ton per year capacity*	*$16 - $20/ton*	*$37/ton*	
Case Example: Pinnacle Biotechnology, based on Stanton, CA pilot facility[2]	*$8 - $9 million for 73,000 tpy facility $110 - $125 per one-ton per year capacity.*	*Not Available*	*Not Available*	
BIOREFINING	Not Available	Not Available	All tipping fees are very project specific, including consideration of scale, land costs, labor rates, specific feedstock received, financing methods, etc.	A comprehensive siting study to identify a preferred location could be conducted by either County or vendor. Permit requirements include: Solid waste facility permit Local building and construction permits Land use review Regional air quality permits Fire, health and business permits and licenses
Case Example: Masada Resource Group integrated biorefining and recycling system and facility in Middletown, NY.[3]	*$150 million for 230,000 tpy capacity.* *$650 per one-ton per year capacity*	*Not Available* *However, plant will employ 200 workers*	*$65/ton tip fee will be paid by participating municipalities to the City of Middleton*	
Case Example: Arkenol, Inc.[4]	*$76 million for 260,000 tpy capacity* *$292 per one-ton per year capacity*	*$45/ton* *$11.7 million for 260,000 tpy*	*$30/ton tip fee (Assumes selling price of $1.62 per gallon for ethanol)*	

Table 10. Evaluation of Alternatives

MANAGEMENT ALTERNATIVE	Capital Costs	Operating Costs (Annual)	Cost Per Ton	Siting, Design, Permitting and Construction Requirements
ORGANIC (AEROBIC) COMPOSTING	Not Available	Not Available	Generic Cost[6] All tipping fees are very project specific, including consideration of scale, land costs, labor rates, specific feedstock received, financing methods, etc. $20 - 50/ton tipping fee for food waste processing	In addition to the requirements for anaerobic composting, aerobic composting will require a CA composting permit (a tiered permit depending on the type of feedstock processed). Mixed organics, including food waste, require the highest level permit and environmental controls.
Case Example: Guelph, Ontario integrated wet/dry collection and processing system[5]	*$16 million for 125,000 tpy capacity.* *$130 per one-ton per year capacity*	*Net processing cost (1998): Dry: $50/ton; Wet: $46/ton* *Material revenue (1998) Dry (average): $67/ton; Wet: $18/ton*	*$25/ton tipping fee.*	

Table 10. Evaluation of Alternatives

MANAGEMENT ALTERNATIVE	Ownership/Operation Responsibilities	Environmental Impacts	Implementation Considerations and Impacts
ANAEROBIC DIGESTION	Options include: 1. County owned and private contract operated 2. Private owned and operated Since these are proprietary and only-recently implemented technologies (for MSW), County operation does not seem feasible.	Produces less greenhouse gas emissions than landfilling, open composting, or incineration. Controls toxic emissions in comparison to landfilling or open composting. Methane can be used as an energy source. Potential environmental impacts at MSW processing facilities to evaluate as part of CEQA include: • Water quality • Air quality and odors • Biological and cultural resources • Public safety • Noise • Traffic	May also incorporate sewage sludge and/or grape pomace. May require revision to JPA agreement to ensure sufficient waste flow and funding mechanism. Supporting policy could include flow control. A critical factor is the developing maturity of the technology for MSW. Sonoma County may wish to work cooperatively with the CIWMB in ongoing technology assessment. A potential policy approach would be to identify the County's intention to procure a technology when it has demonstrated a reasonable track record, as defined by X years of commercial-scale implementation in N. America. The CIWMB should be challenged to incorporate the technology into the solid waste hierarchy in recognition of its environmental values.
BIOREFINING	Options include: 1. County owned and private contract operated 2. Private owned and operated Since these are proprietary and only-recently implemented technologies (for MSW), County operation does not seem feasible	Reduces greenhouse gas emissions over landfilling, open composting, or incineration. Controls toxic and NOX emissions in comparison to landfilling or open composting. Ethanol can be used as a fuel or as an anti-knock additive to gasoline to replace lead and MTBE. Potential environmental impacts at MSW processing facilities to evaluate as part of CEQA include: • Water quality • Air quality and odors • Biological and cultural resources • Public safety • Noise • Traffic	May also incorporate sewage sludge and/or grape pomace. May require revision to JP agreement to ensure sufficient waste flow and funding mechanism. Supporting policy could include flow control. A critical factor is the developing maturity of the technology for MSW. Sonoma County may wish to work cooperatively with the CIWMB in ongoing technology assessment. A potential policy approach would be to identify the County's intention to procure a technology when it has demonstrated a reasonable track record, as defined by X years of commercial-scale implementation in N. America. The CIWMB should be challenged to explicitly incorporate the technology into the solid waste hierarchy in recognition of its environmental values

Table 10. Evaluation of Alternatives

MANAGEMENT ALTERNATIVE	Ownership/Operation Responsibilities	Environmental Impacts	Implementation Considerations and Impacts
ORGANIC (AEROBIC) COMPOSTING	Options include: 1. County owned and private contract operated 2. Private owned and operated 3. County owned and operated.	Odor can be a problem. Composting is a net energy consumer, since it utilizes process energy and generates no usable energy itself. Hazardous materials in the feedstock are not degraded. Composting generates somewhat less global warming gases than landfilling and approximately the same as incineration. Potential environmental impacts at MSW processing facilities to evaluate as part of CEQA include: • Water quality • Air quality and odors • Biological and cultural resources • Public safety • Noise • Traffic	May require revision to JP agreement to ensure sufficient waste flow and funding mechanism. Supporting policy could include flow control. The main challenge is to develop an integrated collection/processing system that cost-effectively delivers a clean organics stream. This may require wholesale revamping of recyclables and trash collection in the county.

Table 10. Evaluation of Alternatives

MANAGEMENT ALTERNATIVE	Capital Costs	Operating Costs (Annual)	Cost Per Ton	Siting, Design, Permitting and Construction Requirements
NEW LANDFILL IN SONOMA COUNTY	New cell construction costs = $125,000 to $175,000 per acre. Closure construction costs = $100,000 to $120,000 per acre. (30 to 35 years out) Above costs exclude land acquisition costs. New landfill development will likely require purchase/condemnation of several hundred acres. Above costs are industry averages and exclude environmental review, permitting and post-closure maintenance.	Daily operations costs estimated between $5-$15/ton (for waste placement, compaction and cover only). Excludes environmental monitoring/control system costs. Annual costs could range from $2.8 million (@ 460,000 tons/yr) to $8.6 million (@ 575,000 tons/yr)	March 2000 average for all CA landfills with intake >1,000 tpd) = $35/ton Cost above excludes waste processing or transfer. Current tipping fee at Central Landfill is $45.20/ton (includes costs for non-landfill programs undertaken by the County).	Comprehensive siting study to identify preferred location(s) Preliminary site characterization (site constraints analysis, hydrogeologic investigation, geotechnical study, cultural and biological resource assessments) CEQA evaluation (comprehensive EIR) Detailed site characterization for design Permit Documents: Joint Technical Document (design and operating standards, closure/post-closure plan) Permit Requirements: Solid Waste Facility Permit; Land Use/CUP; Waste Discharge Requirements. Design and construction features will include engineered base liners; leachate collection, treatment and/or recirculation systems; and LFG control/energy recovery.
OUT OF COUNTY LANDFILL	Not Applicable	Not Applicable	March 2000 average for all CA landfills with intake >1000 tpd = $35/Ton. Cost excludes waste processing or transfer. Tip fee could be higher or lower depending on contractual arrangements with owner/operator	Siting, design, permitting, and construction would be responsibility of others. County may be required to conduct CEQA evaluation of impacts related to long-haul disposal

Table 10. Evaluation of Alternatives

MANAGEMENT ALTERNATIVE	Capital Costs	Operating Costs (Annual)	Cost Per Ton	Siting, Design, Permitting and Construction Requirements
EXTEND LIFE OF CENTRAL LANDFILL (Vertical expansion + expansion into "west" canyon)	New cell construction costs not available at this time, but should be comparable to recent bids for new cell construction at Central. Closure construction costs = $100,000 to $120,000 per acre. Above costs exclude land acquisition, environmental review, permitting and post- closure maintenance.	Daily operations costs estimated between $5-$15/ton (for waste placement, compaction and cover only). Annual costs could range from $2.8 million (@ 460,000 tons/yr) to $8.6 million (@ 575,000 tons/yr)	Current tipping fee at Central Landfill is $45.20/ton (includes costs for non-landfill programs undertaken by the County).	Preliminary site characterization for "west canyon" property (site constraints analysis, hydrogeologic investigation, geotechnical study, cultural and biological resource assessments) CEQA evaluation (comprehensive EIR) Detailed site characterization for design Permit Documents: Joint Technical Document (design and operating standards, closure/post-closure plan) and revision to existing Waste Discharge Requirements and Solid Waste Facilities Permit Design and construction features will include engineered base liners; leachate collection, treatment and/or recirculation systems; and LFG control/energy recovery.
CENTRALIZED MRF	Site development and construction cost estimated at $15,000,000 to $25,000,000 (for facility input of 1,300 to 1,600 tpd) Above costs are industry averages and exclude land acquisition and environmental review.	Daily operations costs estimated between $20-$30/ton (for waste processing only, excludes debt service). Annual operating costs could range from $9.2 million (@ 460,000 tons/yr) to $17.3 million (@ 575,000 tons/yr)	$41 / ton (March, 2000 average for all CA TS/MRFs with intake >1000 tpd). Range of costs expected between $35 – $50 /ton. Costs exclude disposal fee for residuals.	Comprehensive siting study to identify preferred location(s) Preliminary site characterization (site constraints analysis, including geotechnical study) CEQA evaluation (comprehensive EIR) Detailed site characterization for design Permit Documents: Report of Site Information Permit Requirements: Solid Waste Facility Permit; Land Use/CUP; Local Building and Construction Permits; Fire Permit; Health Permit; and Business License.

Table 10. Evaluation of Alternatives

MANAGEMENT ALTERNATIVE	Ownership/Operation Responsibilities	Environmental Impacts	Implementation Considerations and Impacts
NEW LANDFILL IN SONOMA COUNTY	Options include: 1. County own and operate 2. Private own and operate 3. County own and private operate	Site will be designed, constructed and operated to minimize environmental impacts. Potential environmental impacts at landfill sites which would be evaluated as part of CEQA would include those to: • Water quality • Air quality and odors • Biological and cultural resources • Public safety • Noise • Traffic • Aesthetics/visual	May require revision to JPA agreement(s) to ensure sufficient waste flow and funding mechanisms. Supporting policy could include flow control. Depending on site location, may require delivery and pre-processing at MRF or transfer station. Depending on haul distance, may require revisions to collection practices or franchise agreements.
OUT OF COUNTY LANDFILL	Private own and operate	Potential environmental impacts would be related to long-haul from MRF/transfer stations in Sonoma County and could include: • Air quality • Traffic	May require revision to JPA agreement(s) to ensure sufficient waste flow. Supporting policy could include flow control. Will require delivery and pre-processing at MRF(s) or transfer station(s). Depending on haul distance to MRF/TS, may require revisions to collection practices or franchise agreements. Implementation steps: • Research to identify potential out-of-county sites and long-term capacity. • Issue RFP, RFB or negotiate for disposal capacity. • Perform environmental, financial and legal due diligence for candidate or selected site(s) • Parties enter into long-term disposal agreement.

Table 10. Evaluation of Alternatives

MANAGEMENT ALTERNATIVE	Ownership/Operation Responsibilities	Environmental Impacts	Implementation Considerations and Impacts
EXTEND LIFE OF CENTRAL LANDFILL (Vertical expansion + expansion into "west" canyon)	Options include: 1. County own and operate 2. County own and private operate	Expansion will be designed, constructed and operated to minimize environmental impacts. Potential environmental impacts at landfill sites which would be evaluated as part of CEQA could include those to: • Water quality • Air quality and odors • Biological and cultural resources • Public safety • Noise • Traffic • Aesthetics/Visual	No significant departure(s) from current practices and policies expected in the medium term. Expansion alternative may not meet long-term disposal needs unless significant capacity is available via development onto adjacent properties not presently owned by the County. Siting studies as described above for new landfill site would be required.

Table 10. Evaluation of Alternatives

CENTRALIZED MRF	Options include: 1. County own and operate. 2. Private own and operate 3. Public/private construction and ownership: • County-own land, private construction and operation • County-own land, J/V construction and operation • County-own land, private construction with County operation.	Facility will be designed, constructed and operated to minimize environmental impacts. Potential environmental impacts at MRFs and to be evaluated as part of CEQA could include those to: • Water quality • Air quality and odors • Biological and cultural resources • Public safety • Noise • Traffic	May require revision to JPA agreement(s) to ensure sufficient waste flow and funding mechanisms. Supporting policy could include flow control. Depending on haul distance to MRF, may require revisions to collection practices or franchise agreements.

SECTION 5

SOLID WASTE MANAGEMENT STRATEGY

At this point in the process of developing a long-term solid waste management strategy for Sonoma County, the individual alternatives had each been evaluated twice: the preliminary screening analysis, and the final evaluation. Through this two-step process, alternatives were either eliminated from further review or were selected to remain in the study for possible incorporation into the final strategy.

STRATEGY DEVELOPMENT

The remaining disposal and processing technology alternatives, and supportive policies and programs, were then combined in different ways to produce a variety of comprehensive scenarios for managing the County's wastestream during the period 2015 to 2050. The scenarios varied considerably in key areas:

- The magnitude and types of changes to the current waste management system in the County.
- The relative emphasis on generator source separation versus material processing technologies for handling and preparation of recyclables.
- The level of control exercised by the County and the cities over the environmental and cost impacts of disposal.
- The use of special technologies for processing the organic portion of the wastestream (not including yard waste) into a useful product.
- The use of a new facility (or facilities), in addition to current private operations, for processing recyclables according to end user specifications.

A total of nine scenarios were developed and are presented in Table 11. The scenarios are identified across the top of the page with a letter (A through E), and some have sub-variations (i.e., A-1 and A-2). A short description of each scenario is included that highlights the main features of that scenario. The alternatives that constitute each scenario are indicated along the left side, with check marks indicating if they are included in that particular scenario. Finally, specific comments, advantages, and disadvantages are presented for each scenario.

It is emphasized that all the scenarios share a baseline assumption: by 2015, the combination of existing and planned diversion programs will have reduced the disposed wastestream by 50%. Thus, the scenarios all target the remaining 50% of the wastestream, and additional diversion proposed by a given scenario also targets the same remaining 50% of the wastestream.

Table 11. Solid Waste and Materials Management Scenarios for 2015-2050

Note: All scenarios assume existing County programs will be diverting 50% of waste stream by 2015 and thereafter. All scenarios address remaining 50% of waste stream.

SCENARIO		A-1	A-2	B-1	B-2	C-1[1]	C-2[1]	D	E-1	E-2
DESCRIPTION		▸ Existing and/or new transfer stations used to consolidate waste ▸ Out-of-County landfill	▸ County establishes formal flow control policy with Cities ▸ Additional diversion accomplished through one or more MRFs ▸ Out-of-County landfill	▸ Flow control policy adopted ▸ Expand capacity of Central Landfill for use 2015 to 2035 ▸ Out-of-County landfill following closure of Central Landfill	▸ No formal flow control policy ▸ Expand capacity of Central Landfill for use 2015 to 2035 ▸ New in-County landfill developed while existing Central Landfill operates	▸ Formal policies for flow control and mandatory recycling for commercial, industrial, institutional generators ▸ Collection/processing system for organics ▸ Expand capacity of Central Landfill for use 2015-2050	▸ Formal policy to process all waste, including mixed refuse, for materials recovery/waste reduction ▸ Additional diversion through one or more MRFs and organics collection/processing system ▸ Expand capacity of Central Landfill for use 2015-2050	▸ Use existing and/or new transfer stations ▸ New in-County landfill	▸ Formal policies for flow control and mandatory recycling for commercial, industrial, institutional generators ▸ Collection/processing system for organics ▸ New in-County landfill	▸ Formal policy to process all waste, including mixed refuse, for materials recovery/waste reduction ▸ Additional diversion through one or more MRFs and organics collection/processing system ▸ New in-County landfill
COST PER TON (for comparison only)		$ 54	$ 41 - 47	$ 36	$ 32	$ 34	$ 62	$ 32	$ 36	$ 63
RECYCLING RATE		50%	54%	50%	50%	68%	80%	50%	68%	80%
SUPPORTING POLICIES / PROGRAMS	Process All Waste						✓			✓
	Flow Control		✓	✓		✓	✓		✓	✓
	Mandatory Source Separation of Recyclables (Commercial, Industrial, and Institutional)					✓			✓	
	Wet / Dry Collection					✓			✓	
PROCESSING TECHNOLOGIES	MRF - Material Recovery Facility(ies)[1]		✓				✓			✓
	Organics[2]					✓	✓		✓	✓
DISPOSAL	Out-of-County Landfill	✓	✓	✓						
	Expand Capacity of Central Landfill			✓	✓	✓	✓			
	New In-County Landfill				✓			✓	✓	✓
COMMENTS		▸ County will continue to operate transfer stations and will negotiate for out-of-county disposal of material delivered to County facilities. ▸ Cities will have opportunity to use County transfer stations or pursue their own disposal options. ▸ Out-of-County price escalation outside of direct County control.	▸ County negotiates long-term disposal agreement for County and Cities. ▸ MRF could incorporate functions such as processing of recyclables, yard waste, and C&D debris, appliance recycling, and Recyclatown. ▸ Out-of-County price escalation outside of direct County control.	▸ Optimize Out-of-County disposal with Central operations.	▸ Consistent with CoIWMP adopted April 1996. ▸ Jurisdictional cooperation essential to success of option.	▸ Generators more responsible for diversion, in accordance with current philosophy.	▸ "Process all waste" policy requires MRF capability to recover and process recyclables from wastestream. ▸ Increased diversion through processing.	▸ Existing waste management system, with a new in-County landfill to replace Central Landfill.	▸ Generators more responsible for diversion, in accordance with current philosophy.	- "Process all waste" policy requires MRF capability to recover and process recyclables from wastestream. - Increased diversion through processing.
ADVANTAGES		▸ May provide opportunity for lowest disposal costs. ▸ No new transportation infrastructure needed.	▸ May provide lower disposal costs, relative to A-1. ▸ No new transportation infrastructure needed. ▸ Recovery of any economically valid materials through MRF. ▸ Greater flexibility to divert materials, relative to A-1.	▸ Out-of-County price escalation outside of direct County control. ▸ Could be implemented in short-term. ▸ No new transportation infrastructure needed. ▸ Minimizes risks of price escalation with use of Central Landfill.	▸ No amendment to CoIWMP needed. ▸ More direct control over disposal costs for County and Cities. ▸ Minimizes risks of price escalation with use of Central Landfill.	▸ Diverts portion of wastestream (organics) previously disposed. ▸ Promotes citizen, business responsibility for recycling throughout County. ▸ Increased diversion allows longer use of Central Landfill. ▸ Avoids problems associated with out-of-county landfill or new in-county landfill. ▸ Strong private sector role in recyclables processing / marketing. ▸ Minimizes risks of price escalation with use of Central Landfill.	▸ Diverts portion of wastestream (organics) previously disposed. ▸ Maximizes recovery through "process all waste" policy. ▸ Increased diversion allows longer site life of Central Landfill. ▸ Avoids problems associated with out-of-county landfill or new, in-county landfill. ▸ MRF option creates opportunity for public/private partnership. ▸ Recovery of any economically valid materials through MRF. ▸ Minimizes risks of price escalation with use of Central Landfill. ▸ "Flow control" and "process all waste" policies assure sufficient flow of material to recovery facilities.	▸ No new transportation infrastructure needed. ▸ County only has one site to manage. ▸ Utilizes existing transfer station system, including tipping pad at Central. ▸ No major system changes. ▸ Maintains County / City responsibility for waste disposal. ▸ Greater control over disposal costs than use of out-of-county site.	▸ Diverts portion of wastestream (organics) previously disposed. ▸ Promotes citizen, business responsibility for recycling throughout County. ▸ Increased diversion allows longer use of new landfill. ▸ Strong private sector role in recyclables processing. ▸ Maintains County / City responsibility for waste disposal. ▸ Greater control over disposal costs than use of out-of-county site.	▸ Diverts portion of wastestream (organics) previously disposed. ▸ Maximizes recovery through "process all waste" policy. ▸ Increased diversion allows longer use of new landfill. ▸ Maintains County / City responsibility for waste disposal. ▸ MRF option creates opportunity for public/private partnership. ▸ Greater control over disposal costs than use of out-of-county site. ▸ "Flow control" and "process all waste" policies assure sufficient flow of material to recovery facilities. ▸ Recovery of any economically valid materials through MRF.
DISADVANTAGES		▸ Ability to divert additional materials is limited. ▸ Potential reduced revenue to support SCWMA-sponsored programs. ▸ Additional economic and environmental impacts from long-haul disposal. ▸ Risk of pollution liability at site(s) outside of County control. ▸ Inconsistent with County policy of local responsibility for waste management.	▸ Countywide adoption of flow control may be politically difficult. ▸ Potential reduced revenue to support SCWMA-sponsored programs. ▸ Siting new MRF could be a costly, lengthy and controversial process. ▸ Risk of pollution liability at site(s) outside of County control. ▸ Inconsistent with County policy of local responsibility for waste management.	▸ Countywide adoption of flow control may be politically difficult. ▸ Potential reduced revenue to support SCWMA-sponsored programs. ▸ Ability to divert additional materials is limited. ▸ Risk of pollution liability at sites outside of County control. ▸ Inconsistent with County policy of local responsibility for waste management. ▸ Extending Central Landfill operation and commitment to flow control by jurisdictions could encounter strong political opposition.	▸ Siting new in-County landfill could be a costly, lengthy and controversial process. ▸ New environmental and socio-political impacts. ▸ Without flow control, jurisdictions can have separate disposal arrangements, possibly undermining economics of new landfill. ▸ Extending Central Landfill operation and commitment to flow control by jurisdictions could encounter strong political opposition.	▸ Countywide adoption of flow control may be politically difficult. ▸ Mandatory policies may be politically unacceptable. ▸ Potential environmental impacts associated with handling, storing, siting and permitting organics facilities. ▸ Organics processing technologies do not have reliable, long-term operating history in comparison to other management methods. ▸ Extending Central Landfill operation and commitment to flow control by jurisdictions could encounter strong political opposition. ▸ Siting organics facility could be a costly, lengthy, and controversial process.	▸ Countywide adoption of flow control may be politically difficult. ▸ Siting new MRF and/or organics facility could be a costly, lengthy and controversial process. ▸ De-emphasizes citizen and business role in source separation recycling. ▸ Organics processing technologies do not have reliable, long-term operating history in comparison to other management methods. ▸ Potential recovery may not justify cost to process mixed refuse. ▸ Greater reliance on processing facilities. ▸ Extending Central Landfill operation and commitment to flow control by jurisdictions could encounter strong political opposition.	▸ Siting new in-County landfill could be a costly, lengthy and controversial process. ▸ Landfill capacity will be reached sooner than Scenarios E-1 and E-2. ▸ Competes with private sector disposal operators in other Counties. ▸ Without flow control, jurisdictions can have separate disposal arrangements, possibly undermining economics of new landfill. ▸ New environmental and socio-political impacts.	▸ Siting new in-County landfill and/or organics facility could be a costly, lengthy and controversial process. ▸ Countywide adoption of flow control may be politically difficult. ▸ Mandatory policies may be politically unacceptable. ▸ Competes with private sector disposal operators in other Counties. ▸ Organics processing technologies do not have reliable, long-term operating history in comparison to other management methods. ▸ Potential recovery may not justify cost to process mixed refuse. ▸ New environmental and socio-political impacts.	▸ Siting new MRF, landfill, and /or organics facility could be a costly, lengthy and controversial process. ▸ Countywide adoption of flow control may be politically difficult. ▸ De-emphasizes citizen and business role in source separation recycling. ▸ Competes with private sector disposal operators in other Counties. ▸ Organics processing technologies do not have reliable, long-term operating history in comparison to other management methods. ▸ Potential recovery may not justify cost to process mixed refuse. ▸ Greater reliance on processing facilities. ▸ New environmental and socio-political impacts.

[1] Could be one or several facilities, either operated publicly or privately, that process all or a significant portion of the wastestream.

[2] Organics Technologies includes anaerobic digestion, biorefining, and composting.

[3] It is projected that increased diversion will contribute to a longer site life for an expanded Central Landfill that covers the 2015-2050 planning period.

COST ANALYSIS

A cost model was developed for the project that incorporates the relative costs associated with each of the alternatives included in the nine scenarios. The model produces a cost projection for each scenario expressed in cost per ton. Key assumptions for each scenario were established that determined the data inputs for the cost model. The assumptions underlying each scenario were prepared based on a combination of technical research, practical experience, and industry interviews. It is believed the cost per ton figures represent a balanced, reasonable approach to defining the factors relevant to calculating a scenario's estimated cost. However, different assumptions will produce different cost projections. Examples of some of the assumptions are as follows:

- Tipping fees at an expanded Central Landfill, a new in-county landfill, and an out-of-county landfill.
- Transport/haul costs to in-county transfer stations, Central Landfill, a new in-county landfill, an out-of-county landfill, an organics processing site, and a centralized MRF.
- Costs for owning/operating a transfer station.
- Percentages of disposed waste hauled directly to a landfill versus percentage of disposed waste transferred through a transfer station(s).
- Round-trip distance to out-of-county disposal site.
- Long-haul transfer vehicle capacity.
- Average travel speed for transfer vehicle in and out of the County.
- Cost to operate standard refuse packer vehicle.
- Cost for MRF operation.
- Costs for wet/dry collection method.
- Costs for operating an organics processing site.
- Percentage of materials collected through wet/dry collection method.
- Percentage of materials directed to an organics processing site, and percentage of those materials that are processed into a usable product versus remaining as residue for disposal.

Some assumptions are specific to a given scenario--for example, the estimate of how much material will be sent through a MRF for processing, and the estimate of how much of that material will actually be recovered for recycling versus how much of it will be disposed as

residue. Other assumptions are common to all the scenarios. For example, the total quantity of wastes to be disposed (except for scenario B-1) is assumed to be 530,000 tons per year (tpy), or 1,450 tons per day (tpd). This is the average waste disposal rate over the entire 35-year planning period (2015 to 2050) for the Solid Waste Management Alternatives Project.

The results of the cost projections are summarized in Table 12. The cost model and related assumptions are included in Appendix B. It is intended that the cost estimates be viewed as important to the process of selecting a final scenario for implementation. However, costs are only one factor among the several criteria used by the LTF to evaluate the relative value of each scenario. The other criteria, including technical, institutional, and environmental considerations, were also evaluated in the earlier analysis of the individual alternatives and scenarios.

SCENARIO EVALUATION

The final stage of the analysis involved evaluation of the nine scenarios for relative risk (technological, environmental, and economic), cost per ton, diversion and disposal quantities, local control, and resource efficiency. The objective was to narrow down the selection to three preferred scenarios. This element of the process involved a vote by the LTF members, where each member was given three votes, and asked to select their top three scenarios.

The voting process resulted in three scenarios receiving a majority of the votes, with the remaining scenarios each receiving two or fewer votes. The three scenarios are summarized in Table 13. As indicated, they each contain flow control policy and organics processing technologies, and eliminated the option to send waste out of the County. The decision to not send wastes out of the County for disposal emphasized the commitment to be responsible for the waste generated/disposed in the County. The scenarios differ in terms of requirements for processing all waste versus mandatory source separation of recyclables, which emphasizes generator responsibility versus reliance on technologies for diversion. There are also differences in selecting expansion of Central Landfill versus development of a new in-county landfill. This again reemphasized the County's commitment to final disposition of the waste, but indicated some differences in whether the disposal should be at the existing site or a new location.

SELECTION OF PREFERRED STRATEGY

On October 12, 2000, the LTF reached a consensus on a strategy to meet Sonoma County's solid waste management goals and needs for the planning period 2015 to 2050. The strategy consists of the following four (4) key elements:

- Formal agreement among all cities and the County to direct flow of refuse and green waste to a new integrated resource management facility.
- Mandatory source separation of recyclables from waste for residential, commercial, industrial, and institutional waste generators.
- Expansion of Central Landfill beyond its current permitted capacity.
- Siting of an integrated resource management facility to include organics processing (anaerobic digestion or biorefining), green waste composting, and landfilling.

Table 12. Cost Summary

SCENARIO	DESCRIPTION	COST PER TON
A-1	Uses existing and/or new transfer stations. All waste disposed at an out-of-county landfill.	$ 54
A-2	Uses flow control and MRFs to increase diversion. All waste disposed at an out-of-county landfill.	$ 41
B-1	Uses flow control. All waste disposed at an out-of-county landfill after closure of an expanded Central Landfill.	$ 36
B-2	All waste disposed at either a new in-county landfill or an expanded Central Landfill.	$ 32
C-1	Policies for flow control and mandatory source separation of Industrial, Commercial and Institutional (ICI) waste. Organics processed at organics processing facility. All waste disposed at an expanded Central Landfill.	$ 34
C-2	Processes all waste through MRFs to increase diversion. Organics processed at organics processing facility. All waste disposed at an expanded Central Landfill.	$ 62
D	Uses existing and/or new transfer stations. All waste disposed at a new in-county landfill.	$ 32
E-1	Policies for flow control and mandatory source separation of ICI wastes. Organics processed at organics processing facility. All waste disposed at a new in-county landfill.	$ 36
E-2	Processes all waste through MRFs to increase diversion. Organics processed at organics processing facility. All waste disposed a new in-county landfill.	$ 63

Table 13. Selected Scenarios

SCENARIO		C-1	C-2	E-1
DESCRIPTION		▸ Formal policies for flow control and mandatory recycling for commercial, industrial, institutional generators ▸Collection/processing system for organics ▸ Expand capacity of Central Landfill for use 2015-2050	▸ Formal policy to process all waste, including mixed refuse, for materials recovery/waste reduction ▸ Additional diversion through one or more MRFs and organics collection/processing system ▸ Expand capacity of Central Landfill for use 2015-2050	▸ Formal policies for flow control and mandatory recycling for commercial, industrial, institutional generators ▸ Collection/processing system for organics ▸ New in-County landfill
SUPPORTING POLICIES / PROGRAMS	Process All Waste		✓	
	Flow Control	✓	✓	✓
	Mandatory Source Separation of Recyclables (Commercial, Industrial, and Institutional)	✓		✓
	Wet / Dry Collection	$ 5		$ 5
PROCESSING TECHNOLOGIES	MRF - Material Recovery Facility(ies)		$ 30	
	Organics	$ 40	$ 40	$ 40
DISPOSAL	Expand Capacity of Central Landfill	$ 22	$ 22	
	New In-County Landfill			$ 25
RECYCLING RATE		68%	80%	68%
RISK		HIGH	HIGH	HIGH
LOCAL CONTROL		HIGH	HIGH	HIGH
RESOURCE EFFICIENCY		HIGH	MEDIUM - HIGH	HIGH
WEIGHTED AVERAGE COST PER TON		$ 34	$ 62	$ 36

These four elements are designed to support each other in achieving a countywide, integrated materials management strategy for the 35-year planning period that begins when the current permitted capacity of Central Landfill is reached. The strategy elements fulfill priorities established by the LTF, as explained below:

- Fully utilize existing waste management resources and infrastructure in both the public and private sectors. This maintains local control over the costs and environmental impacts of disposal, and facilitates further development of in-county recycling collection/processing capabilities. Relevant strategy elements are Central Landfill expansion, flow control policy, and mandatory recycling policy.

- Maximize waste diversion/resource utilization at a reasonable cost on the principle of generator responsibility. This will extend the useful life of an expanded Central Landfill, while minimizing the size a new landfill in the County or need to contract with an out-of-county landfill operator for waste disposal. Relevant strategy elements are mandatory recycling and the integrated resource management facility incorporating organics processing and green waste composting.

- Complement existing and planned private sector operations for collection/processing of both refuse and recyclables. This recognizes and enhances the historically accepted role in the County that the private sector has fulfilled in providing waste management services under municipal/County licenses or franchises. Relevant strategy elements are Central Landfill expansion, flow control policy, and mandatory recycling policy.

SECTION 6

IMPLEMENTATION TIMELINE AND GUIDELINES

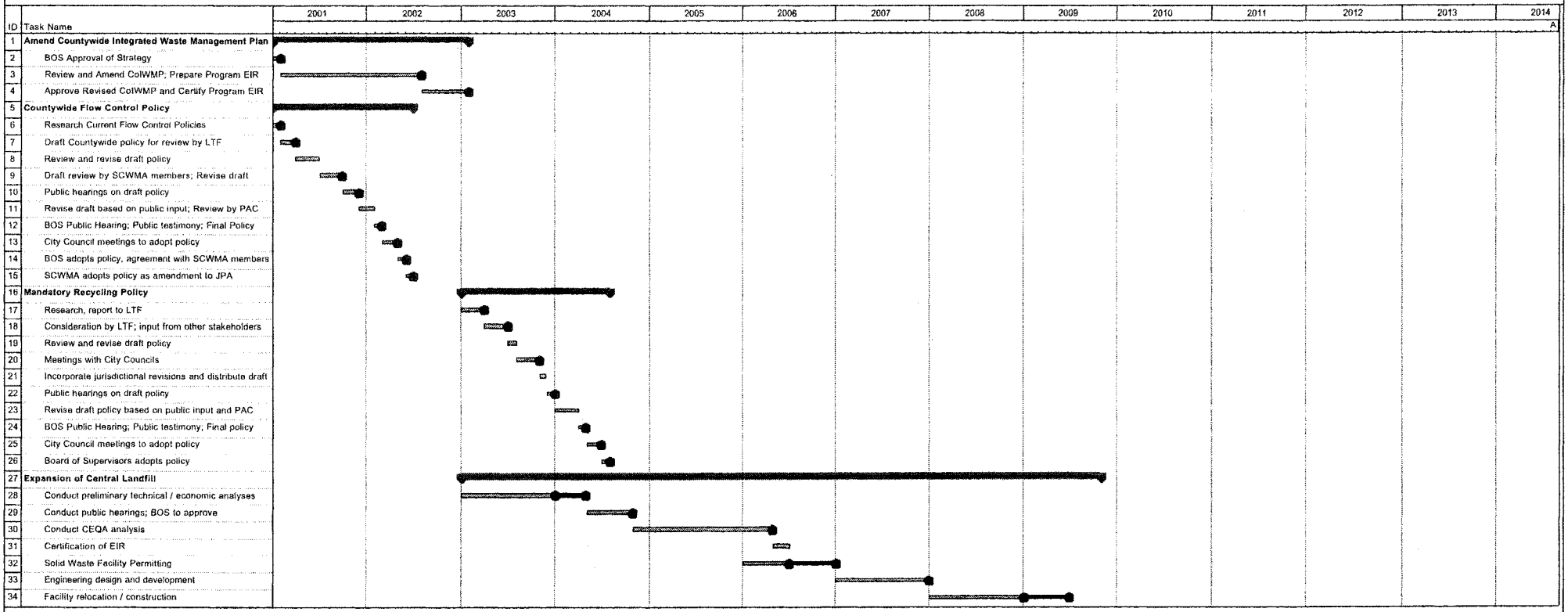
The preferred strategy was presented to the Policy Advisory Committee (PAC) on October 16, 2000. The PAC reviewed, accepted, and forwarded the preferred strategy for completion by the LTF. The next stage in the process is consideration and approval of the recommended strategy by the County Board of Supervisors (BOS). Following approval by the BOS, County staff will be directed to proceed with implementation of the strategy. The implementation timeline and guidelines for the selected strategy are described below.

The implementation period is established as 2001 to 2014. The short-term implementation period is considered to be from 2001 through 2005, while the long-term implementation period is considered to be from 2006 through 2014. The implementation schedule for each strategy element consists of the activities, milestones, and decision points related to securing the resources, permits, agreements, and associated actions required for strategy implementation. The parties involved in implementation activities, and their role/responsibility in the process, will also be noted. Those parties could include, but are not limited to, the following:

- Staff from the County's Department of Transportation and Public Works.
- Staff from other County departments.
- City Councils for each of the nine (9) incorporated jurisdictions in the County.
- Staff from the municipal governments for each of the nine incorporated jurisdictions.
- The Sonoma County Waste Management Agency.
- The AB 939 Local Task Force.
- The Policy Advisory Committee.
- The Board of Supervisors.
- California Integrated Waste Management Board (CIWMB).
- Private sector waste and recycling service providers.
- Private sector waste management and recycling processing facility vendors/operators.
- Community, neighborhood, and civic organizations.
- Homeowners associations.
- Chamber of Commerce and other local/regional business or industry groups.
- School districts, colleges, and universities.
- Non-profit environmental advocacy and action organizations.
- Apartment building owners/managers.

For each element of the selected strategy, a description of decision steps and activities, milestones, and involved parties, along with the estimated time frame for each step, is provided below. A graphical schedule for implementation of all elements of the strategy is depicted in Exhibit 6.

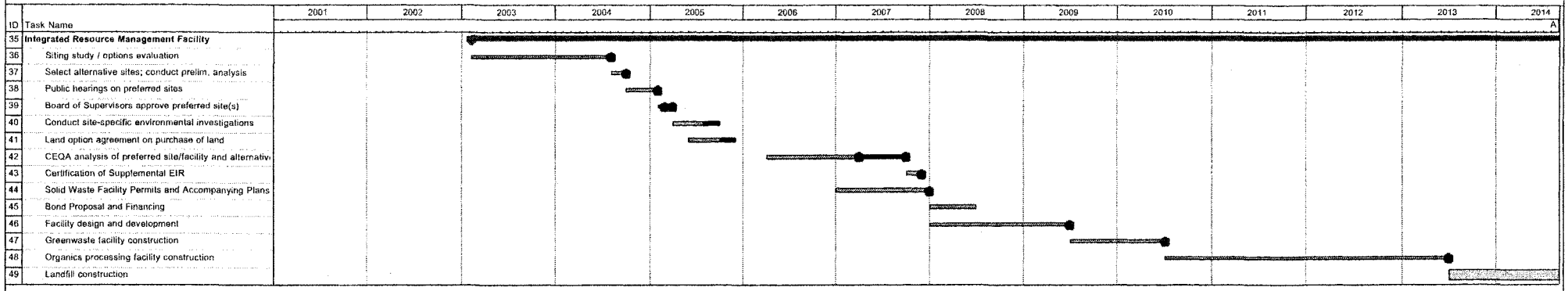
EXHIBIT 6. SONOMA COUNTY SOLID WASTE MANAGEMENT ALTERNATIVES ANALYSIS PROJECT
IMPLEMENTATION TIMELINE



Element Summary | Activity/Milestone | Activity | Range | Range/Milestone | Landfill Construction

SCS ENGINEERS

EXHIBIT 6. SONOMA COUNTY SOLID WASTE MANAGEMENT ALTERNATIVES ANALYSIS PROJECT
IMPLEMENTATION TIMELINE



Element Summary | Activity/Milestone | Activity | Range | Range/Milestone | Landfill Construction

SCS ENGINEERS

AMEND COUNTYWIDE INTEGRATED WASTE MANAGEMENT PLAN

In order to become an adopted policy for the community, the strategy approved by the County Board of Supervisors must be incorporated into the Countywide Integrated Waste Management Plan (CoIWMP). This process included review under the California Environmental Quality Act (CEQA), including preparation of a program environmental impact report (EIR). The LTF must consider the proposed amendment to the CoIWMP, and the SCWMA must also approve the amendment. Approval of the revised CoIWMP is also required by the CIWMB. Finally, the County Board of Supervisors must certify the CEQA document. The total anticipated timeline for this step in the process is 25 months. The process is summarized below.

AMEND COUNTYWIDE INTEGRATED WASTE MANAGEMENT PLAN		
Estimated Time to Complete	**Activity/Milestone/Decision Points**	**Involved and Responsible Parties**
1 month	Board of Supervisors approval of strategy; direct staff to proceed with implementation.	County Board of Supervisors; County Transportation and Public Works Department staff.
18 months	Review and amend CoIWMP, including identifying weighting and ranking criteria for facility siting. Prepare Program EIR.	County Transportation and Public Works Department staff.
6 months	LTF consider amended CoIWMP; SCWMA approve CoIWMP; CIWMB approval of CoIWMP; Board of Supervisors certify EIR.	LTF; SCWMA; CIWMB; Board of Supervisors, Transportation and Public Works Department staff.
TOTAL: **25 MONTHS**	**RESULT:** **Amended CoIWMP incorporating selected strategy; certified CEQA document.**	

COUNTYWIDE FLOW CONTROL POLICY

At the PAC meeting, there was general discussion and agreement that the flow control policy/agreement among the cities/County would need to come as an early step in order to assure an adequate supply of materials, as well as to enable financing mechanisms for the proposed integrated resource management facility. This policy will be a formal agreement among all cities and the County to direct the flow of disposed waste and source-separated green waste to a new integrated resource management facility. The purpose of the policy will be to assure the availability of materials for the facility, and therefore enable financing mechanisms for development of the facility.

The SCWMA consists of representatives from all ten (10) jurisdictions in the County; namely, the nine incorporated cities and the County unincorporated areas. The SCWMA is structured and operated according to the terms of a JPA. A countywide flow control policy could be

adopted by the SCWMA as an amendment to the JPA. However, it is anticipated that for an issue as significant as this, the jurisdictional representatives would probably also formally adopt the policy by vote of their respective city councils, and then accept and ratify the policy by membership of the SCWMA. The total anticipated timeline for this strategy element is 18 months, excluding revisions to individual jurisdiction's refuse ordinances or franchise agreements with their collection service providers.

COUNTYWIDE FLOW CONTROL POLICY		
Estimated Time to Complete	**Activity/Milestone/Decision Points**	**Involved and Responsible Parties**
1 month	Research status of flow control authority for public agencies based on recent, relevant judicial rulings.	County Transportation and Public Works Department staff and County Counsel.
2 months	Prepare draft countywide flow control policy for review by LTF.	County Transportation and Public Works Department staff.
3 months	Review and revise draft policy.	LTF; County Transportation and Public Works Department staff.
3 months	Draft policy review by SCWMA member jurisdictions; Revise draft policy.	SCWMA members; County Transportation and Public Works Department staff.
2 months	Public hearings on draft policy.	City Councils of member jurisdictions.
2 months	Revise draft policy based on public input; Review by PAC.	PAC; SCWMA members; County Transportation and Public Works Department staff; County Counsel.
1 month	Board of Supervisors Public Hearing; Public testimony; Final Policy.	Board of Supervisors; County Transportation and Public Works Department staff.
2 months	City Council meeting to adopt policy.	City Councils of Member jurisdictions.
1 month	Board of Supervisors adopts flow control policy as formal, legal agreement between SCWMA member jurisdictions.	County Board of Supervisors.
1 month	SCWMA adopts flow control policy as amendment to JPA.	SCWMA.
TOTAL: **18 MONTHS**	**RESULT:** **Formal Flow Control Policy to direct flow of waste to new integrated resource management facility.**	

MANDATORY RECYCLING POLICY

This policy will require source separation of recyclables from residential, commercial, industrial, and institutional generators. The process of adopting a mandatory recycling policy applicable countywide is similar in some respects to the process for adopting a countywide flow control policy. However, the actual formulation of the mandatory program recommendation is considerably more complicated. Responsibilities of different generators, the role of private sector recycling service providers, monitoring methods, non-compliance sanctions/penalties at the municipal and County level, a potential ban on the disposal of certain materials at Central Landfill, and other issues must be considered in developing the mandatory recycling policy.

It is proposed that the LTF be the forum and mechanism for policy development. Interested parties outside the LTF would have the opportunity to present to the LTF their perspectives on a draft policy. Under sponsorship of the County Department of Transportation and Public Works and the SCMWA, the draft policy would be submitted to the appropriate staff and city councils for each city. A sequence of review and revision would follow these submissions, culminating in adoption by each jurisdiction and the County Board of Supervisors.

The total anticipated timeline for this element of the strategy is 19 months, excluding revisions to individual jurisdiction's refuse ordinances or franchise agreements with their collection service providers.

MANDATORY RECYCLING POLICY		
Estimated Time to Complete	**Activity/Milestone/Decision Points**	**Involved and Responsible Parties**
3 months	Research other mandatory recycling policies/programs, and prepare report for review by LTF.	County Transportation and Public Works Department staff; County Counsel.
3 months	Consideration by LTF of policies and programs; input from other stake-holders.	LTF; private sector recyclers; institutions; apartment/building owners and managers; Chamber of Commerce; homeowner associations; community /civic/environ-mental organizations.
1 month	Review and revise draft policy.	SCWMA representatives; County Trans-portation and Public Works Department staff; County Counsel.
3 months	Meetings with City Councils.	County Transportation and Public Works Department; SCWMA representatives.
1 month	Incorporate jurisdictional revisions, distribute draft policy back to jurisdic-tions.	County Transportation and Public Works Department staff.

MANDATORY RECYCLING POLICY		
Estimated Time to Complete	**Activity/Milestone/Decision Points**	**Involved and Responsible Parties**
1 month	Public hearings on draft policy.	City Councils of member jurisdictions.
3 months	Revise draft policy based on public input; Review and recommendation by PAC.	PAC; SCWMA members; County Transportation and Public Works Department staff; County Counsel.
1 month	Board of Supervisors Public Hearing; Public testimony; Final policy prepared.	Board of Supervisors; County Transportation and Public Works Department staff; County Counsel.
2 months	City Council meetings to adopt policy.	City Councils of Member jurisdictions.
1 month	Board of Supervisors adopts policy.	County Board of Supervisors.
TOTAL: **19 MONTHS**	**RESULT:** **Mandatory policy for source separation of recyclables from waste for residential, commercial, industrial, and institutional generators.**	

EXPANSION OF CENTRAL LANDFILL

This element of the preferred strategy seeks to fully utilize the value of Central Landfill by allowing for additional expansion beyond its current permitted capacity. The expansion would be implemented prior to siting of the new integrated resource management facility. The expansion would provide short- and medium-term landfill capacity while a new facility was being developed. The expansion plan would depend on regulatory and site constraints.

This element of the strategy would encompass an involved public input process, and supporting technical and environmental studies. The total estimated timeframe for this element of the preferred strategy is 5.5 to 6.5 years.

EXPANSION OF CENTRAL LANDFILL		
Estimated Time to Complete	**Activity/Milestone/Decision Points**	**Involved and Responsible Parties**
12 to 16 months	Conduct preliminary technical / economic analyses, including environmental constraints analysis to identify major environmental issues and fatal flaws, and develop 2 to 4 expansion plan options.	County Transportation and Public Works Department staff.

EXPANSION OF CENTRAL LANDFILL		
Estimated Time to Complete	**Activity/Milestone/Decision Points**	**Involved and Responsible Parties**
6 months	Conduct public hearings; LTF review and recommend preferred expansion option to Board of Supervisors. Board of Supervisors approve proposed expansion plan.	LTF; Board of Supervisors; County Transportation and Public Works Department staff; interested/affected stakeholders.
18 months	Conduct CEQA analysis. Includes preparation of preliminary engineering drawings, land use planning documents, field investigations, EIR.	County Transportation and Public Works Department staff.
2 months	Certification of EIR.	Board of Supervisors.
6 to 12 months	Solid Waste Facility Permitting, including preparation of Joint Technical Document, Preliminary Closure/Post-Closure Maintenance Plan, Waste Discharge Requirements, local land use permits.	County Transportation and Public Works Department staff; County Counsel.
12 months	Engineering design and development, including design studies, plans and specifications, local permits, contractor bidding.	County Transportation and Public Works Department staff; other County Departments; County Counsel.
12 to 16 months	Facility relocation and construction of initial cell(s) and infrastructure.	County Transportation and Public Works Department staff.
TOTAL: **5.5 to 6.5 years**	**RESULT:** **Expansion of Central Landfill.**	

SITING, DESIGN, AND CONSTRUCTION OF AN INTEGRATED RESOURCE MANAGEMENT FACILITY

This element of the strategy will involve the selection of a site, technical and economic analysis of organic processing technologies, permitting, design and construction, and finally the preliminary operation of an integrated resource management facility. The facility, as envisioned, will incorporate the existing green waste composting operations at Central Landfill, which must be relocated due to site constraints at the expanded Central Landfill site, as well as the operation of a selected organics processing facility. This may include either an anaerobic digester, or a biorefinery, for the processing of organics materials into useable products. This facility will also

incorporate landfilling operations for residual materials not handled by the green waste or organics processing operations.

For this element of the strategy, a myriad of stakeholders will be involved, and the pubic input process will incorporate numerous public hearings, review of draft documents, and final selection of a site and technology. Because of the incorporation of new technologies into this element, further review and analysis of these technologies will be required. This may also involve visitation to existing pilot or full-scale facilities, and presentations and proposal by potential vendors of these technologies.

It is anticipated that a County bond measure will be required to finance the construction and perhaps operation of the organics processing facility. (The county may also wish to issue bonds for engineering and land use studies.) The timeframe for this aspect of the element is included in the estimated schedule. The total estimated timeframe for this element of the preferred strategy is 8.5 to 11.5 years.

SITING, DESIGN, AND CONSTRUCTION OF AN INTEGRATED RESOURCES MANAGEMENT FACILITY		
Estimated Time to Complete	**Activity/Milestone/Decision Points**	**Involved and Responsible Parties**
18 months	Conduct siting study/options evaluation utilizing exclusionary criteria.	County Transportation and Public Works Department.
2 months	Select a limited number of alternative sites, and conduct preliminary technical/economic analysis of alternative sites, utilizing comparative criteria.	LTF; County Transportation and Public Works Department staff.
4 months	Conduct public hearings on preferred sites.	County Transportation and Public Works Department staff.
1 to 2 months	Board of Supervisors approve preferred site(s).	Board of Supervisors; County Counsel.
4 to 6 months	Conduct site specific environmental investigations of preferred site(s) to identify major environmental issues and fatal flaws.	County Transportation and Public Works Department staff.
4 to 6 months	Land option agreement on purchase of land by County.	County staff; County Counsel.
12 to 18 months	Conduct CEQA analysis of preferred site/facility and alternatives. Includes preparation of engineering drawings, land use planning documents, field investigations, supplemental EIR.	County Transportation and Public Works Department staff

SITING, DESIGN, AND CONSTRUCTION OF AN INTEGRATED RESOURCES MANAGEMENT FACILITY		
Estimated Time to Complete	**Activity/Milestone/Decision Points**	**Involved and Responsible Parties**
2 months	Certification of EIR.	Board of Supervisors.
12onths	Solid Waste Facility Permitting, including preparation of Joint Technical Document, Preliminary Closure/Post-Closure Maintenance Plan, Waste discharge requirements, air quality permit to construct, local land use permits.	County Transportation and Public Works Department staff; County Counsel.
6 months	Bond Proposal and Financing.	County Board of Supervisors; affected stakeholders.
18 months	Facility design and pre-construction, including design studies, plans and specifications, local permits, contractor bidding.	County Transportation and Public Works Department staff; other County Departments; County Counsel; regulatory agencies.
12 to 36 months	Facility construction: • Infrastructure/civil improvements. • Greenwaste facility construction. • Organics processing facility. • Landfill.	County Transportation and Public Works Department staff.
TOTAL: **8.5 to 11.5 years**	**RESULT:** **Development of an integrated resource management facility for organics processing, green waste composting and landfilling.**	

APPENDIX A

SITING ELEMENT TABLE C-1

TABLE C-1
SONOMA COUNTY DISPOSAL CAPACITY OPTIONS
Summary Of Primary Issues

OPTIONS	ADVANTAGES	DISADVANTAGES
Two landfills operating concurrently, one general access and one restricted access.	• Defers closure/post closure costs for Central Landfill. • Extends for 10 to 40 years (depending on expansion option) the current site for self-haul customers. • Potential for increased revenues for the County due to excess capacity. • Minimize risk from changes to operating/regulatory requirements. • Minimizes traffic impact of new vehicles in the area around the restricted access site. • Reduces traffic in the area around Central. • Improves the safety of operations at Central. • Minimizes litter at the restricted access site.	• More expensive closure/post-closure requirements may make it cheaper to close Central earlier. • Possibly more hauling traffic and altered circulation patterns. • Higher operating costs for two landfills than for one. • Creating an excess of disposal capacity may undermine source reduction and recycling programs. • Could discourage new technologies. • Costs of second site incurred sooner.
Two general access landfills operating concurrently.	• More convenient for commercial and self haulers. • Potential for increased revenues for the County due to excess capacity. • Minimize risk from changes to operating/regulatory requirements.	
One landfill only (Central Landfill with expansion) with intensive education and Reduce, Reuse and Recycling Programs	• Less cost to operate than two landfills. • Maintains focus on three R's. • Maintains focus on education and public information programs. • Keeps funding available for three R's instead of being diverted to landfill operations. • Eliminates the temptation to accept imported waste to cover operations costs. • Encourages state waste management hierarchy.	• Would require closure/post-closure funds be made available sooner for the Central Landfill. • Uncertainty as to effectiveness of education and public information programs could leave county short on disposal capacity, which would only postpone need to site new landfills. • The County could be left with an emergency situation with much higher disposal costs if siting of the new landfill is delayed or unsuccessful. • Does not address County's long term capacity goals if siting of the new landfill is delayed or unsuccessful. • Could force County to rapidly identify new disposal capacity at higher cost.
One landfill only (Central Landfill), with a second landfill after closure of Central.		
One landfill only (alternative site), with a transfer station and MRF at Central to transfer waste to the new landfill.		
Export waste to an alternative site outside of the county.	• Eliminates need to site new landfill in Sonoma County. • Provides long-term disposal capacity. • Could extend life of Central Landfill. • Can be combined with intensive diversion projects. • Expands the universe of potential disposal sites.	• Puts county at risk for higher disposal cost in future. • Loss of local control. • Loss of funds used for waste diversion programs and closed landfill maintenance. • Could put county at risk for disposal if interstate transportation rules change.
New and alternate technology (landfill mining, pyrolysis, ultra-compaction, MSW composting).	• Potential to extend landfill life. • New local jobs possible.	• Expensive • Risky, unproven technology. • Regulatory climate uncertain. • Cannot be depended upon to meet long term term disposal goals

APPENDIX B

COST MODEL

ESTIMATED COSTS FOR SCENARIO A-1

Uses existing and/or new transfer stations. All waste disposed at an out-of-county landfill.

Transfer Cost Calculation

Haul only--

$$\frac{(\text{hr}/45\ \text{mi}) \times 135\ \text{mi} \times (\$80/\text{hr}) + (.5\ \text{hr}) \times (\$80/\text{hr})}{22\ \text{tons}} = \$\ 13\ /\text{ton}$$

Facility own/operate-- = $ 10 /ton

Total-- = $ 23 /ton

New Transfer Station (wastes currently direct-hauled)

530,000 tons x 60% = 318,000 tons/yr

$ 23 /ton x 318,000 tons = $7,227,273

Incremental Haul Costs (wastes through existing transfer stations)

530,000 tons x 40% = 212,000 tons/yr

$ 13 /ton x 212,000 tons = $2,696,182

Disposal

530,000 tons @ $ 35 /ton = $ 18,550,000

Total Cost

Annual Cost	$ 28,475,455
Cost per ton (weighted average)	$ 54

Assumptions:

530,000 tpy = waste disposal rate (average over 35-year planning period, equivalent to 1,450 tpd)
60% of wastes now direct-hauled to Central; same percentage will be delivered to new transfer station.
135 miles round-trip = distance to out-of-county disposal site (average from centroid of Sonoma County to potential sites)
22 tons/load = long haul transfer vehicle capacity
$ 10 /ton = cost to own/operate new transfer station (BVA, 1999)
45 miles/hour = average travel speed for transfer vehicle
$ 80 /hour = cost to operate transfer haul vehicle (industry average based on recent municipal bids)
0.5 hours = time to load/unload transfer vehicle
$ 60 /hour = cost to operate refuse packer vehicle w/ 7.5 ton payload (industry average)
$ 35 /ton = out-of-county disposal rate (May 2000 average tip fee at Altamont, Keller, B&J, Potrero Hills, Redwood landfill sites)

Costs above exclude direct-haul expenses from routes to transfer station(s)
Costs for transfer of wastes now direct-hauled to Central Landfill include facility operation plus transport.
Costs for wastes now transferred to Central include incremental expenses for long-haul only (i.e., beyond current transfer haul)

ESTIMATED COSTS FOR SCENARIO A-2

Uses flow control and MRFs to increase diversion. All waste disposal at an out-of-county landfill.

										Annual Cost
New Materials Recovery Facility										
direct haul total:	530,000	tons	x	60%	=	318,000	tons/yr			
% thru MRF:	318,000	tons	x	50%	=	159,000	tons/yr			
MRF residuals:	159,000	tons	x	75%	=	119,250	tons/yr			
MRF costs:	159,000	tons	@		$	30	/ton	=	$	4,770,000
Transfer Cost Calculation										
Haul only--										
((hr/45 mi) x 135 mi x ($80 /hr) + (.5 hr) x ($80 /hr)) / 22 tons					=	$ 13	/ton			
Facility own/operate--					=	$ 10	/ton			
Total--					=	$ 23	/ton			
New Transfer Station (wastes not delivered to MRF)										
direct haul total:	530,000	tons	x	60%	=	318,000	tons/yr			
% thru new TS:	318,000	tons	x	50%	=	159,000	tons/yr			
	$ 23	/ton	x	159,000	tons			=		$3,613,636
Incremental Haul Costs (wastes through existing transfer stations)										
thru exist. TS:	530,000	tons	x	40%	=	212,000	tons/yr			
MRF residuals:					=	119,250	tons/yr			
						331,250	tons/yr			
	$ 13	/ton	x	331,250	tons			=		$4,215,909
Disposal										
thru new TS:					=	159,000	tons/yr			
thru exist. TS:					=	212,000	tons/yr			
Total:						371,000	tons/yr			
	371,000	tons	@		$	25	/ton	=	$	9,275,000
Total Cost										
	Annual Cost								$	21,874,545
	Cost per ton (weighted average)								$	41

Assumptions:

530,000 tpy = waste disposal rate (average over 35-year planning period, equivalent to 1,450 tpd)
60% of wastes now direct-hauled to Central; same percentage will be delivered to new TS or MRF.
50% of wastes now direct-hauled to Central will be processed through MRF; balance will be transferred.
135 miles round-trip = distance to new disposal site from Central wasteshed area (new TS/MRF)
22 tons/load = long haul transfer vehicle capacity
$ 10 /ton = cost to own/operate new transfer station (BVA, 1999)
45 miles/hour = average travel speed for transfer vehicle
$ 80 /hour = cost to operate transfer haul vehicle (industry average based on recent municipal bids)
0.5 hours = time to load/unload transfer vehicle
$ 60 /hour = cost to operate refuse packer vehicle w/ 7.5 ton payload (industry average)
$ 25 /ton = reasonable out-of-county disposal rate that could be negotiated with flow control (market rate based on recent bids).
$ 30 /ton = cost for MRF operation (including residual disposal, based on average for 27 CA sites w/ capacity <1,000 tpd)
25% waste recovery rate for MRF = 75% residuals will require long-haul to disposal site.

Costs above exclude direct-haul expenses from routes to transfer station(s) or MRF.
Costs for transfer of wastes now direct-hauled to Central include facility operation plus transport to out-of-county site.
Costs for wastes now transferred to Central include incremental expenses for long-haul only (i.e., beyond current transfer haul).
Percentage of wastes currently delivered to existing transfer stations will remain the same; these materials will not be delivered to MRF.
New MRF recovery is above and beyond 50% diversion.

ESTIMATED COSTS FOR SCENARIO B-1

Uses flow control. All waste disposed at an out-of-county landfill after closure of an expanded Central Landfill.

Years (2015-2035)

Disposal

500,000 tons @ $ 22 /ton = $ 11,000,000

Total Cost

Annual Cost	$	11,000,000
Cost per ton (weighted average)	$	20

Years (2036-2050)

Transfer Cost Calculation (out-of-county landfill)

Haul only--

$$\frac{(\text{hr}/45\ \text{mi}) \times 135\ \text{mi} \times (\$80/\text{hr}) + (.5\ \text{hr}) \times (\$80/\text{hr})}{22\ \text{tons}} = \$\ 13\ /\text{ton}$$

Facility own/operate-- = $ 10 /ton

Total-- = $ 23 /ton

New Transfer Station (wastes currently direct-hauled)

550,000 tons x 60% = 330,000 tons/yr

$ 23 /ton x 330,000 tons = $7,500,000

Incremental Haul Costs (wastes through existing transfer stations)

550,000 tons x 40% = 220,000 tons/yr

$ 13 /ton x 220,000 tons = $2,800,000

Disposal

550,000 tons @ $ 35 /ton = $ 19,250,000

Total Cost

Annual Cost	$	29,550,000
Cost per ton (weighted average)	$	56

Total Scenario Cost

Annual Cost (weighted average)	$	18,950,000
Cost per ton (weighted average)	$	35

Assumptions:

500,000 tpy = waste disposal rate (average over 20-year planning period, equivalent to 1,389 tpd)

550,000 tpy = waste disposal rate (average over 15-year planning period, equivalent to 1,528 tpd)

60% of wastes now direct-hauled to Central; same percentage will be delivered to new transfer station

60 miles round-trip = distance to in-county disposal site (average from centroid of Sonoma County to potential sites)

135 miles round-trip = distance to out-of-county disposal site (average from centroid of Sonoma County to potential sites)

ESTIMATED COSTS FOR SCENARIO B-2

All waste disposed at either a new in-county landfill or an expanded Central Landfill.

Self Haul Disposal (Central Landfill)							
	530,000	tons	x	20%	=	106,000	
	106,000	tons		@	$ 22	/ton	= $ 2,332,000
Transfer Cost							
	212,000	tons		@	$ 18	/ton	= $ 3,816,000
Disposal (new in-county landfill)							
	530,000	tons	x	80%	=	424,000	
	424,000	tons		@	$ 25	/ton	= $ 10,600,000
Total Cost							
	Annual Cost						**$ 16,748,000**
	Cost per ton (weighted average)						**$ 32**

Assumptions

530,000 tpy = waste disposal rate (average over 35-year planning period, equivalent to 1,450 tpd)

212,000 tpy = amount transferred to new in-county landfill, which is 40% of the 530,000 tpy waste disposed.

20% of wastes now self-hauled to Central

80% of waste now delivered to Central Landfill via Packer Trucks or Transfer Trucks, 40% will now go thru new transfer station to new in-county landfill

$ 22 /ton = tip fee for expanded Central Landfill (10% higher than current fee)

$ 25 /ton = new in-county disposal rate (higher Costs associated with new landfill construction in compliance with Subtitle D requirements)

$ 18 /ton = new in-county transfer cost

ESTIMATED COSTS FOR SCENARIO C-1

Policies for flow control and mandatory source separation of Industrial, Commercial and Institutional waste. Organics processed at organics processing facility. All waste disposed at an expanded Central Landfill.

									Annual Cost
Wet/Dry Collection									
% thru collection	530,000	tons	x	50%	=	265,000	tons/yr		
Wet/Dry incremental costs:	265,000	tons		@	$	5	/ton	= $	1,325,000
Organic Processing Facility (OPF)									
Organic collected:	265,000	tons	x	80%	=	212,000	tons/yr		
OPF costs:	212,000	tons		@	$	40	/ton	= $	8,480,000
Incremental Organic Residuals :	21,200	tons		@	$	8	/ton	= $	169,600
Transfer Station Haul Cost:	53,000	tons		@	$	8	/ton	= $	424,000
Disposal									
Wet/Dry discarded:	265,000	tons	x	20%	=	53,000	tons/yr		
Organic residuals:	212,000	tons	x	10%	=	21,200	tons/yr		
Waste not captured by Wet/Dry collection:	530,000	tons	x	50%	=	265,000	tons/yr		
Total						339,200	tons/yr		
	339,200	tons		@	$	22	/ton	= $	7,462,400
Total Cost									
	Annual Cost							$	17,861,000
	Cost per ton (weighted average)							$	34

Assumptions:

	530,000	tpy = waste disposal rate (average over 35-year planning period, equivalent to 1,450 tpd)
	50%	of Wet/Dry Collection waste is sent to the Organics Processing Facility.
	20%	of Wet/Dry Collection waste is sent to the Existing or New Transfer Station.
	10%	of the Organic Residual is sent to Central landfill.
	50%	of waste is sent directly to existing or new transfer stations
$	5	/ton = Wet/Dry incremental costs for Wet/Dry collection operation
$	22	/ton = tip fee for expanding Central Landfill (10% higher than current fee)
$	40	/ton = cost for OPF operation; which does not include energy revenues.
$	8	/ton= Incremental costs to haul Wet/Dry and Organic Residuals waste to the landfill.

ESTIMATED COSTS FOR SCENARIO C-2

Processes all waste through MRFs to increase diversion. Organics processed at organics processing facility. All waste disposed at an expanded Central Landfill.

										Annual Cost
New Materials Recovery Facility										
100 % thru MRF	530,000	tons	x	100%	=	530,000	tons/yr			
MRF costs:	530,000	tons	@			$ 30	/ton	=	$	15,900,000
Transfer from MRF to OPF:	238,500	tons	@			$ 8	/ton	=	$	1,908,000
Transfer from MRF to LF:	159,000	tons	@			$ 8	/ton	=	$	1,272,000
Organics Processing Facility (OPF)										
% thru OPF:	530,000	tons	x	45%	=	238,500	tons/yr			
OPF costs:	238,500	tons	@			$ 40	/ton	=	$	9,540,000
Transfer Residuals from OPF to LF:	23,850	tons	@			$ 8	/ton	=	$	190,800
Disposal										
Organic residuals:	238,500	tons	x	10%	=	23,850	tons/yr			
MRF waste:	530,000	tons	x	30%	=	159,000	tons/yr			
Total						182,850	tons/yr			
	182,850	tons	@			$ 22	/ton	=	$	4,022,700
Total Cost										
	Annual Cost								**$**	**32,833,500**
	Cost per ton (weighted average)								**$**	**62**

Assumptions:

530,000 tpy = waste disposal rate (average over 35-year planning period, equivalent to 1,450 tpd)
45% of MRF waste goes through the Organics Processing Facility.
50% of the 45% MRF waste will be processed through the Organics Facility.
10% of waste will be Organic residuals and will be disposed in the Central Landfill
30% of MRF waste will automatically go to Central landfill.
$ 22 /ton = tip fee for expanding Central Landfill (10% higher than current fee)
$ 45 /ton =cost for MRF operation
$ 40 /ton = cost for OPT operation; does not include energy revenues.
$ 8 /ton = Incremental cost from MRF to OPF, MRF to Landfill and OPF to Landfill.
New MRF recovery is at 50% diversion.

ESTIMATED COSTS FOR SCENARIO D

Uses existing and/or new transfer stations. All waste disposed at a new in-county landfill.

Transfer Cost Calculation

Haul only--

$$\frac{(\text{hr}/35\ \text{mi}) \times 60\ \text{mi} \times (\$80\ /\text{hr}) + (.5\ \text{hr}) \times (\$80\ /\text{hr})}{22\ \text{tons}} = \$\ 8\ /\text{ton}$$

Facility own/operate-- = $ 10 /ton

Total-- = $ 18 /ton

New Transfer Station (wastes currently direct-hauled)

% thru new TS:	530,000	tons	x	40%	=	212,000	tons/yr		
	$ 18	/ton	x	212,000	tons			=	$3,827,013

Incremental Haul Costs (wastes through existing transfer stations)

	530,000	tons	x	60%	=	318,000	tons/yr		
	$ -	/ton	x	318,000	tons			=	$0

Disposal

530,000	tons	@	$ 25	/ton	=	$ 13,250,000

Total Cost

Annual Cost	$ 17,077,013
Cost per ton (weighted average)	$ 32

Assumptions:

530,000 tpy = waste disposal rate (average over 35-year planning period, equivalent to 1,450 tpd)
40% of wastes now direct-hauled to Central will be transferred to new in-county site.
60 miles round-trip = distance to new disposal site from Central wasteshed area
22 tons/load = long haul transfer vehicle capacity
$ 10 /ton = cost to own/operate new transfer station (BVA, 1999)
35 miles/hour = average travel speed for transfer vehicle to in-county site.
$ 80 /hour = cost to operate transfer haul vehicle (industry average based on recent municipal bids)
0.5 hours = time to load/unload transfer vehicle
$ 60 /hour = cost to operate refuse packer vehicle w/ 7.5 ton payload (industry average)
$ 25 /ton = anticipated tip fee at new site; assumes 25% increase over current cost to site/develop Subtitle D facility.
Costs above exclude direct-haul expenses from routes to transfer station(s)
Costs for transfer of wastes now direct-hauled to Central include facility operation plus transport to new in-county site.
Costs for wastes now transferred to Central assumed to be the same for new site and are excluded (i.e., no incremental haul costs).

ESTIMATED COSTS FOR SCENARIO E-1

Policies for flow control and mandatory source separation of Industrial, Commercial and Institutional waste. Organics processed at organics processing facility. All waste disposed at a new in-county landfill

									Annual Cost
Wet/Dry Collection									
% thru collection	530,000	tons	x	50%	=	265,000	tons/yr		
Wet/Dry incremental costs:	265,000	tons	@		$	5	/ton	= $	1,325,000
Organic Processing Facility (OPF)									
Organic collected from Wet/Dry Collection	265,000	tons	x	80%	=	212,000	tons/yr		
OPF costs:	212,000	tons	@		$	40	/ton	= $	8,480,000
Incremental Organic Residual's :	21,200	tons	@		$	8	/ton	= $	169,600
Transfer Station Haul Cost	53,000	tons	@		$	8	/ton	= $	424,000
Disposal									
Wet/Dry discarded:	265,000	tons	x	20%	=	53,000	tons/yr		
Organic residual's:	212,000	tons	x	10%	=	21,200	tons/yr		
Waste not captured by Wet/Dry collection:	530,000	tons	x	50%	=	265,000	tons/yr		
Total						339,200	tons/yr		
	339,200	tons	@		$	25	/ton	= $	8,480,000
Total Cost									
	Annual Cost							$	**18,878,600**
	Cost per ton (weighted average)							$	**36**

Assumptions:

530,000	tpy	= waste disposal rate (average over 35-year planning period, equivalent to 1,450 tpd)
80%		of Wet/Dry Collection waste is sent to the Organics Processing Facility
20%		of Wet/Dry Collection waste is sent to the Existing or New Transfer Station
10%		of the Organic Residual is sent to Central landfill.
50%		of waste is sent directly to existing or new transfer stations.
$ 5	/ton	= Wet/Dry incremental costs for Wet/Dry collection operation
$ 25	/ton	= new in-county disposal rate (higher Costs associated with new landfill construction in compliance with Subtitle D).
$ 40	/ton	= cost for OPF operation; does not include energy revenues.
$ 8	/ton=	incremental costs to haul Wet/Dry and Organic Residuals waste to the landfill.

ESTIMATED COSTS FOR SCENARIO E-2

Processes all waste through MRFs to increase diversion. Organics processed at organics processing facility. All waste disposed at a new in-county landfill.

									Annual Cost
New Materials Recovery Facility									
% thru MRF	530,000	tons	x	100%	=	530,000	tons/yr		
MRF costs:	530,000	tons	@			$ 30	/ton	= $	15,900,000
Transfer from MRF to OPF:	238,500	tons	@			$ 8	/ton	= $	1,908,000
Transfer from MRF to LF:	159,000	tons	@			$ 8	/ton	= $	1,272,000
Organics Processing Facility (OPF)									
% thru OPF:	530,000	tons	x	45%	=	238,500	tons/yr		
OPF costs:	238,500	tons	@			$ 40	/ton	= $	9,540,000
Transfer Residuals from OPF to LF:	23,850	tons	@			$ 8	/ton	= $	190,800
Disposal									
Organic residuals:	238,500	tons	x	10%	=	23,850	tons/yr		
MRF waste:	530,000	tons	x	30%	=	159,000	tons/yr		
Total						182,850	tons/yr		
	182,850	tons	@			$ 25	/ton	= $	4,571,250
Total Cost									
	Annual Cost							$	33,382,050
	Cost per ton (weighted average)							$	63

Assumptions:

530,000 tpy = waste disposal rate (average over 35-year planning period, equivalent to 1,450 tpd)
45% of MRF waste goes through the Organics Processing Facility.
50% of the MRF waste will be recovered.
50% of the 45% MRF waste will be processed through the Organics Facility.
10% of waste will be Organic residuals and will be disposed in the Central Landfill

30% of MRF waste will automatically go to Central landfill.
$ 25 /ton = new in-county disposal rate (higher Costs associated with new landfill construction in compliance with Subtitle D).
$ 45 /ton = cost for MRF operation
$ 40 /ton = cost for OPT operation; does not include energy revenues.
$ 8 /ton = incremental cost from MRF to OPF, MRF to Landfill and OPF to Landfill.
New MRF recovery is at 50% diversion.

APPENDIX C

LIST OF ACRONYMS

LIST OF ACRONYMS

Acronym	Meaning
AB 939	California Integrated Waste Management Act of 1989
ADC	Alternative Daily Cover
BOS	Board of Supervisors
CEQA	California Environmental Quality Act
CIWMB	California Integrated Waste Management Board
CoIWMP	Countywide Integrated Waste Management Plan
EIR	Environmental Impact Report
ICI	Industrial, Commercial and Institutional
JPA	Joint Powers Authority
LCRS	Leachate Collection and Recovery System
LFG	Landfill Gas
LTF	Local Task Force
MRF	Materials Recovery Facility
MSL	Mean Sea Level
MSW	Municipal Solid Waste
SCWMA	Sonoma County Waste Management Agency
TPD	Tons Per Day
TPY	Tons Per Year
TS	Transfer Station

APPENDIX D

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REFERENCES

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APPENDIX C

1995/95 WASTE CHARACTERIZATION STUDY

Sonoma County
Department of Transportation and Public Works
Integrated Waste Division

1995/96
Waste Stream Characterization Study
Final Report

prepared by
Cascadia Consulting Group, Inc.

in association with
Sky Valley Associates

May 1996

Table of Contents

1. Introduction

Effective solid waste management planning and service delivery begins with knowing what is in the waste stream - how much of which types of material are disposed. This basic information is essential to all aspects of policy and program implementation. Therefore, the Sonoma County Department of Transportation and Public Works Integrated Waste Division commissioned a waste stream characterization study with two primary parts: a vehicle survey and comprehensive waste composition study. Cascadia Consulting Group served as the primary contractor for this project, and Sky Valley Associates performed the fieldwork.

The County's objectives for this study included:

- gathering information for characterizing the total waste stream
- obtaining data to compare with the 1991 EMCON Solid Waste Generation Study, and performing analyses to measure the success of recent waste diversion efforts
- determining the types and amounts of potentially recyclable materials remaining in Sonoma County's disposed waste stream
- understanding the differences between substreams so that targeted recycling programs can be designed, implemented, and monitored in the future

The purpose of this report is to present the results of the waste sampling and vehicle survey, and to compare them with the 1991 EMCON report.

To reach the goals which Sonoma County set forth, the Cascadia Team undertook a series of tasks, beginning with the collection of detailed data from waste haulers on the quantities of waste disposed by both commercial and residential generators. These data were used to construct a sampling plan that specified which vehicles were to be selected for sampling.

Field sampling was conducted in July and August of 1995, and in January and February of 1996. These two time periods were selected to account for differences in waste disposed between the dry and wet seasons typical of the climate in Sonoma County. A description of sampling methodology follows below in Section 2.2. The data gathered during the sampling periods were entered into a database twice and compared to eliminate errors, and composition estimates for each substream (commercial, residential, and self-haul) were calculated. A set of weighted data tables were prepared and are included in this report.

For each substream, 1995 tonnage estimates and corresponding composition estimates were combined to create an overall annual profile of disposed waste. These data, together with a description of methodology and results, are presented in this report.

It is important to note that the 1995 overall disposed tonnage figure used in this report (412,529.59 tons) does not include 11,800 tons of biosolids disposed at Sonoma County's landfills during calendar year 1995. Biosolids were excluded from the study to better match previous solid waste studies performed for Sonoma County, which also excluded this waste. If biosolids are considered as part of Sonoma County's total waste stream, the disposed tonnage figure rises to 424,329.59 tons; biosolids represent 2.8% of that total.

2. Overview of Methodology

2.1 Vehicle Survey

The purpose of the vehicle survey was to obtain data regarding the numbers of each vehicle type by substream (residential, commercial, self-haul, or mixed), generator class (for the commercial substream only), and city of origin. These data, along with net vehicle weights from sample loads, were used to estimate total tonnage amounts for each substream.

As each vehicle approached the scalehouse, the surveyor observed and recorded the vehicle type. All vehicles were asked if their load contained clean green or wood for chipping, and in what city the load originated. If the vehicle was from a franchised hauling company, the driver was asked if his/her load was *residential*, *commercial*, or *mixed residential/commercial* in origin. Drivers with commercial loads were also asked to identify the type(s) of businesses or industries that generated the waste, choosing from a list which the surveyor provided. Self-haul drivers were asked if their loads were *commercial* or *residential* in nature, and if their load was primarily *construction and demolition debris*, or *mixed garbage*.

2.2 Waste Sorting and Characterization

The objective of waste sorting was to develop reliable estimates of wastes arriving at four of Sonoma County's disposal facilities, including the Central Landfill and the Guerneville, Healdsburg, and Sonoma Transfer Stations. The goal of this project was to sample systematically a total of 400 loads of waste divided equally between two sampling periods, one in July/August 1995 and the other in January/February 1996, to account for seasonal differences. Appendix B contains a detailed description of the methodology used to derive a sampling plan.

To maximize sorting crew efficiency, the sampling plan calls for 20 loads to be sorted per day, for a total of 20 days. These 20 days were divided equally between the sampling periods and distributed among the four disposal sites based upon the tonnages handled by each facility. The tonnage information was gathered from County data collected from January 1994 through April 1995.

The 400 samples were divided among three substreams, defined in Section 2.3 below, in the following manner:

- 100 residentially generated loads
- 150 commercially generated loads
- 150 self-hauled loads

More loads were allotted to the *commercial* and *self-haul* substreams to account for the greater variation among loads from these substreams.

Information regarding the number of vehicles arriving at each station during the same day of the week last year (e.g., July 25, 1994) was utilized to estimate how many vehicles to expect. These estimates allowed the calculation of a sampling interval, e.g., whether every third, sixth, or twentieth vehicle was to be sorted. Table 2.2.1 illustrates how sample loads were apportioned among the substreams and the transfer stations by date during the sampling periods.

Allocation of Samples by Date, Transfer Station, and Substream

Date	Site	Samples Commercial	Residential	Self-Haul
7/24/95	Central	4	8	6
7/25/95	Central	8	9	6
7/26/95	Sonoma	5	4	11
7/27/95	Healdsburg	4	5	9
7/28/95	Guerneville	3	5	11
8/21/95	Central	8	6	6
8/22/95	Central	8	6	6
8/23/95	Central	7	6	6
8/24/95	Central	8	6	6
8/25/95	Sonoma	4	4	12
1/22/96	Sonoma	6	4	10
1/23/96	Healdsburg	6	5	9
1/24/96	Guerneville	5	3	12
1/25/96	Central	8	6	6
1/26/96	Central	8	6	5
2/12/96	Healdsburg	8	4	9
2/13/96	Central	8	5	7
2/14/96	Central	8	6	6
2/15/96	Central	8	5	7
2/16/96	Central	8	6	6
TOTAL		**132**	**109**	**156**

On sort days, vehicles were selected at the gate using the predetermined quota for each vehicle type. The selected drivers were then interviewed to determine the origin of their load (jurisdiction), the customer class (*construction and demolition, manufacturing, food and lodging,* etc.), and the source of the materials (*residential, commercial, self-haul*). Samples were extracted from the vehicle, hand-sorted into the prescribed component categories defined in Appendix A, and weighed. The raw data were checked by the director of field operations, and then entered into Excel spreadsheets to facilitate presentation and analysis.

2.3 Definitions of Waste Substreams

The total disposed waste stream is composed of various substreams. A "substream" is defined by the particular generation, collection, and disposal characteristics which make it a unique portion of the total waste stream. This study focused on the following waste substreams:

- ***Residential*** -- waste collected by commercial or public haulers which is 90% or more from single-family residences, multifamily residences, or a combination of single- and multifamily residences.

- ***Commercial*** -- waste collected by commercial or public haulers which is 90% or more from business, industry, government, and institutional generators.

• ***Self-haul*** -- any wastes that are hauled to the landfill or transfer station(s) by any vehicle other than commercial vehicles engaged in waste collection services.

• ***Mixed*** -- waste collected by commercial or public haulers which contains a mix of residential and commercial wastes where neither substream contributes more than 90% of the load. Usually, these loads consist primarily of commercial wastes and include multifamily wastes disposed in commercial dumpsters. It is important to note that in this study, such loads were counted as mixed in the vehicle survey but were *sorted* as commercial loads.

3. Vehicle Survey and Related Data

3.1 Tabulated Results of Vehicle Survey

The following tables present the results of the vehicle survey conducted during both the dry and wet sampling periods. Table 3.1.1 illustrates the distribution of vehicle loads by substream.

Table 3.1.1
Number of Vehicle Loads by Substream
(July 24-28, 1995; August 21-24, 1995; January 22-26, 1996; February 12-16, 1996)

Substream	Count	Percent
Self-Haul	4746	75%
Residential	768	12%
Commercial	714	11%
Mixed Residential and Commercial	99	2%
Total	**6327**	100%

As the table shows, far more self-haul vehicles arrived at Sonoma County's four facilities during the study period than any other type of vehicle. Nearly two-thirds of these 4,746 vehicles were *residential self-haul vehicles*; the remaining third were *commercial self-haul vehicles*, as Table 3.1.2 illustrates.

Table 3.1.2
Distribution of Self-Haul Vehicles Between Residential and Commercial Generators
(July 24-28, 1995; August 21-24, 1995; January 22-26, 1996; February 12-16, 1996)

Self-Haul Substream Generators	Count	Percent
Residential	3424	72%
Commercial	1322	28%
Total	**4746**	**100%**

The drivers of self-haul vehicles also were asked to characterize their loads as either *mixed garbage* or *construction and demolition*. Table 3.1.3 provides the tabulated results of that inquiry. Although most (68%) of the loads were characterized as *mixed garbage*, a significant

percentage (12%) were *construction and demolition* loads. Most of the *construction and demolition* loads were from the commercial self-haul substream.

Table 3.1.3
Distribution of Self-Haul Loads by Description
(July 24-28, 1995; August 21-24, 1995; January 22-26, 1996; February 12-16, 1996)

Description	Commercial	Residential	Total Self-Haul	Percent of Total
Construction & Demolition	401	184	585	12%
Mixed Garbage	666	2541	3207	68%
No Response	255	699	954	20%
Total	**1322**	**3424**	**4746**	**100%**

Haulers were also asked to characterize their commercial loads by seven customer classes. Table 3.1.4 lists the number of loads per customer class for the commercial substream. As the table shows, the *other commercial*, *construction and demolition*, and *wholesale/retail/warehouse* classes send the greatest number of commercial vehicles to Sonoma County's four transfer stations. The *other commercial* category included those vehicles which had collected waste from a *combination* of the customer classes (e.g. retail stores, offices, restaurants, *and* manufacturing facilities).

Table 3.1.4
Distribution of Commercial Vehicle Loads by Customer Class
(July 24-28, 1995; August 21-24, 1995; January 22-26, 1996; February 12-16, 1996)

Customer Class	Count	Percent
Other Commercial	233	33%
Construction and Demolition	144	20%
Wholesale/Retail/Warehouse	104	15%
Office, Govt, Other Business Services	90	13%
Institution (education, health care)	51	7%
Manufacturing	45	6%
Food and Lodging	27	4%
Blank	20	3%
Total	**714**	**100%**

All vehicles were asked if their loads contained clean green or wood waste. The results of this query are tabulated in Table 3.1.5; as the table shows, well over half of the *clean green and wood waste* loads were from the residential self-haul substream.

Table 3.1.5
Number of Clean Green and/or Wood Loads by Substream
(July 24-28, 1995; August 21-24, 1995; January 22-26, 1996; February 12-16, 1996)

Substream	Clean Green		Count	Percent of
	Yes	No		Clean Green Loads
Commercial	17	697	714	1%
Mixed Residential and Commercial	1	98	99	0.1%
Residential	124	644	768	10%
Self Haul: Commercial	302	1020	1322	25%
Self Haul: Residential	754	2670	3424	63%
Total	**1198**	**5129**	**6327**	**100%**

Table 3.1.6 provides a breakdown of vehicle loads by city of origin. The vehicle count from Santa Rosa significantly exceeds that of any other city; the count from the *unincorporated county* is a distant second. The category *other city* includes all loads which originated in any city other than the ones provided in list format to the consultants by the Integrated Waste Division for use in recording the answers to this question.

Table 3.1.6
Vehicle Count by City of Origin
(July 24-28, 1995; August 21-24, 1995; January 22-26, 1996; February 12-16, 1996)

City	Number	Percent
Santa Rosa	2265	36%
Unincorporated County	1216	19%
Petaluma	1105	17%
Sebastopol	552	9%
Rohnert Park	464	7%
Cotati	221	3%
Sonoma	191	3%
Healdsburg	149	2%
Windsor	83	1%
Cloverdale	42	1%
Other City	39	1%
Total	**6327**	**100%**

Lastly, as each vehicle entered the landfill or transfer station, the surveyor recorded its vehicle type. Table 3.1.7 lists the numbers of vehicles by type which entered the Sonoma County facilities during the study period. According to the table, *pick-up trucks and vans* were by far the most numerous type of vehicle. The *large other* category included all vehicles larger than passenger vehicles, vans and pick-ups which were not included in any other category. For example, flat beds and dump trucks fit into the *large other* category.

Table 3.1.7
Number of Vehicles by Type
(July 24-28, 1995; August 21-24, 1995; January 22-26, 1996; February 12-16, 1996)

Vehicle Type	Count	Percent
Compactor	937	15%
Debris Box: Compacted	85	1%
Debris Box: Loose	582	9%
Large Other	1141	18%
Passenger	244	4%
Pick-up/Van	3335	53%
Blank	3	0%
Total	**6327**	**100%**

3.2 Portion of Waste Disposed by Substream

Substream and vehicle type information collected during the survey and net tonnage data recorded for the sample loads were used to estimate Sonoma County's overall waste distribution. As shown in Table 3.2.1, the total tonnage attributed to each substream was calculated by multiplying the number of vehicles (of each type and in each substream) by the corresponding average load weight. (Vehicles carrying "clean green" loads were excluded from the calculation.)

Table 3.2.1
Calculation of the Overall Waste Distribution
(July 24-28, 1995; August 21-24, 1995; January 22-26, 1996; February 12-16, 1996)

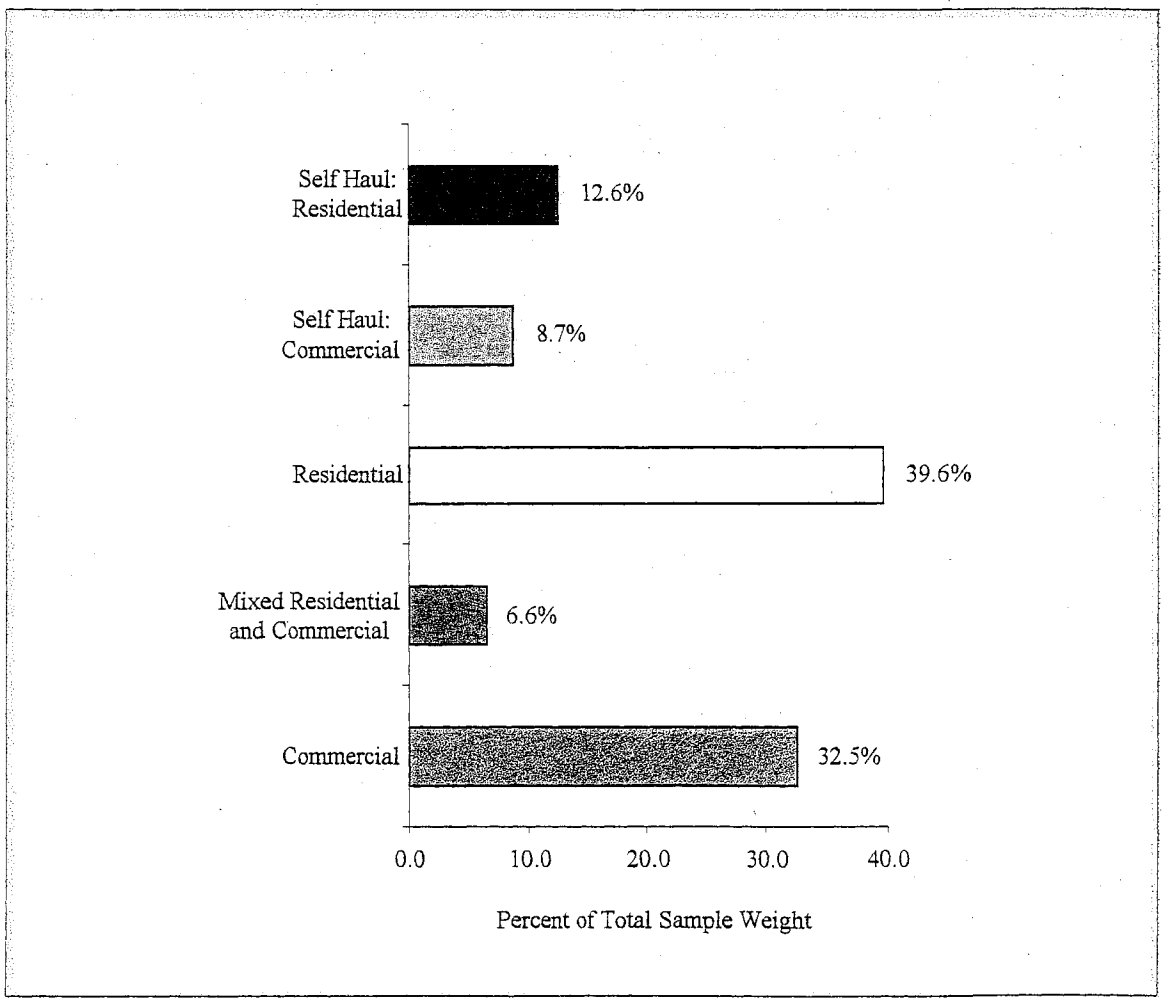
	Vehicle Count	Avg. Net Weight	Calculated Total Tons	
Commercial			**3,507**	**32.5%**
Compactor	240	7.64	1,832	
Debris Box: Compacted	78	4.49	350	
Debris Box: Loose	378	3.50	1,325	
Mixed Residential and Commercial			**716**	**6.6%**
Compactor	90	7.64	687	
Debris Box: Compacted	1	4.49	4	
Debris Box: Loose	7	3.50	25	
Residential			**4,264**	**39.6%**
Compactor	485	7.64	3,703	
Debris Box: Compacted	4	4.49	18	
Debris Box: Loose	155	3.50	543	
Self Haul: Commercial			**940**	**8.7%**
Compactor	9	7.64	69	
Debris Box: Compacted	10	3.50	35	
Large Other	538	1.19	641	
Passenger	10	0.15	1	
Pick-up/Van	452	0.43	194	
Self Haul: Residential			**1,354**	**12.6%**
Large Other	354	1.19	422	
Passenger	212	0.15	31	
Pick-up/Van	2,103	0.43	901	
Total	**5,126**		**10,781**	**100.0%**

Table 3.2.2 and Figure 3.2.1 show the percentage of the sample weights which each substream represents. These percentages were applied to the total Sonoma County 1995 disposal figure to project annual tons by substream. These data were used to calculate a weighted average 8 overall waste composition in Sonoma County.

Table 3.2.2
Percentage of Total Sample Weight (Tons) by Substream for the Sampling Period and Annual Projections

Substream	Total Net Weight of Samples	Percent of Total Sample Net Weight	Projected Annual Tons
Commercial	3,507	32.5%	134,194
Mixed Residential and Commercial	716	6.6%	27,397
Residential	4,264	39.6%	163,160
Self Haul: Commercial	940	8.7%	35,969
Self Haul: Residential	1,354	12.6%	51,810
Total	**10,781**	**100%**	**412,530**

Figure 3.2.1
Percentage of Total Sample Weight by Substream



4. Waste Composition Data

During the study period, 397 loads were sorted into 67 different components, definitions of which are in Appendix A. At the conclusion of sampling, the sort data were analyzed to characterize the entire waste stream, as well as the following three substreams:

1. Residential
2. Commercial
3. Self-Haul

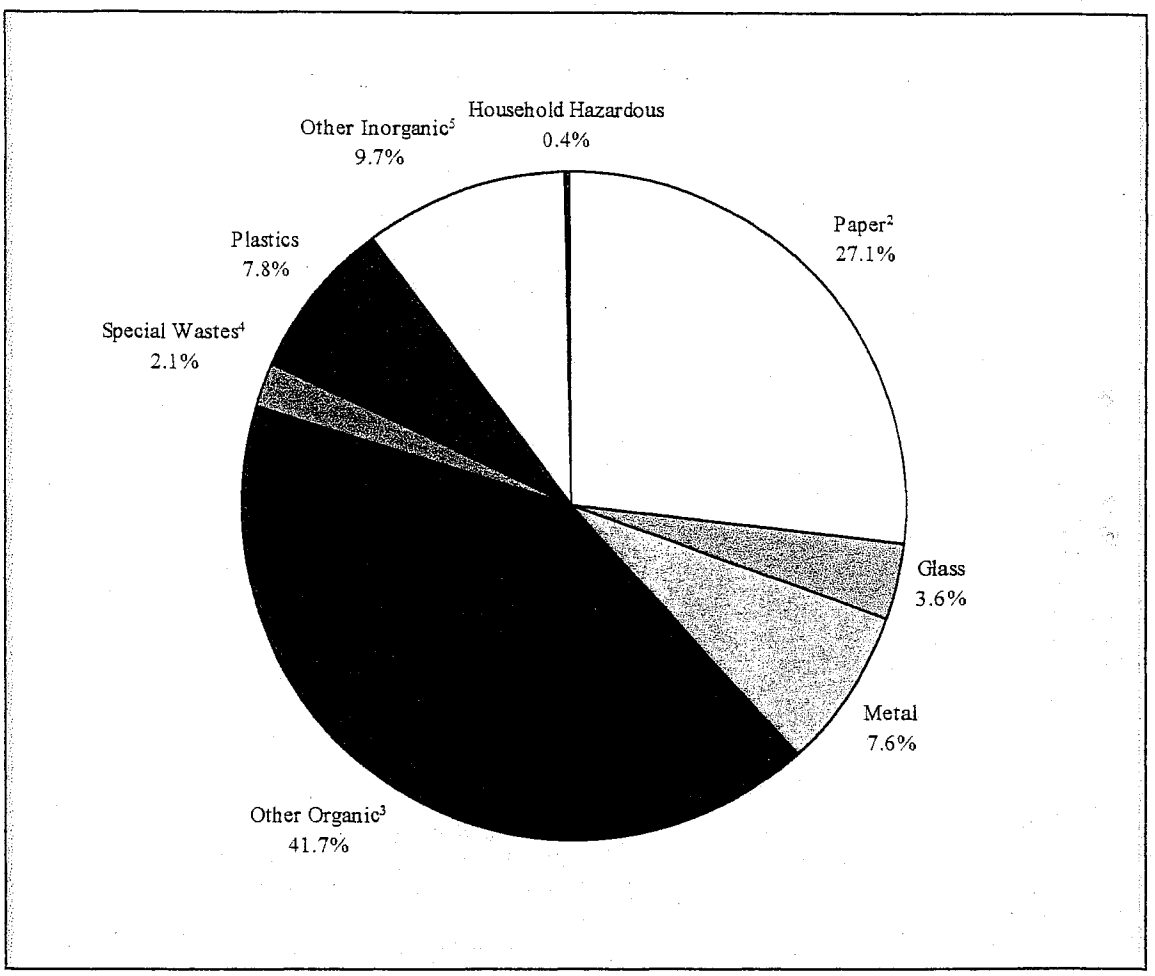
Figures 4.1.1 through 4.4.1 and Tables 4.1.1 through 4.4.3 illustrate the results of the waste characterization study, which Sections 4.1 through 4.4 summarize. The waste characterization has been calculated at a 90% confidence level. This means that we are 90% sure that any waste category percent will fall within the range shown on the tables.

4.1 Sonoma County Overall Waste Stream

As shown in Figure 4.1.1 and Table 4.1.1, *other organics* (41.7%) and *paper* (27.1%) were the two largest categories of waste in the Sonoma County waste stream during the study period.

Food (13.4%) and *wood* (10.2%) dominated the *other organics* category, although *leaves and grass* (4.3%) also contributed a noteworthy amount of waste. Sonoma County residents and businesses also disposed of considerable amounts of *other mixed paper* (7.4%), *remainder/composite paper* (6.4%), and *uncoated corrugated paper* (4.9%).

Figure 4.1.1
Sonoma County Overall Waste Stream
Composition Percentages by Weight 1995/96 [1]



[1] Waste sampling conducted in July and August of 1995 and January and February of 1996.

[2] The *paper* category includes such materials as *uncoated corrugated paper* (4.9%), *newspaper* (2.8%), and *remainder/composite paper* (6.4%).

[3] The *other organic* category includes *food* (13.4%), *wood* (10.2%), *leaves and grass* (4.3%), and *prunings and trimmings* (2.4%).

[4] The *special wastes* category includes *bulky items* (1.6%), *ash* (0.2%), and *treated medical waste* (0.1%).

[5] The *other inorganic* category includes *concrete* (2.3%), *asphalt* (2.0%), and *soil and fines* (2.0%).

Table 4.1.1
Sonoma County Overall Waste Stream
Composition Percentages by Weight

Percent at 90% Confidence Interval

	Tons	Percent		Tons	Percent
PAPER	**111,652**	**27.1%**	**PLASTICS**	**32,185**	**7.8%**
Uncoated Corrugated	20,125	4.9%	#2 HDPE Natural RPPC	1,201	0.3%
Coated Corrugated	2,697	0.7%	#2 HDPE Colored RPPC	1,704	0.4%
Brown Paper Bags	4,714	1.1%	#1 PET RPPC	1,205	0.3%
Newspaper	11,475	2.8%	#1 PET Products/Packaging	92	0.0%
White Ledger	3,589	0.9%	Film Packaging	14,019	3.4%
Colored Ledger	695	0.2%	#3 PVC RPPC	175	0.0%
Computer Paper	217	0.1%	#4 LDPE RPPC	48	0.0%
Other Office Paper	392	0.1%	#5 PP RPPC	322	0.1%
Magazines and Catalogs	7,493	1.8%	#6 PS RPPC	137	0.0%
Phone Books and Directories	1,113	0.3%	#7 and Uncoded RPPC	349	0.1%
Other Mixed Paper	30,437	7.4%	#2 HDPE Products/Packaging	389	0.1%
Remainder/Composite Paper	26,489	6.4%	#3 PVC Products/Packaging	913	0.2%
Milk Cartons and Drink Boxes	2,215	0.5%	#4 LDPE Products/Packaging	9	0.0%
GLASS	**14,866**	**3.6%**	#5 PP Products/Packaging	127	0.0%
Clear Bottles and Containers	5,869	1.4%	#6 PS Products/Packaging	2,272	0.6%
Green Bottles and Containers	2,443	0.6%	#7 and Uncoded Products/Packaging	3,827	0.9%
Brown Bottles and Containers	2,355	0.6%	Polyurethane	2,192	0.5%
Flat Glass	1,470	0.4%	Other Mixed Plastic and Material	3,202	0.8%
Remainder/Composite Glass	2,729	0.7%	**OTHER INORGANICS**	**40,188**	**9.7%**
METAL	**31,239**	**7.6%**	Rock	2,536	0.6%
Tin/Steel Cans	4,960	1.2%	Concrete	9,369	2.3%
Other Ferrous	13,119	3.2%	Brick	1,221	0.3%
Aluminum Cans	1,501	0.4%	Soil and Fines	8,212	2.0%
Other Non-ferrous	2,159	0.5%	Asphalt	8,073	2.0%
White Goods	993	0.2%	Gypsum Board	4,585	1.1%
Remainder/Composite Metal	8,507	2.1%	Remainder/Composite Inorganic	6,191	1.5%
OTHER ORGANIC	**172,120**	**41.7%**	**HOUSEHOLD HAZARDOUS**	**1,784**	**0.4%**
Food	55,186	13.4%	Paint	264	0.1%
Leaves and Grass	17,873	4.3%	Automotive Fluids	312	0.1%
Prunings and Trimmings	9,904	2.4%	Household Batteries	211	0.1%
Branches and Stumps	1,776	0.4%	Vehicle Batteries	332	0.1%
Agricultural Crop Residue	0	0.0%	Remainder Composite HHW	666	0.2%
Manure	0	0.0%	**SPECIAL WASTES**	**8,497**	**2.1%**
Wood	42,007	10.2%	Bulky Items	6,588	1.6%
Textiles	9,662	2.3%	Ash	737	0.2%
Tires	591	0.1%	Industrial Sludge	0	0.0%
Miscellaneous Organics	7,173	1.7%	Treated Medical Waste	465	0.1%
Mixed Textiles/Materials	11,414	2.8%	Remainder Composite Special	707	0.2%
Animal By-Products	9,401	2.3%			
Disposable Diapers/Fem Hygiene	7,132	1.7%			
			TOTAL	**412,530**	**100.0%**

4.2 Residential Substream

This section describes the waste composition of the residential substream. Section 4.2.1 details the overall residential substream, while Sections 4.2.2 and 4.2.3 concern the residential substream during the wet and dry sampling periods respectively. In all of the tables which augment these discussions, the term "range" refers to the spread of possible values, indicated by the "+/-" or confidence interval column, within which the mean value for a given component's composition percentage should fall nine times out of ten. For example, in the overall residential waste stream, the mean composition percentage of newspaper is 3.9%, with a confidence interval of +/- 0.4%. Therefore, nine times out of ten the mean composition percentage by weight of newspaper will be between 3.5% and 4.3%.

4.2.1 Overall Residential Substream

As shown in Figure 4.2.1 and Table 4.2.1, *other organics* (42.1%) account for the largest portion of the residential substream, followed by *paper* (32.3%).

At a more detailed level, *food* (18.2%) is the largest segment of the *other organics* category, while *animal by-products* (3.9%), *leaves and grass* (3.9%), *textiles* (3.3%), and *wood* (3.0%) each contribute a considerable amount. *Other mixed paper* (9.7%) and *remainder/composite paper* (8.0%) comprise the majority of the *paper* component, but it should be noted that residences in Sonoma County still dispose of substantial amounts of *newspaper* (3.9%) and *uncoated corrugated paper* (3.5%).

4.2.2 Residential Substream: Wet Sampling Period

During the wet sampling period, *other organics* (40.3%) and *paper* (35.7%) composed the two greatest segments of the residential substream, as Table 4.2.2 shows.

Food (18.2%) is the largest component within the *other organics* category, followed by *animal by-products* (5.3%), *prunings and trimmings* (4.1%), and *leaves and grass* (3.7%). *Remainder/composite paper* (8.9%) and *other mixed paper* (8.4%) again form the two greatest components of the *paper* category, and *uncoated corrugated paper* (4.4%) and *newspaper* (4.2%) are again significant.

4.2.3 Residential Substream: Dry Sampling Period

Other organics (43.6%) and *paper* (29.2%) were the two largest categories of the residential substream during the dry sampling period, as Table 4.2.3 illustrates.

The greatest component within the *other organics* category was *food* (18.1%), with *wood* (4.4%), *leaves and grass* (4.1%), and *textiles* (4.1%) each contributing noteworthy amounts. Within the *paper* category, *other mixed paper* (10.8%) dominated, with *remainder/composite paper* (7.1%) not far behind. *Newspaper* (3.7%) and *uncoated corrugated paper* (2.7%) were still significant.

Figure 4.2.1
Residential Substream
Composition Percentages by Weight

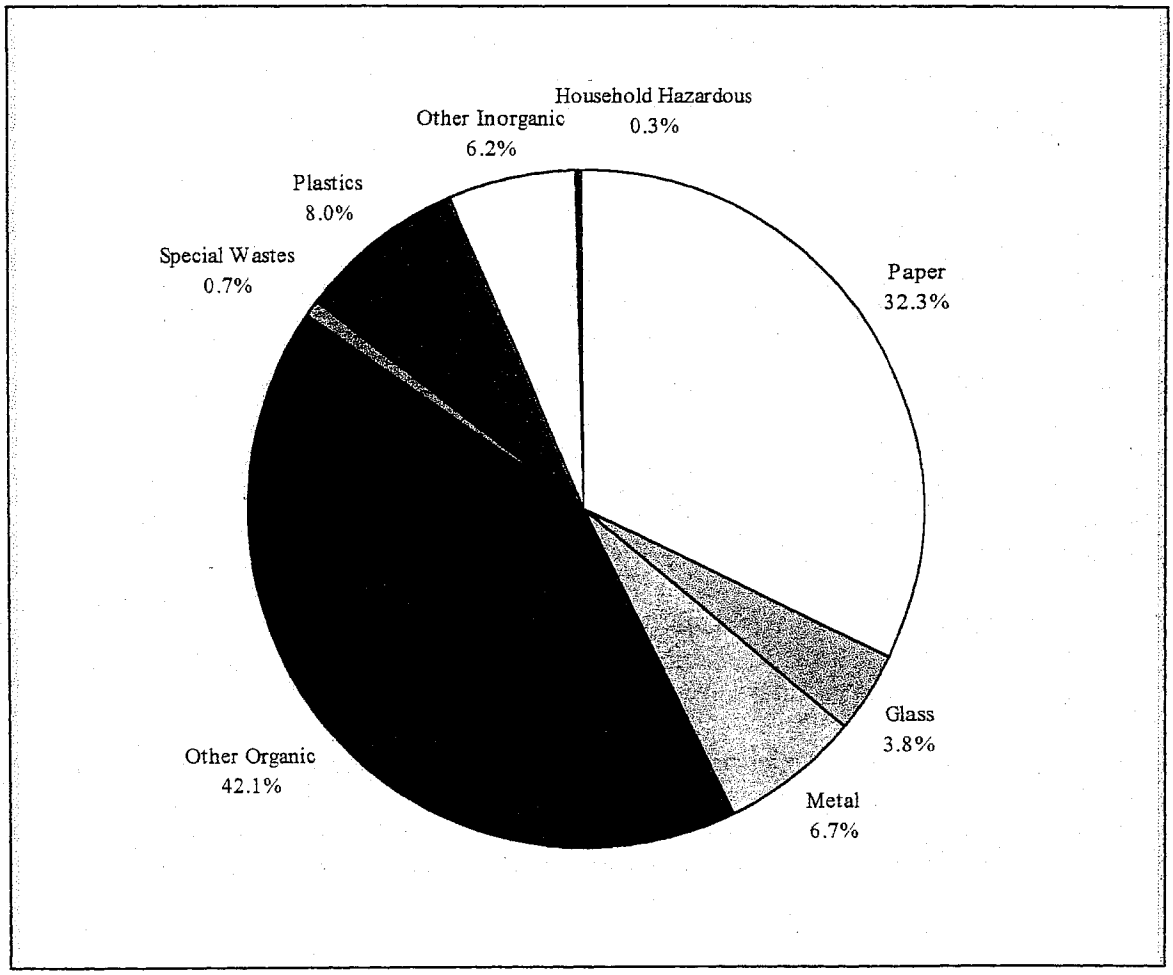


Table 4.2.1
Residential Substream
Composition Percentages by Weight

Percent & Range at 90% Confidence Interval

	Tons	Percent	+/-		Tons	Percent	+/-
PAPER	**52,637**	**32.3%**		**PLASTICS**	**13,098**	**8.0%**	
Uncoated Corrugated	5,717	3.5%	0.5%	#2 HDPE Natural RPPC	499	0.3%	0.0%
Coated Corrugated	314	0.2%	0.2%	#2 HDPE Colored RPPC	814	0.5%	0.1%
Brown Paper Bags	3,111	1.9%	0.3%	#1 PET RPPC	693	0.4%	0.0%
Newspaper	6,346	3.9%	0.4%	#1 PET Products/Packaging	43	0.0%	0.0%
White Ledger	1,179	0.7%	0.2%	Film Packaging	5,780	3.5%	0.3%
Colored Ledger	200	0.1%	0.1%	#3 PVC RPPC	90	0.1%	0.0%
Computer Paper	17	0.0%	0.0%	#4 LDPE RPPC	38	0.0%	0.0%
Other Office Paper	236	0.1%	0.1%	#5 PP RPPC	213	0.1%	0.0%
Magazines and Catalogs	4,800	2.9%	0.5%	#6 PS RPPC	98	0.1%	0.0%
Phone Books and Directories	489	0.3%	0.1%	#7 and Uncoded RPPC	223	0.1%	0.0%
Other Mixed Paper	15,818	9.7%	0.8%	#2 HDPE Products/Packaging	139	0.1%	0.0%
Remainder/Composite Paper	12,982	8.0%	0.8%	#3 PVC Products/Packaging	155	0.1%	0.1%
Milk Cartons and Drink Boxes	1,428	0.9%	0.9%	#4 LDPE Products/Packaging	6	0.0%	0.0%
GLASS	**6,149**	**3.8%**		#5 PP Products/Packaging	80	0.0%	0.0%
Clear Bottles and Containers	3,013	1.8%	0.3%	#6 PS Products/Packaging	1,109	0.7%	0.1%
Green Bottles and Containers	1,118	0.7%	0.1%	#7 and Uncoded Products/Packaging	1,395	0.9%	0.1%
Brown Bottles and Containers	1,242	0.8%	0.2%	Polyurethane	630	0.4%	0.3%
Flat Glass	136	0.1%	0.0%	Other Mixed Plastic and Material	1,093	0.7%	0.2%
Remainder/Composite Glass	640	0.4%	0.4%	**OTHER INORGANICS**	**10,153**	**6.2%**	
METAL	**10,859**	**6.7%**		Rock	1,238	0.8%	0.4%
Tin/Steel Cans	2,798	1.7%	0.2%	Concrete	1,135	0.7%	0.4%
Other Ferrous	2,970	1.8%	0.7%	Brick	87	0.1%	0.1%
Aluminum Cans	716	0.4%	0.2%	Soil and Fines	3,446	2.1%	0.7%
Other Non-ferrous	467	0.3%	0.1%	Asphalt	1,294	0.8%	0.8%
White Goods	755	0.5%	0.8%	Gypsum Board	890	0.5%	0.6%
Remainder/Composite Metal	3,152	1.9%	0.8%	Remainder/Composite Inorganic	2,064	1.3%	0.6%
OTHER ORGANIC	**68,650**	**42.1%**		**HOUSEHOLD HAZARDOUS**	**476**	**0.3%**	
Food	29,631	18.2%	1.7%	Paint	67	0.0%	0.0%
Leaves and Grass	6,384	3.9%	1.4%	Automotive Fluids	166	0.1%	0.1%
Prunings and Trimmings	4,183	2.6%	1.4%	Household Batteries	117	0.1%	0.0%
Branches and Stumps	644	0.4%	0.4%	Vehicle Batteries	5	0.0%	0.0%
Agricultural Crop Residue	0	0.0%	0.0%	Remainder Composite HHW	121	0.1%	0.0%
Manure	0	0.0%	0.0%	**SPECIAL WASTES**	**1,138**	**0.7%**	
Wood	4,874	3.0%	1.5%	Bulky Items	544	0.3%	0.3%
Textiles	5,427	3.3%	1.0%	Ash	591	0.4%	0.3%
Tires	37	0.0%	0.0%	Industrial Sludge	0	0.0%	0.0%
Miscellaneous Organics	2,555	1.6%	0.4%	Treated Medical Waste	2	0.0%	0.0%
Mixed Textiles/Materials	4,013	2.5%	2.1%	Remainder Composite Special	0	0.0%	0.0%
Animal By-Products	6,443	3.9%	2.0%				
Disposable Diapers/Fem Hygiene	4,460	2.7%	0.4%				
				TOTAL	**163,160**	**100.0%**	

Table 4.2.2
Residential Substream: Wet Sampling Period
Composition Percentages by Weight

Percent & Range at 90% Confidence Interval

	Percent	+/-		Percent	+/-
PAPER	**35.7%**		**PLASTICS**	**7.5%**	
Uncoated Corrugated	4.4%	0.8%	#2 HDPE Natural RPPC	0.3%	0.1%
Coated Corrugated	0.4%	0.5%	#2 HDPE Colored RPPC	0.5%	0.1%
Brown Paper Bags	2.4%	0.3%	#1 PET RPPC	0.4%	0.1%
Newspaper	4.2%	0.6%	#1 PET Products/Packaging	0.0%	0.0%
White Ledger	1.0%	0.3%	Film Packaging	3.4%	0.4%
Colored Ledger	0.1%	0.1%	#3 PVC RPPC	0.0%	0.0%
Computer Paper	0.0%	0.0%	#4 LDPE RPPC	0.0%	0.0%
Other Office Paper	0.3%	0.2%	#5 PP RPPC	0.1%	0.0%
Magazines and Catalogs	3.8%	0.7%	#6 PS RPPC	0.1%	0.0%
Phone Books and Directories	0.3%	0.2%	#7 and Uncoded RPPC	0.1%	0.0%
Other Mixed Paper	8.4%	0.8%	#2 HDPE Products/Packaging	0.2%	0.1%
Remainder/Composite Paper	8.9%	1.0%	#3 PVC Products/Packaging	0.1%	0.1%
Milk Cartons and Drink Boxes	1.6%	1.9%	#4 LDPE Products/Packaging	0.0%	0.0%
GLASS	**4.0%**		#5 PP Products/Packaging	0.0%	0.0%
Clear Bottles and Containers	1.8%	0.3%	#6 PS Products/Packaging	0.7%	0.1%
Green Bottles and Containers	0.7%	0.2%	#7 and Uncoded Products/Packaging	0.6%	0.1%
Brown Bottles and Containers	0.8%	0.3%	Polyurethane	0.1%	0.1%
Flat Glass	0.0%	0.0%	Other Mixed Plastic and Material	0.8%	0.2%
Remainder/Composite Glass	0.7%	0.8%	**OTHER INORGANICS**	**8.2%**	
METAL	**6.1%**		Rock	1.1%	0.7%
Tin/Steel Cans	2.0%	0.2%	Concrete	0.9%	0.6%
Other Ferrous	1.6%	0.7%	Brick	0.1%	0.1%
Aluminum Cans	0.3%	0.0%	Soil and Fines	2.4%	1.1%
Other Non-ferrous	0.2%	0.1%	Asphalt	1.0%	1.3%
White Goods	1.0%	1.6%	Gypsum Board	0.9%	1.0%
Remainder/Composite Metal	1.0%	0.4%	Remainder/Composite Inorganic	1.7%	1.0%
OTHER ORGANIC	**40.3%**		**HOUSEHOLD HAZARDOUS**	**0.3%**	
Food	18.2%	2.0%	Paint	0.1%	0.1%
Leaves and Grass	3.7%	1.6%	Automotive Fluids	0.1%	0.1%
Prunings and Trimmings	4.1%	2.7%	Household Batteries	0.1%	0.0%
Branches and Stumps	0.1%	0.1%	Vehicle Batteries	0.0%	0.0%
Agricultural Crop Residue	0.0%	0.0%	Remainder Composite HHW	0.0%	0.0%
Manure	0.0%	0.0%	**SPECIAL WASTES**	**0.5%**	
Wood	1.4%	0.9%	Bulky Items	0.4%	0.5%
Textiles	2.4%	0.5%	Ash	0.0%	0.1%
Tires	0.0%	0.0%	Industrial Sludge	0.0%	0.0%
Miscellaneous Organics	1.2%	0.3%	Treated Medical Waste	0.0%	0.0%
Mixed Textiles/Materials	1.4%	0.4%	Remainder Composite Special	0.0%	0.0%
Animal By-Products	5.3%	4.2%			
Disposable Diapers/Fem Hygiene	2.5%	0.5%			

Table 4.2.3
Residential Substream: Dry Sampling Period
Composition Percentages by Weight

Percent & Range at 90% Confidence Interval

	Percent	+/-		Percent	+/-
PAPER	**29.2%**		**PLASTICS**	**7.5%**	
Uncoated Corrugated	2.7%	0.5%	#2 HDPE Natural RPPC	0.3%	0.1%
Coated Corrugated	0.1%	0.1%	#2 HDPE Colored RPPC	0.5%	0.1%
Brown Paper Bags	1.5%	0.4%	#1 PET RPPC	0.4%	0.1%
Newspaper	3.7%	0.6%	#1 PET Products/Packaging	0.0%	0.0%
White Ledger	0.5%	0.2%	Film Packaging	3.4%	0.4%
Colored Ledger	0.1%	0.1%	#3 PVC RPPC	0.0%	0.0%
Computer Paper	0.0%	0.0%	#4 LDPE RPPC	0.0%	0.0%
Other Office Paper	0.0%	0.0%	#5 PP RPPC	0.1%	0.0%
Magazines and Catalogs	2.2%	0.5%	#6 PS RPPC	0.1%	0.0%
Phone Books and Directories	0.3%	0.1%	#7 and Uncoded RPPC	0.1%	0.0%
Other Mixed Paper	10.8%	1.3%	#2 HDPE Products/Packaging	0.2%	0.1%
Remainder/Composite Paper	7.1%	1.2%	#3 PVC Products/Packaging	0.1%	0.1%
Milk Cartons and Drink Boxes	0.3%	0.0%	#4 LDPE Products/Packaging	0.0%	0.0%
GLASS	**3.6%**		#5 PP Products/Packaging	0.0%	0.0%
Clear Bottles and Containers	1.9%	0.4%	#6 PS Products/Packaging	0.7%	0.1%
Green Bottles and Containers	0.6%	0.2%	#7 and Uncoded Products/Packaging	0.6%	0.1%
Brown Bottles and Containers	0.8%	0.3%	Polyurethane	0.1%	0.1%
Flat Glass	0.1%	0.1%	Other Mixed Plastic and Material	0.8%	0.2%
Remainder/Composite Glass	0.2%	0.1%	**OTHER INORGANICS**	**8.2%**	
METAL	**7.2%**		Rock	1.1%	0.7%
Tin/Steel Cans	1.5%	0.2%	Concrete	0.9%	0.6%
Other Ferrous	2.0%	1.2%	Brick	0.1%	0.1%
Aluminum Cans	0.6%	0.4%	Soil and Fines	2.4%	1.1%
Other Non-ferrous	0.4%	0.1%	Asphalt	1.0%	1.3%
White Goods	0.0%	0.0%	Gypsum Board	0.9%	1.0%
Remainder/Composite Metal	2.8%	1.4%	Remainder/Composite Inorganic	1.7%	1.0%
OTHER ORGANIC	**43.6%**		**HOUSEHOLD HAZARDOUS**	**0.3%**	
Food	18.1%	2.6%	Paint	0.1%	0.1%
Leaves and Grass	4.1%	2.2%	Automotive Fluids	0.1%	0.1%
Prunings and Trimmings	1.3%	1.2%	Household Batteries	0.1%	0.0%
Branches and Stumps	0.7%	0.7%	Vehicle Batteries	0.0%	0.0%
Agricultural Crop Residue	0.0%	0.0%	Remainder Composite HHW	0.0%	0.0%
Manure	0.0%	0.0%	**SPECIAL WASTES**	**0.5%**	
Wood	4.4%	2.6%	Bulky Items	0.4%	0.5%
Textiles	4.1%	1.9%	Ash	0.0%	0.1%
Tires	0.0%	0.0%	Industrial Sludge	0.0%	0.0%
Miscellaneous Organics	1.8%	0.6%	Treated Medical Waste	0.0%	0.0%
Mixed Textiles/Materials	3.4%	3.9%	Remainder Composite Special	0.0%	0.0%
Animal By-Products	2.8%	0.9%			
Disposable Diapers/Fem Hygiene	2.9%	0.6%			

4.3 Commercial Substream

This section describes the composition of the commercial substream. Section 4.3.1 summarizes the data for the entire substream, while Sections 4.3.2 and 4.3.3 present the data for the wet and dry sampling periods respectively.

4.3.1 Overall Commercial Substream

Figure 4.3.1 and Table 4.3.1 illustrate the composition of the entire commercial substream. Like the residential substream, the commercial substream's two largest categories were *other organics* (42.8%) and *paper* (28.1%).

Unlike the residential substream, *wood* (14.0%) is a slightly higher percentage of the commercial substream than *food* (13.7%). In the *paper* category, *remainder/composite paper* (7.0%), *other mixed paper* (6.8%), and *uncoated corrugated paper* (6.5%) each form noteworthy percentages of the commercial substream.

4.3.2 Commercial Substream: Wet Sampling Period

During the wet sampling period, *other organics* (43.8%) and *paper* (28.3%) were again the largest categories, as Table 4.3.2 shows.

Wood (15.8%) is again the greatest component of the *other organics* category, followed by *food* (12.1%) and more distantly, *leaves and grass* (6.1%). The same set of paper types again dominates the *paper* category: *remainder/composite paper* (7.6%), *uncoated corrugated* (7.0%), and *other mixed paper* (6.3%).

4.3.3 Commercial Substream: Dry Sampling Period

As Table 4.3.3 shows, *other organics* (41.3%) and *paper* (27.8%) constituted the greatest proportion of the commercial substream during the dry sampling period.

Within the *other organics* component, *food* (16.0%) and *wood wastes* (11.3%) were the two greatest contributors, while *other mixed paper* (7.6%), *remainder/composite paper* (6.3%), and *uncoated corrugated paper* (5.7%) dominated the paper category.

Figure 4.3.1
Commercial Substream
Composition Percentages by Weight

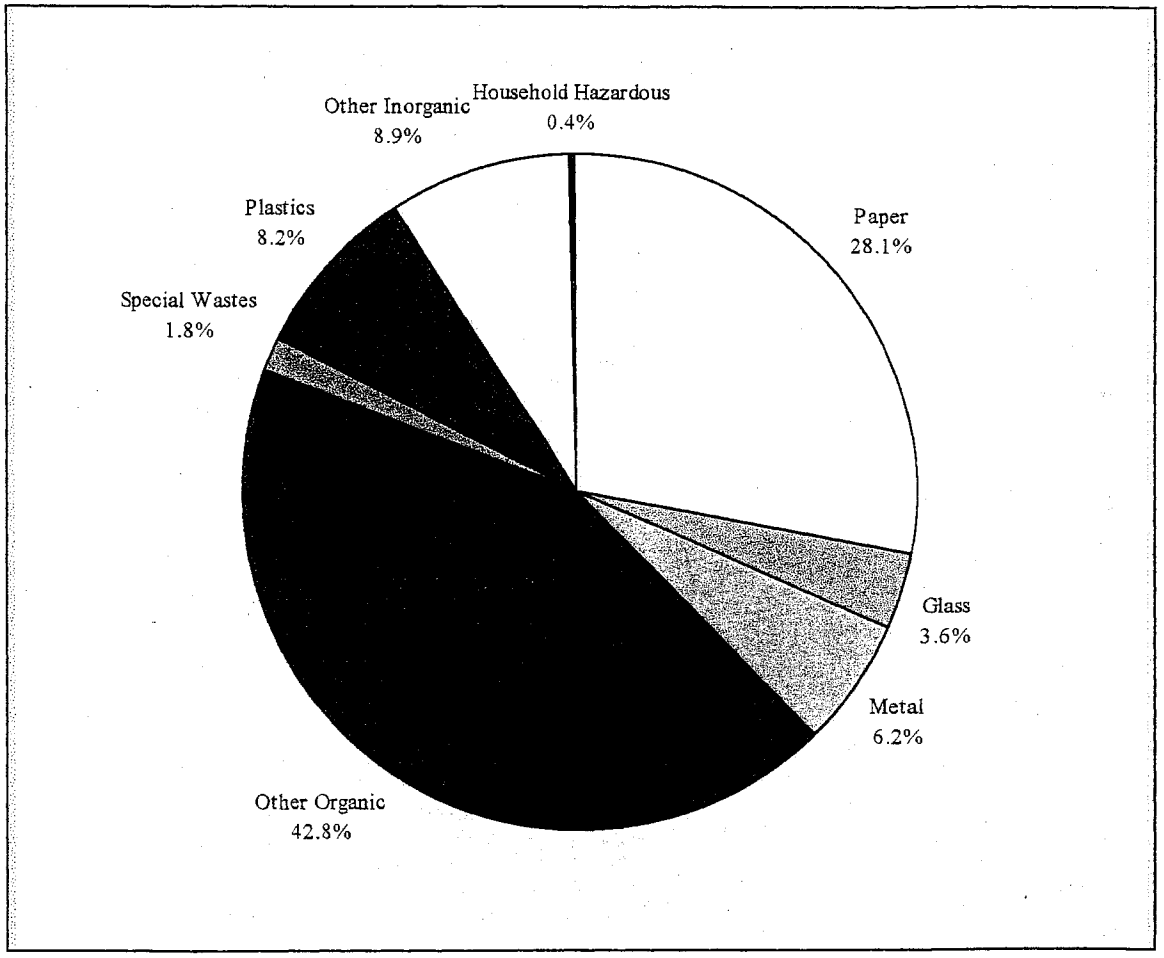


Table 4.3.1
Commercial Substream
Composition Percentages by Weight

Percent & Range at 90% Confidence Interval

	Tons	Percent	+/-		Tons	Percent	+/-
PAPER	**45,424**	**28.1%**		**PLASTICS**	**13,181**	**8.2%**	
Uncoated Corrugated	10,473	6.5%	1.0%	#2 HDPE Natural RPPC	546	0.3%	0.1%
Coated Corrugated	2,240	1.4%	0.9%	#2 HDPE Colored RPPC	603	0.4%	0.1%
Brown Paper Bags	1,156	0.7%	0.2%	#1 PET RPPC	379	0.2%	0.0%
Newspaper	3,634	2.2%	0.5%	#1 PET Products/Packaging	31	0.0%	0.0%
White Ledger	1,985	1.2%	0.4%	Film Packaging	6,379	3.9%	0.9%
Colored Ledger	403	0.2%	0.2%	#3 PVC RPPC	64	0.0%	0.0%
Computer Paper	192	0.1%	0.1%	#4 LDPE RPPC	9	0.0%	0.0%
Other Office Paper	92	0.1%	0.0%	#5 PP RPPC	81	0.0%	0.0%
Magazines and Catalogs	1,851	1.1%	0.3%	#6 PS RPPC	35	0.0%	0.0%
Phone Books and Directories	343	0.2%	0.1%	#7 and Uncoded RPPC	77	0.0%	0.0%
Other Mixed Paper	11,000	6.8%	1.2%	#2 HDPE Products/Packaging	48	0.0%	0.0%
Remainder/Composite Paper	11,342	7.0%	1.2%	#3 PVC Products/Packaging	596	0.4%	0.4%
Milk Cartons and Drink Boxes	714	0.4%	0.2%	#4 LDPE Products/Packaging	2	0.0%	0.0%
GLASS	**5,892**	**3.6%**		#5 PP Products/Packaging	32	0.0%	0.0%
Clear Bottles and Containers	1,946	1.2%	0.2%	#6 PS Products/Packaging	949	0.6%	0.2%
Green Bottles and Containers	725	0.4%	0.1%	#7 and Uncoded Products/Packaging	1,637	1.0%	0.3%
Brown Bottles and Containers	641	0.4%	0.1%	Polyurethane	344	0.2%	0.1%
Flat Glass	986	0.6%	0.7%	Other Mixed Plastic and Material	1,370	0.8%	0.4%
Remainder/Composite Glass	1,594	1.0%	1.4%	**OTHER INORGANICS**	**14,371**	**8.9%**	
METAL	**10,060**	**6.2%**		Rock	655	0.4%	0.4%
Tin/Steel Cans	1,482	0.9%	0.2%	Concrete	4,978	3.1%	2.4%
Other Ferrous	4,145	2.6%	0.7%	Brick	196	0.1%	0.1%
Aluminum Cans	463	0.3%	0.2%	Soil and Fines	3,796	2.3%	1.2%
Other Non-ferrous	1,057	0.7%	0.5%	Asphalt	1,933	1.2%	1.1%
White Goods	122	0.1%	0.1%	Gypsum Board	1,165	0.7%	0.6%
Remainder/Composite Metal	2,790	1.7%	0.7%	Remainder/Composite Inorganic	1,649	1.0%	0.7%
OTHER ORGANIC	**69,094**	**42.8%**		**HOUSEHOLD HAZARDOUS**	**670**	**0.4%**	
Food	22,202	13.7%	2.6%	Paint	61	0.0%	0.0%
Leaves and Grass	8,168	5.1%	2.2%	Automotive Fluids	85	0.1%	0.1%
Prunings and Trimmings	4,067	2.5%	1.2%	Household Batteries	64	0.0%	0.0%
Branches and Stumps	875	0.5%	0.5%	Vehicle Batteries	133	0.1%	0.1%
Agricultural Crop Residue	0	0.0%	0.0%	Remainder Composite HHW	326	0.2%	0.2%
Manure	0	0.0%	0.0%	**SPECIAL WASTES**	**2,899**	**1.8%**	
Wood	22,542	14.0%	3.4%	Bulky Items	2,405	1.5%	0.8%
Textiles	2,030	1.3%	0.3%	Ash	5	0.0%	0.0%
Tires	89	0.1%	0.1%	Industrial Sludge	0	0.0%	0.0%
Miscellaneous Organics	2,762	1.7%	1.0%	Treated Medical Waste	461	0.3%	0.5%
Mixed Textiles/Materials	3,073	1.9%	0.9%	Remainder Composite Special	28	0.0%	0.0%
Animal By-Products	1,447	0.9%	0.3%				
Disposable Diapers/Fem Hygiene	1,839	1.1%	0.4%				
				TOTAL	**161,591**	**100.0%**	

Table 4.3.2
Commercial Substream: Wet Sampling Period
Composition Percentages by Weight

Percent & Range at 90% Confidence Interval

	Percent	+/-		Percent	+/-
PAPER	**28.3%**		**PLASTICS**	**7.9%**	
Uncoated Corrugated	7.0%	1.4%	#2 HDPE Natural RPPC	0.3%	0.1%
Coated Corrugated	1.4%	1.0%	#2 HDPE Colored RPPC	0.4%	0.1%
Brown Paper Bags	0.8%	0.2%	#1 PET RPPC	0.2%	0.0%
Newspaper	1.8%	0.5%	#1 PET Products/Packaging	0.0%	0.0%
White Ledger	1.2%	0.5%	Film Packaging	4.0%	0.9%
Colored Ledger	0.3%	0.2%	#3 PVC RPPC	0.0%	0.0%
Computer Paper	0.1%	0.1%	#4 LDPE RPPC	0.0%	0.0%
Other Office Paper	0.1%	0.0%	#5 PP RPPC	0.0%	0.0%
Magazines and Catalogs	1.1%	0.3%	#6 PS RPPC	0.0%	0.0%
Phone Books and Directories	0.2%	0.1%	#7 and Uncoded RPPC	0.1%	0.0%
Other Mixed Paper	6.3%	1.6%	#2 HDPE Products/Packaging	0.0%	0.0%
Remainder/Composite Paper	7.6%	1.6%	#3 PVC Products/Packaging	0.3%	0.3%
Milk Cartons and Drink Boxes	0.5%	0.3%	#4 LDPE Products/Packaging	0.0%	0.0%
GLASS	**4.3%**		#5 PP Products/Packaging	0.0%	0.0%
Clear Bottles and Containers	1.0%	0.2%	#6 PS Products/Packaging	0.5%	0.2%
Green Bottles and Containers	0.4%	0.2%	#7 and Uncoded Products/Packaging	1.3%	0.4%
Brown Bottles and Containers	0.3%	0.1%	Polyurethane	0.2%	0.2%
Flat Glass	1.0%	1.1%	Other Mixed Plastic and Material	0.6%	0.3%
Remainder/Composite Glass	1.5%	2.3%	**OTHER INORGANICS**	**6.4%**	
METAL	**6.9%**		Rock	0.1%	0.1%
Tin/Steel Cans	0.8%	0.2%	Concrete	1.8%	2.0%
Other Ferrous	3.0%	1.0%	Brick	0.0%	0.1%
Aluminum Cans	0.2%	0.0%	Soil and Fines	2.7%	1.9%
Other Non-ferrous	0.4%	0.2%	Asphalt	0.3%	0.2%
White Goods	0.1%	0.2%	Gypsum Board	0.8%	1.0%
Remainder/Composite Metal	2.4%	1.1%	Remainder/Composite Inorganic	0.7%	0.4%
OTHER ORGANIC	**43.8%**		**HOUSEHOLD HAZARDOUS**	**0.3%**	
Food	12.1%	3.1%	Paint	0.0%	0.1%
Leaves and Grass	6.1%	3.5%	Automotive Fluids	0.1%	0.1%
Prunings and Trimmings	2.1%	1.4%	Household Batteries	0.0%	0.1%
Branches and Stumps	0.5%	0.6%	Vehicle Batteries	0.0%	0.0%
Agricultural Crop Residue	0.0%	0.0%	Remainder Composite HHW	0.1%	0.2%
Manure	0.0%	0.0%	**SPECIAL WASTES**	**2.0%**	
Wood	15.8%	4.9%	Bulky Items	1.5%	1.2%
Textiles	1.4%	0.5%	Ash	0.0%	0.0%
Tires	0.0%	0.1%	Industrial Sludge	0.0%	0.0%
Miscellaneous Organics	1.6%	0.9%	Treated Medical Waste	0.5%	0.8%
Mixed Textiles/Materials	2.1%	1.5%	Remainder Composite Special	0.0%	0.0%
Animal By-Products	0.6%	0.3%			
Disposable Diapers/Fem Hygiene	1.3%	0.6%			

Table 4.3.3
Commercial Substream: Dry Sampling Period
Composition Percentages by Weight

Percent & Range at 90% Confidence Interval

	Percent	+/-		Percent	+/-
PAPER	**27.8%**		**PLASTICS**	**8.5%**	
Uncoated Corrugated	5.7%	1.3%	#2 HDPE Natural RPPC	0.4%	0.1%
Coated Corrugated	1.4%	1.5%	#2 HDPE Colored RPPC	0.3%	0.1%
Brown Paper Bags	0.5%	0.2%	#1 PET RPPC	0.3%	0.1%
Newspaper	2.9%	0.9%	#1 PET Products/Packaging	0.0%	0.0%
White Ledger	1.2%	0.7%	Film Packaging	3.9%	1.7%
Colored Ledger	0.2%	0.2%	#3 PVC RPPC	0.0%	0.0%
Computer Paper	0.1%	0.1%	#4 LDPE RPPC	0.0%	0.0%
Other Office Paper	0.0%	0.0%	#5 PP RPPC	0.1%	0.0%
Magazines and Catalogs	1.2%	0.5%	#6 PS RPPC	0.0%	0.0%
Phone Books and Directories	0.2%	0.1%	#7 and Uncoded RPPC	0.0%	0.0%
Other Mixed Paper	7.6%	1.6%	#2 HDPE Products/Packaging	0.1%	0.0%
Remainder/Composite Paper	6.3%	1.6%	#3 PVC Products/Packaging	0.5%	0.9%
Milk Cartons and Drink Boxes	0.4%	0.4%	#4 LDPE Products/Packaging	0.0%	0.0%
GLASS	**2.7%**		#5 PP Products/Packaging	0.0%	0.0%
Clear Bottles and Containers	1.5%	0.4%	#6 PS Products/Packaging	0.7%	0.3%
Green Bottles and Containers	0.4%	0.2%	#7 and Uncoded Products/Packaging	0.7%	0.2%
Brown Bottles and Containers	0.5%	0.2%	Polyurethane	0.2%	0.1%
Flat Glass	0.0%	0.0%	Other Mixed Plastic and Material	1.2%	0.9%
Remainder/Composite Glass	0.2%	0.1%	**OTHER INORGANICS**	**12.4%**	
METAL	**5.3%**		Rock	0.9%	1.0%
Tin/Steel Cans	1.0%	0.4%	Concrete	4.9%	5.2%
Other Ferrous	2.0%	1.1%	Brick	0.2%	0.3%
Aluminum Cans	0.4%	0.4%	Soil and Fines	1.8%	1.3%
Other Non-ferrous	1.0%	1.2%	Asphalt	2.4%	2.7%
White Goods	0.0%	0.0%	Gypsum Board	0.6%	0.5%
Remainder/Composite Metal	0.8%	0.5%	Remainder/Composite Inorganic	1.5%	1.5%
OTHER ORGANIC	**41.3%**		**HOUSEHOLD HAZARDOUS**	**0.6%**	
Food	16.0%	4.6%	Paint	0.0%	0.0%
Leaves and Grass	3.6%	1.8%	Automotive Fluids	0.0%	0.0%
Prunings and Trimmings	3.1%	2.3%	Household Batteries	0.0%	0.0%
Branches and Stumps	0.6%	1.0%	Vehicle Batteries	0.2%	0.3%
Agricultural Crop Residue	0.0%	0.0%	Remainder Composite HHW	0.3%	0.5%
Manure	0.0%	0.0%	**SPECIAL WASTES**	**1.5%**	
Wood	11.3%	4.6%	Bulky Items	1.5%	1.1%
Textiles	1.1%	0.4%	Ash	0.0%	0.0%
Tires	0.1%	0.1%	Industrial Sludge	0.0%	0.0%
Miscellaneous Organics	1.9%	2.0%	Treated Medical Waste	0.0%	0.0%
Mixed Textiles/Materials	1.6%	0.9%	Remainder Composite Special	0.0%	0.0%
Animal By-Products	1.3%	0.6%			
Disposable Diapers/Fem Hygiene	0.9%	0.4%			

4.4 Self-Haul Substream

This section presents the composition data for the self-haul substream. Section 4.4.1 discusses the entire self-haul substream, while Sections 4.4.2 and 4.4.3 describe the self-haul substream during the wet and dry sampling periods respectively.

4.4.1 Self-Haul Substream: Overall

As Figure 4.4.1 and Table 4.4.1 indicate, *other organics* (39.2%) was the largest category within the self-haul substream. The *other inorganics* (17.6%), *paper* (15.8%), and *metal* (11.7%) categories dominated the remainder of the substream.

Wood (16.3%) was the main component of the *other organics* category; *asphalt* (5.4%) and *concrete* (3.6%) were the cardinal components of the *other inorganics* category. *Uncoated corrugated* (4.5%) was the most common type of *paper*, and *other ferrous* (6.7%) the most prevalent type of *metal*.

4.4.2 Self-Haul Substream: Wet Sampling Period

During the wet sampling period, *other organics* (39.2%) again formed the greatest portion of the self-haul substream. *Other inorganics* (18.7%) and *paper* (16.9%) also composed significant portions of the substream, with the metals category (10.3%) a distant fourth.

Like the overall self-haul substream, the largest component of the *other organics* category in the wet self-haul substream was *wood* (16.3%). *Asphalt* (5.1%) and *gypsum board* (4.8%) dominated the *other inorganics* category; *uncoated corrugated* (4.8%) and *other mixed paper* (4.0%) dominate the *paper* category; and *other ferrous metals* (6.3%) again commands the *metals* category.

4.4.3 Self-Haul Substream: Dry Sampling Period

As Table 4.4.3 shows, *other organics* (39.3%) was the largest category within the self-haul substream during the dry sampling period. The remainder of the substream was nearly evenly divided among the *other inorganics* (16.3%), *paper* (14.6%), and *metal* (13.2%) categories.

Wood (16.3%) was the main component of the *other organics* category; *asphalt* (5.8%) and *concrete* (4.9%) dominated the *other inorganics* category. *Other mixed paper* (4.6%) and *uncoated corrugated paper* (4.1%) split the *paper* category, and *other ferrous metals* (7.3%) was the primary component of the *metals* category.

Figure 4.4.1
Self-Haul Substream
Composition Percentages by Weight

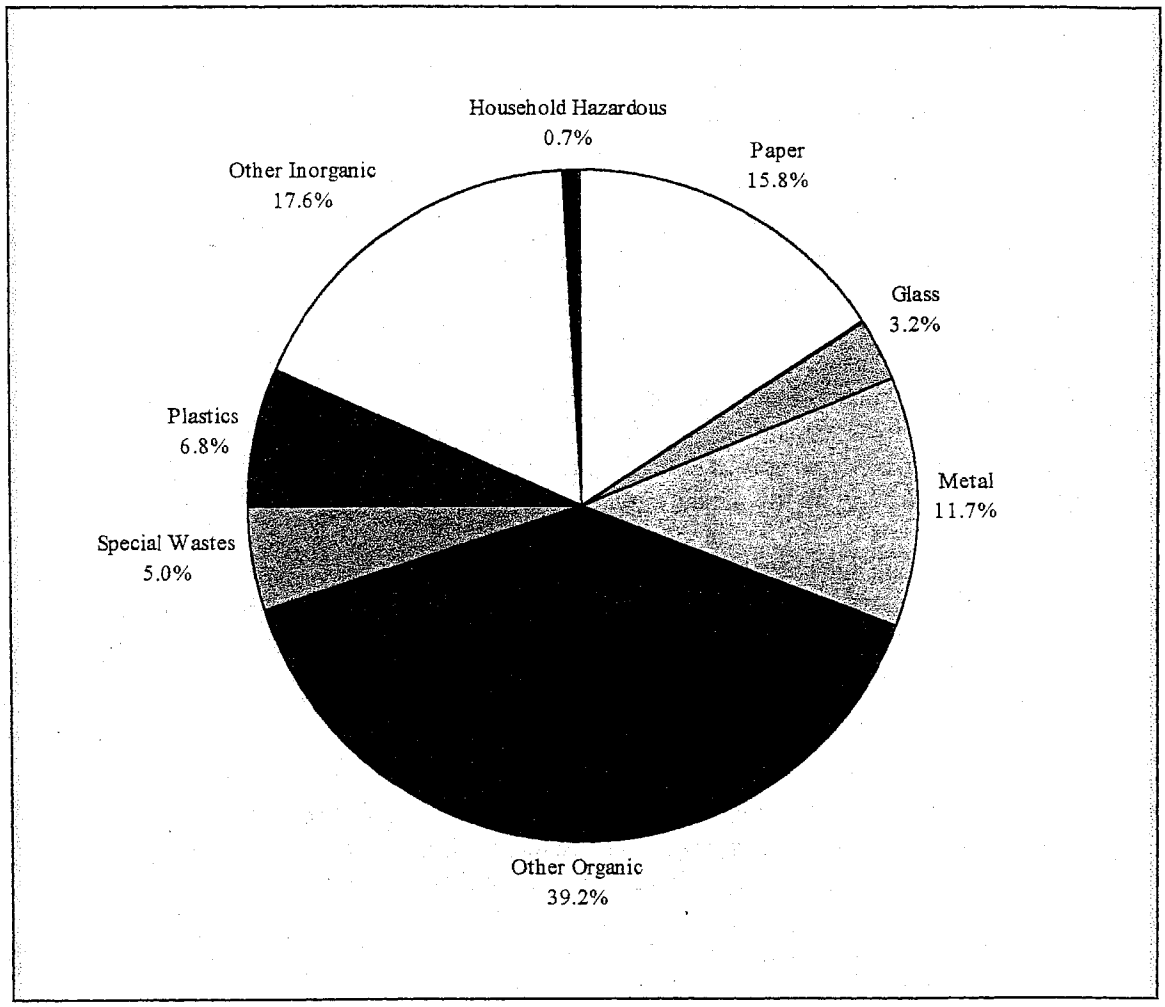


Table 4.4.1
Self-Haul Substream
Composition Percentages by Weight

Percent & Range at 90% Confidence Interval

	Tons	Percent	+/-		Tons	Percent	+/-
PAPER	**13,894**	**15.8%**		**PLASTICS**	**5,928**	**6.8%**	
Uncoated Corrugated	3,910	4.5%	0.9%	#2 HDPE Natural RPPC	158	0.2%	0.1%
Coated Corrugated	139	0.2%	0.2%	#2 HDPE Colored RPPC	289	0.3%	0.1%
Brown Paper Bags	475	0.5%	0.2%	#1 PET RPPC	139	0.2%	0.0%
Newspaper	1,539	1.8%	0.5%	#1 PET Products/Packaging	19	0.0%	0.0%
White Ledger	428	0.5%	0.2%	Film Packaging	1,882	2.1%	0.6%
Colored Ledger	92	0.1%	0.1%	#3 PVC RPPC	22	0.0%	0.0%
Computer Paper	8	0.0%	0.0%	#4 LDPE RPPC	2	0.0%	0.0%
Other Office Paper	66	0.1%	0.1%	#5 PP RPPC	31	0.0%	0.0%
Magazines and Catalogs	882	1.0%	0.5%	#6 PS RPPC	6	0.0%	0.0%
Phone Books and Directories	281	0.3%	0.2%	#7 and Uncoded RPPC	51	0.1%	0.0%
Other Mixed Paper	3,725	4.2%	1.0%	#2 HDPE Products/Packaging	200	0.2%	0.2%
Remainder/Composite Paper	2,262	2.6%	0.6%	#3 PVC Products/Packaging	160	0.2%	0.1%
Milk Cartons and Drink Boxes	88	0.1%	0.0%	#4 LDPE Products/Packaging	0	0.0%	0.0%
GLASS	**2,835**	**3.2%**		#5 PP Products/Packaging	15	0.0%	0.0%
Clear Bottles and Containers	927	1.1%	0.3%	#6 PS Products/Packaging	222	0.3%	0.1%
Green Bottles and Containers	602	0.7%	0.3%	#7 and Uncoded Products/Packaging	794	0.9%	0.3%
Brown Bottles and Containers	477	0.5%	0.3%	Polyurethane	1,202	1.4%	1.3%
Flat Glass	341	0.4%	0.2%	Other Mixed Plastic and Material	736	0.8%	0.3%
Remainder/Composite Glass	490	0.6%	0.3%	**OTHER INORGANICS**	**15,455**	**17.6%**	
METAL	**10,232**	**11.7%**		Rock	645	0.7%	0.9%
Tin/Steel Cans	698	0.8%	0.2%	Concrete	3,197	3.6%	1.8%
Other Ferrous	5,915	6.7%	1.8%	Brick	921	1.0%	1.2%
Aluminum Cans	324	0.4%	0.2%	Soil and Fines	987	1.1%	0.5%
Other Non-ferrous	626	0.7%	0.4%	Asphalt	4,764	5.4%	2.7%
White Goods	122	0.1%	0.2%	Gypsum Board	2,489	2.8%	1.6%
Remainder/Composite Metal	2,548	2.9%	0.9%	Remainder/Composite Inorganic	2,452	2.8%	1.1%
OTHER ORGANIC	**34,424**	**39.2%**		**HOUSEHOLD HAZARDOUS**	**630**	**0.7%**	
Food	3,615	4.1%	1.0%	Paint	134	0.2%	0.1%
Leaves and Grass	3,319	3.8%	1.8%	Automotive Fluids	61	0.1%	0.1%
Prunings and Trimmings	1,667	1.9%	1.0%	Household Batteries	31	0.0%	0.0%
Branches and Stumps	258	0.3%	0.2%	Vehicle Batteries	190	0.2%	0.2%
Agricultural Crop Residue	0	0.0%	0.0%	Remainder Composite HHW	215	0.2%	0.2%
Manure	0	0.0%	0.0%	**SPECIAL WASTES**	**4,381**	**5.0%**	
Wood	14,321	16.3%	5.0%	Bulky Items	3,570	4.1%	1.5%
Textiles	2,225	2.5%	0.8%	Ash	146	0.2%	0.2%
Tires	456	0.5%	0.4%	Industrial Sludge	0	0.0%	0.0%
Miscellaneous Organics	1,846	2.1%	0.9%	Treated Medical Waste	0	0.0%	0.0%
Mixed Textiles/Materials	4,287	4.9%	2.3%	Remainder Composite Special	666	0.8%	1.2%
Animal By-Products	1,560	1.8%	1.0%				
Disposable Diapers/Fem Hygiene	869	1.0%	1.0%				
				TOTAL	87,779	100.0%	

Table 4.4.2
Self-Haul Substream: Wet Sampling Period
Composition Percentages by Weight

Percent & Range at 90% Confidence Interval

	Percent	+/-		Percent	+/-
PAPER	**16.9%**		**PLASTICS**	**6.5%**	
Uncoated Corrugated	4.8%	1.3%	#2 HDPE Natural RPPC	0.1%	0.1%
Coated Corrugated	0.2%	0.4%	#2 HDPE Colored RPPC	0.4%	0.2%
Brown Paper Bags	0.8%	0.3%	#1 PET RPPC	0.1%	0.0%
Newspaper	2.1%	0.9%	#1 PET Products/Packaging	0.0%	0.0%
White Ledger	0.5%	0.2%	Film Packaging	2.4%	1.1%
Colored Ledger	0.1%	0.0%	#3 PVC RPPC	0.0%	0.0%
Computer Paper	0.0%	0.0%	#4 LDPE RPPC	0.0%	0.0%
Other Office Paper	0.0%	0.0%	#5 PP RPPC	0.0%	0.0%
Magazines and Catalogs	1.0%	0.7%	#6 PS RPPC	0.0%	0.0%
Phone Books and Directories	0.4%	0.3%	#7 and Uncoded RPPC	0.0%	0.0%
Other Mixed Paper	4.0%	1.5%	#2 HDPE Products/Packaging	0.1%	0.1%
Remainder/Composite Paper	2.8%	0.9%	#3 PVC Products/Packaging	0.1%	0.1%
Milk Cartons and Drink Boxes	0.1%	0.0%	#4 LDPE Products/Packaging	0.0%	0.0%
GLASS	**2.6%**		#5 PP Products/Packaging	0.0%	0.0%
Clear Bottles and Containers	0.8%	0.3%	#6 PS Products/Packaging	0.3%	0.1%
Green Bottles and Containers	0.6%	0.3%	#7 and Uncoded Products/Packaging	0.9%	0.4%
Brown Bottles and Containers	0.4%	0.2%	Polyurethane	1.3%	2.1%
Flat Glass	0.3%	0.2%	Other Mixed Plastic and Material	0.7%	0.4%
Remainder/Composite Glass	0.6%	0.4%	**OTHER INORGANICS**	**18.7%**	
METAL	**10.3%**		Rock	0.0%	0.0%
Tin/Steel Cans	1.0%	0.4%	Concrete	2.5%	1.5%
Other Ferrous	6.3%	2.6%	Brick	1.7%	2.3%
Aluminum Cans	0.1%	0.0%	Soil and Fines	1.5%	1.0%
Other Non-ferrous	0.6%	0.4%	Asphalt	5.1%	3.6%
White Goods	0.0%	0.0%	Gypsum Board	4.8%	3.0%
Remainder/Composite Metal	2.4%	1.3%	Remainder/Composite Inorganic	3.1%	1.6%
OTHER ORGANIC	**39.2%**		**HOUSEHOLD HAZARDOUS**	**0.8%**	
Food	4.7%	1.5%	Paint	0.0%	0.0%
Leaves and Grass	3.8%	1.9%	Automotive Fluids	0.1%	0.1%
Prunings and Trimmings	2.1%	1.8%	Household Batteries	0.0%	0.1%
Branches and Stumps	0.3%	0.4%	Vehicle Batteries	0.3%	0.3%
Agricultural Crop Residue	0.0%	0.0%	Remainder Composite HHW	0.4%	0.4%
Manure	0.0%	0.0%	**SPECIAL WASTES**	**5.0%**	
Wood	16.3%	8.8%	Bulky Items	3.4%	1.9%
Textiles	2.8%	1.2%	Ash	0.1%	0.1%
Tires	0.3%	0.4%	Industrial Sludge	0.0%	0.0%
Miscellaneous Organics	1.4%	0.7%	Treated Medical Waste	0.0%	0.0%
Mixed Textiles/Materials	4.6%	2.9%	Remainder Composite Special	1.4%	2.3%
Animal By-Products	1.8%	1.2%			
Disposable Diapers/Fem Hygiene	0.8%	0.7%			

Table 4.4.3
Self-Haul Substream: Dry Sampling Period
Composition Percentages by Weight

Percent & Range at 90% Confidence Interval

	Percent	+/-		Percent	+/-
PAPER	**14.6%**		**PLASTICS**	**7.0%**	
Uncoated Corrugated	4.1%	1.2%	#2 HDPE Natural RPPC	0.2%	0.1%
Coated Corrugated	0.1%	0.1%	#2 HDPE Colored RPPC	0.3%	0.1%
Brown Paper Bags	0.3%	0.1%	#1 PET RPPC	0.2%	0.1%
Newspaper	1.3%	0.6%	#1 PET Products/Packaging	0.0%	0.0%
White Ledger	0.5%	0.3%	Film Packaging	1.8%	0.5%
Colored Ledger	0.2%	0.2%	#3 PVC RPPC	0.0%	0.0%
Computer Paper	0.0%	0.0%	#4 LDPE RPPC	0.0%	0.0%
Other Office Paper	0.1%	0.1%	#5 PP RPPC	0.1%	0.0%
Magazines and Catalogs	1.0%	0.6%	#6 PS RPPC	0.0%	0.0%
Phone Books and Directories	0.2%	0.1%	#7 and Uncoded RPPC	0.1%	0.0%
Other Mixed Paper	4.6%	1.2%	#2 HDPE Products/Packaging	0.4%	0.3%
Remainder/Composite Paper	2.3%	0.6%	#3 PVC Products/Packaging	0.3%	0.2%
Milk Cartons and Drink Boxes	0.1%	0.0%	#4 LDPE Products/Packaging	0.0%	0.0%
GLASS	**3.9%**		#5 PP Products/Packaging	0.0%	0.0%
Clear Bottles and Containers	1.4%	0.6%	#6 PS Products/Packaging	0.2%	0.1%
Green Bottles and Containers	0.8%	0.7%	#7 and Uncoded Products/Packaging	0.9%	0.3%
Brown Bottles and Containers	0.7%	0.6%	Polyurethane	1.4%	1.3%
Flat Glass	0.5%	0.4%	Other Mixed Plastic and Material	1.0%	0.5%
Remainder/Composite Glass	0.5%	0.3%	**OTHER INORGANICS**	**16.3%**	
METAL	**13.2%**		Rock	1.5%	1.9%
Tin/Steel Cans	0.6%	0.1%	Concrete	4.9%	3.6%
Other Ferrous	7.3%	2.5%	Brick	0.3%	0.4%
Aluminum Cans	0.7%	0.5%	Soil and Fines	0.7%	0.4%
Other Non-ferrous	0.9%	0.7%	Asphalt	5.8%	4.2%
White Goods	0.3%	0.5%	Gypsum Board	0.6%	0.4%
Remainder/Composite Metal	3.5%	1.4%	Remainder/Composite Inorganic	2.5%	1.3%
OTHER ORGANIC	**39.3%**		**HOUSEHOLD HAZARDOUS**	**0.6%**	
Food	3.4%	1.2%	Paint	0.3%	0.2%
Leaves and Grass	3.7%	3.1%	Automotive Fluids	0.0%	0.1%
Prunings and Trimmings	1.7%	0.8%	Household Batteries	0.0%	0.0%
Branches and Stumps	0.3%	0.3%	Vehicle Batteries	0.1%	0.2%
Agricultural Crop Residue	0.0%	0.0%	Remainder Composite HHW	0.1%	0.1%
Manure	0.0%	0.0%	**SPECIAL WASTES**	**5.0%**	
Wood	16.3%	4.0%	Bulky Items	4.8%	2.2%
Textiles	2.2%	0.9%	Ash	0.2%	0.4%
Tires	0.7%	0.8%	Industrial Sludge	0.0%	0.0%
Miscellaneous Organics	2.8%	1.7%	Treated Medical Waste	0.0%	0.0%
Mixed Textiles/Materials	5.2%	3.6%	Remainder Composite Special	0.0%	0.0%
Animal By-Products	1.7%	1.7%			
Disposable Diapers/Fem Hygiene	1.2%	0.8%			

5. Comparisons

The data presented above allow for comparisons of the composition of the substreams. Section 5.1 provides an overview of the more detailed comparisons presented in Sections 5.2 through 5.4. Section 5.2 compares the composition of the overall residential, commercial, and self-haul substreams; and Sections 5.3 and 5.4 contrast the three substreams' composition during the wet and dry sampling periods respectively. In general, *within the same substream* there were few differences between composition percentages by weight of particular components when comparing the wet sampling period to the dry sampling period. The major differences in the composition percentages by weight of particular components appear when two substreams are compared (e.g. residential vs. commercial, self-haul vs. residential, commercial vs. self-haul).

5.1 Overview of Comparisons

- In all of the substreams during both sampling periods, *other organics* is the largest category of waste, ranging from 39.2% in the self-haul stream to 42.8% in the commercial stream. The *other organics* category includes such materials as food, wood, leaves and grass, textiles, and animal by-products.

- *Paper,* including newspaper, brown paper bags, uncoated corrugated paper, and magazines, is the second largest category in all of the residential and commercial streams. In the self-haul streams, *other inorganics* is the second largest category. The *other inorganics* category includes, among other items, asphalt, concrete, gypsum board, and brick.

- *Food* is the largest component within the *other organics* category in both of the residential streams, as well as in the commercial dry season waste stream. *Wood* is the largest component in overall commercial waste, commercial wet season waste, and all self-haul streams.

- Within the *other inorganics* category of the self-haul streams, *asphalt* is the greatest component. *Concrete* is the second largest in the overall and dry season self-haul waste streams, while *gypsum board* is the second greatest in the self-haul wet season waste stream.

- The composition percentage by weight of *uncoated corrugated paper* is always at a minimum in the residential substreams, and at a maximum in the commercial substreams (overall, wet season, and dry season).

- The composition percentages by weight of *other mixed paper* and *remainder/composite paper* were always at a minimum in the self-haul streams and at a maximum in the residential streams.

- The composition percentage by weight of *plastics,* including #1 PET RPPC, film packaging, polyurethane, and #2 HDPE natural and colored RPPC, was always at a maximum in the commercial streams, and at a minimum in the self-haul streams.

- The composition percentages by weight of *household hazardous wastes* and *special wastes* were both always at a minimum in the residential streams and at a maximum in the self-haul streams. *Household hazardous wastes,* including paint, automotive

fluids, and vehicle batteries, never composed more than 1% of any substream. *Special wastes* included ash, biosolids, and industrial sludge.

5.2 Annual Substream Comparisons

This section compares the overall composition by weight of the residential, commercial, and self-haul substreams.

- *Other organics* was the largest category in all three substreams (42.1% residential; 42.8% commercial; 39.2% self-haul); *paper* (32.3% residential; 28.1% commercial) was the second greatest in all but the self-haul substream (15.8%), in which *other inorganics* (17.6%) was the second largest.

- *Wood* is the primary component of the *other organics* category in both the commercial (14.0%) and self-haul (16.3%) streams, while *food* is dominant in the residential stream (18.2%).

- The composition percentage by weight of *uncoated corrugated paper* ranged from a low of 3.5% in the residential stream to a high of 6.5% in the commercial stream. The composition percentages by weight of *other mixed paper* (4.2%) and *remainder/composite paper* (2.6%) were both at their minimum in the self-haul stream, and at their height in the residential stream (9.7% and 8.0%, respectively).

- *Glass* was a fairly constant percentage of all three streams (3.8% residential; 3.6% commercial; 3.2% self-haul). *Plastics* also did not vary much (8.0% residential; 8.2% commercial; 6.8% self-haul).

5.3 Wet Sampling Period

This section compares the composition percentages by weight of all three substreams during the wet sampling period (January 22 through January 26, 1996, and February 12 through February 16, 1996).

- Again, *other organics* was the largest category of waste in all three substreams during the wet sampling period (40.3% residential; 43.8% commercial; 39.2% self-haul).

- Likewise, *paper* was the second largest category of both the residential and commercial substreams (35.7% and 28.3% respectively). *Other inorganics* was again the second largest category of the self-haul substream (18.7%).

- *Glass* was at its lowest in the self-haul substream (2.6%), and at its greatest in the commercial substream (4.3%).

- *Metals* comprised a noteworthy percentage of the self-haul substream (10.3%). They represented a slightly lower percentage of the commercial (6.9%) and residential (6.1%) substreams.

5.4 Dry Sampling Period

This section compares the composition percentages by weight of all three substreams during the dry sampling period (July 24 through July 28, 1995 and August 21 through August 25, 1995).

- *Other organics* was again the largest category of waste in all three substreams (43.6% residential; 41.3% commercial; 39.3% self-haul).

- *Paper* was again the second largest category of waste in the residential (29.2%) and commercial (27.8%) streams. In the self-haul substream, *other inorganics* was again the second largest category (16.3%).

- Within the *other organics* category, *food* was the greatest component of the residential (18.1%) and commercial (16.0%) streams. In the self-haul substream, *wood* (16.3%) dominated the category.

6. Comparison with 1991 EMCON Report

This section compares the waste composition findings of the 1991 EMCON Report with the waste composition findings of this study. The table below compares the tonnages and composition percentages by weight of selected categories in the two years.

The 1991 report contains two categories, *yard waste* and *other wastes*, the components of which the 1995/96 study includes in other categories. In order to more accurately compare data from the two years, the following material types from the 1995/96 report were reassigned to match the categories in the 1991 report:

- The *leaves and grass*, *prunings and trimmings*, and *branches and stumps* components were summed to create a *yard waste* category to compare with the 1991 report. The three components' tonnages and percentages were then subtracted from the 1995/96 *other organics* category.
- The *white goods* component, the *household hazardous waste* category, and the *other inorganics* category were summed to create an *other wastes* category to compare with the 1991 report. The *white goods* component tonnage and percentage were then subtracted from the *metals* category of the 1995/96 report.

As Table 6.1.1 shows, Sonoma County's waste stream has decreased over the past five years (541,506 tons in 1991 versus 412,529.59 tons in 1995), even though the population of the county has increased. The tonnages of *yard waste*, *other organics* (food, wood, textiles, etc.), and *paper* (uncoated corrugated, newspaper, white paper, etc.) decreased the most notably. This decrease is most likely due to the successful recycling and waste reduction programs the county has initiated since 1991.

The table also shows that in many cases, the percentage of the waste stream that a category comprises increased over the five year period even though its tonnage decreased. Since the composition percentage by weight that each component comprises is relative to all of the other components in the waste stream, this phenomenon is most likely due to the removal from the

waste stream of significant amounts of other wastes, especially yard wastes, through the recycling and waste reduction programs.

The most dramatic diversion which the table highlights is that of *yard waste*. Between 1991 and 1995/96, the amount of *yard waste* arriving at Sonoma County's disposal facilities and transfer stations decreased by 54,423 tons. In the same time period, *yard waste's* composition percentage by weight also fell 8.4%, from 15.5% in 1991 to 7.1% in 1995/96. The *metals* category also witnessed decreases in both tonnage (-13,162 tons) and percentage by weight (-0.6%).

Table 6.1.1
Sonoma County Overall Waste Stream: 1991 vs. 1995/96

Component	1991 Tons	1995/96 Tons	Difference	1991%	1995/96 %	Difference
Paper	141,760	111,652	-30,108	26.2	27.1	0.9
Plastics	37,508	32,185	-5,323	6.9	7.8	0.9
Glass	15,505	14,866	-639	2.9	3.6	0.7
Metals	43,408	30,246	-13,162	8.0	7.4	-0.6
Yard Waste	83,976	29,553	-54,423	15.5	7.1	-8.4
Other Organics	174,916	142,567	-32,349	32.3	34.6	2.3
Other Wastes	37,858	42,965	5,107	7.0	10.3	3.3
Special Wastes	6,576	8,497	1,921	1.2	2.1	0.9
Totals	**541,507**	**412,531**	**-128,976**	**100**	**100**	**0**

Appendix A: Sorting Component Definitions

PAPER CATEGORY DEFINITIONS

(a) "Corrugated Cardboard and Paper Bags" includes the three subtypes defined below. The subtypes are "uncoated corrugated", "coated corrugated", and "paper bags".

(1) "Uncoated Corrugated" is a complex paperboard. It usually has three layers and is brown. The center layer is wavy paper or paperboard sandwiched between the two outer layers. It does not have any wax, plastic, or other coating on the inside or outside. The surface is dull and absorbs water.

Examples: This subtype includes entire shipping boxes, sheets, and pieces. This subtype does not include single-layer paperboard like the gray type used for cereal boxes.

(2) "Coated Corrugated" is a complex paperboard. It usually has three layers and is brown. The center layer is wavy paper or paperboard sandwiched between the two outer layers. It has a wax, plastic, or other coating on the inside and/or outside. The coated surface is shiny and resists water.

Examples: This subtype includes entire shipping boxes, sheets, and pieces. This type includes containers for produce, meat, or other food products. This subtype does not include single-layer paperboard like the gray type used for cereal boxes.

(3) "Brown Paper Bags" means bags and wrappings made from paper.

Examples: This subtype includes brown paper grocery bags, white ice cream or fast food bags, department store bags, Kraft bags, and sheets of packing paper.

(b) "Newspaper" means paper used in newspapers. This type does not include any subtypes.

Examples: This type includes newspaper, newsprint, and all inserts.

(c) "Office Paper" includes the four subtypes defined below. The subtypes are "white ledger", "colored ledger", "computer paper", and "other office paper".

(1) "White Ledger" means uncolored bond, rag, or stationery grade paper. It may have colored ink on it. When the paper is torn, the fibers are white.

Examples: This subtype includes white photocopy, letter, and notebook paper.

(2) "Colored Ledger" means colored bond, rag, or stationery grade paper. When the paper is torn, the fibers are colored throughout.

Examples: This subtype includes colored photocopy, letter, and notebook paper. This subtype does not include fluorescent, fiesta, or goldenrod.

(3) "Computer Paper" means paper used for computer printouts. This subtype usually has a strip of formfeed holes along two edges. If there are no holes, then the edges show tear marks. This subtype can be white or striped.

Examples: This subtype includes computer paper and printouts from continuous feed printers. This subtype does not include "white ledger" used in laser printers.

(4) "Other Office Paper" means other kinds of paper used in offices.

Examples: This subtype includes manila folders, manila envelopes, and index cards. This subtype does not include "white ledger", "colored ledger" or "computer paper".

(d) "Mixed Paper" includes the three subtypes defined below. The subtypes are "magazines", "phone books and directories", and "other mixed paper".

(1) "Magazines and Catalogs" means items made of glossy coated paper. This paper is usually slick, smooth to the touch, and reflects light.

Examples: This subtype includes glossy magazines, catalogs, brochures and pamphlets.

(2) "Phone Books and Directories" means thin, tissue grade paper between coated covers. These items are bound along the spine with glue. They are often made of colored paper with two or more ink colors.

Examples: This subtype includes whole or damaged telephone books, "yellow pages", real estate listings, and some non-glossy mail order catalogs.

(3) "Other Mixed Paper" means a combination of any of the paper types and subtypes in subsections (a) through (d) of this section that has not been separated.

Examples: This subtype includes gray paperboard boxes, envelopes with windows or self stick adhesive, paper plates or cups, fiesta, and goldenrod paper.

(e) "Remainder and Composite Paper" means paper that cannot be put in any other type or subtype. It includes items made mostly of paper but combined with other materials such as wax, plastic, or foil. This type does not include any subtypes.

Examples: This type includes tissue, paper towels, blueprints, sepia, onion skin, NCR paper, thermal facsimile paper, fast food wrappers, carbon paper, carbonless forms, self adhesive notes, photographs, aseptic packages, wax coated milk cartons, and wax paper.

GLASS CATEGORY DEFINITIONS

(f) "Clear Glass Bottles and Containers" means clear glass carbonated beverage containers with or without a CRV label.

Examples: This type includes whole and broken clear soda and beer bottles, fruit juice bottles, peanut butter and mayonnaise jars, and noncarbonated beverage bottles.

(g) "Colored Glass Bottles and Containers" includes two subtypes defined below. The subtypes are "Green Glass Bottles and Containers" and "Brown Glass Bottles and Containers".

(1) "Green Glass Bottles and Containers" means green-colored glass containers with or without a CRV label.

Examples: This subtype includes whole or broken green soda and beer bottles, and whole or broken green wine bottles.

(2) "Brown Glass Bottles and Containers" means brown-colored glass containers with or without a CRV label.

Examples: This subtype includes whole or broken brown soda and beer bottles, and whole or broken brown wine bottles.

(h) "Flat Glass" means clear glass that is perfectly flat. This type does not include any subtypes.

Examples: This type includes glass window panes, doors, and table tops, flat automotive window glass (side windows) and architectural glass. This subtype does not include windshields or any curved glass.

(i) "Remainder and Composite Glass" means glass that cannot be put in any other type or subtype. It includes items made mostly of glass but combined with other materials. This type does not include any subtypes.

Examples: This type includes Pyrex, Corningware, mirrors, and auto windshields.

METAL CATEGORY DEFINITIONS

(j) The type "Ferrous Metals" includes two subtypes defined below. The subtypes are "Tin/Steel Cans" and "Other Ferrous".

(1) "Tin/Steel Cans" means rigid containers made mainly of steel. These items will stick to a magnet and may be tin-coated. This subtype is used to store food, beverages, paint, and a variety of other household and consumer products.

Examples: This subtype includes canned food and beverage containers, empty metal paint cans, empty spray paint and other aerosol containers, and bimetal containers (steel sides and aluminum ends).

(2) "Other Ferrous" means any iron, steel, or stainless steel item that will stick to a magnet, except "tin/steel cans".

Examples: This subtype includes structural steel beams, metal clothes hangers, metal pipes, stainless steel cookware, security bars, and scrap ferrous items. This subtype does not include steel, bimetal, or tin cans.

(k) "Non-Ferrous Metals" includes the two subtypes defined below. The subtypes are "Aluminum Cans" and "Other Non-Ferrous".

(1) "Aluminum Cans" means any food or beverage container made mainly of aluminum.

Examples: This subtype includes aluminum soda or beer cans, and some cat food cans. This subtype does not include bimetal containers (steel sides and aluminum ends).

(2) "Other Non-Ferrous" means any metal item, other than aluminum cans, that does not stick to a magnet. These items may be made of aluminum, copper, brass, bronze, lead, zinc, or other metals.

Examples: This subtype includes aluminum window frames, aluminum siding, copper wire, shell casings, brass pipe, and aluminum foil.

(l) "White Goods" means discarded major appliances. These items are often enamel-coated. This type does not include any subtypes.

Examples: This type includes washing machines, clothes dryers, hot water heaters, stoves and refrigerators.

(m) "Remainder and Composite Metal" means metal that cannot be put in any other type or subtype. This type includes items made mostly of metal but combined with other materials. This type does not include any subtypes.

Examples: This type includes brown goods (electronics and other small appliances), computers, televisions, radios, and electronic parts.

OTHER ORGANIC CATEGORY DEFINITIONS

(n) "Food" means food material resulting from the storage, preparation, cooking, handling or consumption of food. This type does not include any subtypes.

Examples: This type includes discarded meat scraps, dairy products, egg shells, fruit or vegetable peels, and other food items.

(o) "Yard and Landscape" includes the three subtypes defined below. The subtypes are "Leaves and Grass", "Prunings and Trimmings", and "Branches and Stumps".

(1) "Leaves and Grass" means plant material, except woody material, from any public or private landscapes.

Examples: This subtype includes leaves, grass clippings, and plants. This subtype does not include woody material or material from agricultural sources.

(2) "Prunings and Trimmings" means woody plant material up to 4 inches in diameter from any public or private landscape.

Examples: This subtype includes prunings, shrubs, and small branches with branch diameters that do not exceed 4 inches. This subtype does not include stumps, tree trunks, or branches exceeding 4 inches in diameter. This subtype does not include material from agricultural sources.

(3) "Branches and Stumps" means woody plant material, branches and stumps that exceed 4 inches in diameter from any public or private landscape.

(p) "Agricultural Crop Residues" means plant material from agricultural sources. This type does not include any subtypes.

Examples: This type includes orchard and vineyard prunings, rice hulls, vegetable by-products from farming, residual fruits, vegetables, and other crop remains after usable crop is harvested. This subtype does not include processed material from canneries, wineries, or other industrial sources.

(q) "Manures" means manure and soiled bedding materials from domestic, farm, or ranch animals. This type does not include any subtypes.

Examples: This type includes manure and soiled bedding from animal production operations, race-tracks, riding stables, animal hospitals, and other sources.

(r) "Wood" means processed wood for building. This type does not include any subtypes.

Examples: This type includes dimensional lumber, lumber cutoffs, engineered wood such as plywood and particleboard, wood scraps, pallets, and wood from construction and demolition.

(s) "Textiles" means items made of thread, yard, fabric, or cloth. This type does not include any subtypes.

Examples: This type includes clothes, fabric trimmings, draperies, and all natural and synthetic cloth fibers. This subtype does not include cloth covered furniture, mattresses, leather shoes, leather bags, or leather belts.

(t) "Tires" means vehicle tires. This type does not include any subtypes.

Examples: This type includes truck, automobile, motorcycle, heavy equipment, and bicycle tires.

(u) The type "Miscellaneous Organics" means organic material that cannot be put in any other type or subtype. This type includes items made mostly of organic materials but combined with other materials. This type does not include any subtypes.

Examples: This type includes leather items, carpets, cork, hemp rope, garden hoses, rubber items, and carpet padding.

(v) "Mixed Textiles/Materials" means any of the textile types defined above combined with another material.

Examples: This type includes mattresses, cloth-covered furniture, carpets, and upholstery.

(w) The type "Animal By-Products" includes organic materials produced by animals. This type does not include any subtypes.

Examples: This type includes animal carcasses and kitty litter.

(x) "Disposable Diapers/Feminine Hygiene" means disposable diapers and feminine sanitary products. This type does not include any subtypes.

Examples: This type includes disposable diapers, adult protective undergarments, and products used during the female menstrual cycle.

PLASTIC CATEGORY DEFINITIONS

(y) "HDPE" includes the two subtypes defined below. The subtypes are "HDPE Natural RPPC" and "HDPE Colored RPPC".

(1) "HDEP Natural RPPC" means rigid HDPE packaging containers. This plastic is usually cloudy white, allowing light to pass through it. When marked for identification, it bears the number "2" in the triangular recycling symbol.

Examples: This subtype includes milk jugs, water jugs, and some other containers.

(2) "HDPE Colored RPPC" means opaque/solid colored rigid HDPE packaging containers. This plastic is usually of a solid color, preventing light from passing through it. When marked for identification, it bears the number "2" in the triangular recycling symbol.

Examples: This subtype includes detergent bottles, some hair-care bottles, empty motor oil, empty antifreeze and other empty automotive fluid containers.

(z) "#1 PET RPPC" means rigid plastic PET containers. When marked for identification, it bears the number "1" in the center of the triangular recycling symbol and may also bear the letters "PETE" or "PET". The color is usually transparent green or clear. A PET container usually has a small dot or nipple left from the manufacturing process, not a seam. It does not turn white when bent. This type does not include any subtypes.

Examples: This type includes soft drink and water bottles, some liquor bottles, cooking oil containers, aspirin bottles, and some microwave food trays.

(aa) "Film Plastic" means flexible plastic sheeting. It is made from a variety of plastic resins including LDPE. It can be easily contoured around an object by hand pressure. This type does not include any subtypes.

Examples: This type includes plastic garbage bags, food bags, dry cleaning bags, grocery store bags, packaging wrap, and food wrap.

(bb) The type "Other Plastic RPPC" includes five subtypes defined below. The subtypes are "#3 PVC RPPC", "#4 LDPE RPPC", "#5 PP RPPC", "#6 PS RPPC", and "#7 and Uncoded RPPC".

(1) "#3 PVC RPPC" means rigid plastic packaging made of PVC. When marked for identification, it bears the number "3" in the triangular recycling symbol and may also have the letters "PVC" or "V". A PVC container usually has a seam at the bottom, not a small dot or nipple. This material has a shiny finish, and shows white stress marks when bent.

Examples: This subtype includes food containers such as bottles for salad dressings and vegetable oils, and flexible yogurt cups and lids.

(2) "#4 LDPE RPPC" means rigid plastic packaging made of LDPE. When marked for identification, it bears the number "4" in the triangular recycling symbol and may also have the letters "LDPE".

(3) "#5 PP RPPC" means rigid plastic packaging made of PP. When marked for identification, it bears the number "5" in the triangular recycling symbol and may also have the letters "PP".

Examples: This subtype includes food containers such as syrup bottles and some margarine tubs. hard plastic pill bottle caps, and some shampoo containers.

(4) "#6 PS RPPC" means rigid plastic packaging made of solid PS or hardened PS foam. When marked for identification, it bears the number "6" in the triangular recycling symbol and may also have the letters "PS". Hardened PS foam has very small air pockets throughout. Solid PS may be brittle.

Examples: This subtype includes hardened PS foam items such as egg cartons. This subtype also includes solid PS: brittle yogurt and cottage cheese cups, and vitamin bottles.

(cc) The type "Plastic Products/Packaging" means plastic products not included in the above definitions, and non-rigid plastic packaging. This type includes seven subtypes, defined below. The subtypes are "#1 PET Products/Packaging". "#2 HDPE Products/Packaging", "#3 PVC Products/Packaging", "#4 LDPE Products/Packaging", "#5 PP Products/Packaging", "#6 PS Products/Packaging", and "#7 and Uncoded Products/Packaging".

(1) "#1 PET Products/Packaging" includes PET products not included in the above definitions, and non-rigid packaging products made of PET.

Examples: This subtype includes some microwave trays.

(2) "#2 HDPE Products/Packaging" includes HDPE products not included in the above definitions, and non-rigid packaging products made of HDPE.

Examples: This subtype includes some toys, trash bags, fuel tanks, and crates.

(3) "#3 PVC Products/Packaging" includes PVC products not included in the above definitions, and non-rigid packaging products made of PVC.

Examples: This subtype includes products such as plastic strapping and hair combs, and building materials such as house siding, window sashes and frames, and plastic pipes.

(4) "#4 LDPE Products/Packaging" includes LDPE products not included in the above definitions, and non-rigid packaging products made of LDPE.

Examples: This subtype includes some pipes and mugs.

(5) "#5 PP Products/Packaging" includes PP products not included in the above definitions, and non-rigid packaging products made of PP.

Examples: This subtype includes drinking straws, hard plastic pill bottle caps, and some shampoo containers.

(6) "#6 PS Products/Packaging" includes PS products not included in the above definitions, and non-rigid packaging products made of PS.

Examples: This subtype includes clamshell-shaped fast food containers, Styrofoam, drinking cups, produce trays, foam packing blocks, and packing peanuts. It also includes brittle PS products such as cookie and muffin trays, most disposable cutlery, and disposable dishes and cups.

(7) "#7 and Uncoded Products/Packaging" includes all plastic products and non-rigid packaging materials which are made of resins other than numbers one through six, and those containers whose resin type is unidentifiable.

(dd) The type "Polyurethane" includes both rigid and flexible foam products and packaging made of polyurethane resin. This type does not include any subtypes.

Examples: This type includes building insulation, industrial insulation, and rug underlays.

(ee) The type "Other Mixed Plastic and Material" means plastic that cannot be put in any other type or subtype. This type includes items made mostly of plastic but combined with other materials. This type does not include any subtypes.

Examples: This type includes disposable razors, pens, lighters, toys, 3-ring binders, and all other miscellaneous plastic items.

OTHER INORGANIC CATEGORY DEFINITIONS

(ff) "Inerts" includes six subtypes defined below. The subtypes are "Rock", "Concrete", "Brick", "Soil and Fines", "Asphalt" and "Gypsum Board".

(1) "Rock" means stone and rock of all origins or types.

Examples: This subtype includes gravel, landscape rock materials, miscellaneous roadbase, large rocks and boulders.

(2) "Concrete" means a hard material made from sand, gravel, aggregate, cement mix and water.

Examples: This subtype includes pieces of building foundations, concrete paving, and cinder blocks.

(3) "Brick" means a block of hardened clay used for building or paving.

Examples: This subtype includes whole or broken red brick, and some paving stones.

(4) "Soil and Fines" means soil, dirt, other matter less than 0.05 inch in diameter.

(5) "Asphalt" means a black or brown, tar-like material used as a roofing or paving material.

(6) "Gypsum Board" means interior wall covering made of a sheet of gypsum sandwiched between paper layers.

Examples: This subtype includes broken or whole sheets of sheetrock, drywall, gypsum board, plasterboard, gypboard, gyproc, and wallboard.

(gg) The type "Remainder and Composite Inorganic" means inorganic material that cannot be put in any other type or subtype. This type includes items made mostly of inorganic materials but combined with other materials. This type does not include any subtypes.

Examples: This type includes ceramics, tiles, toilets, and sinks.

HOUSEHOLD HAZARDOUS AND SPECIAL WASTE CATEGORY DEFINITIONS

(hh) "Household Hazardous" includes the four subtypes defined below. The subtypes are "Paint", "Automotive Fluids", "Batteries", and "Remainder and Composite Household Hazardous".

(1) "Paint" means containers with paint in them.

Examples: This subtype includes latex paint, oil based enamel paint, and tubes of pigment or fine art paint. This subtype does not include empty paint cans or empty aerosol containers.

(2) "Automotive Fluids" means containers with fluids used in vehicles or engines.

Examples: This subtype includes oil, antifreeze, and brake fluid. This subtype does not include empty vehicle fluid containers.

(3) "Batteries" means any type of battery including both drycell and lead acid.

Examples: This subtype includes car, flashlight, small appliance, watch and hearing aid batteries.

(4) "Remainder and Composite Household Hazardous" means household hazardous material that cannot be put in the "Paint", "Automotive Fluids", or "Batteries" subtypes. This subtype also includes household hazardous material that is mixed.

Examples: This subtype includes solvents, bleach, other cleaning products, pesticides, and swimming pool products.

(ii) "Special Waste" includes five subtypes defined below. The subtypes are "Ash", "Industrial Sludge", "Treated Medical Waste", "Bulky Items" and "Remainder and Composite Special Waste".

(1) "Bulky Items" means large hard to handle items that are not defined separately, including furniture, mattresses, and other large items.

Examples: This subtype includes wood, leather, vinyl, metal, or upholstered furniture. This subtype includes all sizes and types of mattresses, box springs, and base components.

(2) "Ash" means a residue from the combustion of any solid or liquid material.

Examples: This subtype includes ash from fireplaces, incinerators, biomass facilities, waste-to-energy facilities, and barbecues.

(3) "Industrial Sludge" means sludge from factories, manufacturing facilities, and refineries.

Examples: This subtype includes paper pulp sludge, and water treatment filter cake sludge.

(4) "Treated Medical Waste" has the same meaning as treated medical waste in Section 25023.5 of the Health and Safety Code.

(5) "Remainder and Composite Special Waste" means special waste, or waste that requires special handling, that cannot be put in any other subtype.

Examples: This subtype includes asbestos-containing materials, auto fluff, auto-bodies, trucks, trailers, truck cabs, certain types of pipe insulation and floor tiles, and artificial fireplace logs.

Appendix B: Sampling Methodology

Goals

Designing and executing the sampling plan is an important process in waste characterization studies, because the statistical validity of the resulting data depends on acquiring a systematic selection of waste from all appropriate generator types and facility locations. In order to ensure that the data collected from these samples accurately represent the total amount of waste in each substream, the planning phase of the sample methodology is developed in detail before the data collection begins.

The goal of the Sonoma County Solid Waste Characterization Study was to systematically sample 400 loads of waste arriving at the County's four facilities:

1. Central Landfill;
2. Sonoma Transfer Station;
3. Healdsburg Transfer Station; and
4. Guerneville Transfer Station.

To ensure that adequate data were collected for each generator type, the number of samples sorted was predetermined to be:

- 100 residentially generated loads;
- 150 commercially generated loads; and
- 150 self-hauled loads.

Because waste generation tends to differ by seasons, it was decided that one-half of the samples should be collected during the "dry" season and one-half of the samples should be collected during the "wet" season. Two weeks were arbitrarily chosen in July and August to represent the "dry" season, and two weeks were arbitrarily chosen in January and February to represent the "wet" season. One hundred samples were examined during each of the four weeks of data collection.

Further, for this sampling plan it was predetermined that 20 loads per sampling day would be examined. This decision was made in order to extend the data collection over the longest period of time possible, while still achieving sorting crew efficiency.

In general, these 20 days were distributed among the four sites based on tonnage handled by each facility. Tonnage information came from county data gathered from January 1994 through April 1995. **The exception was with the Guerneville Transfer Station.** According to its relative tonnage contribution, Guerneville would have been visited only one day during the study. There was a desire to visit the site at least twice, during different seasons. Thus, two sorting days were assigned to Guerneville.

Methodology

ALLOCATION OF SAMPLES TO SITES

For each site, the county's tonnage data were used to allocate the number of loads to be sorted by generator type for each site. Samples were assigned to each site based on the relative portion of waste received by each type of generator. For example, because Central Landfill received 70% of all residential tonnage at the four sites, 70% of the residential samples were assigned to be collected from Central Landfill.

The county tonnage information used as the basis for determining sampling allocation provided tonnage and number of vehicles for:

- debris boxes;
- residential compactor trucks; and
- commercial compactor trucks.

It was assumed that all waste delivered in debris boxes was commercially generated. Thus, the relative portions of commercial versus residential samples were estimated by combining the data for debris boxes with the data for commercial compactor trucks and comparing this to the data provided for residential compactor trucks.

Using this procedure, the number of samples to be collected for each type of generator at each site location was determined. Please refer to the attached spreadsheet for a display of the detailed calculations.

ALLOCATION OF SAMPLING DAYS TO SITES

It was predetermined that 20 samples would be collected per sampling day from each of the four sites. To determine the number of days during which the sorting crew would be on-site, the total number of samples needed (residential samples plus commercial samples plus self-haul samples) was divided by 20.

For instance, a total of 246 samples was needed from Central Landfill over the four week period, including:

- 70 residential samples;
- 106 commercial samples; and
- 70 self-haul samples.

To accomplish the goal of examining these 246 samples at Central Landfill, the sorting crew was scheduled to spend 12 days at this site (246 samples divided by 20 samples per day equals 12.3 sampling days).

As previously mentioned, the one exception incorporated into this approach was the decision to over-sample from the Guerneville Transfer Station. Remaining true to the methodology would have required that only one day be spent at the Guerneville Transfer Station. To accommodate

the desire to spend two days, very minor modifications were made to under-sample at the other three sites.

ASSIGNING SPECIFIC SAMPLING DATES TO SITES

Within the limits of the methodology, every attempt was made to examine an equal amount of waste during both the "wet" and "dry" seasons at all site locations. Thus, specific dates were allocated to each facility with the goal of providing data that accurately represented both seasons.

The last week of July and the third week of August 1995 were selected, in concert with the client, to represent the "dry" season, because the weather is normally predictable from year to year and would fairly represent the typical situation during the summer months. The last week of January and the second week of February 1996 were selected to represent the "wet" season, again because the weather is normally predictable from year to year and would accurately portray the amount and type of waste generated during this season.

Specific days within these weeks were assigned to each facility location.

CALCULATED SAMPLING INTERVALS BY DAY

Once the number of samples to be sorted, by type of generator, were assigned to each day (and thus to each facility), it was important to design a system for intercepting specific vehicles. For the accuracy of the projections for which the data will be used, it is important that this system incorporate a random selection process that will substantially reduce the possibility of bias in the waste that is examined. To do this, sampling intervals were determined for each type of incoming vehicle. A sampling interval indicates which of the vehicles will be selected for having its load sampled.

Information on numbers of vehicles arriving on the same day of the week during the previous year were used to estimate how many vehicles to expect (e.g., the number of vehicles entering on the first Monday during the last week of July 1994 was considered to predict the number of vehicles entering on the first Monday during the last week of July 1995).

Dividing the number of expected vehicles by the number of trucks from which samples would be selected created the sampling interval. For example, if 130 residential trucks were expected, from which 10 samples were needed, every 13th truck would be intercepted. Please refer to the attached documents to view the number of vehicles and the sampling interval for each location and day of data collection.

The number of samples to be examined, along with information regarding the sampling interval, were provided to the sorting crew for each day of data collection. The data collection forms are presented as part of this appendix.

Sample Calculations

ALLOCATION OF SAMPLES BY GENERATOR TYPE BY SITE									
Based on Data for January 1994 - April 1995									
	Residential Tons	% of Total Res	Samples from 100	Commercial Tons	% of Total Comm	Samples from 150	Self-haul Tons	% of Total SH	Samples from 150
Central Landfill	89,836	70%	70	166,837	71%	106	56,582	46%	70
Sonoma TS	19,722	15%	15	27,236	12%	18*	28,478	23%	35
Healdsburg TS	15,435	12%	12	34,354	15%	22	25,101	21%	31
Guerneville TS	3,944	3%	3	6,715	3%	4	11,665	10%	14
TOTALS	128,937			235,142			121,826		

ALLOCATION OF SAMPLES FOR A TYPICAL SAMPLING DAY									
	Total Residential Samples	Sampling Days	Residential Samples Per Day	Total Commercial Samples	Sampling Days	Commercial Samples Per Day	Total Self-haul Samples	Sampling Days	Self-haul Samples Per Day
Central Landfill	70	12	5.83	106	12	8.83	70	12	5.83
Sonoma TS	15	3	5.00	18	3	6.00	35	3	11.67
Healdsburg TS	12	3	4.00	22	3	7.33	31	3	10.33
Guerneville TS	3	2	1.50	4	2	2.00	14	2	7.00
TOTALS	100			150			150		

REALLOCATION OF SAMPLES TO MAKE 20 SAMPLES PER DAY									
	Total Residential Samples	Sampling Days	Residential Samples Per Day	Total Commercial Samples	Sampling Days	Commercial Samples Per Day	Total Self-haul Samples	Sampling Days	Self-haul Samples Per Day
Central Landfill	70	12	5 to 6	106	12	8	70	12	6
Sonoma TS	13	3	4	19	3	6 to 7	35	3	9 to 10
Healdsburg TS	14	3	4	21	3	7 to 8	31	3	9
Guerneville TS	3	2	4	4	2	4	14	2	12
TOTALS	100			150			150		
* Had to change the number of samples to make it sum to quotas.									

Vehicles Per Sampling Day and Intervals

	Central			Sonoma			Healdsburg			Guerneville	
	Veh	Interval		Veh	Interval		Veh	Interval		Veh	Interval
Monday, July 24											
Residential Compactors	6	4th									
Commercial Debris Boxes	3	6th									
Commercial Compactors	5	6th									
Self-haul vehicles	6	30th									
Tuesday, July 25											
Residential Compactors	6	4th									
Commercial Debris Boxes	3	14th									
Commercial Compactors	5	5th									
Self-haul vehicles	6	35th									
Wednesday, July 26											
Residential Compactors				4	1st 4						
Commercial Debris Boxes				2	2nd						
Commercial Compactors				4	1st 4						
Self-haul vehicles				10	9th						
Thursday, July 27											
Residential Compactors							4	all*			
Commercial Debris Boxes							3	3rd			
Commercial Compactors							4	all*			
Self-haul vehicles							9	12th			
Friday, July 28											
Residential Compactors										4	1st 4
Commercial Debris Boxes										2	2nd
Commercial Compactors										2	all
Self-haul vehicles										12	5th
* There may not be 4 available. Substitute with self-haul and we'll make it up later.											

Vehicles Per Sampling Day and Intervals

	Central			Sonoma			Healdsburg			Guerneville	
	Veh	Interval		Veh	Interval		Veh	Interval		Veh	Interval
Monday, August 21											
Residential Compactors	6	4th									
Commercial Debris Boxes	3	15th									
Commercial Compactors	5	6th									
Self-haul vehicles	6	30th									
Tuesday, August 22											
Residential Compactors	6	4th									
Commercial Debris Boxes	3	17th									
Commercial Compactors	5	6th									
Self-haul vehicles	6	50th									
Wednesday, August 23											
Residential Compactors	6	4th									
Commercial Debris Boxes	3	12th									
Commercial Compactors	5	5th									
Self-haul vehicles	6	50th									
Thursday, August 24											
Residential Compactors	6	3rd									
Commercial Debris Boxes	3	12th									
Commercial Compactors	5	5th									
Self-haul vehicles	6	50th									
Friday, August 25											
Residential Compactors				4	4th						
Commercial Debris Boxes				2	5th						
Commercial Compactors				4	2nd						
Self-haul vehicles				10	13th						
Saturday, August 26											
Residential Compactors											
Commercial Debris Boxes	2	3rd									
Commercial Compactors											
Self-haul vehicles	18	23rd									

Vehicles Per Sampling Day and Intervals

	Central		Sonoma		Healdsburg		Guerneville	
	Veh	Interval	Veh	Interval	Veh	Interval	Veh	Interval
Monday, January 22								
Residential Compactors			4	4th				
Commercial Debris Boxes			2	4th				
Commercial Compactors			4	2nd				
Self-haul vehicles			10	6th				
Tuesday, August 22								
Residential Compactors					4	8th		
Commercial Debris Boxes					2	16th		
Commercial Compactors					5	10th		
Self-haul vehicles					9	6th		
Wednesday, August 23								
Residential Compactors							4	1st 4
Commercial Debris Boxes							3	1st 3
Commercial Compactors							1	1st 1
Self-haul vehicles							12	2nd
Thursday, August 24								
Residential Compactors	6	2nd						
Commercial Debris Boxes	5	5th						
Commercial Compactors	3	3rd						
Self-haul vehicles	6	33rd						
Friday, August 25								
Residential Compactors	6	1.5						
Commercial Debris Boxes	5	4th						
Commercial Compactors	3	3rd						
Self-haul vehicles	6	66th						

Vehicles Per Sampling Day and Intervals

	Central			Sonoma			Healdsburg			Guerneville	
	Veh	Interval		Veh	Interval		Veh	Interval		Veh	Interval
Monday February 12											
Residential Compactors							4	2nd			
Commercial Debris Boxes							2	3rd			
Commercial Compactors							6	1.5			
Self-haul vehicles							9	9th			
Tuesday, February 13											
Residential Compactors	5	9th									
Commercial Debris Boxes	3	16th									
Commercial Compactors	5	10th									
Self-haul vehicles	6	44th									
Wednesday, February 14											
Residential Compactors	6	6th									
Commercial Debris Boxes	3	16th									
Commercial Compactors	5	8th									
Self-haul vehicles	6	45th									
Thursday, February 15											
Residential Compactors	5	7th									
Commercial Debris Boxes	3	15th									
Commercial Compactors	5	8th									
Self-haul vehicles	6	53rd									
Friday, February 16											
Residential Compactors	6	6th									
Commercial Debris Boxes	2	15th									
Commercial Compactors	6	8th									
Self-haul vehicles	6	74th									

APPENDIX D

CENTRAL LANDFILL EXPANSION CAPACITY STUDY PHASE I

Prepared for:

SONOMA COUNTY DEPARTMENT OF PUBLIC WORKS
INTEGRATED WASTE DIVISION
575 Administration Drive, Room 117-A
Santa Rosa, CA 95403

CENTRAL LANDFILL

EXPANSION CAPACITY STUDY
PHASE I

SONOMA COUNTY, CALIFORNIA

August 1992

Job No. EB92-353

Prepared by:

EBA WASTECHNOLOGIES, INC.
825 Sonoma Avenue
Santa Rosa, CA 95404

CENTRAL LANDFILL
EXPANSION CAPACITY STUDY
PHASE I

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CENTRAL LANDFILL
EXPANSION CAPACITY STUDY
PHASE I

INTRODUCTION

The Sonoma County Department of Public Works, Integrated Waste Division operates the Central Landfill. Capacity projections for the existing permitted fill area range between February 2004 and January 2006. The County is considering a plan to expand the existing site and extend the operating life of the landfill.

This study provides a conceptual expansion design and resulting site life projections based on the landfill volumes calculated from the design drawings included in Appendix A. This phase does not consider the economic viability of the potential expansion scenarios.

The designs presented in this preliminary study have been prepared to conform with currently known constraints at the site, and are considered reasonable alternatives at this time under current regulations. Additionally, further site specific analysis will be required to determine if geologic, hydrogeologic or other environmental fatal flaws exist with regard to the proposed expansions.

Additional capacity, beyond that shown in the designs presented in this report, may be available if the existing site constraints (discussed later) are addressed. The approximate volumes and resulting site life estimates for these other additional capacity possibilities are also given in this report.

EXPANSION DESIGN

The anticipated expansion would incorporate a north-south trending canyon, located directly east of the existing waste management unit (WMU), as well as a smaller canyon to the west of the current WMU. See Figure 1 on the following page for delineation of the existing permitted landfill unit and location of the East and West Canyon Expansion areas.

EBA

CENTRAL LANDFILL EXPANSION
SONOMA COUNTY

PROJECT MAP

FIGURE

1

MAY 1992
353TOPO2.DWG

A. Site Constraints

The design presented in this report represents a scenario which can be achieved without mitigating the restrictions listed below.

1. Onsite Facilities

Moving of the facilities located above the East Canyon would provide a larger expansion area, and consequently greater landfill volume. The facilities in question include the operations headquarters building, the recycle area, scales and gate house, and the landfill gas flare station. The additional site life gained is discussed in Section IV.

The design shown in this report does not affect the existing facilities with the exception of a 21 KV distribution power line which crosses the East Canyon.

2. Limit of Height of Fill

The preliminary closure plan for the currently permitted area, prepared by County staff, shows a top of landfill configuration which will not obstruct the view from the residence located directly north of the site. The top of the existing WMU is currently planned to reach an elevation of approximately 565 mean sea level (msl).

The design presented in this report utilizes the top of landfill configuration from the existing preliminary closure plan over the existing landfill area. Additional site life gained by raising the ultimate landfill height is discussed in Section IV.

B. Seismic Stability Conditions

Initial slope stability analyses of proposed landfill refuse slopes under both static and seismic loadings were performed for the Central Landfill site. Stability analyses involve the calculation of a safety factor for assumed failure surfaces through representative slope sections. The static safety factor is defined as the ratio of the forces that act to preserve stability in the slope (resisting forces) with forces and moments acting to make the slope unstable (driving forces). A factor of safety of unity (1.0) indicates the resisting forces are in a state of equilibrium with the driving forces, and that a threshold condition of imminent slope failure prevails. A factor of safety of 1.5 is the generally accepted minimum value for long-term landfill slope stability. Static safety factors of 1.3 to 1.5 are generally accepted as minimum values for short-term slope stability.

The landfill refuse stability was analyzed using the two dimensional limit equilibrium STABL computer program (Purdue, 1991). Possible failure modes included circular and irregular surfaces. In addition, irregular surfaces were generated by forcing the failure surface through zones of weakness such as the proposed clay/HDPE liner. Circular failure surfaces were analyzed by the Simplified Bishop's Method. Irregular surfaces were analyzed by the Simplified Janbu Method.

Seismic analyses were performed for landfill refuse slopes using the Newmark Method. This method evaluates slope stability in terms of permanent slope deformations expected from assumed seismic loadings. The method is based on the assumption that a slope will move and permanently displace when the yield acceleration is exceeded. The ratio between the yield acceleration and the horizontal and vertical coefficients of ground acceleration is used to scale earthquake forces relative to the weight of the sliding mass and calculate the expected amount of permanent deformation.

Analysis Conditions-

The slope sections considered in our preliminary stability analyses include a final 3:1 south-facing slope to elevation 500 feet MSL (based on the existing landfill closure design) and a critical west-facing slope in the East Canyon expansion area filled to an intermediate elevation of 430 feet MSL.

The analyses assumed the following conditions:

- Final fill slope of 3.5:1 (horizontal:vertical) with 20-foot-wide benches at 50-foot-vertical intervals.
- Unsaturated conditions.
- A proposed lining system consisting of a minimum 2-foot-thick clay liner with a high density polyethylene (HDPE) geomembrane liner overlying the clay liner. An increase in clay liner thickness was assumed on the steeper side slopes in order to facilitate placement of the clay in horizontal lifts during construction.
- Native bedrock design values of 20° internal friction angle, a cohesion value of 2,000 pounds/square foot (psf), and a unit weight of 130 pounds/cubic foot (pcf)
- Refuse strength parameters of 30° internal friction angle, a cohesion of 200 psf, and a unit weight of 70 pcf
- Liner strength parameters consisted of 20° friction angle, zero cohesion, and a unit weight of 110 pcf. The estimated values used for the clay liner and clay/geomembrane interface strength should be confirmed by laboratory testing after a clay borrow source is identified.

- Leachate barrier/buttress consists of engineered fill with an assumed internal friction angle of 29°, a cohesion of 150 psf, and a unit weight of 120 pcf.

- Assumed seismic loadings range from 0.45g to 0.38g.

- Refuse fill sequencing in the eastern expansion area would not be symmetrical within the canyon and, therefore, no buttress effects would be realized.

Results of the initial stability analysis indicate the factor of safety for long term loading of the existing closure configuration in the main canyon and of the eastern expansion area exceeds the minimum acceptable value of 1.5. Under seismic loading conditions yield accelerations of approximately 0.25g were calculated. Based on an assumed ground acceleration of 0.45g, the resulting estimated permanent displacement of landfill slopes is less than 1 foot.

C. Soil Rippability

A seismic refraction survey was conducted to evaluate the depth, variability and rippability characteristics of subsurface materials and to assist in selection of landfill expansion design criteria. The seismic refraction survey consisted of nine individual seismic refraction lines, and a "calibration" line with a combined spread length of 3,645 lineal feet. Each seismic refraction line consisted of twelve geophones spaced at equal intervals of 25 to 50 feet along a straight line and monitored simultaneously while small explosive charges were detonated off each end of the alignment. A summary of the seismic refraction survey is presented below and a detailed discussion of the methods and results is presented in Appendix C.

In general, moderate to slightly weathered subsurface materials at the site are characterized by seismic velocities of 8,000-12,500 feet/second. In the eastern expansion area, bedrock materials ranging in velocity from 8,000 to 12,500 feet/second occur 20 to 40 feet below the surface. In the western expansion area, bedrock materials with a velocity of 10,000 to 12,500 feet/second occur as little as 5 feet and as much as 50 feet below the surface. These results are similar to work performed in 1970. This previous work indicated bedrock velocities ranging from 7,000 to approximately 16,800 feet/second occurs at 30 to 60 feet below the surface.

Based on rippability charts published by Caterpillar Tractor Co., sedimentary and metamorphic rocks, such as the Franciscan Formation underlying the site, are generally considered marginal to rip with a D9L Ripper or equivalent in the compression wave velocity range of 9,000 to 11,000 feet/second. Based on this information, a range of excavation to subgrade from 5 to 50 feet below existing ground surface was used in developing the landfill expansion conceptual design.

D. Regulations

The expansion design for the landfill liners and final landfill slopes considered the requirements included in Title 23, California Code of Regulations (CCR), Division 3, Chapter 15, Title 14, CCR, Division 7, Chapters 3 and 5, and new Federal regulations recently adopted in 40 Code of Federal Regulations (40 CFR), Part 257 and 258 (a.k.a. Subtitle D).

The following is a list of pertinent tasks and requirements to permit an expansion of the Central Landfill based on current regulations;

- Determine Geotechnical/Hydrogeologic constraints and/or fatal flaws (Phase II of expansion study);
- Conduct Environmental Studies to determine constraints and fatal flaws;
- Prepare a Master Development Plan which includes, but is not limited to, engineering design, environmental monitoring programs, operations criteria, and closure and post-closure measures;
- Satisfy the California Environmental Quality Act (CEQA);
- Prepare a Report of Waste Discharge (after CEQA determination) to submit to the California Regional Water Quality Control Board in order to obtain Waste Discharge Requirements for the Site; and
- Prepare a Report of Facility Information to submit to the California Integrated Waste Management Board. This along, with adopted Waste Discharge Requirements, will allow for preparation of a Solid Waste Facilities Permit.

EXPANSION CAPACITY

This section discusses the volume capacity potential for the site. Figure 2 on the following page shows cross sections which delineate both the restricted and unrestricted design scenarios.

A. Restricted Design

The design presented in the drawings in this report represents a potential expansion scenario which conforms to the restrictions imposed by current site constraints discussed in Section II. The drawings for the conceptual design are included in Appendix A.

1. West Canyon

The air space volume calculated for the West Canyon WMU is 1,080,000 cubic yards (CY). The available volume for refuse and daily cover soil is 955,295 CY excluding the volume for the closure section.

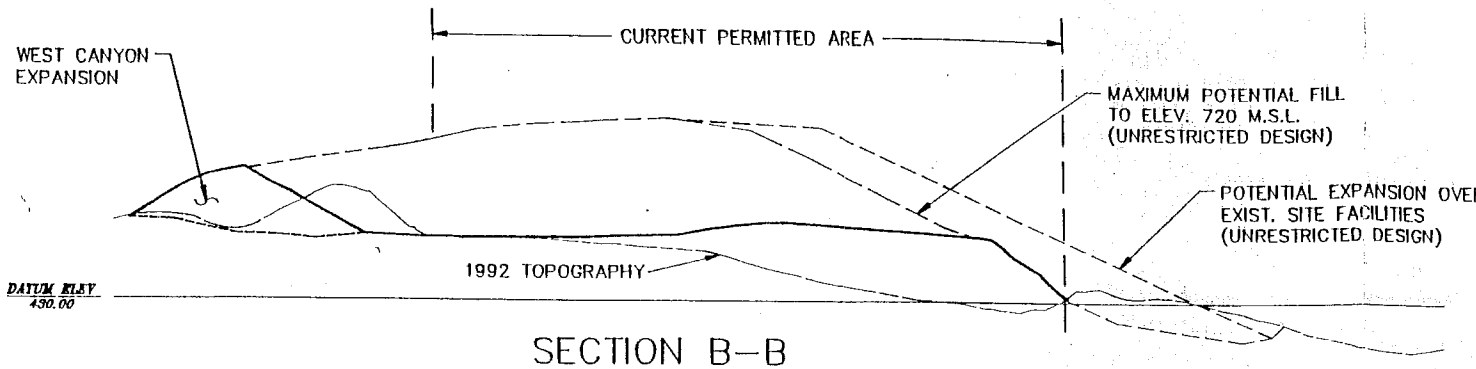
2. East Canyon

The air space volume calculated for the East Canyon WMU is 5,933,613 cubic yards. The available volume for refuse and daily cover soil is 5,672,708 CY excluding the volume for the closure section.

3. Existing Fill Area

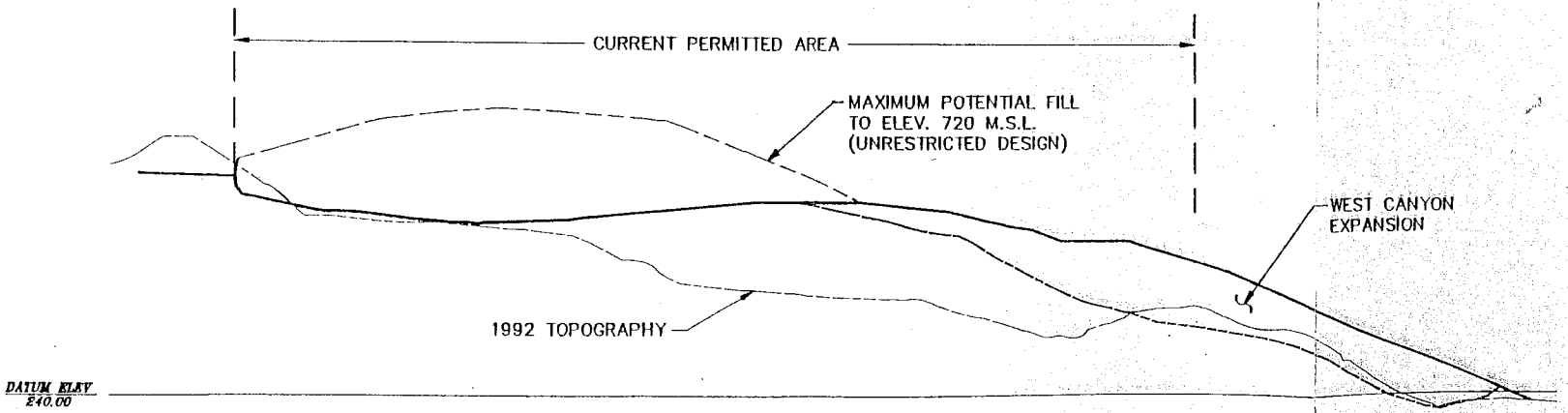
Estimates made by EBA were based on existing cross-sections prepared by the County. The sections were checked for consistency with the proposed design for the existing fill area. The current topography was then plotted on the cross-sections in order to estimate the remaining volume in the current fill area as of January 1992. The remaining landfill capacity in the existing WMU was calculated to be approximately 11,527,736 CY from January 1992.

County staff had previously estimated that approximately 12.1 million CY of capacity was available as of October 1990. EBA's review of the cross-sections confirmed this value. Slight changes in the footprint of the current permitted area since October 1990 have created some additional volume. Therefore, a correlation between the difference in remaining capacity between the October 1990 and January 1992 estimates and incoming tonnage cannot be made.



SECTION B–B

H: 1" = 400'
V: 1" = 200'



SECTION A–A

H: 1" = 400'
V: 1" = 200'

FIGURE 2

JUNE 1992
35PNGZ.DWG

CENTRAL LANDFILL EXPANSION
SONOMA COUNTY

CROSS SECTIONS

EBA

The following table presents the estimated volumes for the WMUs based on the conceptual designs presented in this report.

Table 1. Estimated Landfill Expansion Volumes (Restricted Design)

Waste Management Unit	Air Space Volume (includes landfill cap)	Landfill Volume (refuse + daily cover)
Existing Fill Area	-	11,527,736 CY
East Canyon Expansion	5,933,613 CY	5,672,708 CY
West Canyon Expansion	1,080,000 CY	955,295 CY
Total Site Capacity	-	18,155,739 CY

1. Volumes are in cubic yards.
2. Existing Fill Area volume was calculated below the closure section.
3. Design of Existing Fill Area has been modified since previous County estimate.

B. Unrestricted Design

The volumes presented here reflect additional expansion capacity which could potentially be obtained by addressing the current site constraints.

1. Raise Maximum Height of Fill

By raising the height of the landfill from a maximum elevation of 565 msl to approximately 720± msl, the capacity of the site can be increased by approximately 11 million CY over and above the total volume of the restricted design. If the height of the landfill is raised without expanding into the West Canyon an approximate capacity of 6 million CY would be available in conjunction with the East Canyon Expansion.

Further capacity obtained by filling higher over the existing WMU will also allow for additional capacity over the expansion areas. The additional capacity realized by all three WMUs is reflected in the number given above.

2. Relocate Onsite Facilities

The footprint of the East Canyon expansion area could be enlarged over the existing onsite facilities to provide an additional landfill volume of approximately 2.5 million CY to 5 million CY depending on if the ultimate height of the landfill is raised. This enlargement would be contained on the County owned parcel.

An alternative to this enlargement would be to expand, off County property, further north to the top of the East Canyon. Expansion to the head of the drainage area would provide a better design and additional capacity.

SITE LIFE PROJECTIONS

A. Current Refuse Tonnage

The Central Landfill is currently receiving approximately 500,000 tons of refuse per year. Gate records for the years of 1990 and 1991 show that the incoming tonnage to be disposed at the landfill has decreased. The County has indicated that the drop in tonnage is primarily due to a decrease in debris box tonnage from 1990. Records for tonnage received at the Central Landfill for the past five years are:

1987	483,000 Tons
1988	531,000 Tons
1989	539,000 Tons
1990	522,000 Tons
1991	498,000 Tons

These tonnage values, taken from the gate records, are for waste which is disposed at the landfill and do not reflect the total amount of wastes generated. The current 1991 diversion rate for the Central Landfill wasteshed is approximately 17% (County Summary Report, Agenda Item #52, 2-11-92), therefore using 498,000 tons of waste disposed at the landfill, yields a total of approximately 600,000 tons generated in 1991. This value, 600,000 tons, is used as the basis for projected annual waste generation estimates.

B. Landfill Volume Factors

1. Refuse Density

Previous gate records from October 1990 to January 1992 were reviewed for the purpose of relating the incoming tonnage to actual landfill volume occupied during the period between the aerial survey dates. The actual amount of soil cover material used could not be determined from the available data. This was due to the clean-fill projects (liner construction, tipping pads, barrier dikes, etc.) which have been completed over the past year. Therefore, since the actual inplace density of the refuse can not be calculated, an assumed value consistent with industry standards was used.

A refuse density of 1200 pounds per cubic yard (PCY) was used in this study. The landfill compactors and dozers used at the site are capable of achieving this level of compaction with moderate effort.

2. Cover Ratio

The site operations manager estimates that approximately 400 CY of cover material per day is used on an average. At 360 days per year, about 144,000 CY of cover soil is used per year. Utilizing a refuse density of 1200 PCY for 500,000 tons of refuse per year yields a 5.8:1 waste to cover ratio.

For this study, a waste to cover ratio of 5:1 was used in the site life estimates. This ratio was selected to account for areas receiving intermediate cover before reaching final grade and clean fill projects within the landfill air space.

It should also be noted that alternative cover types could be used to minimize the amount of soil being incorporated into the landfill. Possible alternatives for daily cover, currently used elsewhere, include foam applications and synthetic fabrics. Alternative cover materials are not considered in this study.

C. Population Projections

This report utilizes population projections to estimate increases in waste generation amounts throughout the study period. The percent increase in population is applied annually to the 1991 waste generation value. The County has requested that three population based projections be used. These include the Association of Bay Area Governments (ABAG), California Department of Finance (CDF), and the sum of the County General Plan and eight cities in the County. The population projections for these bases are shown in the following table.

Table 2. Population Projections

Population Base	Growth Rate			
	1990 - 1995	1996 - 2000	2001 - 2005	2006 -
ABAG	1.62%	1.52%	1.44%	1.44%
Dept. of Finance	2.86%	2.02%	1.82%	1.82%
General Plans	2%	1.85%	1.7%	1.6%

1. Growth rates for General Plans are typically between 1% and 2%.
2. Values beyond 2006 are not available.

D. Expected Diversion Goals

The County has requested that three scenarios for diversion goals be utilized. The anticipated diversion goals are expressed as a percent reduction of the total waste generated in the County. Diversion measures include, but are not limited to recycling, composting and source reduction. The first two scenarios presented here meet state mandated diversion goals.

1. Optimistic Scenario (Linear Increase)

This scenario utilizes an annual increase from the current diversion rate of 17% to 25% in 1995, to 50% in 2000. The annual increase would be 2% per year between 1991 and 1995, and then 5% per year between 1996 and 2000. After 2000, the diversion rate would remain constant at 50%.

2. Less Optimistic Scenario (Step Increase)

This scenario would maintain the current diversion rate of 17% until 1994, then step to 25% in 1995, remain constant at 25% through 1999, and then step to 50% in 2000. After 2000, the diversion rate would remain constant at 50%.

3. Least Optimistic Scenario (Linear Increase to 40%)

This scenario utilizes an annual increase from the current diversion rate of 17% to 25% in 1995, to 40% in 2000. The annual increase would be 2% per year between 1991 and 1995, and then 3% per year between 1996 and 2000. After 2000, the diversion rate would remain constant at 40%.

Diversion rates and subsequent diverted tonnages are shown in the site life projection tables in Appendix B for the three scenarios and each of the three different population based generation projections.

E. Site Life Projections

The tables in Appendix B show site life projections for the three diversion scenarios (linear and stepped). Each diversion scenario is shown using the three different population projections as the basis for increases in waste generated each year. The tables in Appendix B reflect the landfill capacity volumes estimated from the designs presented in this report. Tables for additional site life gained by implementing one or more of the unrestricted design options are not given, but estimates are discussed later.

Based on the restricted height expansion designs presented in this study, a potential range of site life from approximately August 2010 to May 2014 (18 to 22 years) could be achieved at the Central Landfill. The following table shows the estimated site life projections for each diversion scenario and various population projections.

Table 3. Summary of Site Life Projections (Restricted Expansion Design)

Waste Management Unit	End of Site Life		
	ABAG	Dept. of Finance	General Plan
Current Permitted Area			
Step Diversion Rate	Dec-2004	Feb-2004	Aug-2004
Linear Diversion Rate(50%)	Jan-2006	Mar-2005	Sep-2005
Linear Diversion Rate(40%)	Oct-2004	Jan-2004	Jun-2004
East Canyon Expansion			
Step Diversion Rate	Mar-2012	Nov-2010	Aug-2011
Linear Diversion Rate(50%)	Mar-2013	Oct-2011	Aug-2012
Linear Diversion Rate(40%)	Dec-2010	Sep-2009	May-2010
West Canyon Expansion			
Step Diversion Rate	May-2013	Nov-2011	Sep-2012
Linear Diversion Rate(50%)	May-2014	Nov-2012	Sep-2013
Linear Diversion Rate(40%)	Dec-2011	Aug-2010	Apr-2011

Appendix B contains tables showing the site life projections including waste generated, diversion rates, diverted tonnages, landfilled tonnages, daily cover volumes, landfill volume occupied, and remaining landfill volume.

F. Additional Site Life Capacity

The site life estimates for the potential scenarios discussed here refer to the unrestricted design options discussed in Section III-B. The site life estimates are given in ranges from worst case to best case scenarios of the generation and diversion options discussed previously. Other potential capacity options are discussed in terms of volume only.

1. Raise Maximum Height of Fill

Raising the maximum elevation of the landfill beyond 565 msl could provide a site life range from approximately January 2020 to May 2026. If the height of the landfill is raised, and the West Canyon is not utilized, the site life would range from approximately February 2015 to February 2020.

2. Relocate Existing Facilities

Enlarging the footprint of the East Canyon will increase the total site life range from approximately November 2023 to March 2031 using the maximum fill height in conjunction with the expansion design presented in this report.

If the height of the landfill is not raised, but the East Canyon expansion is enlarged over the existing onsite facilities, the total site life would range from approximately December 2012 to April 2017.

3. Excavate Bedrock Materials

Mining of the bedrock materials under the proposed expansion area could be accomplished to create greater volumes within the landfill expansion canyons. It is estimated that the East Canyon liner design grades could be modified to excavate as much as 1,000,000 cubic yards of additional material.

4. Redesign Expansion Design with Steep Slopes

Additional capacity may also be achieved by modifying the designs presented in this study. A more detailed stability analysis utilizing site specific field data could substantiate steeper criteria for the final landfill slopes. It is estimated that as much as 500,000 cubic yards of additional capacity in the East Canyon expansion could be achieved if final slopes steeper than 3:1 were utilized in the design.

5. Convert to Balefill Operation

Converting the site to a balefill could be a viable method to help reduce the amount of cover soil utilized in the landfill.

APPENDIX E

RESPONSE TO COMMENTS ON THE PRELIMINARY DRAFT OF THE 2003 COIWMP

APPENDIX E

RESPONSE TO COMMENTS ON THE PRELIMINARY DRAFT OF THE COIWMP

The public comment period for the draft 2003 Countywide Integrated Waste Management Plan (2003 CoIWMP) opened on August 23, 2003. On September 17, 2003, the Sonoma County Waste Management Agency (SCWMA) held a public hearing to accept comments on the draft 2003 CoIWMP. No comments were received during this public hearing. The public hearing was continued to October 15, 2003.

On October 15, 2003, the SCWMA held the public hearing continued from the September 17, 2003 meeting. No comments were received during this public hearing.

Each public hearing was noticed in the Press Democrat, a newspaper of general circulation, which included where the draft 2003 CoIWMP could be reviewed and the staff contact. In addition, notices of each public hearing was mailed to a list of neighbors, government agencies, and interested individuals. No written comments were received in response to these public notices.

APPENDIX F

RESOLUTION OF THE
SONOMA COUNTY WASTE MANAGEMENT AGENCY
THAT CERTIFIES
THE FINAL SUPPLEMENTAL PROGRAM ENVIRONMENTAL IMPACT REPORT
AND ADOPTS
THE 2003 SONOMA COUNTY COUNTYWIDE INTEGRATED WASTE MANAGEMENT
PLAN, RELATED FINDINGS, AND MITIGATION MONITORING
PROGRAM POLICY STATEMENT.

Resolution Number 2003 – 023

Sonoma County Waste Management Agency
Santa Rosa, California

October 15, 2003
Steve Dee, Ken Wells

RESOLUTION OF THE SONOMA COUNTY WASTE MANAGEMENT AGENCY (SCWMA), STATE OF CALIFORNIA, THAT CERTIFIES THE FINAL SUPPLEMENTAL PROGRAM ENVIRONMENTAL IMPACT REPORT, AND ADOPTS THE 2003 SONOMA COUNTY COUNTYWIDE INTEGRATED WASTE MANAGEMENT PLAN (2003 CoIWMP), RELATED FINDINGS, MITIGATION MONITORING PROGRAM POLICY STATEMENT, AND DIRECTS STAFF TO FILE A NOTICE OF DETERMINATION AND FORWARD THE 2003 CoIWMP TO THE CALIFORNIA INTEGRATED WASTE MANAGEMENT BOARD IN ACCORDANCE WITH THE SCWMA ENVIRONMENTAL PROCEDURES, THE CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA), AND THE CALIFORNIA INTEGRATED WASTE MANAGEMENT ACT OF 1989 (AB 939).

RESOLVED, by the Sonoma County Waste Management Agency (SCWMA) that it hereby makes the following findings and determinations in connection with the proposed 2003 CoIWMP and alternatives as more particularly described in the Final Supplemental Program Environmental Impact Report ("Final SPEIR").

I. PROPOSED PROJECT

WHEREAS, the adopted 1996 CoIWMP has been updated as the Final 2003 CoIWMP in accordance with AB 939. The Final 2003 CoIWMP proposes to provide: 1) a formal agreement among all cities and the County to direct flow of refuse and green waste solid waste facilities in Sonoma County; 2) mandatory access to recycling facilities for residential, commercial, industrial, and institutional waste generators; 3) an expansion of the Central Landfill beyond its current permitted capacity (i.e., beyond the year 2015); and 4) the siting of an integrated Resource Management Facility (RMF) to include organics processing (anaerobic digestion), green waste composting and landfilling.

II. PROCEDURAL HISTORY

WHEREAS, a Notice of Preparation (NOP) of a Draft Supplemental Program Environmental Impact Report (Draft SPEIR) was circulated to the State Clearinghouse (SCH) and individual agencies on November 15, 2001. A scoping meeting was conducted on November 28, 2001, followed by a Joint Sonoma County Board of Zoning Adjustments (BZA) and Planning Commission Informational Meeting on May 29, 2003.

WHEREAS, the Draft SPEIR dated June 2003 was prepared for the project following consultation with responsible and trustee agencies, including other interested parties. A Notice of Completion (NOC - SCH# 92113072) of the Draft SPEIR was filed with the Office of Planning and Research on or about June 23, 2003.

WHEREAS, the Draft SPEIR was circulated for public review from June 23, 2003 to August 6, 2003. Written comments received on the Draft SPEIR during the 45-day public review period are set forth in the Final SPEIR.

WHEREAS, on June 16, 2003 in accordance with the provisions of law, the SCWMA held a public hearing on the Draft SPEIR for the project at which time all interested persons were given an opportunity to be heard. No testimony or written comments on the Draft SPEIR were received at the public hearing.

WHEREAS, following the end of the public review period, a Final SPEIR dated October 2003 was prepared consisting of the revised Draft SPEIR and responses to comments received on the Draft SPEIR.

WHEREAS, on October 15, 2003, the SCWMA in public session discussed and considered the proposed Final SPEIR, directed staff to make further non-substantive changes, and found that it had been prepared and completed in accordance with CEQA, the current State CEQA Guidelines and the SCWMA CEQA procedures.

III. CERTIFICATION OF THE FINAL SPEIR

WHEREAS, the SCWMA hereby finds that:

- On September 21, 1994, the Agency adopted the objectives, criteria and procedures for implementing the California Environmental Quality Act; and

- The Draft and Final SPEIR have been completed in accordance with all applicable procedural and substantive requirements of CEQA, the current State CEQA Guidelines and the SCWMA CEQA procedures; and

- The preparation of the Final SPEIR represents a good faith effort to achieve completeness and full environmental disclosure; and

- The degree of specificity set forth in the Final SPEIR corresponds to the degree of specificity appropriate for the proposed 2003 CoIWMP; and

- The Final SPEIR was noticed, circulated and reviewed in accordance with CEQA, the current State CEQA Guidelines and the SCWMA CEQA procedures, and constitutes an adequate, accurate, objective and complete Final SPEIR in

accordance with CEQA, the current State CEQA Guidelines and the SCWMA CEQA procedures, for the purpose of approving the proposed 2003 CoIWMP; and

- The Final SPEIR describes a reasonable range of alternatives;

- The SCWMA has reviewed and considered the information in the Final SPEIR and finds that it represents the independent judgement of the SCWMA and is an adequate informational document, and that it has provided the SCWMA and the public with full and fair disclosure of potential environmental impacts associated with the proposed 2003 CoIWMP. The SCWMA has considered the Final SPEIR prior to making its final decision on the merits of the proposed 2003 CoIWMP.

IV. MITIGABLE SIGNIFICANT ADVERSE ENVIRONMENTAL IMPACTS AND NECESSARY MITIGATION MEASURES

WHEREAS, the SCWMA finds that the proposed 2003 CoIWMP would have certain significant or potentially significant adverse environmental impacts, which are summarized in Exhibit A (Impacts That Can Be Reduced to Less Than Significant) attached hereto, incorporated herein by this reference and more fully described in the Final SPEIR. The SCWMA further finds that measures have been incorporated into the proposed 2003 CoIWMP that will mitigate those impacts to less than significant levels as set forth in Exhibits A attached hereto and incorporated herein by this reference. Based on such findings, and the above statement of facts, the SCWMA hereby finds that the significant adverse environmental impacts of the proposed 2003 CoIWMP, as set forth in Exhibits A, have been eliminated or substantially lessened.

V. UNMITIGABLE ADVERSE ENVIRONMENTAL IMPACTS

WHEREAS, the Final SPEIR disclosed significant or potentially significant environmental impacts that may not, or cannot, be avoided if the proposed 2003 CoIWMP is approved as summarized in Exhibit B, attached hereto, and incorporated herein by this reference.

VI. ALTERNATIVES

WHEREAS, the SCWMA finds that the Final SPEIR describes a range of reasonable alternatives as summarized in Exhibit C. The 2003 CoIWMP, as mitigated, would have the lowest overall environmental impact. The first alternative (No Project) would increase the need for additional landfill capacity and would not reduce disposable solid waste volumes, nor produce energy associated with the proposed RMF. Alternative No. 2 (MRF combined with enclosed composting facility) would provide some reduction in disposable solid waste volumes, but not to the same degree as the proposed project. In addition, energy production would be missing as compared to the proposed RMF. Lastly, the third alternative (No Siting of New Landfill with Export of Waste) would eliminate the need for further landfill expansion, or siting in Sonoma County, but would shift the associated environmental impacts outside Sonoma County. Moreover,

addition transfer stations would be required to accommodate the export of the County's solid waste. Therefore, based on the analysis and comparison of the above alternatives, the 2003 CoIWMP, with the mitigation measures as proposed in this DSPEIR, is the environmentally superior alternative.

VII. ADOPTION OF MITIGATION MONITORING PROGRAM POLICY STATEMENT

WHEREAS, pursuant to Public Resources Code section 21081.6, the SCWMA hereby adopts a monitoring and reporting program for the mitigation measures that were included to avoid significant effects on the environment. The contents of this program are set forth in Exhibit D (Mitigation Monitoring Program Policy Statement for the 2003 CoIWMP), attached hereto and incorporated herein by this reference. This mitigation monitoring program is designed to ensure compliance with the mitigation measures adopted for the proposed project. It will be implemented in accordance with all applicable requirements of CEQA, the current State CEQA Guidelines and the SCWMA CEQA procedures.

VIII. STATEMENT OF OVERRIDING CONSIDERATIONS

WHEREAS, the 2003 CoIWMP will cause impacts that cannot be reduced to less than significant even with the implementation of mitigation measures. Although these mitigation measures will be incorporated into specific projects, they may not reduce the impacts to less than significant. The SCWMA has weighed the benefits of the project against its unavoidable adverse environmental effects identified in the Final SPEIR and hereby determines that these environmental impacts are acceptable and hereby finds that there are overriding considerations which support the SCWMA's approval of the project which are identified in Exhibit E, attached hereto, and incorporated herein by this reference.

IX. ADOPTION OF THE FINAL 2003 CoIWMP

WHEREAS, the Agency became a Regional Agency on November 15, 1995, as defined under Section 40970 of the California Public Resources Code, representing the Cities of Cotati, Cloverdale, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, and Sonoma, the Town of Windsor, and the County of Sonoma; and

WHEREAS, the CoIWMP was approved by the California Integrated Waste Management Board ("CIWMB") on April, 1996, and revised at annual intervals with the submission of the AB 939 Annual Report to the CIWMB; and

WHEREAS, the Agency adopted the Sonoma County Waste Management Alternatives Analysis ("Analysis") on February 21, 2001 and directed staff to proceed with the revisions to the CoIWMP and to incorporated the recommendations of the Analysis in order to begin implementation of those recommendations; and

WHEREAS, the AB 939 Solid Waste Local Task Force, in its role as an advisory committee to the Agency, did provide input and comment on the draft 2003 CoIWMP from March, 2001 through March, 2003, directing staff to forward the draft 2003 CoIWMP to the Agency on March 13, 2003; and

WHEREAS, a noticed public hearing was held on the draft 2003 CoIWMP on September 17, 2003, which was continued to October 15, 2003. The continuance of the public hearing was duly noticed in a newspaper of general circulation.

WHEREAS, the Final 2003 CoIWMP was prepared in accordance with the California Integrated Waste Management Act of 1989.

NOW, THEREFORE, based on the record of this proceeding and the foregoing findings and determinations, the SCWMA does hereby take the following actions:

1. Certification of the Final SPEIR. The SCWMA certifies that the Final SPEIR has been completed, reviewed, and considered in compliance with CEQA, the current State CEQA Guidelines and the SCWMA CEQA Procedures, and finds that the Final SPEIR reflects the independent judgement of the SCWMA.

2. Adoption of Mitigation Monitoring Program Policy Statement. The SCWMA adopts the Mitigation Monitoring Program Policy Statement set forth in Exhibit D and directs staff to proceed in accordance with such program to ensure that the policy is carried out.

3. Statement of Overriding Considerations. The SCWMA adopts the Statement of Overriding Considerations set forth in Exhibit E, after finding that the project has certain environmental, economic, legal, social, technological and other benefits which make the unavoidable adverse environmental impacts associated with it acceptable.

4. Adoption of the Final 2003 CoIWMP. The SCWMA adopts the Final 2003 CoIWMP.

5. The SCWMA directs staff to forward a copy of the 2003 CoIWMP to the California Integrated Waste Management Board for consideration and adoption.

6. Custodian of Documents. The SCWMA is the custodian of the documents, or other material, which constitute the record of proceedings upon which the SCWMA's decision herein is based. These documents may be found at the SCWMA, 2300 County Center Drive, Suite B 100, Santa Rosa, California.

7. Notice of Determination. The SCWMA directs staff of the County of Sonoma Permit and Resource Management Department to file a Notice of Determination set forth in

Exhibit H with the County Clerk and the Office of Planning and Research in accordance with the provisions of CEQA, the current state CEQA Guidelines and the SCWMA CEQA procedures.

MEMBERS:

AYE	AYE	AYE	AYE	AYE
Cloverdale	Cotati	County	Healdsburg	Petaluma
AYE	AYE	AYE	AYE	AYE
Rohnert Park	Santa Rosa	Sebastopol	Sonoma	Windsor

AYES: -10- NOES: -0- ABSENT: -0- ABSTAIN: -0-

SO ORDERED.

The within instrument is a correct copy
of the original on file with this office.

ATTEST: DATE:

[redacted] 10/15/03

Gloria Cote
Clerk of the Sonoma County Waste Management
Agency of the State of California in and for the
County of Sonoma

ATTACHMENTS

EXHIBIT A – Impacts That Can Be Reduced to Less Than Significant
EXHIBIT B – Impacts That Cannot Be Reduced to Less Than Significant
EXHIBIT C – Alternatives
EXHIBIT D – Mitigation Monitoring Program
EXHIBIT E – Statement of Overriding Considerations
EXHIBIT F – Final Supplemental Program EIR
EXHIBIT G – Executive Summary 2003 CoIWMP
EXHIBIT H – Notice of Determination

EXHIBIT A

IMPACTS THAT CAN BE REDUCED TO LESS THAN SIGNIFICANT

The Final SPEIR disclosed significant or potentially significant environmental impacts that, with the implementation of mitigation measures, can be reduced to less than significant if the proposed 2003 CoIWMP is approved.

Findings

Changes or alterations will be required in, or incorporated into, the project to avoid or substantially lessen the significant environmental effects as identified in the Final SPEIR. Based on the analysis in the FSPEIR, the significant effects listed below have been found to be reduced to a less - than - significant level by incorporating into the project the following mitigation measures:

LAND USE

Significant Effects

Land Use Impact 4-1 Surrounding Land Use Conflicts (Non-Disposal Facilities) - The construction of new solid waste non-disposal facilities could conflict with surrounding land uses.

Land Use Impact 4-4 Mineral Resources (Landfill) - Location of a new landfill may affect availability of mineral resources.

Mitigation Measures

Land Use Mitigation Measure 4-1 - In siting new or expanded solid waste non-disposal facilities, examine land uses surrounding potential sites and take possible land use conflicts into account in making siting determinations. In addition, require each new or expanded facility to incorporate design and operational measures to minimize land use conflicts.

Land Use Mitigation Measure 4-4 - Geologic studies of future landfill expansion and new landfill sites will address the possibility that mineral resources could be located under sites of new facilities. To the extent practical, mineral recovery efforts will be incorporated into the construction of the Central Landfill expansion or new landfills.

GEOLOGY

Significant Effects

Geology Impact 5-1 Surface Faulting and Ground Shaking (Non-Disposal Facilities) - New and expanded non-disposal facilities could be subject to potentially damaging seismically-induced surface faulting and ground shaking.

Geology Impact 5-2 Liquefaction (Non-Disposal Facilities) - New and expanded non-disposal facilities could be subject to potentially damaging seismically induced liquefaction.

Geology Impact 5-3 Surface Faulting and Ground Shaking (Landfill) - New and expanded solid waste disposal facilities could be subject to potentially damaging seismically induced surface faulting and ground shaking.

Geology Impact 5-4 Liquefaction (Landfill) - New solid waste disposal facilities could be subject to potentially damaging seismically induced liquefaction.

Geology Impact 5-5 Slope Failures (Landfill) - The West Expansion area at the Central Disposal Site and the future landfill could cause significant damage on- and off-site as a result of slope failures, and landsliding could potentially bring refuse to the surface, creating health hazards.

Geology Impact 5-6 Subsidence and Settlement (Landfill) - Settlement of the landfill material at the Central Disposal Site and the future landfill is expected to occur during decomposition of the refuse material. Settlement of refuse has the potential for disrupting the surface drainage pattern and causing ponding on the landfill, and it could also potentially disrupt the gas collection system.

Mitigation Measures

Geology Mitigation Measure 5-1 -

(a) Non-disposal facilities shall be built a sufficient distance from earthquake fault zones as restricted by state and federal regulatory requirements.

(b) Where proposed development may be exposed to significant risks of damage from geologic hazards, a geologic report (prepared by a California Registered Geologist) shall be prepared which evaluates the hazards and shall identify measures which can be implemented to reduce the risks to acceptable levels. Such measures will be implemented.

(c) All grading and building construction for new or expanded non-disposal facilities shall conform with geologic and seismic standards contained in the latest edition of the Uniform Building Code (UBC). Prior to construction activities, the applicant shall submit building plans to the local jurisdiction's building department indicating compliance with the UBC.

(d) All new or expanded disposal facilities shall meet the requirements of the County or Cities' general site design standards. The proposed new non-disposal facilities shall comply with the County or cities' policies and standards pertaining to geologic hazards.

Geology Mitigation Measure 5-2 -

(a) Same as Mitigation Measures 5-1 (b) and 5-1 (d).

(b) All new or expanded non-disposal facilities that are susceptible to seismic ground failure shall include project designs for building and road foundations to withstand potential liquefaction impacts.

Geology Mitigation Measure 5-3 -

(a) New or expanded disposal facilities shall be built a sufficient distance from earthquake fault zones

or as restricted by state and federal regulatory requirements.

(b) Where proposed development may be exposed to significant risks of damage from geologic hazards, a geologic report (prepared by a California Registered Geologist) shall be prepared which evaluates the hazards and shall identify measures which can be implemented to reduce the risks to acceptable levels. Such measures will be implemented.

(c) All grading and building construction for new or expanded disposal facilities shall conform with geologic and seismic standards contained in the latest edition of the Uniform Building Code (UBC). Prior to construction activities, the applicant shall submit building plans to the local jurisdictions' building department indicating compliance with the UBC.

(d) All new or expanded disposal facilities shall meet the requirements of the County or cities' general site design standards. The proposed new and expanded disposal facilities shall comply with the County or cities policies and standards pertaining to geologic hazards.

(e) In accordance with state and federal regulations, restrict the development of landfills in geologically unstable areas.

(f) In accordance with state and federal regulations, restrict the development of landfills in seismic impact zones unless containment structures are engineered and constructed to preclude failure during rapid geologic change.

Geology Mitigation Measure 5- 4 –

(a) Same as Mitigation Measures 5-3 (a through f).

(b) All new or expanded disposal facilities that are susceptible to seismic ground failure shall include project designs for building and road foundations to withstand potential liquefaction impacts.

Geology Mitigation Measure 5-5 -

The grading plan for the West Expansion area at the Central Disposal Site and the future landfill will incorporate grading procedures to prevent slope failures. These include maximum fill slopes as determined suitable by a registered engineering geologist. The embankments of new sedimentation basins and landfill slopes will be constructed so that the factor of safety is greater than 1.5.

Geology Mitigation Measure 5-6 -

Final landfill grades will be constructed in accordance with Section 20650 of Title 27 of the CCR which requires that "Covered surfaces of the disposal area shall be graded to promote lateral runoff of precipitation and to prevent ponding. Grades shall be established of sufficient slopes to account for future settlement of the fill surface." Grades will be of sufficient slopes to allow for future settlement of the final cover and to avoid ponding and infiltration of stormwater. The landfill gas collection system will use flexible pipe and be designed to accommodate settlement of the refuse.

SOILS AND AGRICULTURAL RESOURCES

Significant Effects

Soils and Agricultural Resources Impact 6-1 Erosion and Siltation (Non-Disposal Facilities) - Siting and construction of new or expanded non-disposal facilities on sites with unstable slope conditions or high erosion potential could result in erosion and siltation.

Mitigation Measures

Soils and Agricultural Resources Mitigation Measures 6-1 –

(a) All new facilities shall be designed and constructed to conform with the site development standards contained in the latest edition of the Uniform Building Code (UBC) . Prior to construction activities, the applicant shall submit building plans to the local jurisdiction's building department indicating compliance with the UBC.

(b) All new facilities shall meet the requirements of the County or cities' standards pertaining to site design, grading, and erosion control.

(c) Vegetation on soils exposed during construction shall be reestablished as soon as practical. Mulch or other temporary cover shall be used in the interim where erosion potential exists.

(d) Employ Best Management Practices as required under the NPDES Permit for Construction grading.

(e) To the extent feasible, confine grading, excavation, and other earthwork to the dry seasons. When this is not feasible, erosion and sediment transport control facilities should be in place prior to the onset of the first major winter storms. If wind erosion has the potential to occur during summer months, erosion control methods, such as watering graded areas, shall be implemented.

(f) Prepare and implement detailed erosion and sedimentation control plan(s), which should be submitted for review and approval by the RWQCB. The specific language of such plans varies, but the concepts to be adhered to include the following:

1. To avoid discharge to natural waterways, sediment should be trapped before leaving the construction site through the use of rip-rap, hay bales, fencing, or sediment ponds.
2. Areas of surface disturbance should be minimized.
3. Disturbed areas should be stabilized through vegetative or mechanical methods. When construction is complete, all disturbed areas should be regraded and revegetated. Topsoil should be stockpiled and used for the revegetation of disturbed areas.

HYDROLOGY AND WATER QUALITY

Significant Effects

Hydrology and Water Quality Impact 7-1 Pollutants in Stormwater Runoff (Non-Disposal Facilities) – Construction and operation of new and expanded non-disposal facilities could adversely affect the quality of stormwater runoff.

Hydrology and Water Quality Impact 7-2 Flooding and Increased Runoff (Non-Disposal Facilities) – Construction and operation of new and expanded non-disposal facilities could increase runoff volumes and could be subject to flooding.

Hydrology and Water Quality Impact 7-3 Soil Erosion (Non-Disposal Facilities) – Grading activities associated with the new and expanded non-disposal facilities could adversely affect water quality.

Hydrology and Water Quality Impact 7-4 Household Hazardous Waste (Non-Disposal Facilities) – On-site handling and temporary storage of household hazardous waste at non-disposal facilities could adversely affect water quality.

Hydrology and Water Quality Impact 7-5 Leachate (Landfill) – The operation of new and expanded solid waste disposal facilities could result in an increase in leachate production, which could lead to degradation of County water quality.

Hydrology and Water Quality Impact 7-6 Quality of Stormwater Runoff (Landfill) – The construction and operation of new and expanded solid waste disposal facilities could adversely affect the quality of stormwater runoff.

Hydrology and Water Quality Impact 7-7 Water Quality (Landfill) – Grading activities associated with the new and expanded solid waste disposal facilities could adversely affect water quality.

Hydrology and Water Quality Impact 7-8 Volume and Flow of Surface Waters(Landfill) – The operation of new and expanded solid waste disposal facilities could significantly alter the volume and flow of surface waters.

Hydrology and Water Quality Impact 7-10 Blasting Spills (Landfill) – Blasting for excavation of landfill cells could involve spills of blasting materials, resulting in surface water contamination.

Hydrology and Water Quality Impact 7-11 Ground Vibrations from Blasting (Landfill) – Blasting near an existing landfill could cause fractures to open in bedrock or damage or displace the landfill liner as a result of ground vibrations. This would create the potential for leachate intrusion into groundwater.

Hydrology and Water Quality Impact 7-12 Groundwater Recharge (Non-Disposal Facilities) – Loss of groundwater recharge from large non-disposal facilities (i.e., composting facilities) could occur from impermeable surfaces.

Mitigation Measures

Hydrology and Water Quality Mitigation Measure 7-1 –

(a) Stormwater runoff from waste handling areas shall be treated on site or routed to the sanitary sewer for treatment prior to discharge.

(b) To the extent feasible, materials handling and storage areas shall be covered to prevent contact with stormwaters.

(c) All exterior drainage from each site shall be managed in accordance with the requirements of federal NPDES, state, and local regulations.

Hydrology and Water Quality Mitigation Measure 7-2 –

(a) To the extent feasible, new facilities shall be located outside of areas at high risk for flooding.

(b) The design of new facilities shall, to the extent feasible, minimize the amount of impermeable surface and incorporate methods to lessen surface runoff from the site.

Hydrology and Water Quality Mitigation Measure 7-3 –

(a) Employ Best Management Practices as required under the NPDES Permit for Construction grading.

(b) To the extent feasible, confine grading, excavation, and other earthwork to the dry seasons. When this is not feasible, erosion and sediment transport control facilities should be in place prior to the onset of the first major winter storms. If wind erosion has the potential to occur during summer months, erosion control methods, such as watering graded areas, shall be implemented.

(c) Prepare and implement detailed erosion and sedimentation control plan(s), which should be submitted for review and approval by the RWQCB. The specific language of such plans varies, but the concepts to be adhered to include the following:

1. To avoid discharge to natural waterways, sediment should be trapped before leaving the construction site through the use of rip-rap, hay bales, fencing, or sediment ponds.
2. Areas of surface disturbance should be minimized.
3. Disturbed areas should be stabilized through vegetative or mechanical methods. When construction is complete, all disturbed areas should be regraded and revegetated. Topsoil should be stockpiled and used for the revegetation of disturbed areas.

(d) All new facilities shall be designed and constructed to conform with the site development standards contained in the latest edition of the Uniform Building Code (UBC). Prior to construction activities, the applicant shall submit building plans to the local jurisdiction's building department indicating compliance with the UBC.

(e) All new facilities shall meet the requirements of the County or cities' standards pertaining to site design, grading, and erosion control.

(f) Vegetation on soils exposed during construction shall be reestablished as soon as practical. Mulch or other temporary cover shall be used in the interim where erosion potential exists.

(g) Treat wastewater generated during construction prior to discharge. At a minimum, the wastewater should be treated by sedimentation to remove suspended particles from the water. Sedimentation ponds would need to be maintained regularly. Precipitation agents, such as alum, may be introduced to speed the action of settling suspended particles. Alternatively, either gravity or pressure filtration could be used if sufficient space for sedimentation facilities is unavailable.

(h) Prepare and implement a Spill Prevention Control/Countermeasure (SPCC) Plan prior to the start of

construction. The SPCC Plan should cover actions needed to minimize the potential for accidental spillage of construction-related contaminants such as fuel, oil, or other chemicals. Such contaminants should not be drained onto the soil; rather, they should be confined to sealed containers and removed to proper disposal sites. Refueling should be conducted in a location where spills could be contained.

Hydrology and Water Quality Mitigation Measure 7-4 –

(a) Same as Mitigation Measures 7-1(a), 7-1(b) and 7-1(c).

(b) Construct a separate spill control facility around and under the waste intake, storage, and loading areas to provide for containment of any hazardous spills that might occur in the vicinity.

Hydrology and Water Quality Mitigation Measure 7-5 –

(a) Cover materials (soil) shall be placed over waste materials at the end of each day to prevent water from ponding on the landfill.

(b) A low-permeability final landfill cover, as required by CCR, Title 23, Chapter 15, shall be placed over the landfill during closure.

(c) The volume of fluid that enters the landfill shall be minimized by prohibiting the disposal of liquid waste.

(d) The landfill shall be designed with an adequate drainage and collection system to prevent to the extent possible the migration of leachate off-site.

(e) Landfills shall be located where site characteristics provide adequate separation between solid waste and ground and surface waters and where soil characteristics, distance from waste to groundwater, and other factors will ensure no impairment of beneficial uses of surface or ground water beneath or adjacent to a landfill (California Water Regulations, Chapter 15, Article 3, Section 2533).

(f) Current industry standards for leachate management shall be implemented (e.g., storing leachate in lined on-site ponds where it can evaporate naturally) or, if storage is impossible, transporting leachate to the nearest wastewater treatment plant capable of treating the leachate and not exceeding effluent discharge limits.

(g) Leachate and wastewater collection and disposal systems shall be designed with enough capacity to accommodate the amount of leachate predicted to be generated during the wettest year of record.

(h) Construction of all new landfill cells will comply with the requirements of Title 27 for liner impermeability.

(I) A landfill leachate and wastewater management program will be implemented which will include monitoring leachate levels and wastewater and emptying ponds as necessary to ensure adequate storage capacity.

(j) Investigate and consider methods for treatment of leachate and wastewater on-site and disposal by irrigation at any expanded or new landfill site.

(k) All exterior drainage from each landfill site shall be managed in accordance with the requirements of federal NPDES, state, and local regulations.

Hydrology and Water Quality Mitigation Measure 7-6 –

(a) To the extent feasible, the working face of the landfill shall be covered with soil or other approved alternate cover material to prevent contact with stormwaters.

(b) All exterior drainage from each site shall be managed in accordance with the requirements of federal NPDES, state, and local regulations.

Hydrology and Water Quality Mitigation Measure 7-7 –

Same as Mitigation Measures 7-3 (a) through (f) and (h). In addition the following Mitigation Measure is added:

Treat wastewater generated during construction prior to discharge. At a minimum, the wastewater should be treated by sedimentation to remove suspended particles from the water. Sedimentation ponds would need to be maintained regularly.

Hydrology and Water Quality Mitigation Measure 7-8 –

(a) Mitigation implemented to control erosion during operation of the landfill shall be similar to that implemented during construction (see Mitigation Measure 7-7 above).

(b) Permanent drainage ditches shall be constructed around the landfill perimeter to convey runoff water from the project site. These permanent drainage ditches shall be lined with native grass, concrete, corrugated metal, or other material that will limit water infiltration and soil erosion. Temporary and permanent berms, collection ditches, benches, and stormwater downdrains shall be constructed to convey water runoff from the landfill surface and downslopes.

(c) On-or off-site detention ponds shall be constructed and maintained and site runoff shall be collected and sedimentation completed in the ponds prior to discharge to surface waters. The ponds shall be adequately designed so that no net increase over existing conditions in stormwater flows from the project site are expected to result from a 100-year flood event.

(d) Prior to the rainy season, drainage facilities shall be inspected and, if necessary, cleared of debris.

(e) Drainage facilities shall be inspected after the first significant rain of the season to ensure that the system is functioning.

(f) Runoff from areas up gradient of the landfill shall be routed around the landfill.

(g) Landfills shall not be developed within a 100-year floodplain (40 CFR 258).

Hydrology and Water Quality Mitigation Measure 7-10 – Spill prevention and cleanup plans will be required in all construction contracts. Any contracts which involve blasting will require that explosives spilled during the loading of the blasting holes be cleaned up prior to detonating the explosives.

Hydrology and Water Quality Mitigation Measure 7-11 – If blasting will be done near an existing landfill, a qualified blasting specialist will design the blasting program to ensure that peak particle velocities resulting from blasts will be lower than the amount that could damage the landfill liner or leachate collection system.

Hydrology and Water Quality Mitigation Measure 7-12 – When feasible, large non-disposal facilities (i.e., composting facilities) shall provide permeable surfaces and retention basins to aid in the recharge of groundwater in accordance with the water quality standards of the Regional Water Quality Control Board.

PUBLIC SAFETY

Significant Effects

Public Safety Impact 8-1 Injury & Illness (Non-Disposal Facilities and Landfill) – New and expanded non-disposal facilities and landfill may give rise to the potential for injury and illness among collection program and facility employees.

Public Safety Impact 8-2 Fungi and Bacteria (Non-Disposal Facilities) – Workers in new and expanded non-disposal facilities and participation by the general public in backyard composting programs identified in the 2003 CoIWMP could result in health problems for susceptible persons exposed to allergenic fungi and infectious bacteria (e.g. aspergillous).

Public Safety Impact 8-3 Household Hazardous Wastes (Non-Disposal Facilities and Landfill) – HHW programs identified in the 2003 CoIWMP may increase the potential for public health impacts in surrounding areas.

Public Safety Impact 8-4 Exposure of Employees and the General Public to Accidental Injury (Non-Disposal Facilities) – Construction and operation of new and expanded non-disposal facilities and landfills could expose employees and the general public to accidental injury.

Public Safety Impact 8-5 Accidental Combustion and Exposure of Toxic Substances (Non-Disposal Facilities and Landfill) – Processes inherent in the operation of new and expanded non-disposal facilities and landfill could result in accidental combustion of materials accumulated for transfer and storage and expose area residents to toxic substances and/or increased fire or explosion potential.

Public Safety Impact 8-6 Vectors (Non-Disposal Facilities and Landfill) – Operation of new and expanded non-disposal facilities and landfill may lead to habitation of vectors in and around the facilities.

Public Safety Impact 8-8 Biorefining Chemicals (Non-Disposal Facility) – One type of organics processing being considered for the RMF known as chemical or biological digestion, could involve the transportation, use and disposal of hazardous material to facilitate the digestion process. Improper

handling could result in spills, which could expose people to these materials.

Public Safety Impact 8-9 Blasting for Landfill Excavation (Landfill) – Significant vibration impacts could result from blasting for the excavation for landfill construction.

Public Safety Impact 8-10 State-Designated Contaminated Sites (Non-Disposal Facilities and Landfill) – New facilities could be sited on lands designated by the state as containing hazardous materials contamination.

Public Safety Impact 8-11 Emergency Response Plans (Non-Disposal Facilities and Landfill) – New facilities or expansion of existing non-disposal facilities or landfill may not be covered by existing emergency response and evacuation plans of the county or incorporated cities.

Public Safety Impact 8-12 Hazardous Materials Adjacent to Schools (Non-Disposal Facilities and Landfill) – Hazardous materials could be handled within a quarter mile of a school.

Public Safety Impact 8-13 Wildland Fires (Non-Disposal Facilities and Landfill) – Wildland fires could occur adjacent to new or expanded non-disposal facilities and landfills.

Mitigation Measures

Public Safety Mitigation Measure 8-1 –

(a) Curbside recycling operations shall be established so that no direct worker contact with the materials occurs. Automated can pick-up, commingled collection, and/or separate materials bins could meet this objective.

(b) Workers shall be supplied with appropriate safety gear which provide the maximum protection available while still affording sufficient manual dexterity for accomplishing their sorting tasks.

(c) All workers shall have current vaccinations against diseases such as tetanus, polio, or other diseases which could be spread through direct contact with solid waste.

(d) Workers shall be trained to spot hypodermic needles during sorting, extract them from the sorting line, and deposit them in a plastic sharps disposal container kept at each sorting station.

(e) Sharps containers filled at the non-disposal facility and landfill, as well as containers encountered in curbside materials during sorting operations, shall be properly disposed of with a licensed medical waste hauler.

(f) New and expanded non-disposal facilities and solid waste disposal facilities shall develop and implement an Illness and Injury Prevention Plan to address the potential for injury and illness among facility employees.

(g) A map showing the locations of local emergency services and appropriate telephone numbers shall be posted at all non-disposal facilities and landfills in a conspicuous place (e.g., near the telephone) by either the program operations manager or the safety inspector.

Public Safety Mitigation Measure 8-2 –

(a) Backyard composting training for the general shall address the potential health effects associated with composting. Training will describe how proper moisture content will reduce dust generation and maximize microbial action and how sufficient oxygen content is critical to maintaining microbial action, regulating temperature, and reducing odors and pathogens. Persons with weakened immune systems or persons with allergies, asthma ,or other respiratory problems shall be discouraged from participating in backyard composting. Backyard composters shall also be encouraged to thoroughly wash their hands with soap and water after each contact with backyard compost piles.

(b) Composting operations at new or expanded composting facility(ies) shall include the following procedures:

1. Proper moisture content shall be maintained in compost piles or windrows.
2. Proper temperatures and oxygen content shall be maintained in compost piles/windrows through aeration and compost turning or agitation. Operating procedures shall require that the compost pile be heated to approximately 132-140° to ensure that all pathogens have been eliminated.
3. Loading and compost turning equipment shall have enclosed, ventilated cabs and the ventilation systems shall be maintained regularly, or individual respiratory protection (dust masks) will be utilized.
4. Employees shall be encouraged to wash their hands frequently with soap and water, particularly prior to lunch and other breaks, and at the end of the work day.
5. Composting facility operators shall inform compost workers about the possibility for development of pulmonary hypersensitivity. Workers shall be encouraged to report unusual health problems to their supervisors and physicians.
6. New and expanded non-disposal facilities shall develop and implement an Illness and Injury Prevention Plan to address the potential for injury and illness among facility employees.

Public Safety Mitigation Measure 8-3 –

(a) A HHW Facility Operations Plan shall be developed for each permanent HHW facility. This plan shall include procedures for waste acceptance and screening, waste management practices, stormwater management, worker health and safety, and emergency prevention, precaution and response.

(b) An emergency response plan shall be developed for each collection site in order to plan actions to be taken in the event of a spill incident. The emergency response and evacuation plan shall be developed by the collection site operator in coordination with the appropriate local agencies prior to the operation of the collection site.

(c) A safety inspector shall be assigned by the HHW program operations manager to oversee field activities, spot potential risks, and ensure conformance with regulations.

(d) Employee safety meetings shall be conducted, as necessary, by the program safety inspector.

(e) All vehicles shall be inspected, as necessary, for safety violations by the program safety inspector and facility employees.

(f) An on-site eye wash and shower station shall be provided at all mobile and stationary HHW collection sites.

(g) A map showing the locations of local emergency services and appropriate telephone numbers shall be posted at all mobile and stationary HHW collection sites in a conspicuous place (e.g., near the telephone) by either the program operations manager or the safety inspector.

(h) A training program for facility personnel in CPR and first aid shall be provided by the program safety inspector. In addition, first aid materials shall be maintained in good condition.

(i) A drainage containment and collection system shall be set up around the HHW collection and storage facilities to prevent discharge of spilled materials to soil or groundwater. All spilled material shall be collected and treated separately to prevent the spread of any hazardous constituents.

(j) Any risk posed by unauthorized access to any non-disposal site shall be mitigated by posting warning signs, fencing, patrol personnel, or the disabling of equipment when not in use. Daily inspections would be the responsibility of the facility operations manager.

(k) A Load Checking Program shall be updated and implemented to ensure the proper disposal of hazardous wastes illegally disposed with solid waste accepted at non-disposal facilities and the landfill. Any hazardous wastes found while conducting the Load Checking Program shall be disposed of according to applicable state and federal regulations.

Public Safety Mitigation Measures 8-4 –

(a) Prior to permitting, develop and implement (in consultation with the Fire Marshal) a Fire Prevention Program for each facility, as necessary. This program shall entail both structural fire suppression mechanisms, such as an automatic sprinkler system and fire retardant building materials in the design of the structure, as well as procedural programs for minimizing/extinguishing fire hazards.

(b) Develop an Emergency Response and Evacuation Plan for each new or expanded facility in accordance with relevant county or city emergency response and evacuation plans, and follow it in the event of a fire, earthquake, hazardous materials spill or other emergency. Each emergency response and evacuation plan shall be developed by the facility operator in coordination with the County Office of Emergency Services, the Hazardous Materials Division of the County Environmental Health Department, and the appropriate Fire Protection District.

(c) All potentially disastrous events shall be reported by the project sponsor to the County Office of Emergency Services so that County emergency services such as traffic control, fire and medical equipment, and evacuation notification can be available as needed.

(d) Facility workers shall be provided and required to use safety glasses, safety shoes, coveralls, gloves, noise reducers for ears, or other safety equipment appropriate to the hazard of the job. An emergency eye bath and emergency showers shall be installed in the facility by the project sponsor.

(e) A map showing the locations of local emergency services and appropriate telephone numbers shall be posted at all non-disposal facilities and landfills in a conspicuous place by either the program operations

manager or the safety inspector.

(f) New and expanded non-disposal facilities and solid waste disposal facilities shall develop and implement an Illness and Injury Prevention Plan to address the potential for injury and illness among facility employees.

Public Safety Mitigation Measure 8-5 –

Same as Mitigation Measure 8-4 (a) through (e). In addition, the following Mitigation Measures have been added:

(a) Consider reducing operating hours at new or expanded non-disposal facilities in order to reduce the accumulation of combustible solid waste for transfer and storage.

(b) A map showing the locations of local emergency services and appropriate telephone numbers shall be posted at all non-disposal facilities and landfills in a conspicuous place (e.g., near the telephone) by either the program operations manager or the safety inspector.

(c) Develop an Emergency Response and Evacuation Plan for each new or expanded facility in accordance with relevant county or city emergency response and evacuation plans, and follow it in the event of a fire, earthquake, hazardous materials spill or other emergency. Each emergency response and evacuation plan shall be developed by the facility operator in coordination with the County Office of Emergency Services, the Hazardous Materials Division of the County Environmental Health Department, and the appropriate Fire Protection District.

Public Safety Mitigation Measures 8-6 –

(a) Rodent traps shall be placed strategically around the public drop-off areas and recycling areas, as required. This measure shall be monitored by the facility operations manager.

(b) Landscape materials shall exclude plants, such as ivy, which may provide hidden nesting areas for rodents.

(c) Standing water and moist areas shall be controlled to prevent mosquito breeding. This shall be monitored by the facility operations manager.

Public Safety Mitigation Measure 8-8 – If hazardous materials are used at the RMF, the following mitigations will be implemented:

(a) Same as Mitigation Measures 8-3 (b) through (d) and (f) through (j).

(b) New and expanded non-disposal facilities and solid waste disposal facilities shall develop and implement an Illness and Injury Prevention Plan to address the potential for injury and illness among facility employees.

Public Safety Mitigation Measure 8-9 –

(a) Blasting at the Central Disposal Site shall be conducted in accordance with the recommendations of the study conducted by Geotek in 1998, and any further site specific blasting study conducted by a licensed blasting engineer. At a minimum, mitigation shall include:

1. All blasts will be designed to minimize peak particle velocity at the nearest off-site structures.
2. Measures will be taken to control air blast (over pressure), including stemming explosive charges with clean crushed stone, ensuring the minimum distance between bore holes and the rock face, keeping drilling logs to describe ground conditions, adjusting blast design to isolate explosive charges from weak areas, avoiding blasting during heavy cloud cover or windy conditions and monitoring over pressure at or near nearby residences.

(b) If blasting is necessary at a new solid waste disposal site, a site-specific blasting study to establish procedures to minimize peak particle velocities and over pressure will be conducted.

Public Safety Mitigation Measure 8-10 – In the event that a facility is located on a designated contaminated site, a study will be done to ensure that proper handling and disposal methods will be used to minimize environmental impacts. The study will include a search of records of hazardous materials presence, a field assessment of conditions on the site to determine whether visual evidence of hazardous materials is present, and a plan to treat and/or clean up the site in accordance with regulations of the Regional Water Quality Control Board and Sonoma County Environmental Health if hazardous materials are present. Site specific analysis would be done at the time facility locations are proposed.

Public Safety Mitigation Measure 8-11 – Develop an Emergency Response and Evacuation Plan for each new or expanded facility in accordance with relevant county or city emergency response plans, and follow it in the event of a fire, earthquake, hazardous materials spill or other emergency. Each emergency response plan shall be developed by the facility operator in coordination with the County Office of Emergency Services, the Hazardous Materials Division of the County Environmental Health Department, and the appropriate Fire Protection District.

Public Safety Mitigation Measure 8-12 –

(a) Safety measures shall be implemented, including, at a minimum, emergency response procedures, safety inspections, safety training, restriction of unauthorized access to areas where hazardous materials are stored, and timely containment and cleanup of spills.

(b) All potentially disastrous events shall be reported by the project sponsor to the County Office of Emergency Services so that County emergency services such as traffic control, fire and medical equipment, and evacuation notification can be available as needed.

Public Safety Mitigation Measure 8-13 –

(a) Future non-disposal and disposal facilities located in Sonoma County shall be designed, constructed, and maintained in conformance with the requirements of the Fire Marshall's Vegetation Management Plan and Fire Safe Standards.

(b) Develop an Emergency Response and Evacuation Plan for each new or expanded facility in accordance with relevant county or city emergency response and evacuation plans, and follow it in the event of a fire, earthquake, hazardous materials spill or other emergency. Each emergency response and evacuation plan shall be developed by the facility operator in coordination with the County Office of Emergency Services, the Hazardous Materials Division of the County Environmental Health Department, and the appropriate Fire Protection District.

(c) All potentially disastrous events shall be reported by the project sponsor to the County Office of Emergency Services so that County emergency services such as traffic control, fire and medical equipment, and evacuation notification can be available as needed.

TRANSPORTATION

Significant Effects

Transportation Impact 9-1 Operations (Non-Disposal Facilities) – The operation of new and expanded non-disposal facilities could result in significant impacts to transportation in Sonoma County.

Transportation Impact 9-4 Central Disposal Site Expansion Traffic (Landfill) – Expansion of the landfill at the Central Disposal Site and permanent operation of the site as a landfill and transfer station would extend existing traffic further into the future (past 2015).

Transportation Impact 9-5 Rock Extraction Traffic Safety (Landfill) – Rock extraction at the Central Disposal Site could create transportation safety hazards related to sight distance on Mecham Road and at the site.

Transportation Impact 9-6 New Facilities Traffic (Non-Disposal Facilities and Landfill) – Construction and operation of a new landfill and non-disposal facilities could cause safety problems at its driveway entrance or its access road, or on minor streets that serve the new facility.

Mitigation Measures

Transportation Mitigation Measure 9-1 –

(a) To the extent feasible, new non-disposal facilities shall not be located in areas with significant road congestion, as designated in the cities' and County General Plans;

(b) To the extent feasible, new non-disposal facilities shall be located near other commercial facilities to allow for the combination of activities in one trip and reduce overall trip generation.

(c) Traffic Management Plans (TMP) shall be developed for each of the new and expanded non-disposal facilities, as required. These plans shall schedule truck trips so that roadway segments with the potential to be significantly impacted are avoided during peak hours. In addition, these plans shall detail the hours of operation and other restrictions on truck trips for each of the facilities and shall include plans for employee car pooling and bus transportation, where appropriate and feasible. The plans shall be updated periodically in response to changing traffic conditions and improvements to the highway system. The TMP shall include a site-specific traffic evaluation conducted as part of the siting study for a new non-

disposal facility to identify potential traffic problem areas prior to site selection. The traffic evaluation shall consider limiting non-disposal facility operations to either commercial or private (general public) haulers, as well as co-locating of disposal and non-disposal facilities to reduce haul trips.

(d) Countywide Traffic Mitigation fees shall be paid for new facilities implemented in accordance with the 2003 CoIWMP to help mitigate off-site cumulative traffic impacts.

Transportation Mitigation Measure 9-4 –

If significant traffic impacts to the Stony Point/Roblar Roads and Stony Point Road/West Railroad Avenue intersections continue beyond 2015, mitigation measures such as the following shall be implemented:

(a) The Integrated Waste Division will restrict truck traffic that is subject to County control so that trucks do not travel through the Stony Point/Roblar intersection during peak hour. This shall apply only to new truck trips associated with projects pursuant to the 2003 CoIWMP and not existing traffic using the Central Disposal Site. The restriction shall apply to trucks subject to County control, such as those making deliveries of cover soil and liner materials, and trucks associated with construction at the site. This measure shall remain in effect until a traffic signal has been installed at this intersection.

(b) Prior to construction of projects at the Central Disposal Site pursuant to the 2003 CoIWMP, the Integrated Waste Division shall pay a traffic mitigation fee that includes a fair share contribution toward the installation of signals at the Stony Point/Roblar and Stony Point/West Railroad intersections.

(c) Consider restricting hours of operation so that traffic is not added to the congested intersections during peak traffic hours. This restriction would remain in effect until these intersections are signalized.

(d) Consider restricting traffic the use of the site to commercial operators only, thereby reducing the number of vehicles using the Stony Point/Roblar and Stony Point/West Railroad intersections.

Transportation Mitigation Measure 9-5 – Prior to the commencement of hauling, the quarry operator and the Integrated Waste Division shall implement a truck driver education program which familiarizes rock and commercial refuse haulers with speed limit zones, school bus stops, areas of low sight distance on the haul route, permit limits on trucking, weight and load height limits, circulation routes through the landfill to minimize interference, and other measures which will reduce public conflicts. The Integrated Waste Division shall maintain a record of the drivers receiving the orientation.

Transportation Mitigation Measure 9-6 –

(a) Driveways and access roads for the new landfill and non-disposal facilities shall be designed to the AASHTO standards to ensure safety hazards are minimized. These standards include driveway width, acceleration-deceleration lanes and turning radius requirements.

(b) Prior to operation, minor roads that would be used as haul routes shall be examined for existing safety problems and if feasible corrections will be made if traffic from new facilities exacerbates those problems.

(c) Design access roads for new facilities to accommodate emergency vehicles in accordance with County Fire Safe Standards.

AIR QUALITY

Significant Effects

Air Quality Impact 10-2 Construction PM (Non-Disposal Facilities) – Construction of new and expanded non-disposal facilities could create significant emissions of PM_{10}.

Mitigation Measures

Air Quality Mitigation Measure 10-2 –

(a) The contractor shall reduce particulate emissions by complying with the dust control strategies developed by the NSCAPCD and the BAAQMD. The project sponsor shall include in construction contracts the following requirements:

1. The contractor shall water in late morning and at the end of the day all earth surfaces during clearing, grading, earthmoving, and other site preparation activities.
2. The contractor shall use tarpaulins or other effective covers for haul trucks that travel on public streets and roads.
3. The contractor shall increase the watering frequency for exposed and erodible soil surfaces whenever winds exceed 15 mph.
4. The contractor shall water exposed soil surfaces, including cover stockpiles, roadways, and parking and staging areas, to minimize dust and soil erosion.
5. The contractor shall sweep streets adjacent to the new and expanded non-disposal facilities at the end of each day.
6. The contractor shall control construction, operation, and site maintenance vehicle speed to 15 mph on unpaved roads.

NOISE

Significant Effects

Noise Impact 11-1 Construction Noise (Non-Disposal Facilities) – Construction of new and expanded non-disposal facilities could cause temporary increases in noise levels on, and around, the proposed facilities over the entire period of construction.

Noise Impact 11-4 Construction Noise (Landfill) – Construction of new or expanded solid waste disposal facilities, including any potential rock extraction, could cause temporary increases in noise levels on, and around, the proposed facilities over the entire period of construction.

Mitigation Measures

Noise Mitigation Measure 11-1 –

(a) Construction activities shall be limited to the hours between 7AM and 7PM to the extent practical.

(b) Construction equipment shall be properly outfitted and maintained with noise reduction devices to minimize construction-generated noise. Wherever possible, noise-generating construction equipment shall be shielded from nearby residences by noise-attenuating walls, berms, or enclosures.

(c) The contractor shall attempt to locate stationary noise sources as far away as possible from noise-sensitive land uses.

Noise Mitigation Measure 11-4 – Same as Mitigation Measure 11-1.

VEGETATION AND WILDLIFE

Significant Effects

Vegetation and Wildlife Impact 12-1 Wetlands, Sensitive Wildlife Species, Sensitive Natural Communities, Migratory Wildlife Corridors, and Natural Wildlife Nursery Sites (Non-Disposal Facilities) - New and expanded non-disposal facilities could significantly impact wetlands, listed or sensitive species or their habitat, and/or sensitive/natural communities.

Mitigation Measures

Vegetation and Wildlife Mitigation Measure 12-1 –

(a) When new non-disposal facilities are proposed, site specific biotic studies shall be performed to identify biotic resources on the sites. To the extent practical the new facilities shall be constructed to avoid these resources. Where avoidance is not practical the project sponsor shall consult with the appropriate State or Federal resource agencies to determine appropriate mitigation for any loss of or change to the biotic resources. The project sponsor shall acquire all necessary permits from these agencies. Compliance with permit conditions shall be a condition of approval of the project.

(b) Riparian areas shall be avoided where possible in siting new facilities. If avoidance is not possible, compensation for loss of riparian vegetation shall be made by planting and otherwise enhancing a comparable area of streambank in the general vicinity where habitat quality can be improved. Planting plans shall be reviewed by a qualified biologist and submitted to the California Department of Fish and Game and other agencies, if needed, for review and comment prior to implementation. Revegetation areas shall be managed to permanently protect the riparian vegetation.

(c) Before construction during the active nesting period between March 1 and September 1, a qualified biologist shall determine the locations of any active raptor nests that could be affected. If any active nests are found, removal of the trees containing the nests shall be delayed until a qualified wildlife biologist has determined that the young birds are able to leave the nest and forage on their own. A qualified wildlife biologist shall be consulted to determine what activities must be avoided in the vicinity of the nests while the nests are active, and those recommendations shall be followed during construction.

CULTURAL RESOURCES AND PALEONTOLOGY

Significant Effects

Cultural Resources and Paleontology Impact 13-1 Cultural and Paleontological Resources (Non-Disposal Facilities) – New or expanded non-disposal facilities could result in impacts to cultural and paleontological resources.

Cultural Resources and Paleontology Impact 13-2 Cultural and Paleontological Resources (Landfill) – Development of a new or expanded solid waste disposal facility could result in impacts to cultural and paleontological resources.

Cultural Resources and Paleontology Impact 13-3 Architectural Historical Resources (Non-Disposal Facilities and Landfill) – New non-disposal facilities or a new landfill could result in impacts to historical resources.

Mitigation Measures

Cultural Resources and Paleontology Impact Mitigation Measure 13-1 –

(a) Intensive on-site cultural and paleontological resources surveys shall be conducted by a qualified archeologist and paleontologist prior to construction in any areas of a site to be used for solid waste non-disposal facilities that are designated as sensitive in a city or County planning document. In addition, the NWIC will be consulted to determine if previously recorded archeological sites exist on or in the vicinity of the project site. The purpose of this survey will be to precisely locate and map significant cultural and paleontological resources. The services of the archaeologist and paleontologist shall be retained by the project sponsor.

(b) If, in the process of the cultural resource surveys, significant archaeological resources are found to exist on the site, the project sponsor shall consider changing the facility lay-out to avoid such resources. If it is not possible to make this change, however, formal archaeological data collection work on the significant resources will be completed. This shall include a complete surface collection of cultural material and, at a minimum, excavation of a sample subsurface cultural material sufficient to evaluate the extent, depth, and make-up of site components (i.e., archaeological testing). The overall objectives of such data collection work shall be to explicitly identify those research questions for which the site contains relevant information, with the research questions representing those presently expressed by the body of professional archaeologists in the region. If the results of the archaeological testing indicate that additional mitigative data recovery work is justified or warranted, it will be completed prior to the construction of the facility.

(c) If paleontological resources can not be avoided by changing the site lay-out, a program of data collection and recovery shall be implemented.

(d) Archaeological and paleontological monitors shall be present during studies, site construction and development activities in areas of high cultural and paleontological resource sensitivity when recommended by a site-specific study for a project under the 2003 CoIWMP, or when a designated Native American Tribal representative requests to monitor projects. These monitors shall be retained by

the project sponsor. In the event that human remains are unearthed during construction, state law requires that the County Coroner be notified to investigate the nature and circumstances of the discovery. At the time of discovery, work in the immediate vicinity would cease until the Coroner permits work to proceed. If the remains were determined to be prehistoric, the find would be treated as an archaeological site and the mitigation measure described above would apply.

(e) In the event that unanticipated cultural or paleontological resources are encountered during project construction, all earthmoving activity shall cease until the project sponsor retains the services of a qualified archaeologist or paleontologist. The archaeologist or paleontologist shall examine the finding, assess their significance, and offer recommendations for procedures deemed appropriate to either further investigate or mitigate adverse impacts to those cultural or paleontological archaeological resources that have been encountered. These additional measures shall be implemented.

Cultural Resources and Paleontology Impact Mitigation Measure 13-2 – Same as Mitigation Measure 13-1 (a) through (e)

Cultural Resources and Paleontology Impact Mitigation Measure 13-3 –

(a) Intensive on-site historical resources surveys shall be conducted by a qualified architectural historian prior to construction where structures over 45 years old or sites known to have historical significance could be affected by proposed facilities. The purpose of the survey shall be to determine the historical significance of the resources and whether the proposed project would affect those structures that are found to have historical significance. The services of the architectural historian shall be retained by the project sponsor.

(b) If, in the process of the historical resource surveys, significant resources are found to exist on the site, the project sponsor shall consider changing the facility layout to avoid such resources. If it is not possible to make this change, however, mitigation work in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties which address preservation, rehabilitation, restoration and reconstruction of historic resources shall be completed for the historical resource.

VISUAL RESOURCES

Significant Effects

None identified.

SOCIOECONOMICS, PUBLIC SERVICES AND UTILITIES

Significant Effects

Socioeconomics, Public Services and Utilities Impact 15-1 Fire and Police Services (Non-Disposal Facilities) – Non-disposal facilities and programs may impact existing fire and police services.

Socioeconomics, Public Services and Utilities Impact 15-2 Fire and Police Services (Landfill) – New and expanded solid waste disposal facilities may impact existing fire and police services.

Socioeconomics, Public Services and Utilities Impact 15-4 Exceed Wastewater Treatment Requirements (Non-Disposal Facilities and Landfill) – Future landfill expansion, a new landfill or other facilities could involve activities that produce discharge to waterways and, therefore, would be required to comply with wastewater treatment requirements of the Regional Water Quality Control Board.

Mitigation Measures

Socioeconomics, Public Services and Utilities Mitigation Measure 15-1 –

(a) For each facility and for the applicable CoIWMP programs, a Fire Prevention Program shall be developed and implemented (in consultation with the Fire Marshal). This program shall entail both structural fire suppression mechanisms in the design of the facilities, such as fire sprinkler systems in facility buildings, as well as procedural programs for minimizing fire hazards.

(b) For each facility that handles hazardous materials and for the applicable CoIWMP programs, a Hazardous Materials Inventory and Emergency Response Plan shall be prepared and implemented (in consultation with the appropriate local agency).

(c) Private project sponsors shall pay development impact fees to cover the cost of additional fire protection services, if necessary.

Socioeconomics, Public Services and Utilities Mitigation Measure 15-2 – Same as Mitigation Measure 15-1 (a) and (c).

Socioeconomics, Public Services and Utilities Mitigation Measure 15-4 – Any projects which involve discharge to waterways or stormwater runoff shall comply with the permitting provisions of the applicable Regional Water Quality Control Board.

ENERGY

Significant Effects

None identified.

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EXHIBIT B

IMPACTS THAT CANNOT BE REDUCED TO LESS THAN SIGNIFICANT

The Final SPEIR disclosed significant or potentially significant environmental impacts that, even with the implementation of mitigation measures, may not or cannot be avoided if the proposed 2003 CoIWMP is approved.

Findings

The 2003 CoIWMP will cause impacts that cannot be reduced to less than significant even with the implementation of the mitigation measures identified in the FSPEIR. Based on the analysis in the FSPEIR, it has been found that the significant effects listed below may not be reduced to a less than significant level by incorporating into specific projects the following mitigation measures:

LAND USE

Significant Effects

Land Use Impact 4-2 – The construction of new and expanded solid waste disposal facilities could conflict with surrounding land uses.

Land Use Impact 4-3 – The construction of new solid waste disposal facilities could result in the loss of important open space or other resource lands.

Mitigation Measures

Land Use Mitigation Measure 4-2 – In siting new or expanded solid waste non-disposal facilities, examine land uses surrounding potential sites and take possible land use conflicts into account in making siting determinations. In addition, require each new or expanded facility to incorporate design and operational measures to minimize land use conflicts.

Land Use Mitigation Measure 4-3 – There are no mitigation measures for the loss of important resource lands or for the change in character of the lands.

SOILS & AGRICULTURAL RESOURCES

Significant Effects

Soils & Agricultural Resources Impact 6-2 – Siting new or expanded non-disposal facilities on agricultural land will impair agricultural production.

Soils & Agricultural Resources Impact 6-3 (a) – Development of a new landfill and the expansion of the Central Landfill could have potentially significant adverse soil related impacts. These potential impacts include substantial erosion and siltation.

Soils & Agricultural Resources Impact 6-3 (b) – Development of a new landfill and the expansion of the

Central Landfill could significantly impact agricultural lands. These potential impacts could include the conversion of prime farmland, unique farmland, farmland of statewide importance; conflicts with existing zoning for agricultural use, or a Williamson Act contract; or involve other changes to the environment that could result in the conversion of farmland to non-agricultural use.

Mitigation Measures

Soils & Agricultural Resources Mitigation Measures 6-2 – To the extent feasible, all new facilities and expansion of existing facilities shall comply with the General Plan objectives and avoid siting on agricultural lands as defined in the General Plan.

Soils & Agricultural Resources Mitigation Measure 6-3 (a) – Storm Water Pollution Prevention Plans shall be prepared and revised as needed for all facilities at the Central Disposal Site or other new landfills. Plans shall be submitted to the Regional Water Quality Control Board and at a minimum shall include:

(a) A description of the critical features of the erosion control system, including sediment ponds and drainage ways, along with a description and schedule for routine maintenance of these features.

(b) A construction schedule for components of the erosion control system.

(c) A requirement to vegetate side slopes and waste-fill slopes. Temporary and permanent vegetative cover shall be established as soon as possible on side slopes and waste-fill slopes. To protect the slopes prior to vegetation establishment, a mulch, consisting of straw or wood fiber shall be applied at the time of seeding. A tackifier shall be applied with the mulch as needed to prevent loss of the mulch due to wind or water movement. Sample specifications for revegetating disturbed areas shall be included, with a description of the types of areas to be revegetated, the equipment and procedures to be used, and the dates for the seeding. For areas where an erosion potential exists, but it is not practical to establish vegetation, specifications for placing mulch or temporary covers shall be included.

(d) Specifications for construction features to reduce erosion. These shall include benches on slopes to intercept sheet flow and shorten drainage paths, protective linings (e.g., riprap, concrete, grass, erosion control mats) on interim and final drainage ways, and energy dissipators at inlets and outlets of sediment ponds and at outlets of culverts.

(e) Best Management Practices for construction and operation of the landfill and other facilities. This includes miscellaneous grading and removal of cover soil from all facilities.

(f) Specifications for watering roads, borrow areas, and construction areas to control wind erosion.

(g) An inspection and/or maintenance schedule for critical parts of the sediment control system, including sediment ponds and drainage ways.

(h) A schedule for winterizing that will ensure that critical work is done prior to October 15th

each year.

Soils & Agricultural Resources Mitigation Measure 6-3(b) – Although solid waste facilities would be subject to the Exclusionary and Comparative Criteria in the 2003 CoIWMP Siting Element, there are no mitigation measures for the loss of important agricultural lands or for the change in character of the lands.

HYDROLOGY AND WATER QUALITY

Significant Effects

Hydrology and Water Quality Impact 7-9 – Construction and operation of a new landfill, the RMF or other proposed facilities such as composting operations could use significant amounts of groundwater.

Mitigation Measures

Hydrology and Water Quality Mitigation Measure 7-9 –

(a) New waste management facilities will use water conservation techniques such as reclaimed water use and water recycling where feasible.

(b) If anaerobic digestion is used to process organics, a complete site specific groundwater study or groundwater availability determination to demonstrate that water use levels will not deplete groundwater supplies for surrounding properties.

PUBLIC SAFETY, HAZARDS AND HAZARDOUS MATERIALS

Significant Effects

Public Safety, Hazards and Hazardous Materials Impact 8-7 – Development of a new and expanded non-disposal facilities and landfill or expansion of the Central Landfill would likely have potentially significant adverse impacts on public safety.

Mitigation Measures

Public Safety, Hazards and Hazardous Materials Mitigation Measure 8-7 – Mitigation measures will result from the site specific CEQA review process, and will include the general following mitigation measures:

(a) (1) An emergency response and evacuation plan shall be developed for each collection site in order to plan actions to be taken in the event of a spill incident. The emergency response and evacuation plan shall be developed by the collection site operator in coordination with the appropriate local agencies prior to the operation of the collection site.

(2) Employee safety meetings shall be conducted, as necessary, by the program safety inspector.

(3) All vehicles shall be inspected, as necessary, for safety violations by the program safety inspector and facility employees.

(4) A map showing the locations of local emergency services and appropriate telephone numbers shall be posted at all mobile and stationary HHW collection sites in a conspicuous place (e.g., near the telephone) by either the program operations manager or the safety inspector.

(5) A training program (including periodic retraining) for facility personnel in CPR and first aid shall be provided by the program safety inspector. In addition, first aid materials shall be maintained in good condition.

(6) Any risk posed by unauthorized access to any non-disposal site shall be mitigated by posting warning signs, fencing, patrol personnel, or the disabling of equipment when not in use. Daily inspections would be the responsibility of the facility operations manager.

(7) All potentially disastrous events shall be reported by the project sponsor to the County Office of Emergency Services so that County emergency services such as traffic control, fire and medical equipment, and evacuation notification can be available as needed.

(8) Facility workers shall be provided and required to use safety glasses, safety shoes, coveralls, gloves, noise reducers for ears, or other safety equipment appropriate to the hazard of the job. An emergency eye bath and emergency showers shall be installed in the facility by the project sponsor.

(b) Employees shall be encouraged to wash their hands frequently with soap and water, particularly prior to lunch and other breaks, and at the end of the work day.

(c) Standing water and moist areas shall be controlled to prevent mosquito breeding. This shall be monitored by the facility operations manager.

(d) New and expanded non-disposal facilities and solid waste disposal facilities shall develop and implement an Illness and Injury Prevention Plan to address the potential for injury and illness among facility employees.

TRANSPORTATION

Significant Effects

Transportation Impact 9-2 – The operation of new solid waste disposal facilities, including rock extraction activities, could add to existing congestion on roads or intersections that currently operate at an unacceptable level of service, or could cause those roads or intersections to operate at an unacceptable level of service.

Transportation Impact 9-3 – Removal of rock at the Central Disposal Site for commercial purposes would generate significant truck traffic trips hauling rock which would increase congestion at the Stony

Point/Roblar or Stony Point/West Railroad intersections.

Mitigation Measures

Transportation Mitigation Measure 9-2 –

(a) The siting study for a new landfill shall consider the adequacy and operation of the local roads and intersections as part of the comparative criteria.

(b) A site-specific traffic evaluation shall be conducted as part of the siting study to identify potential traffic problem areas prior to site selection and to identify road or intersection improvements and /or changes needed to accommodate landfill traffic.

(c) Countywide traffic mitigation fees shall be paid for new facilities implemented in accordance with the 2003 CoIWMP to help mitigate off-site cumulative traffic impacts.

Transportation Mitigation Measure 9-3 – Traffic analysis shall be conducted at the time a site-specific environmental analysis of a quarry project is undertaken. If rock extraction traffic would cause significant congestion at the Stony Point/Roblar or Stony Point/West Railroad intersections, the following mitigation measures shall be considered:

(a) Trucks hauling rock from the landfill quarry shall be restricted so that they do not add traffic to the congested intersections during peak traffic hours. Restrictions could include alternative hours of operation or alternative haul routes. This restriction shall remain in effect until these intersections are signalized.

(b) The quarry operator shall pay a traffic mitigation fee to provide a fair-share contribution toward the cost of signalizing the intersections.

AIR QUALITY

Significant Effects

Air Quality Impact 10-1 – Construction and operation of the new and expanded non-disposal facilities could result in significant emissions of carbon monoxide, NO_x, and ROG. Also, diesel emissions from trucks and equipment would include TACs which could be potentially hazardous if sensitive receptors (homes, schools, hospitals) are located near a new non-disposal facility.

Air Quality Impact 10-3 Odors – Expanded composting operations at the Central Landfill Organic Material Processing Facility could increase odorous gas emissions. In addition, landfill operations including the active landfill face and leachate ponds, and composting facilities at the Central Disposal Site, or elsewhere, could generate odors that could result in off-site complaints at the Central Disposal Site or at a new landfill in a location where people live or work nearby.

Air Quality Impact 10-4 (a) – The construction of a new landfill or expansion of the Central Landfill

could cause significant emissions of criteria pollutants. Also, diesel emissions from trucks and equipment would include toxic air contaminants (TACs) which could be potentially hazardous if sensitive receptors (homes, schools, hospitals) are located nearby.

Air Quality Impact 10-4 (b) – The operation of a new landfill or expansion of the Central Landfill could cause significant emissions of criteria pollutants. Also, diesel emissions from trucks and equipment would include TACs which could be potentially hazardous if sensitive receptors (homes, schools, hospitals) are located nearby.

Air Quality Impact 10-5 – Blasting and rock crushing for the construction of a new landfill , or expansion of the Central Landfill, may result in PM_{10} emissions that exceed the BAAQMD's or the NSCAPCD's significance thresholds of 15 tons/year.

Air Quality Impact 10-6 – Rock extraction for the construction of a new landfill, or expansion of the Central Landfill could result in NO_x emissions from blasting. Operation of excavating equipment, rock crushers, and haul trucks could cause significant emissions of criteria pollutants (e.g., carbon monoxide, NO_x, and ROG) and TACs.

Mitigation Measures

Air Quality Mitigation Measure 10-1 (a) – The County and cities shall consider air emissions when purchasing new equipment and when entering into agreements with solid waste operators. Cleaner vehicles shall be weighted more favorably than less clean vehicles.

Air Quality Mitigation Measure 10-1(b) –

1. New facilities shall be sited to maximize separation between haul routes/facilities and sensitive receptors to the extent practical.

2. New facilities shall encourage the use of low emissions vehicles that control diesel particulates with engine filters or by using low emissions fuels such as compressed natural gas.

3. The contractor shall reduce No_x, ROG, and CO emissions by complying with the construction vehicle air pollutant control strategies developed by the BAAQMD and the NSCAPCD. The project sponsor shall include in construction contracts the following requirements:

(a) Construction equipment operators shall shut off equipment when not in used to avoid unnecessary idling. As a general rule, vehicle idling should be kept below 10 minutes.
(b) The contractors's construction equipment shall be properly maintained and in good operating condition.
(c) The contractor shall utilize new technologies to control ozone precursor emissions as they become available and feasible.
(d) The contractor shall substitute gasoline-powered for diesel-powered equipment where feasible. The contractor shall electrify equipment where practical.

4. Asphalt paving materials shall conform to the most recent guidelines by the air district having

jurisdiction.

Air Quality Mitigation Measure 10-1(c) –

1. Contracts for operation of facilities described in the 2003 CoIWMP shall require contractors to limit idling time of diesel equipment to 10 minutes when practical. Contracts shall also require that equipment be serviced at regular intervals to keep engines operating within parameters that will prevent excessive emissions.

2. Contracts for operation of facilities described in the 2003 CoIWMP shall include incentives for using electric motors instead of internal combustion engines in stationary equipment.

3. Alternate technology, such as fuel cell or cleaner burning engines, shall be considered for any electricity generation plant implemented by programs in the 2003 CoIWMP.

Air Quality Mitigation Measure 10-1 (d) – If emissions of criteria pollutants are produced by selected technology for processing of organic waste at the RMF, the facility will be equipped with a means to collect or trat emissions which may include air control and emission filters to comply with air quality standards.

Air Quality Mitigation Measures 10-3 –

(a) Control of odors shall be implemented through the use of Best Management Practices utilized with Sonoma County such as the avoidance of compost disturbance in afternoon hours, regulating moisture content, and turning compost windrows.

(b) If odor persists as a problem, compost piles or windrows shall be covered with soil or finished compost to reduce emissions of odors.

(c) The landfill will be covered at the end of every day with plastic, soil or other appropriate material.

(d) Any cracks in the landfill surface will be repaired as soon as practical.

(e) Acidity levels in leachate ponds will be monitored and pH adjusted as necessary to reduce odor problems.

Air Quality Mitigation measure 10-4(a) – Same as Mitigation Measures 10-1 (a), (b), and (c) and 10-2 (a).

Air Quality Mitigation Measure 10-4(b) – Same as Mitigation Measure 10-1 (a), (b), and (c). In addition, the following mitigation measure is added:

To prevent excessive emissions of ROG, future landfill gas collection systems shall be designed to minimize the amount of uncontrolled gas emissions. To ensure that the latest information and technology is considered in the design, the project sponsor will have a qualified consultant prepare recommendations that would include the appropriate collection technology. These

recommendations shall be submitted to the Bay Area Air Quality Management District for approval prior to the issuance of an Authority To Construct.

Air Quality Mitigation Measure 10-5 – Same as Mitigation Measure 10-2 (a). In addition, the following mitigation measures are added:

(a) Blasting operations for landfill construction shall be restricted as follows to control dust emissions:

1. To the extent possible, remove all loose dirt and overburden material from blasting areas prior to drilling blast holes.
2. Spray water over blast areas prior to blasting.
3. No loading of explosives in blast holes or blasts will be conducted when wind speed on site exceeds 15 mph.

(b) Any rock crusher used for landfill construction shall be equipped with a spray mister, or incorporate some other equally effective measure to control dust.

Air Quality Mitigation Measure 10-6 – Same as Mitigation Measures 10-1 (a), (b), and (c). In addition, the following mitigation measure is added:

(a) To prevent excessive NO_x emissions:

(1) Blasting for landfill construction shall be done with water resistant explosives in the wet areas of bore holes. Non-water resistant explosives may be used above the wet areas of bore holes, provided the bore hole is sealed above the wet area so that the non-water resistant explosive remains above the wet area.
(2) Blended ammonium nitrate/fuel oil blasting agents shall contain at least 5.7% fuel oil by weight.

NOISE

Significant Effects

Noise Impact 11-2 – Implementation of proposed 2003 CoIWMP non-disposal programs could produce increased noise levels. New and expanded non-disposal facilities could cause traffic increases resulting in noise level increases along roadways, which would general impacts on nearby land uses.

Noise Impact 11-3 – New and expanded non-disposal facilities could produce operational noise.

Noise Impact 11-5 – Operation of new and expanded solid waste disposal facilities could cause traffic increases resulting in noise level increases along roadways, which would generate impacts on nearby land uses.

Noise Impact 11-6 – Landfill expansion in the west portion of the Central Disposal Site, including rock extraction activities and development of any new landfill, could produce noise levels that exceed the Sonoma County General Plan noise criteria or cause a substantial, permanent increase in ambient noise

levels.

Mitigation Measures

Noise Mitigation Measure 11-2 –

(a) Where feasible, collection activities associated with these facilities shall be conducted during hours of the day which are not noise sensitive for nearby residents and other adjacent land uses. The activities shall be commissioned to occur during normal work hours of the day to provide relative quiet during the more sensitive evening and early morning periods.

(b) The County and cities shall include noise as an evaluation criterion when purchasing new waste/recyclables transportation vehicles, and will purchase the quietest vehicles available when reasonably possible. If the County does not make direct purchases of such vehicles, they will require their licensed/franchised haulers, via their license/franchise agreements, to include noise as an evaluation criterion in their purchase of vehicles.

(c) A site-specific noise evaluation shall be conducted as part of the siting study for a new and expanded non-disposal facilities to identify potential noise problem areas prior to site selection. The noise evaluation shall consider the location of sensitive receptors and evaluate sound barriers or other means to reduce noise exposure. The evaluation shall also consider operational changes such as restricting hours of operation.

Noise Mitigation Measure 11-3 –

(a) Same as Mitigation Measure 11-2 (b) and (c).

(b) The noise evaluation described in Mitigation Measure 11-2 (c) shall consider the location of sensitive receptors and locate equipment and operations to minimize the noise exposure to the extent practical. The evaluation should consider enclosures for noisy equipment or sound barriers to shield off-site receptors from noise.

Noise Mitigation Measure 11-5 – Same as Mitigation Measures 11-2 (a) and (b).

Noise Mitigation Measure 11-6 –

(a) Same as Mitigation Measure 11-2 (b). In addition the following mitigation measure is added:

(b) During project analysis, sound levels for landfill and quarry equipment will be analyzed to determine whether standards would be exceeded. If it is determined that noise standards would be exceeded at the property line of any residential use, the project shall include, to the extent practical, sound barriers, special mufflers on equipment, or other means to reduce the noise levels at the property line. A berm or other noise barrier shall be used to break the line of sight between noisy equipment, such as rock hammers and rock crushers, and the property line prior to operation of the equipment.

VEGETATION AND WILDLIFE

Significant Effects

Vegetation and Wildlife Impact 12-2 – The development of a new landfill or the expansion of the Central Landfill could potentially affect listed and sensitive species and sensitive natural communities. The new and expanded landfill could have the following effects:

(a) Eradication of existing biological component in the active landfill area.
(b) Disturbance to adjacent sites and buffers due to containment and clean-up activities where sensitive species may occur.
(c) Increased traffic on local roads leading to the landfill, resulting in vehicle collisions with listed and sensitive animals.
(d) Creating an attractive nuisance for certain listed and sensitive animals choosing to forage in landfills, subjecting them to toxic substances, crushing by heavy equipment, and unnatural food sources.
(e) Providing conditions which allow populations of native and exotic species to congregate and/or increase, resulting in competition with and/or predation upon listed and sensitive species.

Mitigation Measures

Vegetation and Wildlife Mitigation Measure 12-2 –

(a) No solid waste disposal facility shall be built or expanded within a wetland unless it can be demonstrated that the landfill will not contribute to or cause significant degradation of wetlands or violations of the Clean Water Act or State water quality standards, jeopardize endangered or threatened species, violate any toxic effluent standard, or violate any requirement of the Marine Protection, Research, and Sanctuaries Act. There must also be no practicable alternative to the proposed location which does not involve wetlands. (Title 40, Chapter 1, Subchapter 1, Part 258, Subpart B [40 CFR 258]).

(b) When new non-disposal facilities are proposed, site specific biotic studies shall be performed to identify biotic resources on the sites. To the extent practical the new facilities shall be constructed to avoid these resources. Where avoidance is not practical the project sponsor shall consult with the appropriate State or Federal resource agencies to determine appropriate mitigation for any loss of or change to the biotic resources. The project sponsor shall acquire all necessary permits from these agencies. Compliance with permit conditions shall be a condition of approval of the project.

(c) Riparian areas shall be avoided where possible in siting new facilities. If avoidance is not possible, compensation for loss of riparian vegetation shall be made by planting and otherwise enhancing a comparable area of streambank in the general vicinity where habitat quality can be improved. Planting plans shall be reviewed by a qualified biologist and submitted to the California Department of Fish and Game and other agencies, if needed, for review and comment prior to implementation. Revegetation areas shall be managed to permanently protect the riparian vegetation.

(d) Before construction during the active nesting period between March 1 and September 1,

a qualified biologist shall determine the locations of any active raptor nests that could be affected. If any active nests are found, removal of the trees containing the nests shall be delayed until a qualified wildlife biologist has determined that the young birds are able to leave the nest and forage on their own. A qualified wildlife biologist shall be consulted to determine what activities must be avoided in the vicinity of the nests while the nests are active, and those recommendations shall be followed during construction.

VISUAL RESOURCES

Significant Effects

Visual Resources Impact 14-1 – New and expanded non-disposal facilities could be visible from surrounding areas, which could impact scenic vistas, waterways, routes, ridges, and degrade the existing character or quality of the site and its surroundings, that may result in significant aesthetic impacts.

Visual Resources Impact 14-2 – New and expanded non-disposal facilities could potentially impact visual resources through the generation of litter in site areas and along transportation routes.

Visual Resources Impact 14-3 – New and expanded solid waste disposal facilities (including lighting plans) could be visible from surrounding areas, which could impact scenic vistas, waterways, routes, trees, rock outcroppings, ridges, including historic buildings within a state scenic highway, and could result in significant aesthetic impacts.

Visual Resources Impact 14-4 – New and expanded solid waste disposal facilities could potentially impact visual resources through the generation of litter at the site and along transportation routes to the site.

Mitigation Measures

Visual Resources Mitigation Measure 14-1 –

(a) To the extent possible, new facilities shall not be located within Designated Scenic Resource Areas as designated in the Sonoma County General Plan unless the facilities are not visible from public roads.

(b) A landscaping plan for each facility, if required by local regulations, shall include visual mitigation measures, such as earthen berms, tree screening, and other landscaping elements along the perimeter of the site in order to screen the proposed facility from public view. Earthen berms and tree screening would be especially important along nearby roadways or other visual corridors.

(c) Existing trees shall be retained to the extent feasible as a visual screen.

(d) New or expanded facility buildings shall be located away (to the extent feasible) and shall maximize the use of any natural shielding provided by the relief of site landforms.

(e) Consistent with any required local design review recommendations, facility support buildings and site plans shall be designed and constructed with appropriate materials, exterior colors, and architectural details compatible with the natural landscape and surrounding development in the project vicinity.

(f) Disturbed areas that are not directly a part of the project shall be revegetated immediately following construction.

(g) Project lighting equipment shall be of low-profile design, unobtrusive, and consistent with adjacent land uses.

Visual Resources Mitigation Measure 14-2 –

On-site Mitigation:

(a) Litter shall be controlled by a litter abatement program.

(b) Litter fences shall be established around new or expanded non-disposal facilities, as necessary to prevent litter blowing onto off-site areas.

(c) Litter along on-site roads shall be collected and removed routinely.

Off-site Mitigation:

(d) Litter shall be controlled on nearby roads providing access to new or expanded non-disposal facilities with a litter abatement program.

(e) Open cargo areas of vehicles hauling waste shall be covered. This requirement will be enforced with financial penalties levied at the time of delivery to County non-Disposal Sites and by the California Highway Patrol (CHP) in the areas near disposal sites.

(f) A litter abatement program shall be implemented to reduce litter accumulation resulting from the activities of commercial haulers. The program could include but not be limited to: 1) education of commercial haulers, and 2) requirements for thorough cleaning of debris boxes, covering emptied containers or other similar measures to reduce litter created upon exiting non-disposal facilities.

(g) The litter abatement program shall consider limiting non-disposal facility operations to commercial or private (general public) haulers, including the co-location of disposal and non-disposal facilities to reduce roadside litter.

Visual Resources Mitigation Measure 14-3 – Same as Mitigation Measures 14-1 (a), (b), (c), and (g).

(d) New or expanded landfills shall utilize site buffer areas (to the extent feasible) and shall maximize the use of any natural shielding provided by the relief of site landforms.

(e) Consistent with any required local design review recommendations, construct new and

expanded landfills and facility support buildings with appropriate materials, exterior colors, and architectural details compatible with the natural landscape and surrounding development in the project vicinity.

(f) Disturbed areas that are not directly a part of the project shall be revegetated as soon as practicable.

In addition, the following mitigation measures are added:

(h) Exterior security lighting plans shall be prepared for all new facilities. Designs shall be consistent with County design standards, including exterior lighting that does not glare onto adjacent parcels, and includes motion sensors to minimize light and glare impacts on surrounding land uses.

(i) Visual analysis of the Central Landfill expansion or a new landfill shall include photo simulation, three dimensional terrain modeling or similar methods to evaluate change in visual character as seen from nearby public roads.

Visual Resources Mitigation Measure 14-4 – Same as Mitigation Measure 14-2 (a), (c), (d) and (e).

On-site Mitigation:

(b) Litter fences shall be established around active landfill areas to prevent litter from blowing onto off-site areas.

Offsite Mitigation:

(d) Litter shall be controlled with a litter abatement program on nearby roads which provide access to new or expanded disposal facilities.

In addition, the following mitigation measures are added:

(f) Roadsides adjacent to landfill sites shall be cleaned each day the landfill is open. Signs will be posted on roadways adjacent to the landfill site that will give a phone number that people may call to report vehicles that are seen littering on the way to or from the landfill. The County or their designee will, to the extent feasible, identify offending haulers and request that corrective action be taken.

(g) A litter abatement program will be implemented to reduce litter accumulation resulting from the activities of commercial refuse haulers. The program could include, but not be limited to: 1) education of commercial refuse haulers, and 2) requirements for thorough cleaning of debris boxes, covering emptied containers or other similar measures to reduce litter created upon exiting the Central Disposal Site or any new landfill.

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EXHIBIT C

ALTERNATIVES

The alternatives in the FSPEIR were selected for evaluation because they could feasibly attain most of the project objectives, but would avoid or substantially lessen significant environmental effects of the proposed project. The alternatives to the proposed 2003 CoIWMP are: 1) No Project; 2) SRRE – Materials Recovery Facility (MRF) Combined with an Enclosed (Indoor) Green Waste Composting Facility; and 3) Siting Element – No Siting of a New Landfill with Export of Waste. A comparison of the alternatives is attached in Table 18.1.

1) NO PROJECT ALTERNATIVE

This alternative would retain the Source Reduction and Recycling Element (SRRE), Non-Disposal Facilities Element (NDFE), and Siting Element as adopted in the 1996 CoIWMP.

Under this alternative, the adopted 1996 CoIWMP would remain the planning document for the management of solid waste in Sonoma County. Projects consistent with the 1996 CoIWMP would continue to be implemented, but none of the new programs proposed in the 2003 CoIWMP would be implemented.

Impacts Analysis and Comparison

Recent advancements in solid waste technologies, programs, and management practices required to meet AB 939 requirements are not included in the1996 CoIWMP. When compared with the proposed 2003 CoIWMP, the "No Project" alternative includes eliminated, changed, and unchanged impacts.

With the No Project alternative there would not be an RMF or a new transfer station in Santa Rosa. Therefore, the impacts associated with these facilities would not occur. However, the lack of an RMF would generally increase landfill-related impacts compared to the proposed 2003 CoIWMP. This is because the No Project alternative would not have an RMF, and the volume of solid waste to be disposed of would not be reduced as much as it would with the proposed 2003 CoIWMP. Therefore, the No Project alternative would require a larger landfill than the 2003 CoIWMP, and landfill-related impacts would be increased.

Although some expansion within the existing landfill boundaries would be allowed with the No Project alternative, the primary provision for extra disposal space would be limited to the standard practice of siting a new landfill. This alternative does not include the acquisition of neighboring parcels for expansion and the consolidation of solid waste disposal operations at the existing Central Landfill.

Siting a new landfill is accelerated in this alternative by the lack of advanced technologies that would reduce disposable waste volumes. Reducing the volume of waste for disposal, other than the conventional composting of green waste and separating recyclables, is missing from this alternative.

Meaningful reduction in disposable waste volume is less under this alternative, compared to the proposed project. Introducing state-of-the-art technologies and solid waste management becomes less feasible under the No Project alternative because it would not include flow control. Flow Control is necessary to

ensure funding will be available for large capital projects such as the RMF.

Evolving technologies and waste management practices (e.g., the RMF and advanced energy recovery systems) are not considered with the current solid waste policies in Sonoma County. In sum, this alternative is more wasteful than what is proposed in the 2003 CoIWMP.

2) SRRE – MRF COMBINED WITH AN ENCLOSED (INDOOR) GREEN WASTE COMPOSTING FACILITY

This alternative would construct a Materials Recovery Facility (MRF), rather than the proposed Resource Management Facility (RMF). This alternative is based on specific assumptions identified in the Section 18 of the FSPEIR.

Although this alternative could be located at the Central Landfill, the space available at the site may be insufficient to accommodate these facilities. Other locations may be available at sites designated for MSW facilities, industrial, or commercial land uses in Sonoma County's General Plan.

This alternative would accept residential/commercial/industrial mixed wastes from the cities and unincorporated areas of Sonoma County. It would retain all other programs and policies of the proposed SRRE (e.g., mandatory recycling access, flow control, and new transfer station) and Siting Element (e.g., expansion of the Central Landfill and siting a new landfill). In contrast with the proposed project, the MRF would not recover energy from the refuse.

Impacts Analysis and Comparison

The enclosed operation would include the composting of green waste inside a building. This alterative would eliminate storm water runoff and odor impacts on surrounding land uses because the green waste composting facility would be enclosed. Also, chemical impacts would be eliminated because there would be no chemical digestion of solid waste from the proposed RMF. This alternative would exhibit changed impacts resulting from the reduced demand for water supplies and by reducing public exposure to fungi and bacteria. In addition, the potential of accidental combustion of toxic chemicals, the creation of PM_{10}, odors, and operational noise would be less. Some reduction in waste volume would be achieved compared to the no project alternative. However, it would not reduce waste volume as much as the proposed project, and would require more landfill capacity than the proposed project. Therefore, landfill -related impacts would be increased with this alternative compared to the proposed project. There would be increased impacts to roadside litter, open space, mineral resources, leachate production, soil erosion, volume and flow of surface waters, blasting and blasting spills/ground vibrations, traffic impacts, noise, and conflicts with surrounding land uses.

Although the impacts of the green waste composting operation would be reduced, increased landfill-related impacts make this alternative less desirable than the proposed project.

All other impacts remain unchanged from the 1996 CoIWMP EIR.

3) SITING ELEMENT – NO SITING OF NEW LANDFILL WITH EXPORT OF WASTE

This alternative would not site a new landfill in Sonoma County and would export all of the MSW out of

Sonoma County. This alternative is based on specific assumptions identified in the Section 18 of the FSPEIR.

Full export of Sonoma County's MSW would eliminate the need to use and expand the Central Landfill or to site a new landfill as proposed in the 2003 CoIWMP. It would require additional non-disposal facilities to accommodate truck and/or rail transfer of solid waste to out-of-county disposal site(s). Full export is often done by jurisdictions with inadequate area for landfills. Out-of-county disposal could result in loss of control over disposal and transportation costs and would reduce the County's flexibility in dealing with waste disposal issues in the future. Although this alternative assumes that no MRF or RMF would be constructed in Sonoma County, development of these facilities in the county could occur in the future and subsequently reduce the demand for transfer stations. Since a RMF may not be constructed for some time, this alternative assumes that no RMF would be constructed, but that development of other new and expanded non-disposal facilities would proceed as proposed in the 2003 CoIWMP. Potential options outside of Sonoma County for future solid waste disposal have been addressed in the Sonoma County Solid Waste Management Alternatives Analysis Project Final Report ("Alternatives Analysis") prepared December 29, 2000, by SCS Engineers.

According to the Alternatives Analysis, export of MSW would require the County or the SCWMA to consider candidate sites and negotiate disposal capacity at one or more existing or proposed private or publicly owned Class III landfill sites located outside of Sonoma County. At a minimum, it is assumed that the landfill operations would employ environmental protection standards embodied in Subtitle D and CCR Title 27 regulations (or the equivalent of CCR Title 27 for out-of-state facilities). As stated above, this alternative would likely require expansion of existing in-county transfer stations (to accommodate truck and/or rail transfer) and/or future siting, permitting, and development of new transfer stations/MRF or RMF sites in Sonoma County. Incorporated areas in Sonoma County could use SCWMA MRF/RMF/transfer station(s) or pursue their own disposal options.

Potential air quality, litter, noise, and traffic impacts could result from the transport of solid waste from facilities in Sonoma County to out-of-county landfills. Implementation of this alternative may require delivery and pre-processing of solid waste at existing and/or future MRF/RMF/transfer station(s) in Sonoma County, including the identification of potential long-term out-of-county disposal sites.

The counties that would likely be impacted from export of MSW include Alameda, Contra Costa, Marin and Solano. Surrounding counties have, or have arranged for, adequate disposal capacity for the next 30 to 40 years. Examples of jurisdictions that export their solid waste include both Napa and San Francisco Counties. Napa County trucks its MSW to the Keller Canyon Landfill in Contra Costa County; San Francisco City/County trucks nearly all of its waste to the Altamont Landfill in Alameda County. Altamont Landfill obtained approval in 2000 for an expansion, which will extend the life of the facility to approximately 2029.

Although this alternative would eliminate the need to expand the existing Sonoma County Central Landfill or site a new landfill in Sonoma County, it would not achieve several 2003 CoIWMP project objectives as described at the end of Section 18.4.

Impact Analysis and Comparison

Landfill impacts under this alternative are transferred from Sonoma County to another county. This

alternative could involve the development of more non-disposal facilities (e.g., transfer stations) to prepare and export solid waste to other counties in the Bay Area. Expansion and siting of landfills in Sonoma County could be replaced by disposal arrangements with neighboring counties. Because composting of green waste is not landfill-dependent, it could continue to operate within the County.

This alternative would eliminate open space and mineral resource impacts caused by landfills in Sonoma County, including conflicts with surrounding land uses. In addition, it would eliminate leachate, storm water runoff, soil erosion, volume and flow of surface waters, blasting and blasting spills/ground vibrations, public safety, traffic, air quality and visual impacts from landfill development and operation.

In Sonoma County, this alternative would have impacts different from the proposed project due to increased surrounding land use conflicts from additional transfer stations. Compared to the proposed project, it would have increased visual, litter, storm water runoff, flooding, soil erosion, injury and illness, accidents, combustion and exposure of toxics, vectors, traffic, air quality, and odor impacts caused by these added facilities.

Dependency on out-of-county transport infrastructure, haul routes, landfill capacity and disposal management that would be provided and maintained by other jurisdictions would result from this alternative.

All other impacts remain unchanged from the 1996 CoIWMP EIR.

It is concluded that this alternative would not be environmentally superior to the proposed project. While this alternative would remove certain significant landfill-related impacts from Sonoma County, these impacts would be transferred to some other location in another County. At the same time, impacts associated with the transport of refuse would increase with this alternative.

CONCLUSION

The 2003 CoIWMP, as mitigated, would have the lowest overall environmental impact. The first alternative (No Project) would increase the need for additional landfill capacity and would not reduce disposable solid waste volumes, nor produce energy associated with the proposed RMF. Alternative No. 2 (MRF combined with enclosed composting facility) would provide some reduction in disposable solid waste volumes, but not to the same degree as the proposed project. In addition, energy production would be missing as compared to the proposed RMF. Lastly, the third alternative (No Siting of New Landfill with Export of Waste) would eliminate the need for further landfill expansion, or siting in Sonoma County, but would shift the associated environmental impacts outside Sonoma County. Moreover, addition transfer stations would be required to accommodate the export of the County's solid waste.

Therefore, based on the analysis and comparison of the above alternatives, the 2003 CoIWMP, with the mitigation measures as proposed in this DSPEIR, is the environmentally superior alternative.

Table 18.1: Comparison of Project Alternatives to the Project Objectives.				
#	**Objective**	**No Project**	**MRF w/enclosed source-separated green waste composting facility**	**No new landfill; export waste**
	Y=Meets Objective N/A=Not Applicable N=Does Not Meet Objective			
1	In order to help ensure the sustainability of our communities and to conserve natural resources and landfill capacity, the SCWMA, County and the Cities will continue to improve their municipal solid waste management system through emphasis on the solid waste management hierarchy of waste prevention (source reduction), reuse, recycling, composting and disposal.	N	Y	Y
2	The County and the Cities will achieve a 50 percent diversion of wastes being disposed of in County landfills by the year 2003 and a 70 percent diversion rate by 2015 based on 1990 rates.	N	Y	Y
3	Satisfy the AB 939 solid waste planning and diversion mandates in a manner that is consistent with the objectives of the community, as reflected by the deliberations and documents of the AB 939 Local Task Force and SCWMA.	N	N	N
4	The solid waste management system in Sonoma County will be planned and operated in a manner to protect public health, safety and the environment.	Y	Y	Y
5	The County will provide alternative disposal options for recyclable items or materials such as, but not limited to, yard debris, recyclable wood waste, whole tires, and appliances and ban the landfill disposal of these items.	Y	Y	N
6	The County and the Cities and/or the SCWMA will provide cost-effective and environmentally sound waste management services, including special waste and household hazardous waste handling and disposal, over the long term to all community residents and promote access to the services.	Y	Y	N/A
7	The County and the Cities will provide access to residential recycling programs for all households, including single-family, multi-family, and mobile homes, that subscribe to garbage services by the end of the short-term planning period.	N	Y	Y
8	The County's solid waste disposal facilities will be sited and operated in a manner to minimize energy use, conserve natural and financial resources, and protect prime agricultural lands and other environmentally sensitive or culturally sensitive areas.	Y	Y	N

9	The County will develop disposal capacity for solid waste not handled by other elements of the management hierarchy for a 50-year horizon. Disposal capacity is addressed in the Siting Element of the CoIWMP.	N	Y	N
10	Use the existing landfill parcel to maximize its useful life and maximize the return on the public infrastructure improvements so far as it is consistent with protection of the environment.	Y	Y	N
11	Provide landfill capacity at least through the year 2017 as required by state law by expanding the Central Landfill.	Y	Y	N
12	Direct the flow of all refuse produced in Sonoma County to integrated waste management facilities publicly owned and located within Sonoma County or its incorporated cities in order to provide cost effective waste disposal services to all community residents.	N	Y	Y
13	Maintain local control over costs and environmental impacts of disposal by siting facilities within Sonoma County.	Y	Y	N
14	The SCWMA, County and the Cities will encourage and support the use of waste minimization practices for business, government agencies, and the public by distributing information on the availability of waste minimization options.	Y	Y	Y
15	Complement existing and planned private sector operations for collection/processing of both refuse and recyclables.	Y	Y	Y
16	Create and maintain employment opportunities for Sonoma County residents and growth opportunities for Sonoma County businesses, industries and entrepreneurs who make productive use of otherwise wasted materials.	Y	Y	N
17	Make productive use of waste that is not reused or recycled through energy production.	Y	N	Y
18	The SCWMA, County and the Cities will provide access to composting opportunities through implementation of composting facilities and programs which may be regional or local, public or private.	N	Y	Y
19	The County and/or the Cities will provide solid waste disposal facilities or transfer facilities within reasonable distances of the county's population centers. This policy will provide a means for achieving the goal of conservation of natural resources and energy and minimizing the cost of disposal.	Y	Y	Y

EXHIBIT D

MITIGATION MONITORING PROGRAM
FOR THE
FINAL SUPPLEMENTAL PROGRAM ENVIRONMENTAL IMPACT REPORT
2003 SONOMA COUNTY INTEGRATED WASTE MANAGEMENT PLAN
(2003 CoIWMP)

Introduction

The SCWMA is the lead agency for the 2003 CoIWMP Final SPEIR (FSPEIR). As lead agency, it is responsible for ensuring that the mitigation measures included in the certified FSPEIR are adequate, feasible, and implemented pursuant to CEQA. The purpose of this Mitigation Monitoring Program is to identify how the SCWMA will comply with these requirements.

As identified in the 2003 CoIWMP, the SCWMA is a composite of the County of Sonoma and different incorporated jurisdictions located within Sonoma County. Specific projects that will implement the 2003 CoIWMP may be carried out or permitted by the County of Sonoma, one of the incorporated cities, or the SCWMA. The mitigation measures identified in the 2003 CoIWMP FSPEIR will be the responsibility of the entity proposing to carry out the project. It is anticipated that these entities will function as Lead Agencies in accordance with CEQA.

Section 21081.6 of the Public Resources Code requires that, when making findings required by subdivision (a) of Section 21081, a lead agency shall adopt a reporting or monitoring program for "changes to the project which it has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment. The reporting or monitoring program shall be designed to ensure compliance during project implementation."

The Mitigation Monitoring Program for the 2003 CoIWMP is organized in outline form and keyed to each adopted FSPEIR mitigation measure. For each measure, the following information is provided:

1. A statement of the mitigation measure;
2. The timing for verification of implementation of the mitigation measures.
3. Specification of the party/parties responsible for implementation of the measure;
4. The assignment of mitigation monitoring responsibility; and

For most Mitigation Measures, the verification timing and agencies responsible for implementation and monitoring are indicated and are self-explanatory; however, additional explanation is provided for the following situations.

In cases where the timing for verification of the mitigation is indicated as "ongoing", the agency responsible for monitoring compliance with the mitigation already had jurisdiction over the activity along with inspection obligations required by law. For example, to mitigate impacts to Hydrology and Water Quality (Mitigation Measure 7-6), solid waste disposal facilities are required to cover waste with soil (or other cover material) each day to prevent contact with stormwater. This measure will be monitored on a regular and ongoing basis through required inspections by the Local Enforcement Agency (Sonoma County Public Health Department, Environmental Health Division).

In certain cases, where "implementation" of a plan is a part of the Mitigation Measure, and two agencies are listed as responsible for monitoring, the first agency listed is responsible for ensuring that such a plan is prepared. The second agency listed has jurisdiction under existing law to enforce implementation and compliance with requirements of the plan. For example, to mitigate impacts to Hydrology and Water Quality (Revised Mitigation Measure 7-3), solid waste non-disposal facilities are required to prepare a detailed Erosion and Sedimentation Control Plan. In this case, the Member Jurisdiction as lead agency will ensure that such a plan is prepared followed by the review, approval, and monitoring by the Regional Water Quality Control Board.

In general, this monitoring plan ensures that each mitigation measure will be implemented because the designated monitoring agency will make sure that the party responsible for implementing the measure has actually carried out the measure (or otherwise appropriately guaranteed that it will be complied with through contractual or other agreements) before the particular project is allowed to go any further in the construction or operations process. For instance, if the timing for verification of implementation of a mitigation measure is noted as "prior to issuance of building permits," then the party responsible for complying with the mitigation measure (usually the project applicant) will have to demonstrate to the monitoring agency that the measure has been implemented before the monitoring agency will issue a building permit.

Any new or expanded solid waste disposal facilities that result from implementation of the 2003 CoIWMP are expected to be located on land within the jurisdiction of the County. Therefore, the monitoring agency for each mitigation measure designed to address disposal facilities is generally a County agency. The 2003 CoIWMP contemplates, however, that new or expanded solid waste non-disposal facilities may be located either in a city within the County or on land under County jurisdiction. Because it is not now known precisely where such facilities will be (and several of the same type of facilities may be located in different cities throughout the County), the monitoring program specifies that the member jurisdiction and a city if the property lies within a city's boundaries – will monitor compliance with mitigation measures required for that project.

Abbreviations

Abbreviations used in this Mitigation Monitoring Program include the following:

BAAQMD – Bay Area Air Quality Management District
LEA – Local Enforcement Agency (Sonoma County Environmental Health)
NSCAPCD – Northern Sonoma County Air Pollution Control District
RWQCB – Regional Water Quality Control Board
SCWMA – Sonoma County Waste Management Agency

LAND USE

Mitigation Measure 4-1

In siting new or expanded solid waste non-disposal facilities, examine land uses surrounding potential sites and take possible land use conflicts into account in making siting determinations. In addition, require each new or expanded facility to incorporate design and operational measures to minimize land use conflicts. Examples of such measures include establishing buffer zones, sound-proofing facilities, restricting outdoor activities and limiting hours of operation.

- **Timing of Implementation** - Prior to project approval; Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Mitigation Measure 4-2

In siting new or expanded solid waste disposal facilities, examine land uses surrounding potential sites and take possible land use conflicts into account in making siting determinations. In addition, require each new facility to incorporate design and operational measures to minimize land use conflicts. Examples of such measures include establishing buffer zones, visual screens using berms and landscaping, and limiting hours of operation.

- **Timing of Implementation** - Prior to project approval; Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Mitigation Measure 4-3

Although solid waste facilities would be subject to the Exclusionary and Comparative Criteria in the2003 CoIWMP Siting Element, there are no mitigation measures for the loss of important resource lands or for the change in character of the lands. Therefore, this impact is considered ***significant and unavoidable.***

- **Timing of Implementation** - Prior to project approval.
- **Implementation** - Lead Agency.
- **Monitoring** -Lead Agency.

Mitigation Measure 4-4

Geologic studies of future landfill expansion and new landfill sites will address the possibility that mineral resources could be located under sites of new facilities. To the extent practical, mineral recovery efforts will be incorporated into the construction of the Central Landfill expansion or new landfills.

- **Timing of Implementation** - Prior to project approval.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

GEOLOGY AND SEISMICITY

Revised Mitigation Measure 5-1

(a) Non-disposal facilities shall be built a sufficient distance from earthquake fault zones as restricted by state and federal regulatory requirements.

(b) Where proposed development may be exposed to significant risks of damage from geologic hazards, a geologic report (prepared by a California Registered Geologist) shall be prepared which evaluates the hazards and shall identify measures which can be implemented to reduce the risks to acceptable levels. Such measures will be implemented.

(c) All grading and building construction for new or expanded non-disposal facilities shall

conform with geologic and seismic standards contained in the latest edition of the Uniform Building Code (UBC). Prior to construction activities, the applicant shall submit building plans to the local jurisdictions' building department indicating compliance with the UBC.

(d) All new or expanded disposal facilities shall meet the requirements of the County or Cities' general site design standards. The proposed new non-disposal facilities shall comply with the County or cities' policies and standards pertaining to geologic hazards.

- **Timing of Implementation** - (a), (b) Prior to project approval; (c), (d), Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 5-2

(a) Same as Mitigation Measures 5-1 (b) and 5-1 (d).

(b) All new or expanded non-disposal facilities that are susceptible to seismic ground failure (i.e., liquefaction) shall include project designs (e.g., soil densification) for building and road foundations to withstand potential liquefaction impacts.

- **Timing of Implementation** - Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 5-3

(a) New or expanded disposal facilities shall be built a sufficient distance from earthquake fault zones or as restricted by state and federal regulatory requirements.

(b) Where proposed development may be exposed to significant risks of damage from geologic hazards, a geologic report (prepared by a California Registered Geologist) shall be prepared which evaluates the hazards and shall identify measures which can be implemented to reduce the risks to acceptable levels. Such measures will be implemented.

(c) All grading and building construction for new or expanded disposal facilities shall conform with geologic and seismic standards contained in the latest edition of the Uniform Building Code (UBC). Prior to construction activities, the applicant shall submit building plans to the local jurisdictions' building department indicating compliance with the UBC.

(d) All new or expanded disposal facilities shall meet the requirements of the County or cities' general site design standards. The proposed new and expanded disposal facilities shall comply with the County or cities policies and standards pertaining to geologic hazards.

(e) In accordance with state and federal regulations, restrict the development of landfills in geologically unstable areas.

(f) In accordance with state and federal regulations, restrict the development of landfills in seismic impact zones unless containment structures (leachate collection systems, liners, surface

water management systems, etc.) are engineered and constructed to preclude failure during rapid geologic change.

- **Timing of Implementation** - (a), (b), (e), (f) Prior to project approval; approval; (c), (d) Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Regional Water Quality Control Board.

Revised Mitigation Measure 5-4

(a) Same as Mitigation Measures 5-3 (a through f).

(b) All new or expanded disposal facilities that are susceptible to seismic ground failure (i.e, liquefaction) shall include project designs (e.g., soil densification) for building and road foundations to withstand potential liquefaction impacts.

- **Timing of Implementation** -Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Regional Water Quality Control Board.

Mitigation Measure 5-5

The grading plan for the West Expansion area at the Central Disposal Site and the future landfill will incorporate design features to prevent slope failures. These include maximum fill slopes as determined suitable by a registered engineering geologist. The embankments of new sedimentation basins and landfill slopes will be constructed so that the factor of safety is greater than 1.5.

- **Timing of Implementation** -Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Mitigation Measure 5-6

Final landfill grades will be constructed in accordance with Section 20650 of Title 27 of the CCR which requires that "Covered surfaces of the disposal area shall be graded to promote lateral runoff of precipitation and to prevent ponding. Grades shall be established of sufficient slopes to account for future settlement of the fill surface." Grades will be of sufficient slopes to allow for future settlement of the final cover and to avoid ponding and infiltration of stormwater. The landfill gas collection system will use flexible pipe and be designed to accommodate settlement of the refuse.

- **Timing of Implementation** - Prior to project construction; ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Local Enforcement Agency, Regional Water Quality Control Board.

SOILS AND AGRICULTURAL RESOURCES

Revised Mitigation Measures 6-1

(a) All new facilities shall be designed and constructed to conform with the site development

standards contained in the latest edition of the Uniform Building Code (UBC). Prior to construction activities, the applicant shall submit building plans to the local jurisdiction's building department indicating compliance with the UBC.

(b) All new facilities shall meet the requirements of the County or cities' standards pertaining to site design, grading, and erosion control.

(c) Vegetation on soils exposed during construction shall be reestablished as soon as practical. Mulch or other temporary cover shall be used in the interim where erosion potential exists.

(d) Employ Best Management Practices as required under the NPDES Permit for Construction grading.

(e) To the extent feasible, confine grading, excavation, and other earthwork to the dry seasons. When this is not feasible, erosion and sediment transport control facilities should be in place prior to the onset of the first major winter storms. If wind erosion has the potential to occur during summer months, erosion control methods, such as watering graded areas, shall be implemented.

(f) Prepare and implement detailed erosion and sedimentation control plan(s), which should be submitted for review and approval by the RWQCB. The specific language of such plans varies, but the concepts to be adhered to include the following:

- To avoid discharge to natural waterways, sediment should be trapped before leaving the construction site through the use of rip-rap, hay bales, fencing, or sediment ponds.
- Areas of surface disturbance should be minimized.
- Disturbed areas should be stabilized through vegetative or mechanical methods. When construction is complete, all disturbed areas should be regraded and revegetated. Topsoil should be stockpiled and used for the revegetation of disturbed areas.

- **Timing of Implementation** - (a) through (f) Prior to and during project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Regional Water Quality Control Board.

Mitigation Measures 6-2

To the extent feasible, all new facilities and expansion of existing facilities shall comply with the General Plan objectives and avoid siting on agricultural lands as defined in the General Plan. If a non-disposal facility is sited on agricultural land, this would constitute a ***significant and unavoidable*** impact.

- **Timing of Implementation** -Prior to project approval.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 6-3(a)

Storm Water Pollution Prevention Plans shall be prepared and revised as needed for all facilities at the Central Disposal Site or other new landfills. Plans shall be submitted to the Regional Water Quality Control Board and at a minimum shall include:

(a) A description of the critical features of the erosion control system, including sediment ponds and drainage ways, along with a description and schedule for routine maintenance of these features.

(b) A construction schedule for components of the erosion control system.

- **Timing of Implementation** - (a) Prior to project construction, during project construction, ongoing; (b) Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Regional Water Quality Control Board

Additions to Mitigation Measure 6-3(a)

(c) A requirement to vegetate side slopes and waste-fill slopes. Temporary and permanent vegetative cover shall be established as soon as possible on side slopes and waste-fill slopes. To protect the slopes prior to vegetation establishment, a mulch, consisting of straw or wood fiber shall be applied at the time of seeding. A tackifier shall be applied with the mulch as needed to prevent loss of the mulch due to wind or water movement. Sample specifications for revegetating disturbed areas shall be included, with a description of the types of areas to be revegetated, the equipment and procedures to be used, and the dates for the seeding. For areas where an erosion potential exists, but it is not practical to establish vegetation, specifications for placing mulch or temporary covers shall be included.

(d) Specifications for construction features to reduce erosion. These shall include benches on slopes to intercept sheet flow and shorten drainage paths, protective linings (e.g., riprap, concrete, grass, erosion control mats) on interim and final drainage ways, and energy dissipators at inlets and outlets of sediment ponds and at outlets of culverts.

(e) Best Management Practices for construction and operation of the landfill and other facilities. This includes miscellaneous grading and removal of cover soil from all facilities.

(f) Specifications for watering roads, borrow areas, and construction areas to control wind erosion.

(g) An inspection and/or maintenance schedule for critical parts of the sediment control system, including sediment ponds and drainage ways.

(h) A schedule for winterizing that will ensure that critical work is done prior to October 15th each year.

- **Timing of Implementation** - (c) Prior to project construction, during project construction, ongoing; (d) Prior to project construction; (e), (f) Prior to project construction, during project construction; (g), (h) Prior to project construction.

- **Implementation** - Lead Agency.
- **Monitoring** -Lead Agency.

New Mitigation Measure 6-3(b)

Although solid waste facilities would be subject to the Exclusionary and Comparative Criteria in the 2003 CoIWMP Siting Element, there are no mitigation measures for the loss of important agricultural lands or for the change in character of the lands. Therefore, this impact is considered ***significant and unavoidable***.

- **Timing of Implementation** - Prior to project approval.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

HYDROLOGY AND WATER QUALITY

Revised Mitigation Measure 7-1

(a) Stormwater runoff from waste handling areas shall be treated on site or routed to the sanitary sewer for treatment prior to discharge.

(b) To the extent feasible, materials handling and storage areas shall be covered to prevent contact with stormwaters.

(c) All exterior drainage from each site shall be managed in accordance with the requirements of federal NPDES, state, and local regulations.

- **Timing of Implementation** - (a), (b) Prior to project construction, ongoing; (c) Prior to project construction, ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** -Lead Agency, Regional Water Quality Control Board, Local Enforcement Agency.

Mitigation Measure 7-2

(a) To the extent feasible, new facilities shall be located outside of areas at high risk for flooding (i.e., near rivers, within 100-year floodplains).

(b) The design of new facilities shall, to the extent feasible, minimize the amount of impermeable surface and incorporate methods to lessen surface runoff from the site.

- **Timing of Implementation** - (a) Prior to project approval, prior to project construction; (b) Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Regional Water Quality Control Board.

Revised Mitigation Measure 7-3

(a) Employ Best Management Practices as required under the NPDES Permit for Construction grading.

(b) To the extent feasible, confine grading, excavation, and other earthwork to the dry seasons.

When this is not feasible, erosion and sediment transport control facilities should be in place prior to the onset of the first major winter storms. If wind erosion has the potential to occur during summer months, erosion control methods, such as watering graded areas, shall be implemented.

(c) Prepare and implement detailed erosion and sedimentation control plan(s), which should be submitted for review and approval by the RWQCB. The specific language of such plans varies, but the concepts to be adhered to include the following:

- To avoid discharge to natural waterways, sediment should be trapped before leaving the construction site through the use of rip-rap, hay bales, fencing, or sediment ponds.
- Areas of surface disturbance should be minimized.
- Disturbed areas should be stabilized through vegetative or mechanical methods. When construction is complete, all disturbed areas should be regraded and revegetated. Topsoil should be stockpiled and used for the revegetation of disturbed areas.

(d) All new facilities shall be designed and constructed to conform with the site development standards contained in the latest edition of the Uniform Building Code (UBC). Prior to construction activities, the applicant shall submit building plans to the local jurisdiction's building department indicating compliance with the UBC.

(e) All new facilities shall meet the requirements of the County or cities' standards pertaining to site design, grading, and erosion control.

(f) Vegetation on soils exposed during construction shall be reestablished as soon as practical. Mulch or other temporary cover shall be used in the interim where erosion potential exists.

(g) Treat wastewater generated during construction prior to discharge. At a minimum, the wastewater should be treated by sedimentation to remove suspended particles from the water. Sedimentation ponds would need to be maintained regularly. Precipitation agents, such as alum, may be introduced to speed the action of settling suspended particles. Alternatively, either gravity or pressure filtration could be used if sufficient space for sedimentation facilities is unavailable.

(h) Prepare and implement a Spill Prevention Control/Countermeasure (SPCC) Plan prior to the start of construction. The SPCC Plan should cover actions needed to minimize the potential for accidental spillage of construction-related contaminants such as fuel, oil, or other chemicals. Such contaminants should not be drained onto the soil; rather, they should be confined to sealed containers and removed to proper disposal sites. Refueling should be conducted in a location where spills could be contained.

- **Timing of Implementation** - (a), (b), (f), (g), (h) Prior to project construction, during project construction; (c), (d), (e) Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** -Lead Agency, Regional Water Quality Control Board.

Mitigation Measure 7-4

(a) Same as Mitigation Measures 7-1(a), 7-1(b) and 7-1(c).

(b) Construct a separate spill control facility around and under the waste intake, storage, and loading areas to provide for containment of any hazardous spills that might occur in the vicinity.

- **Timing of Implementation** - (a) Same as 7-1(a), (b), & (c); (b) Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Regional Water Quality Control Board.

Revised Mitigation Measure 7-5

(a) Cover materials (soil) shall be placed over waste materials at the end of each day to prevent water from ponding on the landfill.

(b) A low-permeability final landfill cover, as required by CCR, Title 23, Chapter 15, shall be placed over the landfill during closure.

(c) The volume of fluid that enters the landfill shall be minimized by prohibiting the disposal of liquid waste.

(d) The landfill shall be designed with an adequate drainage and collection system to prevent to the extent possible the migration of leachate off-site.

(e) Landfills shall be located where site characteristics provide adequate separation between solid waste and ground and surface waters and where soil characteristics, distance from waste to groundwater, and other factors will ensure no impairment of beneficial uses of surface or ground water beneath or adjacent to a landfill (California Water Regulations, Chapter 15, Article 3, Section 2533).

(f) Current industry standards for leachate management shall be implemented (e.g., storing leachate in lined on-site ponds where it can evaporate naturally) or, if storage is impossible, transporting leachate to the nearest wastewater treatment plant capable of treating the leachate and not exceeding effluent discharge limits.

- **Timing of Implementation** - (a), (b), (c) Prior to project construction and ongoing (d) Prior to project construction; (e), (f) Prior to project approval, prior to project construction
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Local Enforcement Agency, Regional Water Quality Control Board.

Additions to Mitigation Measures 7-5

(g) Leachate and wastewater collection and disposal systems shall be designed with enough capacity to accommodate the amount of leachate predicted to be generated during the wettest year of record.

(h) Construction of all new landfill cells will comply with the requirements of Title 27 for liner impermeability.

(i) A landfill leachate and wastewater management program will be implemented which will include monitoring leachate and wastewater levels and emptying ponds as necessary to ensure adequate storage capacity.

(j) Investigate and consider methods for treatment of leachate and wastewater on-site and disposal by irrigation at any expanded or new landfill site.

(k) All exterior drainage from each landfill site shall be managed in accordance with the requirements of federal NPDES, state, and local regulations.

- **Timing of Implementation** - (g), (h) Prior to project construction; (i) Ongoing; (j), (k) Prior to project construction and ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Local Enforcement Agency, Regional Water Quality Control Board.

Mitigation Measure 7-6

(a) To the extent feasible, the working face of the landfill shall be covered with soil or other approved alternate cover material to prevent contact with stormwaters.

(b) All exterior drainage from each site shall be managed in accordance with the requirements of federal NPDES, state, and local regulations.

- **Timing of Implementation** - (a) Prior to project construction and ongoing; (b) Prior to project construction, and ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Local Enforcement Agency.

Revised Mitigation Measure 7-7

(a) Employ Best Management Practices as required under the NPDES Permit for Construction grading.

(b) To the extent feasible, confine grading, excavation, and other earthwork to the dry seasons. When this is not feasible, erosion and sediment transport control facilities should be in place prior to the onset of the first major winter storms. If wind erosion has the potential to occur during summer months, erosion control methods, such as watering graded areas, shall be implemented.

(c) Prepare and implement detailed erosion and sedimentation control plan(s), which should be submitted for review and approval by the RWQCB. The specific language of such plans varies, but the concepts to be adhered to include the following:

1. To avoid discharge to natural waterways, sediment should be trapped before leaving the construction site through the use of rip-rap, hay bales, fencing, or sediment ponds.

2. Areas of surface disturbance should be minimized.

3. Disturbed areas should be stabilized through vegetative or mechanical methods. When construction is complete, all disturbed areas should be regraded and revegetated.

(d) All new facilities shall be designed and constructed to conform with the site development standards contained in the latest edition of the Uniform Building Code (UBC). Prior to construction activities, the applicant shall submit building plans to the local jurisdiction's building department indicating compliance with the UBC.

(e) All new facilities shall meet the requirements of the County or cities' standards pertaining to site design, grading, and erosion control.

(f) Vegetation on soils exposed during construction shall be reestablished as soon as practical. Mulch or other temporary cover shall be used in the interim where erosion potential exists.

(g) Treat wastewater generated during construction prior to discharge. At a minimum, the wastewater should be treated by sedimentation to remove suspended particles from the water. Sedimentation ponds would need to be maintained regularly.

(h) Prepare and implement a Spill Prevention Control/Countermeasure (SPCC) Plan prior to the start of construction. The SPCC Plan should cover actions needed to minimize the potential for accidental spillage of construction-related contaminants such as fuel, oil, or other chemicals. Such contaminants should not be drained onto the soil; rather, they should be confined to sealed containers and removed to proper disposal sites. Refueling should be conducted in a location where spills could be contained.

- **Timing of Implementation** - (a), (b), (d), (e) Prior to project construction; (c) Prior to project construction; (f) During project construction; (g) During project construction and ongoing; (h) Prior to project construction and ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Regional Water Quality Control Board.

Revised Mitigation Measure 7-8

(a) Mitigation implemented to control erosion during operation of the landfill shall be similar to that implemented during construction (see Mitigation Measure 7-7 above).

(b) Permanent drainage ditches shall be constructed around the landfill perimeter to convey runoff water from the project site. These permanent drainage ditches shall be lined with native grass, concrete, corrugated metal, or other material that will limit water infiltration and soil erosion. Temporary and permanent berms, collection ditches, benches, and stormwater downdrains shall be constructed to convey water runoff from the landfill surface and downslopes.

(c) On- or off-site detention ponds shall be constructed and maintained and site runoff shall be collected and sedimentation completed in the ponds prior to discharge to surface waters. The ponds shall be adequately designed so that no net increase over existing conditions in stormwater flows from the project site are expected to result from a 100-year flood event.

(d) Prior to the rainy season, drainage facilities shall be inspected and, if necessary, cleared of debris.

(e) Drainage facilities shall be inspected after the first significant rain of the season to ensure that the system is functioning.

(f) Runoff from areas upgradient of the landfill shall be routed around the landfill.

(g) Landfills shall not be developed within a 100-year floodplain (40 CFR 258).

- **Timing of Implementation** - (a), (b), (d) Prior to project construction and ongoing; (b) Prior to project construction and ongoing; (c), (g) Prior to project approval, prior to project construction; (e) ongoing; (f) Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** -Lead Agency, Regional Water Quality Control Board.

Mitigation Measure 7-9

(a) New waste management facilities will use water conservation techniques such as reclaimed water use and water recycling where feasible.

(b) If anaerobic digestion is used to process organics, a complete site specific groundwater study or groundwater availability determination to demonstrate that water use levels will not deplete groundwater supplies for surrounding properties.

- **Timing of Implementation** - (a) Prior to project construction and ongoing; (b) Prior to project approval.
- **Implementation** - Lead Agency.
- **Monitoring** -Lead Agency.

Mitigation Measure 7-10

Spill prevention and cleanup plans will be required in all construction contracts. Any contracts which involve blasting will require that explosives spilled during the loading of the blasting holes be cleaned up prior to detonating the explosives.

- **Timing of Implementation** - Prior to project construction, during project construction.
- **Implementation** - Lead Agency.
- **Monitoring** -Lead Agency.

Mitigation Measure 7-11

If blasting will be done near an existing landfill, a qualified blasting specialist will design the blasting program to ensure that peak particle velocities resulting from blasts will be lower than the amount that could damage the landfill liner or leachate collection system.

- **Timing of Implementation** - Prior to project construction, during project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Regional Water Quality Control Board.

Mitigation Measure 7-12

When feasible, large non-disposal facilities (i.e., composting facilities) shall provide permeable surfaces and retention basins to aid in the recharge of groundwater in accordance with the water

quality standards of the Regional Water Quality Control Board.

- **Timing of Implementation** - Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Regional Water Quality Control Board.

PUBLIC SAFETY, HAZARDS AND HAZARDOUS MATERIALS

Revised Mitigation Measure 8-1

(a) Curbside recycling operations shall be established so that no direct worker contact with the materials occurs. Automated can pick-up, commingled collection, and/or separate materials bins could meet this objective.

(b) Workers shall be supplied with appropriate safety gear which provide the maximum protection available while still affording sufficient manual dexterity for accomplishing their sorting tasks.

(c) All workers shall have current vaccinations against diseases such as tetanus, polio, or other diseases which could be spread through direct contact with solid waste.

(d) Workers shall be trained to spot hypodermic needles during sorting, extract them from the sorting line, and deposit them in a plastic sharps disposal container kept at each sorting station.

(e) Sharps containers filled at the non-disposal facility and landfill, as well as containers encountered in curbside materials during sorting operations, shall be properly disposed of with a licensed medical waste hauler.

(f) New and expanded non-disposal facilities and solid waste disposal facilities shall develop and implement an Illness and Injury Prevention Plan to address the potential for injury and illness among facility employees.

(g) A map showing the locations of local emergency services and appropriate telephone numbers shall be posted at all non-disposal facilities and landfills in a conspicuous place (e.g., near the telephone) by either the program operations manager or the safety inspector.

- **Timing of Implementation** - Prior to project construction and ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 8-2

(a) Backyard composting training for the general public shall address the potential health effects associated with composting. Training will describe how proper moisture content will reduce dust generation and maximize microbial action and how sufficient oxygen content is critical to maintaining microbial action, regulating temperature, and reducing odors and pathogens. Persons with weakened immune systems or persons with allergies, asthma, or other respiratory problems shall be discouraged from participating in backyard composting. Backyard composters shall also be encouraged to thoroughly wash their hands with soap and water after each contact with backyard compost piles.

(b) Composting operations at the new or expanded composting facility(ies) shall include the following procedures:

1. Proper moisture content shall be maintained in compost piles or windrows.

2. Proper temperatures and oxygen content shall be maintained in compost piles/windrows through aeration and compost turning or agitation. Operating procedures shall require that the compost pile be heated to approximately 132-140° to ensure that all pathogens have been eliminated.

3. Loading and compost turning equipment shall have enclosed, ventilated cabs and the ventilation systems shall be maintained regularly, or individual respiratory protection (dust masks) will be utilized.

4. Employees shall be encouraged to wash their hands frequently with soap and water, particularly prior to lunch and other breaks, and at the end of the work day.

5. Composting facility operators shall inform compost workers about the possibility for development of pulmonary hypersensitivity. Workers shall be encouraged to report unusual health problems to their supervisors and physicians.

6. New and expanded non-disposal facilities shall develop and implement an Illness and Injury Prevention Plan to address the potential for injury and illness among facility employees.

- **Timing of Implementation** - (a), (b) Prior to project construction and ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 8-3

(a) A HHW Facility Operations Plan shall be developed for each permanent HHW facility. This plan shall include procedures for waste acceptance and screening, waste management practices, stormwater management, worker health and safety, and emergency prevention, precaution and response.

(b) An emergency response and evacuation plan shall be developed for each collection site in order to plan actions to be taken in the event of a spill incident. The emergency response and evacuation plan shall be developed by the collection site operator in coordination with the appropriate local agencies prior to the operation of the collection site.

(c) A safety inspector shall be assigned by the HHW program operations manager to oversee field activities, spot potential risks, and ensure conformance with regulations.

(d) Employee safety meetings shall be conducted, as necessary, by the program safety inspector.

(e) All vehicles shall be inspected, as necessary, for safety violations by the program safety inspector and facility employees.

(f) An on-site eye wash and shower station shall be provided at all mobile and stationary HHW collection sites.

(g) A map showing the locations of local emergency services and appropriate telephone numbers shall be posted at all mobile and stationary HHW collection sites in a conspicuous place (e.g., near the telephone) by either the program operations manager or the safety inspector.

(h) A training program (including periodic retraining) for facility personnel in CPR and first aid shall be provided by the program safety inspector. In addition, first aid materials shall be maintained in good condition.

(i) A drainage containment and collection system shall be set up around the HHW collection and storage facilities to prevent discharge of spilled materials to soil or groundwater. All spilled material shall be collected and treated separately to prevent the spread of any hazardous constituents.

(j) Any risk posed by unauthorized access to any non-disposal site shall be mitigated by posting warning signs, fencing, patrol personnel, or the disabling of equipment when not in use. Daily inspections would be the responsibility of the facility operations manager.

(k) A Load Checking Program shall be updated and implemented to ensure the proper disposal of hazardous wastes illegally disposed with solid waste accepted at non-disposal facilities and the landfill. Any hazardous wastes found while conducting the Load Checking Program shall be disposed of according to applicable state and federal regulations.

- **Timing of Implementation** - (a) through (k) Prior to project construction and ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** -Lead Agency.

Revised Mitigation Measure 8-4

(a) Prior to permitting, develop and implement (in consultation with the Fire Marshal) a Fire Prevention Program for each facility, as necessary. This program shall entail both structural fire suppression mechanisms, such as an automatic sprinkler system and fire retardant building materials in the design of the structure, as well as procedural programs for minimizing/extinguishing fire hazards.

(b) Develop an Emergency Response and Evacuation Plan for each new or expanded facility in accordance with relevant county or city emergency response and evacuation plans, and follow it in the event of a fire, earthquake, hazardous materials spill or other emergency. Each emergency response and evacuation plan shall be developed by the facility operator in coordination with the County Office of Emergency Services, the Hazardous Materials Division of the County Environmental Health Department, and the appropriate Fire Protection District.

(c) All potentially disastrous events shall be reported by the project sponsor to the County Office of Emergency Services so that County emergency services such as traffic control, fire and medical equipment, and evacuation notification can be available as needed.

(d) Facility workers shall be provided and required to use safety glasses, safety shoes, coveralls, gloves, noise reducers for ears, or other safety equipment appropriate to the hazard of the job. An emergency eye bath and emergency showers shall be installed in the facility by the project sponsor.

(e) A map showing the locations of local emergency services and appropriate telephone numbers shall be posted at all non-disposal facilities and landfills in a conspicuous place (e.g., near the telephone) by either the program operations manager or the safety inspector.

(f) New and expanded non-disposal facilities and solid waste disposal facilities shall develop and implement an Illness and Injury Prevention Plan to address the potential for injury and illness among facility employees.

- **Timing of Implementation** - (a) through (f) Prior to project construction and ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** -Lead Agency.

Revised Mitigation Measure 8-5

Same as Mitigation Measure 8-4 (a through e).

(f) Consider reducing operating hours at new or expanded non-disposal facilities in order to reduce the accumulation of combustible solid waste for transfer and storage.

(g) A map showing the locations of local emergency services and appropriate telephone numbers shall be posted at all non-disposal facilities and landfills in a conspicuous place (e.g., near the telephone) by either the program operations manager or the safety inspector.

(h) Develop an Emergency Response and Evacuation Plan for each new or expanded facility in accordance with relevant county or city emergency response and evacuation plans, and follow it in the event of a fire, earthquake, hazardous materials spill or other emergency. Each emergency response and evacuation plan shall be developed by the facility operator in coordination with the County Office of Emergency Services, the Hazardous Materials Division of the County Environmental Health Department, and the appropriate Fire Protection District.

- **Timing of Implementation** -(a) through (h) Prior to project construction and ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** -Lead Agency.

Mitigation Measures 8-6

(a) Rodent traps shall be placed strategically around the public drop-off areas and recycling areas, as required. This measure shall be monitored by the facility operations manager.

(b) Landscape materials shall exclude plants, such as ivy, which may provide hidden nesting areas for rodents.

(c) Standing water and moist areas shall be controlled to prevent mosquito breeding. This shall be monitored by the facility operations manager.

- **Timing of Implementation** - (a) through (c) Prior to project construction and ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** -Lead Agency, Local Enforcement Agency.

Revised Mitigation Measure 8-7

Mitigation measures will result from the site specific CEQA review process, and will include the general following mitigation measures:

(a) Employees shall be encouraged to wash their hands frequently with soap and water, particularly prior to lunch and other breaks, and at the end of the work day.

(b) Employee safety meetings shall be conducted, as necessary, by the program safety inspector.

(c) All vehicles shall be inspected, as necessary, for safety violations by the program safety inspector and facility employees.

(d) A training program (including periodic retraining) for facility personnel in first aid shall be provided by the program safety inspector. In addition, first aid materials shall be maintained in good condition.

(e) Any risk posed by unauthorized access to any areas of the disposal site shall be mitigated by posting warning signs, fencing, patrol personnel, and/or the disabling of equipment when not in use. Daily inspections would be the responsibility of the facility operations manager.

(f) Prior to operations, develop and implement (in consultation with the Fire Marshal) a Fire Prevention Program for each facility, as necessary. This program shall entail both structural fire suppression mechanisms, such as an automatic sprinkler system and fire retardant building materials, in the design of the structure, as well as procedural programs for minimizing/extinguishing fire hazards.

(g) All potentially disastrous events shall be reported by the project sponsor to the County Office of Emergency Services so that County emergency services such as traffic control, fire and medical equipment, and evacuation notification can be available as needed.

(h) Facility workers shall be provided and required to use safety glasses, safety shoes, coveralls, gloves, noise reducers for ears, or other safety equipment appropriate to the hazard of the job. An emergency eye bath and emergency showers shall be installed in the facility by the project sponsor.

(i) Standing water and moist areas shall be controlled to prevent mosquito breeding. This shall be monitored by the facility operations manager.

(j) A map showing the locations of local emergency services and appropriate telephone numbers shall be posted at all non-disposal facilities and landfills in a conspicuous place (e.g., near the telephone) by either the program operations manager or the safety inspector.

(k) Develop an Emergency Response and Evacuation Plan for each new or expanded facility in accordance with relevant county or city emergency response and evacuation plans, and follow it in

the event of a fire, earthquake, hazardous materials spill or other emergency. Each emergency response and evacuation plan shall be developed by the facility operator in coordination with the County Office of Emergency Services, the Hazardous Materials Division of the County Environmental Health Department, and the appropriate Fire Protection District.

(l) New and expanded non-disposal facilities and solid waste disposal facilities shall develop and implement an Illness and Injury Prevention Plan to address the potential for injury and illness among facility employees.

- **Timing of Implementation** - (a) through (l) Prior to project construction and ongoing; (k) Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** -Lead Agency, Local Enforcement Agency.

Mitigation Measure 8-8

If hazardous materials are used at the RMF, the following mitigations will be implemented:

(a) An emergency response and evacuation plan shall be developed for the RMF in order to plan actions to be taken in the event of a spill incident. The emergency response plan shall be developed by the facility operator in coordination with the appropriate local agencies prior to the operation of the facility.

(b) A safety inspector shall be assigned by the RMF operations manager to oversee the transportation, use and disposal of hazardous materials to ensure that workers, the general public, and the environment are protected from accidents or spills.

(c) Employee safety meetings shall be conducted as necessary by the program safety inspector.

(d) An on-site eye wash and shower station shall be provided at the RMF.

(e) A map showing the locations of local emergency services and appropriate telephone numbers shall be posted at the RMF in a conspicuous place (e.g., near the telephone) by either the program operations manager or the safety inspector.

(f) A training program (including periodic retraining) for facility personnel in CPR and first aid shall be provided by the program safety inspector. In addition, first aid materials shall be maintained in good condition.

(g) A drainage containment and collection system shall be set up around the chemical use area at the RMF to prevent discharge of spilled materials to soil or groundwater. All spilled material shall be collected and treated separately to prevent the spread of any hazardous constituents.

(h) Any risk posed by unauthorized access to the RMF shall be mitigated by posting warning signs, fencing, patrol personnel, or the disabling of equipment when not in use. Daily inspections would be the responsibility of the facility operations manager.

(i) New and expanded non-disposal facilities shall develop and implement an Illness and Injury Prevention Plan to address the potential for injury and illness among facility employees.

- **Timing of Implementation** - (a)through (j) Prior to project construction, ongoing. Prior to project
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Regional Water Quality Control Board.

Mitigation Measure 8-9

(a) Blasting at the Central Disposal Site shall be conducted in accordance with the recommendations of the study conducted by Geotek in 1998, and any further site-specific blasting study conducted by a licensed blasting engineer. At a minimum, mitigation shall include:

1. All blasts will be designed to minimize peak particle velocity at the nearest off-site structures.

2. Measures will be taken to control air blast (overpressure), including stemming explosive charges with clean crushed stone, ensuring the minimum distance between bore holes and the rock face, keeping drilling logs to describe ground conditions, adjusting blast design to isolate explosive charges from weak areas, avoiding blasting during heavy cloud cover or windy conditions and monitoring overpressure at or near nearby residences.

(b) If blasting is necessary at a new solid waste disposal site, a site-specific blasting study to establish procedures to minimize peak particle velocities and overpressure will be conducted.

- **Timing of Implementation** - (a) Prior to project construction, during project construction; (b) Prior to Project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Mitigation Measure 8-10

In the event that a facility is located on a designated contaminated site, a site-specific study will be done to ensure that proper handling and disposal methods will be used to minimize environmental impacts. The study shall include a search of records of hazardous materials presence, a field assessment of conditions on the site to determine whether visual evidence of hazardous materials is present, and a plan to treat and/or clean up the site in accordance with regulations of the Regional Water Quality Control Board and Sonoma County Environmental Health if hazardous materials are present. Site specific analysis would be done at the time facility locations are proposed.

- **Timing of Implementation** - Prior to project approval, prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Local Enforcement Agency, Regional Water Quality Control Board.

Mitigation Measure 8-11

Update the existing or develop a new Emergency Response and Evacuation Plan for each new or expanded facility in accordance with relevant county or city emergency response and evacuation plans, and follow it in the event of a fire, earthquake, hazardous materials spill or other emergency. Each emergency response and evacuation plan shall be developed by the facility operator in

coordination with the County Office of Emergency Services, the Hazardous Materials Division of the County Environmental Health Department, and the appropriate Fire Protection District.

- **Timing of Implementation** - Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Mitigation Measure 8-12

(a) Safety measures shall be implemented, including, at a minimum, emergency response procedures, safety inspections, safety training, restriction of unauthorized access to areas where hazardous materials are stored, and timely containment and cleanup of spills.

(b) All potentially disastrous events shall be reported by the project sponsor to the County Office of Emergency Services so that County emergency services such as traffic control, fire and medical equipment, and evacuation notification can be available as needed.

- **Timing of Implementation** - (a), (b) Prior to project construction, and ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Mitigation Measure 8-13

(a) Future non-disposal and disposal facilities located in Sonoma County shall be designed, constructed, and maintained in conformance with the requirements of the Fire Marshall's Vegetation Management Plan and Fire Safe Standards.

(b) Develop an Emergency Response and Evacuation Plan for each new or expanded facility in accordance with relevant county or city emergency response and evacuation plans, and follow it in the event of a fire, earthquake, hazardous materials spill or other emergency. Each emergency response and evacuation plan shall be developed by the facility operator in coordination with the County Office of Emergency Services, the Hazardous Materials Division of the County Environmental Health Department, and the appropriate Fire Protection District.

(c) All potentially disastrous events shall be reported by the project sponsor to the County Office of Emergency Services so that County emergency services such as traffic control, fire and medical equipment, and evacuation notification can be available as needed.

- **Timing of Implementation** - (a) Prior to project approval, ongoing; (b) Prior to project construction, ongoing; (c) Ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

TRANSPORTATION

Revised Mitigation Measure 9-1

(a) To the extent feasible, new non-disposal facilities shall not be located in areas with significant road congestion, as designated in the cities' and County General Plans;

(b) To the extent feasible, new non-disposal facilities shall be located near other commercial facilities to allow for the combination of activities in one trip and reduce overall trip generation.

(c) Traffic Management Plans (TMP) shall be developed for each of the new and expanded non-disposal facilities, as required. These plans shall schedule truck trips so that roadway segments with the potential to be significantly impacted are avoided during peak hours. In addition, these plans shall detail the hours of operation and other restrictions on truck trips for each of the facilities and shall include plans for employee car pooling and bus transportation, where appropriate and feasible. The plans shall be updated periodically in response to changing traffic conditions and improvements to the highway system. The TMP shall include a site-specific traffic evaluation conducted as part of the siting study for a new non-disposal facility to identify potential traffic problem areas prior to site selection. The traffic evaluation shall consider limiting non-disposal facility operations to either commercial or private (general public) haulers, as well as co-locating of disposal and non-disposal facilities to reduce haul trips.

- **Timing of Implementation** - (a), (b), (c) Prior to project approval.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Additions to Mitigation Measures 9-1

(d) Countywide Traffic Mitigation Fees shall be paid for new facilities implemented in accordance with the 2003 CoIWMP to help mitigate off-site cumulative traffic impacts.

- **Timing of Implementation** - (d) Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 9-2

(a) The siting study for a new landfill shall consider the adequacy and operation of the local roads and intersections as part of the comparative criteria.

- **Timing of Implementation** - (a) Prior to project approval.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Additional Mitigation Measure 9-2

(b) A site-specific traffic evaluation shall be conducted as part of the siting study for a new landfill, to identify potential traffic problem areas prior to site selection and to identify road or intersection improvements and/or changes needed to accommodate landfill traffic.

(c) Countywide Traffic Mitigation Fees shall be paid for new facilities implemented in accordance with the 2003 CoIWMP to help mitigate off-site cumulative traffic impacts.

- **Timing of Implementation** - (b) Prior to project approval; (c) Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Mitigation Measure 9-3

Traffic analysis shall be conducted at the time a site-specific environmental analysis of a quarry project is undertaken. If rock extraction traffic would cause significant congestion at the Stony Point/Roblar or Stony Point/West Railroad intersections, the following mitigation measures shall be considered:

(a) Trucks hauling rock from the landfill quarry shall be restricted so that they do not add traffic to the congested intersections during peak traffic hours. Restrictions could include alternative hours of operation or alternative haul routes. This restriction shall remain in effect until these intersections are signalized.

(b) The quarry operator shall pay a traffic mitigation fee to provide a fair-share contribution toward the cost of signalizing the intersections.

- **Timing of Implementation** - (a) Prior to project approval; (b) Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Mitigation Measure 9-4

If significant traffic impacts to the Stony Point/Roblar Roads and Stony Point Road/West Railroad Avenue intersections continue beyond 2015, mitigation measures such as the following shall be implemented:

(a) The Integrated Waste Division will consider restricting truck traffic that is subject to County control so that trucks do not travel through the Stony Point/Roblar and/or Stony Point Road/West Railroad intersections during peak traffic hours. This shall apply only to new truck trips associated with projects pursuant to the 2003 CoIWMP and not existing traffic using the Central Disposal Site. The restriction shall apply to trucks subject to County control, such as those making deliveries of cover soil and liner materials, and trucks associated with construction at the site. This measure shall remain in effect until a traffic signal has been installed at these intersections.

(b) Prior to construction of projects at the Central Disposal Site pursuant to the 2003 CoIWMP, the Integrated Waste Division shall pay a traffic mitigation fee that includes a fair share contribution toward the installation of signals at the Stony Point/Roblar and Stony Point/West Railroad intersections.

(c) Consider restricting hours of operation so that traffic is not added to the congested intersections during peak traffic hours. This restriction would remain in effect until these intersections are signalized.

(d) Consider restricting the use of the site to commercial operators only, thereby reducing the number of vehicles using the Stony Point/Roblar and Stony Point/West Railroad intersections.

- **Timing of Implementation** - (a), (c), (d) Prior to project approval; (b) Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Mitigation Measure 9-5

Prior to the commencement of hauling, the quarry operator and the Integrated Waste Division shall implement a truck driver education program which familiarizes rock and commercial refuse haulers with speed limit zones, school bus stops, areas of low sight distance on the haul route, permit limits on trucking, weight and load height limits, circulation routes through the landfill to minimize interference, and other measures which will reduce public conflicts. The Integrated Waste Division shall maintain a record of the drivers receiving the orientation.

- **Timing of Implementation** - Prior to project construction, during project construction, ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Mitigation Measure 9-6

(a) Driveways and access roads for the new landfill and non-disposal facilities shall be designed to AASHTO standards to ensure safety hazards are minimized. These standards include driveway width, acceleration-deceleration lanes, and turning radius requirements.

(b) Prior to operation, minor roads that would be used as haul routes shall be examined for existing safety problems and corrections shall be made as necessary to accommodate traffic from new facilities.

(c) Design access roads for new facilities to accommodate emergency vehicles in accordance with County Fire Safe Standards.

- **Timing of Implementation** - (a), (c) Prior to project construction; (b) Ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

AIR QUALITY

Revised Mitigation Measure 10-1 (a)

The County and cities shall consider air emissions when purchasing new equipment and when entering into agreements with solid waste operators. Cleaner vehicles shall be weighted more favorably than less clean vehicles.

- **Timing of Implementation** - (a) Prior to project constructtion and ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Additional Mitigation Measure 10-1 (b) (Construction)

1. New facilities shall be sited to maximize separation between haul routes/facilities and sensitive receptors to the extent practical.

2. New facilities shall encourage the use of low emissions vehicles that control diesel particulates with engine filters or by using low emissions fuel such as compressed natural gas.

3. The contractor shall reduce NO_x, ROG, and CO emissions by complying with the construction

vehicle air pollutant control strategies developed by the BAAQMD and the NSCAPCD. The project sponsor shall include in construction contracts the following requirements:

a. Construction equipment operators shall shut off equipment when not in use to avoid unnecessary idling. As a general rule, vehicle idling should be kept below 10 minutes.

b. The contractor's construction equipment shall be properly maintained and in good operating condition.

c. The contractor shall utilize new technologies to control ozone precursor emissions as they become available and feasible.

d. The contractor shall substitute gasoline-powered for diesel-powered equipment where feasible. The contractor shall electrify equipment where practical.

4. Asphalt paving materials shall conform to the most recent guidelines by the air district having jurisdiction.

- **Timing of Implementation** - (b1) Prior to project approval; (b2) Ongoing; (b3), (b4) Prior to project construction, during project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Additional Mitigation Measure 10-1 (c) (Operations)

1. Contracts for operation of facilities described in the 2003 CoIWMP shall require operators to limit idling time of diesel equipment to 10 minutes when practical. Contracts shall also require that equipment be serviced at regular intervals to keep engines operating within parameters that will prevent excessive emissions.

2. Contracts for operation of facilities described in the 2003 CoIWMP shall include incentives for using electric motors instead of internal combustion engines in stationary equipment.

3. Alternate technology, such as a fuel cell or cleaner burning engines, shall be considered for any electricity generation plant implemented by programs in the 2003 CoIWMP.

- **Timing of Implementation** - (c1) through (c3) Ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Additional Mitigation Measure 10-1 (d)

If emissions of criteria pollutants are produced by the selected technology for processing of organic waste at the RMF, the facility will be equipped with a means to collect or treat emissions which may include air control and emission filters to comply with air quality standards.

- **Timing of Implementation** - (d) Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Air Quality Management District/Air Pollution Control District.

Revised Mitigation Measure 10-2

The contractor shall reduce particulate emissions by complying with the dust control strategies developed by the NSCAPCD and the BAAQMD. The project sponsor shall include in construction contracts the following requirements:

1. The contractor shall water in late morning and at the end of the day all earth surfaces during clearing, grading, earthmoving, and other site preparation activities.

2. The contractor shall use tarpaulins or other effective covers for haul trucks that travel on public streets and roads.

3. The contractor shall increase the watering frequency for exposed and erodible soil surfaces whenever winds exceed 15 mph.

4. The contractor shall water exposed soil surfaces, including cover stockpiles, roadways, and parking and staging areas, to minimize dust and soil erosion.

5. The contractor shall sweep streets adjacent to the new and expanded non-disposal facilities at the end of each day.

6. The contractor shall control construction, operation and maintenance vehicle speed to 15 mph on unpaved roads.

- **Timing of Implementation** - Ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 10-3

(a) Control of odors shall be implemented through the use of Best Management Practices utilized with Sonoma County such as the avoidance of compost disturbance in afternoon hours, regulating moisture content, and turning compost windrows.

(b) If odor persists as a problem, compost piles or windrows shall be covered with soil or finished compost to reduce emissions of odors.

- **Timing of Implementation** - (a), (b) Ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Local Enforcement Agency.

Additions to Mitigation Measure 10-3

(c) The landfill shall be covered at the end of every day with plastic, soil or other appropriate material.

(d) Any cracks in the landfill surface shall be repaired as soon as practical.

(e) Acidity levels in leachate ponds shall be monitored and pH adjusted as necessary to reduce odor problems.

(f) When new compost facilities are proposed, consideration will be given to operations that are conducted inside buildings using air filtration systems to prevent release of odors.

- **Timing of Implementation** - Ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Local Enforcement Agency, Regional Water Quality Control Board.

Revised Mitigation Measure 10-4 (a)

Mitigation measures will include revised Mitigation Measure 10-1 (a), additional Mitigation Measures 10-1 (b) and 10-1 (c), including revised Mitigation Measure 10-2 described above.

- **Timing of Implementation** - Same as Mitigation Measures 10-1(a), (b) and (c); 10-2.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 10-4 (b)

1. To prevent excessive emissions of ROG, future landfill gas collection systems shall be designed to minimize the amount of uncontrolled gas emissions. To ensure that the latest information and technology is considered in the design, the project sponsor will have a qualified consultant prepare recommendations that would include the appropriate collection technology. These recommendations shall be submitted to the Bay Area Air Quality Management District for approval prior to the issuance of an Authority To Construct.

2. Mitigation measures shall include revised Mitigation Measure 10-1 (a) and additional Mitigation Measures 10-1 (b) and 10-1 (c).

- **Timing of Implementation** - (b1) Prior to project construction; (b2) Same as 10-1(a), (b), and (c).
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Air Quality Management District/Air Pollution Control District.

Mitigation Measure 10-5

(a) Blasting operations for landfill construction shall be restricted as follows to control dust emissions:

1. To the extent possible, remove all loose dirt and overburden material from blasting areas prior to drilling blast holes.

2. Spray water over blast areas prior to blasting.

3. No loading of explosives in blast holes or blasts shall be conducted when wind speed on site exceeds 15 mph.

(b) Any rock crusher used for landfill construction shall be equipped with a spray mister, or incorporate some other equally effective measure to control dust.

(c) Revised Mitigation Measure 10-2 shall be implemented for the rock extraction operations.

- **Timing of Implementation** - (a) Prior to project construction, during project construction; (b) During project construction; (c) Same as Revised Mitigation Measure 10-2.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Air Quality Management District/Air Pollution Control District.

Mitigation Measure 10-6

(a) To prevent excessive NO_x emissions: 1) Blasting for landfill construction shall be done with water resistant explosives in the wet areas of bore holes. Non-water resistant explosives may be used above the wet areas of bore holes, provided the bore hole is sealed above the wet area so that the non-water resistant explosive remains above the wet area. 2) Blended ammonium nitrate/fuel oil blasting agents shall contain at least 5.7% fuel oil by weight.

(b) Revised Mitigation Measure 10-1 (a) and Additional Mitigation Measures 10-1 (b) and 10-1 (c) shall also be applied to rock extraction associated with new or expanded landfills.

- **Timing of Implementation** - (a) Prior to project construction, during project construction; (b) Same as Revised Mitigation Measure 10-1(a); additional Mitigation Measures (b), (c).
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Air Quality Management District/ Air Pollution Control District.

NOISE

Revised Mitigation Measure 11-1

(a) Construction activities shall be limited to the hours between 7 AM and 7 PM to the extent practical.

(b) Construction equipment shall be properly outfitted and maintained with noise reduction devices to minimize construction-generated noise. Wherever possible, noise-generating construction equipment shall be shielded from nearby residences by noise-attenuating walls, berms, or enclosures.

(c) The contractor shall attempt to locate stationary noise sources as far away as possible from noise-sensitive land uses.

- **Timing of Implementation** - (a) Prior to project construction; (b), (c) During project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 11-2

(a) Where feasible, collection activities associated with these facilities shall be conducted during hours of the day which are not noise sensitive for nearby residents and other adjacent land uses. The activities shall be commissioned to occur during normal work hours of the day to provide relative quiet during the more sensitive evening and early morning periods.

(b) The County and cities shall include noise as an evaluation criterion when purchasing new waste/recyclables transportation vehicles, and will purchase the quietest vehicles available when reasonably possible. If the County or cities do not make direct purchases of such vehicles, it will

require licensed/franchised haulers, via license/franchise agreements, to include noise as an evaluation criterion in their purchase of vehicles.

- **Timing of Implementation** - (a), (b) Ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Addition to Mitigation Measure 11-2

(c) A site-specific noise evaluation shall be conducted as part of the siting study for new and expanded non-disposal facilities to identify potential noise problem areas prior to site selection. The noise evaluation shall consider the location of sensitive receptors and evaluate sound barriers or other means to reduce noise exposure. The evaluation shall also consider operational changes such as restricting hours of operation (see Mitigation Measure 11-3 (b)).

- **Timing of Implementation** - (c) Prior to project approval.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 11-3

(a) The County and cities shall include noise as an evaluation criterion during facility design and when purchasing equipment for the new and expanded facilities and will purchase the quietest equipment available to buy, when reasonably possible. If the County or cities do not make direct purchases of such equipment, it will require facility owner/operators, via conditions of approval, to include noise as an evaluation criterion in their purchase of equipment.

(b) The noise evaluation described in Mitigation Measure 11-2 (c) shall consider the location of sensitive receptors and locate equipment and operations to minimize the noise exposure to the extent practical. The evaluation should consider enclosures for noisy equipment or sound barriers to shield off-site receptors from noise.

- **Timing of Implementation** - (a) Prior to project approval, ongoing; (b) Prior to project approval.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 11-4

Same as Mitigation Measure 11-1.

- **Timing of Implementation** - Same as Mitigation Measure 11-1.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 11-5

(a) Where feasible, collection activities associated with these facilities shall be conducted during hours of the day which are not noise sensitive for nearby residents and other adjacent land uses. The activities shall be commissioned to occur during normal work hours of the day to provide relative quiet during the more sensitive evening and early morning periods.

(b) The County and cities shall include noise as an evaluation criterion when purchasing new waste/recyclables transportation vehicles, and will purchase the quietest vehicles available when reasonably possible. If the County or cities do not make direct purchases of such vehicles, it will require licensed/franchised haulers, via license/franchise agreements, to include noise as an evaluation criterion in their purchase of vehicles.

- **Timing of Implementation** - (a), (b) Ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 11-6

(a) The County and cities shall include noise as an evaluation criterion when purchasing equipment for the disposal facility and will purchase the quietest equipment available to buy, when reasonably possible. If the County or cities do not make direct purchases of such equipment, it shall require facility owner/operators, via conditions of approval, to include noise as an evaluation criterion in their purchase of equipment.

- **Timing of Implementation** - (a) Ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Addition to Mitigation Measure 11-6

(b) During project analysis, sound levels for landfill and quarry equipment will be analyzed to determine whether standards would be exceeded. If it is determined that noise standards would be exceeded at the property line of any residential use, the project shall include, to the extent practical, sound barriers, special mufflers on equipment, or other means to reduce the noise levels at the property line. A berm or other noise barrier shall be used to break the line of sight between noisy equipment, such as rock hammers and rock crushers, and the property line prior to operation of the equipment.

- **Timing of Implementation** - (b) Prior to project approval.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

VEGETATION AND WILDLIFE

Revised Mitigation Measure 12-1

(a) When new non-disposal and landfill facilities are proposed, site specific biotic studies shall be performed to identify biotic resources on the sites. To the extent practical the new facilities shall be constructed to avoid these resources. Where avoidance is not practical the project sponsor shall consult with the appropriate State or Federal resource agencies to determine appropriate mitigation for any loss of or change to the biotic resources. The project sponsor shall acquire all necessary permits from these agencies. Compliance with permit conditions shall be a condition of approval of the project.

- **Timing of Implementation** - (a) Prior to project approval, prior to project construction.
- **Implementation** - Lead Agency.

- **Monitoring** - Lead Agency, California Department of Fish and Game, U.S. Fish and Wildlife.

Additions to Mitigation Measure 12-1

(b) Riparian areas shall be avoided where possible in siting new facilities. If avoidance is not possible, compensation for loss of riparian vegetation shall be made by planting and otherwise enhancing a comparable area of streambank in the general vicinity where habitat quality can be improved. Planting plans shall be reviewed by a qualified biologist and submitted to the California Department of Fish and Game and other agencies, if needed, for review and comment prior to implementation. Revegetation areas shall be managed to permanently protect the riparian vegetation

- **Timing of Implementation** - (b) Prior to project approval, prior to project construction, during project construction, ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, California Department of Fish and Game, U.S. Fish and Wildlife.

Revised Mitigation Measure 12-2

(a) No solid waste disposal facility shall be built or expanded within a wetland unless it can be demonstrated that the landfill will not contribute to or cause significant degradation of wetlands or violations of the Clean Water Act or State water quality standards, jeopardize endangered or threatened species, violate any toxic effluent standard, or violate any requirement of the Marine Protection, Research, and Sanctuaries Act. There must also be no practicable alternative to the proposed location which does not involve wetlands. (Title 40, Chapter 1, Subchapter 1, Part 258, Subpart B [40 CFR 258].)

(b) When new non-disposal and landfill facilities are proposed, site specific biotic studies shall be performed to identify biotic resources on the sites. To the extent practical the new facilities shall be constructed to avoid these resources. Where avoidance is not practical the project sponsor shall consult with the appropriate State or Federal resource agencies to determine appropriate mitigation for any loss of or change to the biotic resources. The project sponsor shall acquire all necessary permits from these agencies. Compliance with permit conditions shall be a condition of approval of the project.

- **Timing of Implementation** - (a) Prior to project approval, prior to project construction, ongoing; (b) Prior to project approval, prior to project construction, ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, California Department of Fish and Game, U.S. Fish and Wildlife.

Additions to Mitigation Measure 12-2

(c) Riparian areas will be avoided where possible in siting new facilities. If avoidance is not possible, compensation for loss of riparian vegetation shall be made by planting and otherwise enhancing a comparable area of streambank in the general vicinity where habitat quality can be improved. Planting plans shall be reviewed by a qualified biologist and submitted to the California Department of Fish and Game and other agencies, if needed, for review and comment prior to implementation. Revegetation areas shall be managed to permanently protect the riparian vegetation.

(d) Before construction during the active nesting period between March 1 and September 1, the Integrated Waste Division of the Sonoma County Department of Transportation and Public Works

shall determine the locations of any active raptor nests that could be affected. If any active nests are found, removal of the trees containing the nests shall be delayed until a qualified wildlife biologist has determined that the young birds are able to leave the nest and forage on their own. A qualified wildlife biologist shall be consulted to determine what activities must be avoided in the vicinity of the nests while the nests are active, and those recommendations shall be followed during construction.

- **Timing of Implementation** - (a) Prior to project approval, prior to project construction, during project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, California Department of Fish and Game, U.S. Fish and Wildlife.

CULTURAL RESOURCES AND PALEONTOLOGY

Revised Mitigation Measure 13-1

(a) Intensive on-site cultural and paleontological resources surveys shall be conducted by a qualified archaeologist and paleontologist prior to construction in any areas of a site to be used for solid waste non-disposal facilities that are designated as sensitive in a city or County planning document. In addition, the Northwest Information Center (NWIC) will be consulted to determine if previously recorded archaeological sites exist on or in the vicinity of the project site. The purpose of this survey will be to more precisely locate and map significant cultural and paleontological resources. The services of the archaeologist and paleontologist shall be retained by the project sponsor.

(b) If, in the process of the cultural resource surveys, significant archaeological resources are found to exist on the site, the project sponsor shall consider changing the facility layout to avoid such resources. If it is not possible to make this change, however, formal archaeological data collection work on the significant resources will be completed. This shall include a complete surface collection of cultural material and, at a minimum, excavation of a sample subsurface cultural material sufficient to evaluate the extent, depth, and make-up of site components (i.e., archaeological testing). The overall objectives of such data collection work shall be to explicitly identify those research questions for which the site contains relevant information, with the research questions representing those presently expressed by the body of professional archaeologists in the region. If the results of the archaeological testing indicate that additional mitigative data recovery work is justified or warranted, it will be completed prior to the construction of the facility.

(c) If paleontological resources cannot be avoided by changing the site layout, a program of data collection and recovery shall be implemented.

(d) Archaeological and paleontological monitors shall be present during studies, site construction and development activities in areas of high cultural and paleontological resource sensitivity when recommended by a site-specific study for a project under the CoIWMP or the 2003 CoIWMP, or when a designated Native American tribal representative requests to monitor projects. These monitors shall be retained by the project sponsor. In the event that human remains are unearthed during construction, state law requires that the County Coroner be notified to investigate the nature and circumstances of the discovery. At the time of discovery, work in the immediate vicinity would cease until the Coroner permits work to proceed. If the remains were determined to be prehistoric, the find would be treated as an archaeological site and the mitigation measure described above would apply.

(e) In the event that unanticipated cultural or paleontological resources are encountered during project construction, all earthmoving activity shall cease until the project sponsor retains the services of a qualified archaeologist or paleontologist. The archaeologist or paleontologist shall examine the finding, assess their significance, and offer recommendations for procedures deemed appropriate to either further investigate or mitigate adverse impacts to those cultural or paleontological archaeological resources that have been encountered (e.g., excavate the significant resource). These additional measures shall be implemented.

- **Timing of Implementation** - (a) through (e) Prior to project approval, prior to project construction, during project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 13-2

Same as Mitigation Measure 13-1.

- **Timing of Implementation** - Same as Mitigation Measure 13-1.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Mitigation Measure 13-3

(a) Intensive on-site historical resources surveys shall be conducted by a qualified architectural historian prior to construction where structures over 45 years old or sites known to have historical significance could be affected by proposed facilities. The purpose of the survey shall be to determine the historical significance of the resources and whether the proposed project would affect those structures that are found to have historical significance. The services of the architectural historian shall be retained by the project sponsor.

(b) If, in the process of the historical resource surveys, significant resources are found to exist on the site, the project sponsor shall consider changing the facility layout to avoid such resources. If it is not possible to make this change, however, mitigation work in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties, which address preservation, rehabilitation, restoration and reconstruction of historic resources, shall be completed for the historical resource.

- **Timing of Implementation** - (a), (b) Prior to project approval, prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

VISUAL RESOURCES

Revised Mitigation Measure 14-1

(a) To the extent possible, new facilities shall not be located within Designated Scenic Resource Areas as designated in the adopted 1989 Sonoma County General Plan (as amended), unless the facilities are not visible from public roads.

(b) A landscaping plan for each facility, if required by local regulations, shall include visual mitigation measures, such as earthen berms, tree screening, and other landscaping elements along the

perimeter of the site in order to screen the proposed facility from public view. Earthen berms and tree screening would be especially important along nearby roadways or other visual corridors.

(c) Existing trees shall be retained to the extent feasible as a visual screen.

(d) New or expanded facility buildings shall be located away from site borders (to the extent feasible) and shall maximize the use of any natural shielding provided by the topographical relief of site's existing landforms.

(e) Consistent with any required local design review recommendations, facility support buildings and site plans shall be designed and constructed with appropriate materials, exterior colors, and architectural details compatible with the natural landscape and surrounding development in the project vicinity.

(f) Disturbed areas that are not directly a part of the project shall be revegetated immediately following construction.

(g) Project lighting equipment shall be of low-profile design, unobtrusive, and consistent with adjacent land uses.

- **Timing of Implementation** - (a) through (e, g) Prior to project approval, prior to project construction; (f) Ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 14-2

On-site Mitigation:

(a) Litter shall be controlled by a litter abatement program.

(b) Litter fences shall be established around new or expanded non-disposal facilities, as necessary to prevent litter from blowing onto off-site areas.

(c) Litter along on-site roads shall be routinely collected and removed.

Off-site Mitigation:

(d) Litter shall be controlled on nearby roads providing access to new or expanded non-disposal facilities with a litter abatement program.

(e) Open cargo areas of vehicles (e.g., pick-ups, trucks, trailers, etc.) hauling waste shall be covered. This requirement will be enforced with financial penalties levied at the time of delivery to County Non-Disposal Sites and by the California Highway Patrol (CHP) in the areas near disposal sites.

- **Timing of Implementation** - (a) through (e) Ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Local Enforcement Agency, (e)California Highway Patrol.

Additions to Mitigation Measure 14-2

(f) A litter abatement program shall be implemented to reduce litter accumulation resulting from the

activities of commercial haulers. The program could include, but not be limited to: 1) education of commercial haulers; and 2) requirements for thorough cleaning of debris boxes, covering emptied containers, or other similar measures, to reduce litter created upon exiting non-disposal facilities.

(g) The litter abatement program shall consider limiting non-disposal facility operations to commercial or private (general public) haulers, including the co-location of disposal and non-disposal facilities to reduce roadside litter.

- **Timing of Implementation** - (f), (g) Ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 14-3

(a) To the extent possible, new facilities shall not be located within Designated Scenic Resource Areas, as designated in the adopted 1989 Sonoma County General Plan (as amended), unless the facilities are not visible from public roads.

(b) A landscaping plan shall be required for each facility and shall include visual mitigation measures, such as earthen berms, tree screening, and other landscaping elements along the perimeter of the site in order to screen the proposed facility from public view. Earthen berms and tree screening would be especially important along nearby roadways or other visual corridors.

(c) Existing trees shall be retained to the extent feasible as a visual screen.

(d) New or expanded landfills shall utilize site buffer areas (to the extent feasible) and shall maximize the use of any natural shielding provided by the relief of site landforms.

(e) Consistent with any required local design review recommendations, construct new and expanded landfills and facility support buildings with appropriate materials, exterior colors, and architectural details compatible with the natural landscape and surrounding development in the project vicinity.

(f) Disturbed areas that are not directly a part of the project shall be revegetated as soon as practicable.

(g) Project lighting equipment shall be of low-profile design, unobtrusive, and consistent with adjacent land uses.

- **Timing of Implementation** - (a) through (e, g) Prior to project approval, prior to project construction; (f) Ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Addition to Mitigation Measure 14-3

(h) Exterior security lighting plans shall be prepared for all new facilities. Designs shall be consistent with County design standards, including exterior lighting that does not glare onto adjacent parcels, and includes motion sensors to minimize light and glare impacts on surrounding land uses.

- **Timing of Implementation** - (a) Prior to project approval, prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Addition to Mitigation Measure 14-3

(i) Visual analysis of the Central Landfill expansion, or a new landfill site, shall include photo simulation, three-dimensional-terrain modeling, or similar methods to evaluate potential change in visual character as seen from nearby public roads.

- **Timing of Implementation** - (i) Prior to project approval.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Revised Mitigation Measure 14-4

On-site Mitigation:

(a) Litter shall be controlled by a litter abatement program.

(b) Litter fences shall be established around active landfill areas to prevent litter from blowing onto off-site areas.

(c) Litter along on-site roads shall be routinely collected and removed.

Offsite Mitigation:

(d) Litter shall be controlled with a litter abatement program on nearby roads which provides access to new or expanded disposal facilities.

(e) Open cargo areas of vehicles (e.g, pick-ups, trucks, trailers, etc.) hauling waste shall be covered. This requirement will be enforced with financial penalties levied at the time of delivery to County Disposal Sites and by the CHP in the areas near disposal sites.

- **Timing of Implementation** - (a) through (e) Ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Local Enforcement Agency, (e) California Highway Patrol.

Addition to Mitigation Measure 14-4

(f) Roadsides adjacent to landfill sites shall be cleaned each day that the landfill is open. Signs will be posted on roadways adjacent to the landfill site that will provide a phone number that people may call to report vehicles that are seen littering on the way to or from the landfill. The County, or its designee, will, to the extent feasible, identify offending haulers and request that corrective action be taken.

(g) A litter abatement program will be implemented to reduce litter accumulation resulting from the activities of commercial refuse haulers. The program could include, but not be limited to, 1) education of commercial refuse haulers, and 2) requirements for thorough cleaning of debris boxes, covering emptied containers or other similar measures to reduce litter created upon exiting the Central Disposal Site or any new landfill.

- **Timing of Implementation** - (f), (g) Ongoing.

- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Local Enforcement Agency.

POPULATION & HOUSING, PUBLIC SERVICES, RECREATION, &UTILITIES

Revised Mitigation Measure 15-1

(a) For each facility and for the applicable CoIWMP programs, a Fire Prevention Program shall be developed and implemented (in consultation with the Fire Marshal). This program shall detail both structural fire suppression mechanisms in the design of the facilities, such as fire sprinkler systems in facility buildings, as well as procedural programs for minimizing fire hazards.

(b) For each facility that handles hazardous materials and for the applicable CoIWMP programs, a Hazardous Materials Inventory and Emergency Response Plan shall be prepared and implemented (in consultation with the appropriate local agency).

(c) Private project sponsors shall pay development impact fees to cover the cost of additional fire protection services, if necessary.

- **Timing of Implementation** - (a), (b), (c) Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Mitigation Measure 15-2

(a) For each new and expanded solid waste disposal facility, a Fire Prevention program shall be developed and implemented (in consultation with the Fire Marshal). This program shall entail both structural fire suppression mechanisms in the design of the facilities, such as fire sprinkler systems in facility buildings, as well as procedural programs for minimizing fire hazards.

(b) Private project sponsors shall pay development impact fees to cover the cost of additional fire protection services, if necessary.

- **Timing of Implementation** - (a), (b) Prior to project construction.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency.

Mitigation Measure 15-4

Any projects which involve discharge to waterways or stormwater runoff shall comply with the permitting provisions of the applicable Regional Water Quality Control Board.

- **Timing of Implementation** - Prior to project construction, during project construction, ongoing.
- **Implementation** - Lead Agency.
- **Monitoring** - Lead Agency, Regional Water Quality Control Board.

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EXHIBIT E

STATEMENT OF OVERRIDING CONSIDERATIONS FOR THE 2003 CoIWMP FINAL SUPPLEMENTAL PROGRAM ENVIRONMENTAL IMPACT REPORT

Pursuant to California Public Resources Code § 21081, subd. (b); and § 15093, et.seq. of Title 14, Chapter 3, of the California Code of Regulations (State CEQA Guidelines, as amended December 1, 2002), the SCWMA issues the following Statement of Overriding Considerations:

The adopted 1996 CoIWMP has been updated as the proposed 2003 CoIWMP in accordance with the California Integrated Waste Management Act of 1989 (AB 939). A Final Supplemental Program Environmental Impact Report (Final SPEIR) was prepared on the proposed 2003 CoIWMP in accordance with CEQA Guidelines. The proposed 2003 CoIWMP will have certain potentially significant adverse impacts which are identified in the proposed project's Final SPEIR. These significant impacts will not be reduced to insignificant levels with the implementation of the mitigation measures proposed in the Final SPEIR; namely in the areas of land use, soils and agricultural resources, hydrology and water quality, public safety, transportation, air quality, noise, vegetation and wildlife, and visual resources. Therefore, the SCWMA must issue a Statement of Overriding Considerations.

The SCWMA has carefully considered the proposed 2003 CoIWMP and the unavoidable significant adverse environmental impacts associated with it, and hereby determines that specific overriding environmental, economic, legal, social, technological, or other benefits of the proposed 2003 CoIWMP outweigh the significant effects on the environment because:

1. The SCWMA believes that the proposed CoIWMP is the best plan available to achieve the 50% waste diversion goal that has been mandated by AB 939. For example, the proposed CoIWMP includes a formal agreement among member jurisdictions to direct the flow of refuse and green waste to solid waste facilities in Sonoma County. This will be necessary to finance the implementation of waste reduction programs, facilities and transfer stations. In addition, the programs and facilities envisioned in the CoIWMP are considered to provide the most efficient and cost-effective means of achieving the AB 939 goals over the long term.

2. While significant unavoidable impacts may result from some of the disposal and non-disposal facilities envisioned in the CoIWMP, these facilities are necessary to protect public health and safety. New solid waste facilities will protect the public from health risks associated with exposure to non-managed solid waste disposal which can result from the lack of disposal sites. These health risks include diseases carried by vectors, such as rats and flies, which are harbored and nourished in uncontrolled garbage piles and the potentially toxic compounds released during open burning of refuse. Lack of sufficient solid waste facilities could result in more frequent illegal dumping and other unhealthy waste management practices. Thus, the proposed 2003 CoIWMP provides greater health protection benefits to the residents in Sonoma County (including the incorporated areas within the County) by providing adequate facilities. By providing convenient and cost-effective alternatives to illegal dumping, the project minimizes the risk of exposing the public to diseases that may otherwise result from the creation of roadside dumps, backyard burning and littering.

3. Impacts from solid waste facilities will be reduced to the extent practicable by the mitigation measures identified in the FSPEIR and by existing State and Federal laws that regulate solid waste facilities. The environmental impacts associated with the new solid waste facilities in the project are minimized as such facilities will allow solid waste in the County to be disposed of in regulatory compliant facilities as opposed to a lack of regulatory-compliant disposal facilities (e.g., illegal dumps, backyard burning, littering) which could result in more significant adverse air, water, soil, health and biological impacts.

4. The proposed CoIWMP will improve the waste diversion program. The long-term social benefits resulting from waste diversion programs include conservation of resources, both natural resources and landfill capacity, strengthening the economic base of the community by maximizing the use of materials, and encouraging local businesses. In particular, the implementation of the non-disposal solid waste facilities described in the project support recycling, composting and waste reduction behavior by the public which in turn provides the following benefits to the community:

i) Conservation of natural resources through the recycling of paper products (e.g., newspaper, corrugated cardboard, office paper, etc.) metal (aluminum, steel, other scrap metal), glass and plastics (thereby conserving non-renewable petroleum products). Additional conservation of resources will result from greater reuse of products before recycling or disposal.

ii) Conservation of energy will result from the recycling of paper, metal, glass, and plastics.

iii) Conservation of landfill capacity is achieved through recycling and reuse of products and materials which would otherwise be discarded. In addition, the reduction of disposable waste will be achieved through the siting of an integrated Resource Management Facility (RMF). A reduction in disposable waste from the implementation of the proposed RMF means that the landfill would last longer and require less long-term landfill capacity, thereby reducing the associated environmental and social impacts of larger landfills. It would also produce methane gas for the production of electricity.

iv) Composting yard debris and other organic wastes create compost, a valuable soil amendment which helps replenish topsoil, and essential element for food production. Yard debris composes part of the waste stream. Diverting this material and converting it to compost as described in the proposed 2003 CoIWMP thereby conserves landfill capacity and at the same time helps create new topsoil.

v) Providing mandatory access to recycling facilities for residential, commercial, industrial, and institutional waste generators.

5. By approving a comprehensive program, rather than incremental projects over time, the SCWMA (in cooperation with the County of Sonoma and the incorporated areas in the County) can plan its solid waste management systems to optimize the use of financial and human resources to achieve or exceed the goals of AB 939.

6. Implementation of the proposed 2003 CoIWMP will ensure that the solid waste infrastructure is in place to accommodate projected new development within the County, thereby

avoiding the numerous and significant negative social, economic, health and environmental impacts which would result from inadequate waste management capacity.

7. The landfill expansion and siting processes identified in the proposed 2003 CoIWMP will enable the SCWMA to maximize the use of existing landfill capacity and infrastructure that meets the stringent local, state, and federal requirements, and provide for future long-term disposal capacity through the possible location of a new disposal site in Sonoma County. For example, the proposed 2003 CoIWMP will provide an expansion of the Central Landfill beyond its current permitted capacity (i.e., beyond the year 2015). This will maximize the return on the public investment in infrastructure at the Central Landfill, thereby reducing the solid waste disposal costs to the public. It will also delay the development of a new landfill and the associated impacts.

The SCWMA has weighed the above benefits of the proposed 2003 CoIWMP against its unavoidable environmental risks and adverse environmental effects identified in the Final SPEIR. The SCWMA hereby finds that the unavoidable impacts have been reduced to the extent practicable by the inclusions of the mitigation measures set forth in Exhibit B, and determines that the benefits described above outweigh that risks and adverse effects and, therefore, determines that these risks and adverse environmental effects are acceptable.

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EXHIBIT F

The Final Supplemental Program EIR was delivered to the SCWMA on September 17, 2003.

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EXHIBIT G

Executive Summary 2003 CoIWMP

Exhibit G of the executed resolution included Chapter 1, Executive Summary, of the 2003 CoIWMP. Chapter 1 is not reproduced in Appendix F to conserve paper. See Chapter 1, Executive Summary, page 1-1, of this document for the complete text of this exhibit.

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This notice was posted on OCT 16 2003
and will remain posted for a period of thirty days
until 11/15/03.

03-1016-1

EEVE T. LEWIS, Co. Clerk
BY C. FARIAS
DEPUTY CLERK

SONOMA COUNTY
Waste Management Agency

$850.00
CO

EXHIBIT H

☐ Office of Planning and Research (OPR)
1400 Tenth Street, Room 121
Sacramento, CA 95814

☑ County Clerk
County of Sonoma

Date Received for Filing and Posting at OPR OCT 16 2003.

Pursuant to Section 21152 of the Public Resources Code, this form constitutes the **Notice of Determination** indicating the action and environmental findings adopted by the Sonoma County Waste Management Agency for the project described below.

Project Title: Sonoma County 2003 Countywide Integrated Waste Management Plan (2003 CoIWMP)
Project Location/Address/APN: County of Sonoma - Countywide
Lead Agency: Sonoma County Waste Management Agency (SCWMA)
Decision Making Body: SCWMA
Date of Approval: October 15, 2003
Project Applicant: SCWMA
State Clearinghouse Number: SCH# 92113072

Project Description: The adopted 1996 CoIWMP has been updated as the draft 2003 CoIWMP in accordance with the California Integrated Waste Management Act of 1989 (AB 939). The draft 2003 CoIWMP proposes to provide: 1) a formal agreement among all cities and the County to direct flow of refuse and green waste solid waste facilities in Sonoma County; 2) mandatory access to recycling facilities for residential, commercial, industrial, and institutional waste generators; 3) an expansion of the Central Landfill beyond its current permitted capacity (i.e., beyond the year 2015); and 4) the siting of an integrated RMF to include organics processing (chemical or biological digestion), green waste composting and landfilling.

This is to advise that the SCWMA has approved the above described project and has made the following determinations:

1. The project will have a significant effect on the environment.
2. A Supplemental Program Environmental Impact Report (SPEIR) was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures were made a condition of approval of the project.
4. A Statement of Overriding Considerations was adopted for this project.

The environmental documents, including responses to comments received and the record of approval, may be examined at the office of the Sonoma County Permit and Resource Management Department, 2550 Ventura Avenue, Santa Rosa, California. For more information, contact Steve Dee at (707) 565-8350.

[redacted]

Sonoma County Waste Management Agency

W# 23037