EBA WASTECHNOLOGIES

CITY OF WINTERS

SOURCE REDUCTION AND RECYCLING ELEMENT

DECEMBER 1992

ENGINEERS & ENVIRONMENTAL CONSULTANTS

CITY OF WINTERS

SOURCE REDUCTION
AND
RECYCLING ELEMENT

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SECTION 1

EXECUTIVE SUMMARY

The Source Reduction and Recycling Element (SRRE) for the City of Winters was developed in accordance with the requirements of the California Integrated Waste Management Act of 1989 (AB 939). The primary purpose of the SRRE is essentially to function as a guide to evaluate source reduction, recycling, and composting alternatives; provide a framework in making program selections; and ultimately provide an integrated waste management plan to reduce solid waste disposal by 25 percent by 1995 and 50 percent by the year 2000.

1.1 SRRE CONTENTS

The development of the SRRE was based on AB 939 regulations and accompanying legislation which define content requirements for each waste management plan. Specific plan components are the following:

- Waste Characterization Component - This component summarizes the larger Solid Waste Generation Study conducted for the entire County of Yolo, identifying waste generation, disposal, and diversion for the City of Winters.

- Source Reduction Component - This component identifies waste reduction programs to assist residential and commercial/industrial waste sectors in reducing the quantity of waste generated.

- Recycling Component - The Recycling Component identifies and evaluates recycling programs targeting the residential and commercial/industrial waste sectors.

- Composting Component - This component evaluates feasible collection and processing alternatives for the diversion of green waste.

- Special Waste Component - The Special Waste Component identifies diversion options for waste types considered to be a "special waste" such as sewage sludge, industrial waste, etc.

- Education and Public Information Component - This component describes educational and promotion efforts designed to facilitate selected waste diversion programs.

- Facility Capacity Component - This component identifies waste disposal facilities utilized by the City and projects future waste capacity needs.

- Funding Component - The Funding Component summarizes program costs during the short-term planning period (1991 through 1995) and identifies funding sources.

- Integration Component - The Integration Component demonstrates how the selected programs will result in a 25 and 50 percent waste reduction.

1.2 WASTE CHARACTERIZATION

The initial stage in the development of the SRRE was a Solid Waste Generation Study conducted in April of 1991. The purpose of this study was to identify the types and quantities of waste materials currently disposed of and diverted from disposal by residential, commercial and industrial waste generators in the City.

The Solid Waste Generation Study (SWGS) indicates that approximately 4,759 tons of waste is currently disposed of in the City on an annual basis. Approximately 42 percent is disposed from residential sources, commercial/industrial sources account for an estimated 28 percent, and self-haul sources dispose of approximately 30 percent of the City's waste stream.

Waste diversion efforts within the City currently divert approximately 18 percent of the waste stream through source reduction, recycling, composting, and transformation activities. Approximately 14 percent of the City's current diversion is the result of inert waste recycling taking place at the Yolo County Central Landfill; however, the California Integrated Waste Management Board may not allow inert waste diversion to be counted towards the City's waste diversion goals. Table 1-1 summarizes waste generation, disposal, and diversion data for the City of Winters in the base year 1990.

Table 1-1
Summary of Solid Waste Disposal, Diversion and Generation Rates in 1990

Waste Type (Major Categories)	Generated (TPY)	Diverted (TPY)	Incinerated (TPY)	Total Disposed (TPY)	Diversion Rate (% of total waste generated)
Paper	1,252.2	85.9	---	1,166.3	1.5
Plastic	345.2	2.3	---	342.9	---
Glass	236.8	72.4	---	164.4	1.2
Metal	228.1	28.0	---	200.1	0.5
Yard Waste	1,264.9	---	---	1,264.9	---
Other Organic Waste	774.6	3.0	107.8	771.6	0.1
Other Non-Organic Waste	1,396.0	861.0	---	535.0	14.6
Special Waste	421.4	---	---	421.4	---
Total	5,919.2	1,052.6	107.8	4,866.6	17.8

1.3 PROGRAMS SELECTED

Waste management program selections by the City are based on the City's desire to provide Winters residents and businesses the opportunity to participate in waste diversion programs on a voluntary basis. Selections are also based on providing the most cost effective programs available to achieve the City's waste diversion goals and to participate in County efforts to provide regional waste management programs. Participation in these programs allows the City to take full advantage of economies of scale in the development of regional processing facilities and to provide consistent waste management programs throughout the County.

The City of Winters has developed an integrated waste management plan that places preferences on source reduction, recycling, and composting programs as management practices for waste generated and disposed of in the jurisdiction. Selected programs provide the means for residential and commercial/industrial waste generators to participate in waste diversion programs through source reduction efforts and material collection programs provided by the City.

The City's solid waste management plan establishes the following programs to meet state mandated diversion goals.

1.3.1 Source Reduction Programs

Source reduction programs selected by the City are designed to reduce the quantity of waste generated and disposed of in the City. Selected programs will also provide examples of source reduction methods to local business through City demonstration programs and model non-procurement and procurement policies. The source reduction programs which have been selected for implementation by the City are summarized below.

Existing Programs

During the short-term planning period the City will devise methods to identify and quantify the levels of diversion taking place through current source reduction activities in the City. The types of source reduction activities currently servicing the City include thrift shops, repair shops, and other similar businesses. The goal of this effort would be to quantify the amounts and types of materials being repaired or otherwise diverted for reuse by Winters residents.

Quantity Based Variable Rates or User Fees

This alternative has been selected as a contingency measure to facilitate diversion programs should the City fall short in meeting its waste diversion goals. A quantity-based variable rate structure would be implemented in the medium-term if the City is not reaching its waste diversion goals.

Surveys

Commercial Waste Audits

The Recycling Coordinator, in conjunction with local business owners, will conduct waste minimization and recycling audits to assist in the development of source reduction and recycling programs at commercial establishments in the City.

Backyard Composting

Backyard composting has been selected for implementation in the short-term planning period to reduce the quantity of yard waste currently disposed. Though yard waste currently collected at curbside is anticipated to be diverted through the County's regional composting facility, City education efforts to promote backyard composting will serve to reduce the quantity of yard waste collected, transported, and composted at the facility.

The County has implemented a differential tipping fee to encourage the source separation of yard waste. Though disposal fees for source separated yard waste will be less than that for normal refuse, City efforts to promote backyard composting will ultimately reduce disposal fees funded through refuse collection rates.

Education Programs

The Recycling Coordinator will develop an education program for both residents and businesses of the City. A school curriculum program will also be developed as part of the Public Education and Information Component.

Awards and Public Recognition Program

This alternative has been selected for implementation in the short-term planning period and will focus on source reduction, recycling, and composting programs developed and maintained through private business efforts. The City will work with the Winters Chamber of Commerce to seek proper venues to call attention to local businesses. Press releases will also be provided to local newspapers to highlight Winters business efforts.

Government Non-Procurement Source Reduction Policies

This alternative has been selected for implementation in the short-term planning period and will target materials in the municipal government waste stream. The primary goal will be to improve efficiency in the use of office paper and other products or materials utilized by the City. Through this alternative the City will provide an example of source reduction policies and efforts to residential and commercial/industrial waste generators.

Government Procurement Policies

During the short-term planning period the City will develop a procurement policy which will consider product durability, recyclability, recycled material content and potential environmental impacts of materials currently utilized in City operations. This procurement policy will also be promoted as an example to local businesses as to how they can reduce the quantity and toxicity of wastes currently disposed.

1.3.2 Recycling Programs

Winters has no formal City sponsored recycling programs operating in the City. Beginning in 1993, the City will establish single-family residential, multi-unit, and commercial/industrial recycling collection programs. In an effort to provide for greater levels of diversion through recycling activities, the City will promote all recycling programs through public education efforts, technical assistance, and participation in regional integrated waste management programs. Summarized below are the recycling programs selected for implementation by the City.

Residential Curbside Collection Program

This alternative has been selected for implementation in the short-term planning period. The program will collect recyclable glass, aluminum, PET and HDPE, and newspaper. Mixed paper will be added in the medium-term. The program will be implemented by the City Department of Public Works.

Multi-Unit Residential Recycling

This alternative has been selected for implementation in the short-term planning period. The program will collect recyclable glass, aluminum, PET and HDPE, and newspaper. Mixed paper will be added in the medium-term. The program will be implemented by the City Department of Public Works. In an effort to facilitate curbside collection of residential dwellings greater than 4 units in size, the City is planning to review building code requirements in the short-term planning period to allow for additional storage space for locating refuse and recyclable material collection containers.

Commercial/Industrial Recycling Collection

This alternative has been selected for implementation in the medium-term planning period. Through this alternative, the City's recycling coordinator will facilitate commercial/industrial waste diversion through program promotion and in-person contact with prospective Winters businesses. The Recycling Coordinator will facilitate the development of company in-house programs; however, site specific program development will ultimately be the responsibility of the hauler.

Commercial/industrial recycling programs will likely target materials with readily available markets. Material types to be targeted will include restaurant and bar glass, cardboard, and high-grade paper. Other materials may be targeted on a site specific basis.

The refuse crew will also be directed to collect restaurant and other food-waste-refuse separately for disposal at YCCL. This will result in a reduction of material contamination in mixed waste loads and will facilitate waste recovery at the County materials recovery facility proposed for the medium-term planning period.

Drop-off/Buy-back Center

This alternative has been selected for implementation in the short-term and will be implemented by a private service provider. Curently, there is an operation at the Town and Country market which will probably remain as the selected site.

Mandatory Recycling Laws

This alternative has been selected for implementation in the medium-term as a short-fall mitigation effort for source separated residential and commercial/industrial collection programs should it become apparent that the City will not meet its AB 939 mandates for the year 2000.

Material Recovery Facility

This alternative has been selected by the City for implementation in the medium-term planning period in a cooperative integrated waste management effort with Yolo County and the Cities of West Sacramento, Woodland, and Winters. Through this alternative, the City of Winters has committed non-source separated commercial/industrial wastes to be diverted to the County materials recovery facility proposed for development in the medium-term planning period.

A feasibility study is scheduled to be undertaken in 1992 by the Yolo County Department of Public Works and Transportation to determine facility parameters, economics, and targeted waste streams for the proposed facility. At this time, policy issues will be developed to determine the County's role in facility ownership, operation, and waste flow controls. Construction of the facility is not expected to take place until 1996. The cost of development, construction, and operation of the facility will be funded through the County Sanitation Enterprise Fund.

Specific waste types to be targeted at the facility will be determined based on available markets, market specifications, and material availability. Tables 1-2 and 1-3 summarize projected waste diversion for the selected recycling programs in the City of Winters.

Table 1-2
Summary of Waste Diversion Through Selected Recycling Alternatives in the Short-Term Planning Period as Measured in Tons Per Year (TPY)

Material	1995 Available Tonnage (TPY)	Amount Diverted Through Programs					Total Diverted (TPY)
		Curbside	Multi-Family	Commercial/ Industrial	Drop-off/ Buy-back	Mixed Waste MRF	
Newspaper	296	73	7	24	8	–	112
Cardboard	357	–	–	98	16	–	114
High Grade	53	–	–	–	2	–	2
Mixed Paper	455	–	7	–	24	–	31
HDPE, PET	62	16	1	5	3	–	25
Plastic Film	227	–	–	–	–	–	–
Glass	320	98	5	16	8	–	127
Aluminum cans	48	3	–	2	–	–	5
Bi-metal/tin cans	93	65	3	4	4	–	76
Ferrous metals	111	–	–	–	–	–	–
Non-ferrous metals	47	–	–	–	–	–	–
Total (TPY)	2,069	255	23	149	65	–	492
Total Waste Stream Diversion (%)	–	3.2	.3	1.8	.8	–	6.1

* Total waste stream generation projected for 1995 is approximately 8,136 TPY.

Table 1-3
Summary of Waste Diversion Through Selected Recycling Alternatives in the Medium-Term Planning Period as Measured in Tons Per Year (TPY)

Material	2000 Available Tonnage (TPY)	Amount Diverted Through Programs					Total Diverted (TPY)
		Curbside	Multi-Family	Commercial/ Industrial	Drop-off/ Buy-back	Mixed Waste MRF	
Newspaper	427	141	23	59	23	96	342
Cardboard	514	–	–	211	47	153	411
High Grade	76	–	–	35	7	19	61
Mixed Paper	656	235	23	199	70	–	527
HDPE, PET	88	35	4	9	7	16	71
Plastic Film	326	–	–	–	–	196	196
Glass	462	188	16	23	23	120	370
Aluminum cans	69	4	1	4	–	46	55
Bi-metal/tin cans	134	94	6	12	11	–	123
Ferrous metals	161	–	–	–	–	129	129
Non-ferrous metals	66	–	–	–	–	53	53
Total (TPY)	2,979	697	73	552	188	828	2338
Total Waste Stream Diversion (%)	–	5.9	.6	4.7	1.6	7.1	19.9

* Total waste stream generation projected for 2000 is approximately 11,732 TPY.

1.3.3 Composting Programs

The City of Winters does not have a composting program for yard waste; however, the City does have a very successful source separated yard waste collection program for all single family and several multi-family dwellings in the City. In conjunction with the residential collection program, the City will also provide for the collection of yard waste generated from the commercial/industrial waste sectors. The City will support and participate in the County's regional composting program to take advantage of economies of scale and to provide for regional compost marketing efforts. These programs are briefly summarized below.

Continue Existing Curbside

The City currently offers separate residential curbside collection of yard waste. The collection program targets leaves, grass, and tree and shrub prunings generated by residents of single family and several multi-family dwellings in the City. Yard waste is accumulated into piles on the street and collected weekly by using a claw-equipped front loader and a packer truck with follow-up street sweeping. The material collected is currently disposed of at the YCCL, but will be diverted to the composting facility scheduled to open at YCCL in the short-term. This program has been very successful in the collection of yard waste and will continue through the short and medium-term planning periods. The program is funded through refuse collection fees.

Provide Commercial/Industrial Collection

In an effort to maximize the quantity of waste diverted and to provide commercial/industrial businesses the opportunity to participate in yard waste diversion programs, the City has selected a source separated yard waste collection program for the commercial/industrial waste sectors. Bins, or a street pick-up service similar to the residential program, will be provided for specified businesses in the City which generate significant quantities of yard waste for diversion. The bins will be serviced on a weekly basis by the Department of Public Works and brought to the YCCL composting facility. Funding for this service will be provided through the commercial/industrial refuse collection fees.

Centralized Regional Composting Site

Through this alternative, the City will divert source separated collected yard waste to a regional composting facility at YCCL. This alternative will be implemented in the short-term planning period due to the lower costs associated with the expansion of the existing YCCL composting operation. This existing operation provides the City the opportunity to achieve maximum diversion levels and also the ability to participate in cooperative regional marketing efforts. Expansion of the existing facility is delayed pending release of the final state regulations governing composting facilities. Yard waste is currently mulched and used as an alternative daily cover at the YCCL. Yard waste composting for the City is expected to commence in 1993. Tables 1-4 and 1-5 summarize projected waste diversion for the selected composting programs in the City of Winters.

Table 1-4
Summary of Waste Diversion Through Selected Composting Alternatives in the Short-Term Planning Period as Measured in Tons Per Year (TPY)

Material	1995 Available Tonnage (TPY)	Amount Diverted Through Programs				Total Diverted (TPY)
		Residential Curbside Collection	Commercial/ Industrial Collection	Regional Composting Facility	Windrow Processing	
Yard waste	1,739	1,082	33	–	–	1,115
Total (TPY)	1,739	1,082	33	–	–	1,115
Total Waste Stream Diversion (%)	–	13.3	.4	–	–	13.7

* Total waste stream generation projected for 1995 is approximately 8,136 TPY.

Table 1-5
Summary of Waste Diversion Through Selected Composting Alternatives in the Medium-Term Planning Period as Measured in Tons Per Year (TPY)

Material	2000 Available Tonnage (TPY)	Amount Diverted Through Programs				Total Diverted (TPY)
		Residential Curbside Collection	Commercial/ Industrial Collection	Regional Composting Facility	Windrow Processing	
Yard waste	2,505	1,560	47	–	–	1,607
Total (TPY)	2,505	1,560	47	–	–	1,607
Total Waste Stream Diversion (%)	–	13.3	.4	–	–	13.7

* Total waste stream generation projected for 2000 is approximately 11,732 TPY.

1.3.4 Special Waste Programs

In keeping with the City's policy to participate in regional County integrated waste management programs, the City will participate in the County's Self-Haul Bin Transfer Operations as well as support County efforts to promote and/or require that asphalt, concrete, and inert solids be source separated prior to disposal at YCCL. These programs are briefly described below.

Self-Haul Bin Transfer Operations

The YCCL is currently in the process of developing a "Self-Haul Bin Transfer Operation" recovering white goods, wood waste, yard waste and other materials in sufficient quantity to target for diversion. The operation is scheduled to commence during the 4th quarter of 1992, but has been delayed due to fiscal constraints. Through this alternative the City will promote the use of this facility and encourage residents of Winters to divert white goods and other wastes not targeted through current diversion programs to this recovery operation.

Concrete, Asphalt, and Inert Solids Recycling

Through this alternative the City will promote the source separation of inert wastes through public education efforts. Promotions may be in the form of brochures or in-person contact targeting construction/demolition companies doing work in the City of Winters. The City will also support County efforts in the development of an ordinance to mandate source separation of inert and other wastes. The City will also assist the County in regional market development efforts and will consider revising current City construction specifications requiring percentages of recovered asphalt/concrete materials for new construction.

Tables 1-6 and 1-7 summarize projected waste diversion for the selected special wasate programs in the City of Winters.

Table 1-6
Projected Amounts of Materials to be Diverted by Special Waste Programs in the Short-Term Planning Period

Waste Type	1995 Available Tonnage (TPY)	Amount Diverted Through Programs		Total Diverted (TPY)
		Self-Haul Bin Transfer Operation (TPY)	Concrete, Asphalt, and Inert Solids Recycling (TPY)	
Cardboard	17	14	---	14
Ferrous metals	40	32	---	32
White goods	14	14	---	14
Bulky waste	20	16	---	16
Grass & leaves	14	11	---	11
Prunings	30	24	---	24
Tires	18	14	---	14
Wood	361	289	---	289
Asphalt	78	---	55	55
Concrete	13	---	9	9
Inert solids	1,417	---	992	992
Total (TPY)	2,022	414	1,006	1,470
Total Waste Stream Diversion (%)	---	5.0	12.4	17.4

* Total waste stream generation projected for 1995 is approximately 8,136 tons.

Table 1-7
Projected Amounts of Materials to be Diverted by Special Waste Programs in the Medium-Term Planning Period

Waste Type	2000 Available Tonnage (TPY)	Amount Diverted Through Programs		Total Diverted (TPY)
		Self-Haul Bin Transfer Operation (TPY)	Concrete, Asphalt, and Inert Solids Recycling (TPY)	
Cardboard	25	20	---	20
Ferrous metals	57	66	---	66
White goods	20	20	---	20
Bulky waste	29	23	---	23
Grass & leaves	20	16	---	16
Prunings	44	35	---	35
Tires	25	20	---	20
Wood	521	417	---	417
Asphalt	112		78	78
Concrete	18		13	13
Inert solids	2,043		1,430	1,430
Total (TPY)	2,914	617	1,521	2,138
Total Waste Stream Diversion (%)	---	5.3	12.9	18.2

* Total waste stream generation projected for 2000 is approximately 11,732 tons.

1.3.5 Education and Public Information Programs

To facilitate the selected waste management programs, the City has identified the following education and public information efforts to maximize levels of waste diversion. The combined focus of these programs will target all waste generators in the City. These programs are briefly summarized below.

City Recycling Coordinator

In order to ensure continuity in public education and promotion from the City, the City will hire a Recycling Coordinator to work with the public, the County, and neighboring jurisdictions. The position will be part-time in the short-term and may become full-time or three-quarter-time in the medium-term.

Source Reduction Programs

Source reduction programs are a critical part of all integrated solid waste management techniques. Source reduction is the phrase applied to those procedures which prevent goods and materials from entering the waste stream. Simply put, if there is no waste generated, then there is no waste to manage, thus eliminating the necessity of identifying recycling, reuse or disposal options for materials. Source reduction is perhaps the component most directly dependent upon, and effected by, education and public information programs. However, source reduction requires long-term changes in consumer habits and product purchasing patterns; therefore, an immediate impact on waste generation may not be expected.

Residential Sector Promotional Campaign

Residential instruction/information brochures will be developed stressing source reduction, recycling, composting, and other waste diversion programs taking place in the City. They will be distributed to every applicable residence and utilized at community events to promote City programs. These brochures will also serve as handouts at presentations to service clubs and civic organizations prior to and after the recycling programs are implemented.

School Curriculum

In cooperation with the Winters Unified School District, the City will assist in the implementation of specific educational programs for all elementary (K-6) and secondary grades. Although packaged programs are available from the CIWMB and other sources, materials may be adapted to focus on Winter's specific recycling programs. The City Recycling Coordinator and school district officials will seek a co-sponsor to participate with the City and/or School District by purchasing and/or offsetting some of the expenses associated with this program.

Commercial/Industrial Programs

As part of the expanded commercial/industrial recycling program, the City Recycling Coordinator will assist the Department of Public Works and local businesses in the design, development, and implementation of the specific business recycling programs in the City. As individual programs are developed, the City will provide back-up support in the form of source reduction and recycling information materials and suggested implementation plans. The City, in cooperation with the Winters Chamber of Commerce or other business organizations, will also establish recycling and source reduction recognition events. A full spectrum of awards can be presented to those firms establishing recycling and source reduction programs with special acknowledgements going to major diversion efforts or other significant achievements.

School Tours and Community Events

In cooperation with the Yolo County Department of Public Works, tours will be arranged to provide students the opportunity to visit the YCCL and other local material processing facilities. Additional student tours may also be arranged with local businesses and institutions which have special recycling programs or process recycled materials.

The City will also take part in promoting diversion programs at community events and other local activities such as the County Fair and Youth Day. In most cases promotional information will be offered to attendees.

Media Advertising & Releases

The City will advertise in the Winters Express to show the progress and success of the various recycling and source reduction programs. A quarterly update report on waste diversion activities will be made available to local newspapers to increase awareness of recycling programs and the City's progress towards meeting diversion goals.

In addition to the paid advertising campaign, the City will produce and transmit appropriate releases to all media throughout the Winters area regarding the various aspects of the recycling and source reduction programs. These releases will be targeted towards new programs and to serve as reminders on how to participate in ongoing waste diversion alternatives.

Table 1-8
Education and Public Information Implementation Schedule

Alternative	Responsible Entity	Tasks	Start Date	Completion Date
Recycling Coordinator	Dept. of Public Works/Recycling Coordinator	• Write job description • Interview • Hire	1/93	Ongoing
Source Reduction Programs	Dept. of Public Works/Recycling Coordinator	• Develop promotional materials	10/93	Ongoing
Residential Sector Promotional Campaign	Dept. of Public Works/Recycling Coordinator	• Develop promotional materials for all programs targeting the residential sector	9/93	Ongoing
School Curriculum	Dept. of Public Works/Recycling Coordinator	• Meet w/schools • Purchase and deliver materials	9/93	12/93
Commercial/Industrial Business Programs	Dept. of Public Works/Recycling Coordinator	• Develop promotional materials • Develop and plan annual awards event as part of the business recognition program	7/93	Ongoing
Community Events	Dept. of Public Works/Recycling Coordinator	• Develop promotional materials • Prepare display • Participate in events	7/93	Ongoing
Media Advertising and Releases	Dept. of Public Works/Recycling Coordinator	• Develop ads • Schedule & buy media time or space	7/93	Ongoing

* Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.)

1.4 FACILITY CAPACITY

This component addresses the City's future landfill needs, quantifying the current capacity and rate of use. The City of Winters currently exports one hundred percent of its undiverted waste to the Yolo County Central Landfill in the unincorporated County. Because the City of Winters does not have a formal export agreement with the County of Yolo for waste disposal at the Yolo County Central Landfill, Table 1-9 below indicates that the City needs additional waste disposal capacity. In reality, the City will continue to dispose of its refuse at the Yolo County Central Landfill, which has ample capacity for well beyond the 15 years projected waste disposal in this component, and will, if necessary, sign an export agreement with the County. Once this agreement is signed, the City will have ample available landfill capacity. Please see page 9-4 of the Facility Capacity Component for heading definitions

Table 1-9
Additional Capacity Requirements for the City of Winters

Year	AC (yd)[1]	AC (TPY)	G[2] (TPY)	I (TPY)	D (%)	D[3] (TPY)	TC (TPY)	LF (TPY)	E (TPY)
1990	10,119	4,865	5,919	0	17.8	1,054	0	0	0
1991	10,785	5,185	6,308	0	17.8	1,123	0	0	0
1992	11,494	5,526	6,723	0	17.8	1,197	0	0	0
1993	11,174	5,372	7,165	0	25.03	1,793	0	0	0
1994	10,727	5,157	7,636	0	32.46	2,479	0	0	0
1995	10,038	4,826	8,138	0	40.7	3,312	0	0	0
1996	10,344	4,973	8,756	0	43.2	3,783	0	0	0
1997	10,620	5,106	9,420	0	45.8	4,314	0	0	0
1998	10,899	5,240	10,135	0	48.3	4,895	0	0	0
1999	11,161	5,366	10,905	0	50.8	5,539	0	0	0
2000	11,396	5,479	11,732	0	53.3	6,253	0	0	0
2001	12,262	5,895	12,623	0	53.3	6,728	0	0	0
2002	13,191	6,342	13,581	0	53.3	7,239	0	0	0
2003	14,194	6,824	14,612	0	53.3	7,788	0	0	0
2004	15,271	7,342	15,721	0	53.3	8,379	0	0	0
2005	16,430	7,899	16,914	0	53.3	9,015	0	0	0
Total	190,105	91,397	166,288	0	—	74,891	0	0	0

1.5 PROGRAM FUNDING

The City of Winters currently operates all municipal refuse collection services, including the separate collection of residential yard waste at curbside, street sweeping, and other collection services in the City. These services are funded through refuse service fees which are adjusted annually based on the annual percentage increases in the Consumer Price Index (CPI). In the event that increases in landfill disposal fees exceed the CPI, service rates are adjusted by service category based on corresponding waste volume criteria for the incremental disposal cost difference.

Recycling services to be provided by the Department of Public Works include residential curbside and commercial collection programs. The City's integrated waste management plan will be funded through "recycling activity" fees and refuse collection rates. Landfill tipping fees will support countywide programs. Program implementation costs for the City are expected to result from staffing and coordination efforts by City personnel, a feasibility study to evaluate the implementation of a variable refuse collection rate structure, and expenditures for public information and education materials. These expenses will be funded through the City's recycling activities fees and are summarized in Table 1-10.

Table 1-10
Summary of Estimated Program Costs for All Components

Component	1991	1992	1993	1994	1995	1996
Source Reduction	---	---	$13,380	$11,240	$11,240	$11,240
Recycling	---	---	$154,900 + operating costs	$3,200 + operating costs	$3,200 + operating costs	$135,000 + operating costs
Composting	---	$60,600	$127,525 + operating costs	$123,525 + operating costs	$123,525 + operating costs	$123,525 + operating costs
Special Wastes	---	---	$3,600	$1,200	$1,200	$1,200
Education and Public Information	---	---	$50,500 - $72,500	$42,000 - $64,000	$42,000 - $64,000	$42,000 - $64,000
Total Cost	---	$60,600	$349,905 - $371,905 + operating costs	$181,165 - $203,165 + operating costs	$181,165 - $203,165 + operating costs	$312,965 - $334,965 + operating costs

Development of regional processing facilities will be funded by the Yolo County Department of Public Works and Transportation through the County Sanitation Enterprise Fund (CSEF). County refuse disposal fees will be adjusted accordingly to increase revenues to the fund. The County will also consider bond issuance as a means of financing recovery facilities should there be a shortfall in funds.

1.6 INTEGRATION COMPONENT

Table 1-11 illustrates how each program contributes to meet the City's waste diversion goals in the short and medium-term planning periods. Diversion estimates for most source reduction programs have not been provided due to the difficulty in quantifying diversion levels for each individual program.

Table 1-11
Cumulative Diversion Rates For All Programs

Programs	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Source Reduction										
Existing Programs	—	—	—	—	—	—	—	—	—	—
Quantity-Based Variable Rates	—	—	—	—	—	—	—	—	—	—
Commercial Waste Audits	—	—	—	—	—	—	—	—	—	—
Backyard Composting	—	—	.33	.66	1.0	1.1	1.2	1.3	1.4	1.5
Educational Programs	—	—	—	—	—	—	—	—	—	—
Awards and Public Recognition	—	—	—	—	—	—	—	—	—	—
Local Government Non-Procurement Source Reduction Programs	—	—	—	—	—	—	—	—	—	—
Local Government Procurement Programs	—	—	—	—	—	—	—	—	—	—
Recycling										
Residential Curbside Recycling	—	—	1.6	3.2	3.2	3.7	4.2	4.7	5.2	5.9
Multi-Unit Residential Recycling	—	—	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.6
Commercial/Industrial Recycling	—	—	0.7	1.4	1.8	2.4	3.0	3.6	4.2	4.7
Drop-off/Buy-back Recycling	—	—	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.6
Mandatory Recycling Laws	—	—	—	—	—	—	—	—	—	—
Automated Material Recovery Facility	—	—	—	—	2.5	3.4	4.3	5.2	6.1	7.1
Composting										
Residential Curbside Collection of Yard Waste	—	—	12.5	13.0	13.3	13.3	13.3	13.3	13.3	13.3
Commercial Collection of Yard Waste	—	—	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Regional Composting Facility	—	—	—	—	—	—	—	—	—	—
Special Waste										
Self-Haul Bin Transfer Operation	—	—	3.0	4.0	5.0	5.0	5.1	5.1	5.2	5.3
Concrete, Asphalt, and Inerts Solids Recycling	—	—	6.0	9.0	12.4	12.5	12.6	12.7	12.8	12.9
Total	17.8*	17.8*	25.03	32.46	40.7	43.2	45.8	48.3	50.8	53.3

* Existing diversion as measured in the Waste Generation Study conducted in 1991, and assumed constant for 1992.

SECTION 2

AB 939 OVERVIEW

The amount of solid waste generated in California, coupled with diminishing landfill space and potential adverse environmental impacts from landfilling, created an urgent need for state and local agencies to enact and implement an aggressive new integrated waste management program called Assembly Bill 939 (AB 939), the California Integrated Waste Management Act of 1989. The goals of AB 939 are to:

- Specify the responsibilities of local governments to develop and implement integrated waste management programs.
- Maximize the use of all feasible source reduction, recycling, and composting options in order to reduce the amount of solid waste that must be disposed of by transformation and land disposal.
- Improve regulation of existing solid waste landfills.
- Ensure that new solid waste landfills are environmentally sound.
- Streamline permitting procedures for solid waste management facilities.

2.1. GOALS AND OBJECTIVES

It is the goal of this plan to:

- Reduce the amount of waste going to landfill by 25 percent by 1995.
- Reduce the amount of waste going to landfill by 50 percent by 2000.

2.2 REQUIREMENTS

AB 939 requires both city and county governments to develop and implement solid waste management plans covering a 15-year projected period (through 2005). AB 939 also establishes both guidelines and deadlines for the required documents.

AB 939 outlines the requirements for each incorporated city and the county unincorporated area to develop a Source Reduction and Recycling Element (SRRE) providing programs to potentially divert 25 percent of all solid waste from landfill disposal and transformation by 1995 and a total of 50 percent by the year 2000. This SRRE utilizes the information from the county-wide Waste

Generation Study as the basis for solid waste projections.

In addition, each county is required to develop a county-wide Integrated Waste Management Plan (IWMP) which outlines the solid waste management plans for each of its jurisdictions (the incorporated cities and the county unincorporated area). Upon receipt of all SRREs from the jurisdictions, the county will evaluate the disposal capacities and disposal needs of the jurisdictions and conduct a Siting Element study to plan either expansion and/or new locations of landfills for the solid waste generated in the next 15 years (through 2005). The Siting Element and the individual SRREs are then integrated by the County to develop the County Integrated Waste Management Plan (IWMP). The IWMP is due on January 1; the year - 1992, 1993, or 1994 - depending on the current landfill capacity. The IWMP for Yolo County is due on January 1, 1994.

2.3 APPROVAL PROCESS

The process by which the Source Reduction Recycling Element is approved by the local jurisdiction ensures opportunity for public comment. Approval of the preliminary draft by the jurisdiction must be at a public hearing that is advertised in the local paper at least thirty days in advance of the hearing. The approved Preliminary Draft Source Reduction Recycling Element is then circulated for a review period of 45 days to the State, County Local Task Force (LTF), and neighboring jurisdictions.

Following the comment period for the preliminary draft element, the final draft element is then prepared which addresses all comments received. This draft is then circulated for a 15 day period for review and comment by the LTF. A public hearing must also be advertised at least 30 days in advance of the date at which time the local jurisdiction will approve the final draft element with changes per the comments received.

After each jurisdiction has approved and submitted their Source Reduction Recycling Element to the County, the County Board of Supervisors must hold a public hearing to approve the Integrated Waste Management Plan for the County. This document incorporates all the local jurisdictions' elements with the County's plan for the unincorporated area. When approved, it is submitted to the State of California Integrated Waste Management Board for approval.

The California Integrated Waste Management Board will review each city and the county's plan for the unincorporated area. The California Integrated Waste Management Board has 120 days from the date of receipt to approve or disapprove the plans. A notice of disapproval will include specific recommendations for correction.

2.4 ENFORCEMENT

At least every two years the CIWMB will review each city/county SRRE and hold a public hearing in the local agency's jurisdiction (when possible). If the CIWMB determines that the city/county has failed to implement the programs, the Board will issue an order of compliance with specific deadlines.

Should the jurisdiction not meet the 25 percent diversion level by 1995, or the 50 percent requirements by 2000, the CIWMB may levy a $10,000 per day fine on that jurisdiction until compliance is attained.

2.5 REVISION PROCESS

After approval of the Final Source Reduction Recycling Element by both the local jurisdiction and the State Board, the jurisdiction shall monitor the programs to be implemented in the element to document the amount of waste reduced as a result of the element. An annual report summarizing the jurisdiction's progress toward achieving the mandated goals shall be submitted to the State Board. This report shall serve as the basis for determining if revisions to the adopted element are necessary.

The annual report shall be submitted within 90 days of the anniversary date the Board approved the element. The contents of the annual report shall be based on data gathered during the year following the SRRE's adoption, or the most recent revision by the Board.

If, in the process of implementing the adopted Source Reduction Recycling Element the jurisdiction finds it necessary to revise the element, this may be done during or prior to the annual review of the SRRE. All revisions to the adopted SRRE must be submitted to the State Board for approval. Requests for revisions must address the reasons for the revisions. These may include:

- Monitoring of programs finds targeted materials are not being diverted from the waste in the quantities originally projected.
- Demographics of jurisdiction have changed, altering the waste stream.
- Data base used for adopted SRRE is found to be inaccurate.
- Implementation of programs/facilities cited in SRRE are delayed due to permitting, and/or funding.

Revisions to the adopted SRRE must be approved by the same process as adoption of the SRRE, as described in Section 2.3, Approval Process, above.

SECTION 3

WASTE CHARACTERIZATION COMPONENT

As specified in Section 18722(a) of the California Code of Regulations (CCR), each jurisdiction must prepare an initial Solid Waste Generation Study which provides data to allow a jurisdiction to fully understand, in quantifiable terms, its current solid waste disposal and diversion practices, as well as forecast future solid waste generation rates. This information is then used as the basis for planning all future waste handling, disposal and diversion programs and is used throughout this SRRE. This Waste Characterization Component presents the findings of the Solid Waste Generation Study that was performed by EBA Wastechnologies in the Spring and Summer of 1991. The study was completed as a part of a regional study that included the Cities of Davis, Woodland, West Sacramento and Winters, as well as the unincorporated area of Yolo County. The study was performed in accordance with the requirements presented in Section 18724 of the CCR.

The Waste Generation Study characterizes the waste which is generated from residential, commercial, industrial, and other waste sources in the City. Definitions of the source categories are as follows:

- Residential solid waste - waste originating from single-family dwellings.
- Multi-family waste - waste originating from multi-family dwellings including apartments, condominiums, and other residential sources.
- Commercial solid waste - waste originating from retail businesses, offices, warehouses, distribution centers, etc.
- Industrial solid waste - waste originating from manufacturing facilities and construction and demolition companies.

As required by AB 939, the Waste Generation Study includes the following sections:

- Waste Disposal Characterization
- Waste Diversion Characterization
- 15-year Waste Generation Projections

The Waste Disposal Characterization provides estimates of the composition and quantity of solid waste disposed of annually. The quantities of waste disposed are expressed both in terms of weight and landfill in-place volume estimates. Waste disposed from residential, commercial, and industrial sources was characterized through field sampling and visual characterization at the Yolo County Central Landfill during the period of April 1 through April 18, 1991. Wastes

were characterized into 34 waste types and then quantified using records provided by the City Public Works Department, the City's authorized waste hauler.

The Waste Diversion Characterization provides estimates of the composition and quantity of solid waste currently being diverted (recycled, composted, and transformed) from the City. Waste diverted from disposal was quantified through existing waste diversion data and a survey of the City's largest waste generators and recyclers. The quantity of waste which is diverted can be applied to the overall waste diversion goals of 25 and 50 percent. Only those wastes which are normally disposed of at permitted solid waste disposal facilities can be included. Waste diverted to transformation (incineration) facilities is not applicable to the short-term 25 percent goal, but may account for up to 10 percent of the medium-term 50 percent diversion goal.

The 15-year Waste Generation Projection is based on the quantities of waste which are currently disposed of and diverted from the waste stream. This rate of waste generation is then projected for the next 15 years based on available planning data for the City. The waste generation forecast was based upon the extrapolation of present levels of waste generation for a 15-year period using estimates of annual development provided by the City of Winters Public Works Department.

After the programs and forecast diversion in the SRRE have been developed, a second set of revised 15 year projections is presented. The Revised Projections present the forecast diversion and disposal estimates after implementation of the SRRE. These projections are presented in the Integration Component, Section 11 of this SRRE.

3.1 SUMMARY OF EXISTING CONDITIONS

As shown in Table 3-1, the results of the study conclude that the City of Winters generated solid waste at a rate of 5,919.2 tons per year in 1990. Of that amount, approximately 19.6 percent of the material (1,160.4 tons per year) is being recycled, reused, composted, or incinerated into energy. Excluding transformation (incineration) activities, the City diverted approximately 17.8% of the total waste stream. The remaining materials (4,850.6 tons per year) are being landfilled in the Yolo County Central Landfill (YCCL).

Table 3-1.
Summary of Solid Waste Disposal, Diversion and Generation Rates in 1990

Waste Type (Major Categories)	Generated (TPY)	Diverted (TPY)	Incinerated (TPY)	Total Disposed (TPY)	Diversion Rate (% of total waste generated)
Paper	1,252.2	85.9	---	1,166.3	1.5
Plastic	345.2	2.3	---	342.9	---
Glass	236.8	72.4	---	164.4	1.2
Metal	228.1	28.0	---	200.1	0.5
Yard Waste	1,264.9	---	---	1,264.9	---
Other Organic Waste	774.6	3.0	107.8	771.6	0.1
Other Non-Organic Waste	1,396.0	861.0	---	535.0	14.6
Special Waste	421.4	---	---	421.4	---
Total	5,919.2	1,052.6	107.8	4,866.6	17.8

The recycling of inert solids such as concrete and asphalt is included as "Other Non-Organic Waste" in Table 3-1 (representing a 14.6 percent diversion rate). This material is used at the YCCL as wet weather decking. Consideration is currently being given by State Legislature to eliminate these materials from inclusion in the diversion rate calculation. If such a change were to occur, the City's existing diversion rate would be reduced to 3.2 percent. (191.6/5,919.2 TPY)

One other material type that is currently diverted in large amounts is wood waste (included in the "Other Organic Waste" category). Wood waste is a large component of the waste stream that is brought to the landfill. However, the material is not deposited in the landfill as it is processed by Valley By-Products and then sold for fuel, resulting in a 1.7 percent diversion rate. However, this diversion cannot be counted in the base year calculations, or in the short-term. Transformation does count in the medium-term up to 10 percent of the total waste stream. Lastly, approximately 6.0 TPY of tires were incinerated for energy. As mentioned earlier, this type of diversion will not be creditable by the City until the medium term, after 1995.

All totalled, 107.8 TPY (1.8 percent of the generated waste stream) of wastes generated in the City in 1990 were diverted to transformation. Thus, only a 17.8 percent diversion (19.6 - 1.8) is being achieved through the more conventional diversion programs which target materials, such

a paper, aluminum cans, food cans, and plastic. As presented in Table 3-1, significant amounts of these types of materials are still currently being landfilled.

3.2 BACKGROUND INFORMATION

3.2.1. Demographic Profile for Yolo County

The City of Winters is one of four incorporated cities located within Yolo County. The following information was obtained from the Yolo County Population and Housing Estimates published by the California Department of Finance Demographic Research Unit, April 26, 1990. Population and housing estimates for each jurisdiction are summarized in Tables 3-2 and 3-3.

Table 3-2.
Population Characterization By Jurisdiction

Jurisdiction	1980	1990	Percent Change	Annual Growth Rate
Davis	36,640	45,310	23.7	1.53
West Sacramento	---	27,331	---	0.07*
Winters	2,652	4,545	71.4	10.05
Woodland	30,235	39,797	31.6	3.54
Unincorporated Area	43,847	22,193	50.6	- 1.81*
County Total	113,374	139,176	22.8	2.23

* Prior to January 1, 1987, West Sacramento was part of the unincorporated area of Yolo County. This accounts for the small or negative annual growth rates reported.

Table 3-3.
Housing Characteristics by Jurisdiction

Jurisdiction	Single Family	2 to 4 Units	5 Plus Units	Mobile Homes
Davis	9,282	1,752	6,741	373
West Sacramento	6,981	851	2,558	1,555
Winters	1,243	142	195	59
Woodland	9,482	1,010	3,794	649
Unincorporated Area	4,445	366	1,136	375
County Total	31,433	4,121	14,424	3,011

* MFD - Multi-family Dwellings = 10 or more units

3.2.2. Current Waste Handling Practices

The City of Winters currently provides refuse collection services for residential and commercial accounts in the City. Collection services and service fee structures include the following:

- Single-family dwellings are provided with limited can collection service (four 30-gallon cans) on a weekly basis and twice per week during summer months. Residents are charged a monthly fee per dwelling.

- Commercial and multi-family accounts are provided with can or bin collection service as often as necessary or a minimum of once per week. Mobile home parks and MFDs are charged with a single billing for the entire complex based on the number of units in the facility. Commercial billing for can service is based on the actual number of cans picked up as reported by the refuse department. The cost per can decreases with each additional can serviced. The cost for commercial bin service is based on the volume of the bin(s) serviced. The cost per cubic yard decreases with each additional yard of bin capacity.

- Non-containerized waste collection for grass clippings, leaves, and tree and shrub prunings are also provided. The loose yard waste is collected by City vehicles and transported to a roll-off container for disposal. Until recently, this yard waste was stored at the Winters disposal site for composting. Information is not available as to the quantity of yard waste generated.

- City-wide cleanup programs are offered to City residents on an annual basis. Roll-off containers, provided by a private contractor, are located at a central site for the collection of bulky wastes such as furniture, appliances, etc.

A drop-off collection center was located in Winters at the City corporation yard which served the residential and commercial sectors of the City. Materials collected included cardboard, newspaper, PET, glass, and aluminum cans. This operation closed in May of 1991. A new buy-back operation is currently operating at the Town and Country Market on Highway 128.

All disposed refuse is collected and transported to YCCL.

3.2.3 Current Waste Diversion Programs

Waste diversion programs operating in the City include the following:

<u>Certified Buy-back/Drop-off Centers</u>

The State of California certifies and provides oversight of redemption centers which redeem California Redemption Value (CRV) beverage containers. Types of containers which can be redeemed include beverage aluminum or steel cans and glass or plastic bottles containing carbonated soda, mineral water, beer and malt beverages, wine coolers, and distilled spirit coolers. CRV is currently 2.5 cents per container under 32 ounces. These centers are not obligated to accept non-CRV containers or other recyclables. In Winters, the general public can take bottles and cans to the following locations:

<u>Yolo County Central Landfill Drop-Off Recycling Center</u>

The Yolo County Central Landfill (YCCL) is owned and operated by Yolo County and serves all the communities within the County. It is located on County Road 28H east of County Road 104; one mile northeast of Davis. Tipping fees are dependent on size of vehicle and the type of waste. The landfill is open:

Monday - Saturday	6:30 a.m. - 4:00 p.m.
Sunday	9:00 a.m. - 5:00 p.m.

The YCCL is also home to a drop-off recycling center, wood processing facility, and a methane gas collection facility. The YCCL has operated a drop-off recycling center since 1981. Receptacles are available for the following products:

- glass
- aluminum and steel cans; aluminum scrap
- newspaper and white office paper
- automobile batteries and waste oil

- plastic (PET, HDPE, and PVC pipe)
- automobile tires

There is no fee for using the drop-off center except for tires which can cost up to $4 depending on rim size. The Drop-Off Recycling Center is open:

Monday - Saturday	7:00 a.m. - 4:00 p.m.
Sunday	9:00 a.m. - 4:00 p.m.

Wood Recycling Center

Valley By-Products Wood Recycling Center is located one mile from the gate of the YCCL entrance. The center collects clean wood for local biomass power plants.

Acceptable wood waste includes:

- tree and brush prunings, stumps and tree trunks
- wooden boxes and pallets
- clean construction and demolition wood waste
- wood with nails and paint is okay

Unacceptable wood waste includes:

- pressure treated wood
- telephone poles and railroad ties
- leaves, palm fronds and palm trunks

The Wood Recycling Center is open:

Monday - Saturday	7:00 a.m. - 4:00 p.m.
Sunday	9:00 a.m. - 4:00 p.m.

As of January 1, 1992, the standard tipping fee is $8.75 per ton ($5.00 minimum charge). Some materials cost more.

Methane Gas Recovery Facility

In 1988 the YCCL began recovering methane gas to reduce atmospheric emissions and generate electric power. After the gas is compressed and cooled during a cleansing process, it is burned to generate electricity which is then sold to Pacific Gas and Electric to help meet some of the local electricity needs.

Private Sector Recycling

Private sector commercial and industrial recycling has been identified in the City through a recycling survey conducted in conjunction with the SWGS.

3.3 WASTE DISPOSAL CHARACTERIZATION

This section summarizes the project approach and presents the quantity and composition of wastes disposed of from residential, commercial, and industrial waste sources for Winters.

3.3.1 Project Approach

The estimated quantities of waste disposed of from residential, commercial, and industrial waste sources were based on information obtained from the City Refuse Department, field data obtained through sampling, and annual tonnage disposal information obtained from YCCL waste disposal data.

Waste composition for the different waste sources in the City were estimated through a combination of field sampling at the point of generation for residential single-family units and sampling and visual characterization at the point of disposal for commercial, industrial, residential multi-family, and other waste sources.

A summary of the methodology used to estimate the quantity and composition of waste generated and disposed of from Winters is supplied in the Yolo County AB 939 Waste Generation Study, Section 3.

3.3.1.1 Waste Quantity

Sources and methods for estimating the quantity of waste generated from residential, commercial, industrial, and other waste sources are summarized below.

Residential Sources

The quantity of waste disposed of from single-family dwellings (SFD) for the City of Winters was based on estimates derived through field sampling and Yolo County waste disposal data for 1990.

The average waste generation rate for multi-family dwellings in the City of Winters was based on available hauler data for April, 1990. The average disposal rate per single-family home per week was estimated to be 32 pounds.

Commercial, Industrial, and Institutional Sources

The quantity of waste disposed of from commercial, industrial, and institutional sources for the City of Winters was based on available information obtained from the City Refuse Department, and YCCL waste disposal records.

In addition to individual hauler disposal data for each City, the County maintains records of the quantity of waste disposed of from companies that haul their own waste to the landfill. This data is referred to as "nonaccount" waste disposal data. The quantity of waste disposed from nonaccount waste generators was allocated to jurisdictions based on the City where each company is located. County-wide, approximately 20 percent of these companies consist of construction and demolition firms which generated up to 70 percent of the nonaccount waste disposed of during 1990. It is likely that some of the waste generated by these construction/demolition firms did not originate from the jurisdictions they are located in; however, information is not available on its source.

Self-Haul Sources

Approximately 14 percent of the waste disposed of in Winters is from self-haul sources. Self-haul sources consist of individuals who haul their own waste utilizing pick-up trucks, automobiles, and small trailers. A study recently conducted by YCCL estimates the average quantity of waste disposed of per self-haul vehicle to be 644 pounds. During the waste sampling period, approximately 1,500 individuals hauling their own waste to the landfill were surveyed by YCCL personnel to identify the jurisdiction they were from. Based on the above information and the total number of self-haul vehicles which disposed of waste in 1990, the quantity of self-haul waste disposed for the City was estimated.

Estimates of Waste Disposed (by volume)

Estimates of the volume of waste disposed of from Winters were based on an in-place landfill density study recently conducted by the YCCL. Estimates for in-place density were approximately 1,200 pounds per cubic yard. This value was applied to the quantity of waste disposed (by weight) from the City of Winters to arrive at disposed volume estimates.

3.3.1.2 Summary of Waste Composition Sampling Methodology - City of Winters

The number of samples obtained for the City during the field sampling program was based on the following:

- The formula for normal approximation as defined in "Sample Weights in Solid Waste Composition Studies," A. L. Klee and D. Carruth, American Society of Civil Engineers, Journal of the Sanitary Engineering Division, Volume 96, August 1970.

- Quantity and availability of waste disposed of from waste generation sources.

Using the formula for normal approximation, the number of samples to be taken is based on the waste type which is expected to contribute the largest percentage of material to the overall waste composition. Assuming a maximum percentage composition value of 35 percent, what normally would be expected for waste paper, the number of samples necessary for statistically valid sampling with corresponding levels of precision are as follows:

Table 3-4.
Minimum Number of Samples Required to Maintain Statistically Valid Precision Levels

Number of Samples	Precision Level (+/- percent)
19	3
7	5
2	10

3.3.1.3 Number of Samples Taken - City of Winters, 1990

Sources of information and methods for estimating the composition of waste disposed of from residential, commercial, industrial, and other waste sources are summarized below.

<u>Residential Waste Sources</u>

Residential sources of waste generation included single-family and multi-family dwellings for the City:

<u>Single-Family Dwellings Waste Composition</u>

The residential samples collected from the Cities of West Sacramento, Winters, and Woodland (109 samples) were combined for statistical analysis to arrive at an estimate of the percent of Household Hazardous Waste (HHW) generated on a regional basis. This value, 0.7 percent, was then used to estimate the quantity of HHW disposed of from the above jurisdictions. The waste composition for SFDs for each City was readjusted to account for the change in the HHW percent value. Recorded weights for HHW included the weight of the container.

<u>Multi-Family Dwelling Waste Composition</u>

County-wide, a total of 6 samples, averaging 218 pounds, were obtained at the point of disposal (YCCL) from the Cities of Winters and Woodland. These samples were combined for statistical analysis and the composition was considered as being representative for MFDs in the Cities of Winters, Woodland, West Sacramento, and the Unincorporated Area.

Commercial/Industrial/Institutional Waste Sources

A total of 94 samples were obtained from commercial, industrial, and institutional sources. The majority of commercial and industrial samples were selected at random at the point of disposal. Samples from roll-off loads were obtained from sections of the discarded loads identified by the field supervisor to be representative of the load. Samples from front-end refuse collection vehicles were obtained by identifying sections of the load which were representative of the waste source targeted (i.e., residential, commercial or industrial). Samples were manually removed in columns or sections of waste to account for light and heavy fractions.

A commercial sample obtained from the City of Winters contained the equivalent of a whole tire inflating the percentage of waste tires in the commercial waste stream composition. To arrive at an accurate estimate of the quantity of waste tires disposed of, a phone survey was conducted of automotive shops and garages which generate waste tires in Winters. From this information, the quantity of waste tires disposed of annually was estimated.

Self-Haul Waste Sources

A total of 125 self-haul vehicles were visually surveyed at YCCL for white goods, mixed yard waste, bulky wastes, and construction and demolition debris, with the remaining refuse characterized as miscellaneous waste. Field personnel made visual estimates of the volume of the targeted self-haul waste types being discarded. These volume estimates were then converted to weight estimates utilizing "loose" volume/weight conversion factors and then allocated across the jurisdictions, including Winters, based upon population.

Seasonal Variations

Monthly waste disposal rates for the City over the last four years was charted to identify any fluctuations in the waste stream due to seasonal variations.

3.3.2 Finding and Conclusions

Section 3.3.2.1 presents estimates for the composition and quantity of refuse disposed of from the City of Winters. Section 3.3.2.2 presents available seasonal information or monthly variations in waste generation.

3.3.2.1 Waste Disposed

Estimates of the total quantity of waste disposed of by waste source are summarized in Table 3-5.

Table 3-5.
Waste Disposal Summary by Source - City of Winters

Source	Tons per year	Percent
Residential SFD	1,800	37.0
Residential MFD	211	4.3
Commercial	892	18.3
Industrial	392	8.1
Self-haul	683	14.0
Other	889	18.3
Total	4,867	100.0

Residential Waste Sources

The total quantity of waste disposed of by the residential sector is approximately 42 percent of the entire disposed waste stream. Based on Department of Public Works waste disposal data the average household generates approximately 40 pounds of waste per week.

Commercial/Industrial Waste Sources

The total quantity of waste disposed of by the commercial and industrial waste sectors accounts for approximately 18.3 and 8.1 percent of the disposed waste stream respectively. Waste types prevalent in the commercial and industrial waste streams are cardboard, food waste, and wood waste. Industrial waste largely consists of waste disposed of from construction and demolition firms.

Self-haul Waste Sources

Based on the results of the YCCL survey, 4.2 percent of self-haul waste disposed from the County is from the City of Winters. Self-haul wastes account for approximately 14.0 percent of the City's discarded waste stream.

Other Waste Sources

Waste materials identified as Other Wastes for the City of Winters include materials characterized as miscellaneous waste, bulky wastes, and other special wastes.

The tables on the following pages depict the percentages of waste disposed per sector.

Table 3-6
Residential Waste Composition, Single-Family Dwellings - City of Winters
(all values % by weight)

			Min Value	Max Value	Mean	Std Dev	90% Confidence Interval Lower	90% Confidence Interval Upper
PAPER	TOTAL	27.0%						
Newspaper			0.0	53.3	5.1	11.6	1.5	8.5
Corrugated			0.0	14.4	4.5	3.8	3.3	5.7
High-Grade			0.0	1.6	0.3	0.4	0.2	0.5
Mixed			0.0	35.3	9.5	8.7	6.7	12.1
Cont. Paper			0.0	29.9	7.9	6.6	5.8	9.8
PLASTIC	TOTAL	7.7%						
PET			0.0	1.6	0.2	0.4	0.1	0.3
HDPE			0.0	3.8	0.8	1.1	0.4	1.1
Pigmented HDPE			0.0	1.6	0.3	0.4	0.1	0.4
PS			0.0	1.0	0.4	0.3	0.3	0.5
Film			0.0	11.7	2.0	2.3	1.3	2.7
Other Plastic			0.0	19.5	4.2	4.0	2.9	5.4
GLASS	TOTAL	6.8%						
CA redemption			0.0	50.9	2.6	9.2	0.0	5.4
Other recyclable			0.0	38.9	4.1	7.1	1.9	6.3
Non-recyclable			0.0	2.0	0.1	0.4	0.0	0.3
METAL	TOTAL	5.6%						
Aluminum cans			0.0	0.8	0.1	0.2	0.1	0.2
Bi-metal/tin			0.0	8.3	2.8	2.4	2.1	3.5
Ferrous metal			0.0	15.6	1.2	3.3	0.2	2.2
Non-ferrous metal			0.0	29.8	1.4	5.3	0.0	3.0
White goods			0.0	0.0	0.0	0.0	0.0	0.0
YARD WASTE	TOTAL	16.1%						
Grass, leaves			0.0	99.0	9.7	26.2	1.6	17.6
Prunings			0.0	51.6	6.6	14.4	2.1	11.0
OTHER ORGANIC	TOTAL	25.1%						
Food			0.0	39.8	14.9	13.2	10.7	18.7
Tires			0.0	0.0	0.0	0.0	0.0	0.0
Rubber			0.0	2.6	0.3	0.6	0.1	0.5
Wood waste			0.0	6.5	0.8	1.6	0.3	1.2
Wood (press board, etc.)			0.0	22.1	1.8	5.3	0.2	3.4
Ag crop residue			0.0	0.0	0.0	0.0	0.0	0.0
Manure			0.0	48.6	1.9	8.7	0.0	4.5
Disposable diapers			0.0	29.1	3.9	8.2	1.4	6.4
Textiles, leather			0.0	7.6	1.9	2.2	1.2	2.5
OTHER WASTE	TOTAL	10.5%						
Asphalt			0.0	0.0	0.0	0.0	0.0	0.0
Concrete			0.0	7.3	0.5	1.6	0.0	1.0
Inert solids			0.0	37.0	3.9	9.9	0.8	6.9
Composite materials			0.0	14.3	2.0	3.6	0.8	3.1
HHW matl/container			0.0	25.8	0.7	5.2	0.0	2.3
Misc.			0.0	18.3	3.5	3.9	2.3	4.7
SPECIAL WASTE	TOTAL	0.0%						
Ash			0.0	0.0	0.0	0.0	0.0	0.0
Medical waste			0.0	0.0	0.0	0.0	0.0	0.0
Auto shredder			0.0	0.0	0.0	0.0	0.0	0.0
Auto bodies			0.0	0.0	0.0	0.0	0.0	0.0
Bulky waste			0.0	0.0	0.0	0.0	0.0	0.0
Other special			0.0	0.0	0.0	0.0	0.0	0.0
TOTAL					100.0			

	Min Value	Max Value	Mean	Std Dev	90% Confidence Interval Lower	90% Confidence Interval Upper
WASTE DISCARDED PER HOUSEHOLD (LBS/WK)	9.6	135.1	50.3	37.1	38.9	61.6

OF SAMPLES: 29

Table 3-7
Residential Waste Composition, Multi-Family Dwellings - City of Winters, 1990
(all values % by weight)

			Min Value	Max Value	Mean	Std Dev	90% Confidence Interval Lower	90% Confidence Interval Upper
PAPER	TOTAL	42.5%						
Newspaper			0.0	15.6	8.7	6.3	3.8	13.7
Corrugated			3.6	9.3	6.1	2.0	4.4	7.7
High-Grade			0.2	4.3	1.1	1.4	0.0	2.2
Mixed			2.8	12.0	9.6	3.2	7.1	12.1
Cont. Paper			8.0	51.7	17.0	15.6	4.7	29.4
PLASTIC	TOTAL	8.7%						
PET			0.0	0.4	0.2	0.1	0.1	0.3
HDPE			0.0	1.7	0.8	0.6	0.3	1.3
Pigmented HDPE			0.0	1.1	0.6	0.3	0.3	0.8
PS			0.3	1.4	0.6	0.4	0.3	0.9
Film			1.6	8.7	3.4	2.4	1.5	5.3
Other Plastic			1.1	5.2	3.1	1.2	2.2	4.1
GLASS	TOTAL	6.2%						
CA redemption			0.6	4.7	1.6	1.4	0.5	2.7
Other recyclable			0.3	11.7	4.5	3.8	1.5	7.6
Non-recyclable			0.0	0.1	0.0	0.0	0.0	0.0
METAL	TOTAL	4.7%						
Aluminum cans			0.2	0.9	0.5	0.3	0.3	0.7
Bi-metal/tin			0.2	3.6	2.3	1.2	1.4	3.3
Ferrous metal			0.0	6.6	1.6	2.3	0.0	3.4
Non-ferrous metal			0.1	0.8	0.3	0.2	0.1	0.5
White goods			0.0	0.0	0.0	0.0	0.0	0.0
YARD WASTE	TOTAL	3.3%						
Grass, leaves			0.0	0.0	0.0	0.0	0.0	0.0
Prunings			0.0	16.1	3.3	5.9	0.0	8.0
OTHER ORGANIC	TOTAL	24.5%						
Food			5.3	17.0	11.9	3.5	9.1	14.7
Tires			0.0	6.4	1.2	2.3	0.0	3.1
Rubber			0.0	0.2	0.0	0.1	0.0	0.1
Wood waste			0.0	6.7	1.5	2.4	0.0	3.4
Wood (press board, etc.)			0.0	1.1	0.3	0.4	0.0	0.6
Ag crop residue			0.0	0.0	0.0	0.0	0.0	0.0
Manure			0.0	0.1	0.0	0.0	0.0	0.0
Disposable diapers			0.0	11.6	5.0	4.2	1.7	8.4
Textiles, leather			2.3	8.7	4.5	2.1	2.8	6.2
OTHER WASTE	TOTAL	10.0%						
Asphalt			0.0	0.0	0.0	0.0	0.0	0.0
Concrete			0.0	0.0	0.0	0.0	0.0	0.0
Inert solids			0.0	0.8	0.2	0.3	0.0	0.4
Composite materials			0.0	20.0	5.7	6.9	0.2	11.1
HHW matl/container			0.0	0.5	0.1	0.2	0.0	0.2
Misc.			2.5	6.0	4.0	1.1	3.1	4.9
SPECIAL WASTE	TOTAL	0.1%						
Ash			0.0	0.0	0.0	0.0	0.0	0.0
Medical waste			0.0	0.6	0.1	0.2	0.0	0.3
Auto shredder			0.0	0.0	0.0	0.0	0.0	0.0
Auto bodies			0.0	0.0	0.0	0.0	0.0	0.0
Bulky waste			0.0	0.0	0.0	0.0	0.0	0.0
Other special			0.0	0.0	0.0	0.0	0.0	0.0
TOTAL					100.0			

AVERAGE SAMPLE WEIGHT: 217.5 LBS.

NO. OF SAMPLES: 6

Table 3-8
Commercial Waste Composition - City of Winters, 1990
(all values % by weight)

			Min Value	Max Value	Mean	Std Dev	90% Confidence Interval Lower	90% Confidence Interval Upper
PAPER	TOTAL							
Newspaper		49.6%	0.0	9.8	4.4	4.1	1.7	7.2
Corrugated			2.9	13.9	7.9	4.0	5.2	10.5
High-Grade			1.9	4.4	3.1	1.0	2.5	3.8
Mixed			5.1	50.2	14.1	16.1	3.3	25.0
Cont. Paper			10.0	52.8	20.0	14.8	10.1	30.0
PLASTIC	TOTAL	11.6%						
PET			0.0	0.2	0.1	0.1	0.0	0.1
HDPE			0.0	0.7	0.3	0.2	0.1	0.5
Pigmented HDPE			0.0	4.2	0.9	1.5	0.0	1.9
PS			0.0	0.8	0.4	0.3	0.2	0.6
Film			3.9	11.2	6.8	2.2	5.3	8.3
Other Plastic			0.3	6.7	3.2	2.0	1.9	4.6
GLASS	TOTAL	1.1%						
CA redemption			0.0	3.1	0.7	1.1	0.0	1.5
Other recyclable			0.0	1.2	0.3	0.5	0.0	0.6
Non-recyclable			0.0	0.6	0.1	0.2	0.0	0.3
METAL	TOTAL	7.4%						
Aluminum cans			0.0	1.3	0.4	0.4	0.1	0.7
Bi-metal/tin			0.6	2.5	1.2	0.6	0.8	1.7
Ferrous metal			0.0	10.7	5.0	3.5	2.6	7.3
Non-ferrous metal			0.0	2.4	0.8	0.8	0.2	1.3
White goods			0.0	0.0	0.0	0.0	0.0	0.0
YARD WASTE	TOTAL	7.9%						
Grass, leaves			0.0	15.0	6.7	6.2	2.5	10.8
Prunings			0.0	6.3	1.2	2.3	0.0	2.7
OTHER ORGANIC	TOTAL	15.5%						
Food			1.0	7.0	4.3	2.2	2.8	5.7
Tires			0.0	20.7	3.5	7.7	0.0	8.6
Rubber			0.0	2.0	0.8	0.7	0.4	1.3
Wood waste			0.0	9.2	3.3	3.5	1.0	5.7
Wood (press board, etc.)			0.0	1.1	0.2	0.4	0.0	0.5
Ag crop residue			0.0	0.0	0.0	0.0	0.0	0.0
Manure			0.0	0.0	0.0	0.0	0.0	0.0
Disposable diapers			0.0	4.4	1.2	1.6	0.2	2.3
Textiles, leather			0.0	4.6	2.1	1.8	0.9	3.4
OTHER WASTE	TOTAL	6.5%						
Asphalt			0.0	0.0	0.0	0.0	0.0	0.0
Concrete			0.0	0.0	0.0	0.0	0.0	0.0
Inert solids			0.0	4.2	1.5	1.8	0.3	2.7
Composite materials			0.0	3.4	1.3	1.2	0.5	2.1
HHW matl/container			0.0	1.6	0.3	0.6	0.0	0.7
Misc.			0.1	6.7	3.4	2.7	1.6	5.2
SPECIAL WASTE	TOTAL	0.3%						
Ash			0.0	0.0	0.0	0.0	0.0	0.0
Medical waste			0.0	0.0	0.0	0.0	0.0	0.0
Auto shredder			0.0	0.0	0.0	0.0	0.0	0.0
Auto bodies			0.0	0.0	0.0	0.0	0.0	0.0
Bulky waste			0.0	1.8	0.3	0.7	0.0	0.8
Other special			0.0	0.0	0.0	0.0	0.0	0.0
TOTAL					100.0			

AVERAGE SAMPLE WEIGHT: 311.4 LBS

NO. OF SAMPLES: 6

Table 3-9
Industrial Waste Composition - City of Winters, 1990
(all values % by weight)

			Mean
PAPER	TOTAL	44.6%	
Newspaper			2.3
Corrugated			22.9
High-Grade			0.5
Mixed			3.1
Cont. Paper			15.8
PLASTIC	TOTAL	26.5%	
PET			0.3
HDPE			0.4
Pigmented HDPE			1.3
PS			0.5
Film			20.7
Other Plastic			3.3
GLASS	TOTAL	5.6%	
CA redemption			1.7
Other recyclable			4.0
Non-recyclable			0.0
METAL	TOTAL	3.8%	
Aluminum cans			0.0
Bi-metal/tin			0.0
Ferrous metal			3.4
Non-ferrous metal			0.4
White goods			0.0
YARD WASTE	TOTAL	0.0%	
Grass, leaves			0.0
Prunings			0.0
OTHER ORGANIC	TOTAL	14.1%	
Food			3.2
Tires			0.0
Rubber			8.4
Wood waste			2.4
Wood (press board, etc.)			0.0
Ag crop residue			0.0
Manure			0.0
Disposable diapers			0.0
Textiles, leather			0.0
OTHER WASTE	TOTAL	5.4%	
Asphalt			0.0
Concrete			0.0
Inert solids			2.4
Composite materials			0.0
HHW matl/container			0.0
Misc.			3.0
SPECIAL WASTE	TOTAL	0.0%	
Ash			0.0
Medical waste			0.00
Auto shredder			0.0
Auto bodies			0.0
Bulky waste			0.0
Other special			0.00
TOTAL			100.0

WEIGHT OF SAMPLE: 246.2 LBS

NO. OF SAMPLES: 1

Table 3-10
Estimated Waste Disposal Rate by Weight - City of Winters, 1990

WASTE TYPE	RESIDENTIAL S.F.D. (TONS/YEAR)	RESIDENTIAL M.F.D. (TONS/YEAR)	RESIDENTIAL TOTAL (TONS/YEAR)	COMMERCIAL (TONS/YEAR)	INDUSTRIAL (TONS/YEAR)	SELF-HAUL (TONS/YEAR)	OTHER WASTE (TONS/YEAR)	TOTAL WASTE (TONS/YEAR)	PERCENT WASTE (BY WEIGHT)
PAPER									
Newspaper	91	18	109	41	7	0	0	157	3.3
Corrugated	82	13	95	72	66	0	0	233	4.9
High-Grade	8	2	8	29	1	0	0	38	0.8
Mixed	171	20	191	130	9	0	0	330	6.9
Cont. Paper	142	36	178	184	46	0	0	408	8.6
PLASTIC									
PET	4	0	4	1	1	0	0	6	0.1
HDPE	14	2	15	3	1	0	0	19	0.4
Pigmented HDPE	5	1	6	6	4	0	0	16	0.4
PS	7	1	9	4	2	0	0	14	0.3
Film	36	7	43	62	60	0	0	165	3.5
Other Plastic	75	7	82	30	10	0	0	121	2.5
GLASS									
CA redemption	47	3	51	7	5	0	0	62	1.3
Other recyclable	75	10	84	3	12	0	0	98	2.1
Non-recyclable	3	0	3	1	0	0	0	4	0.1
METAL									
Aluminum cans	2	1	3	4	0	0	0	7	0.1
Bi-metal/tin	51	5	56	11	0	0	0	66	1.4
Ferrous metal	22	3	26	46	10	0	0	81	1.7
Non-ferrous metal	25	1	26	7	1	0	0	34	0.7
White goods	0	0	0	0	0	10	0	10	0.2
YARD WASTE									
Grass, leaves	174	0	174	61	0	0	0	236	5.0
Prunings	119	7	126	11	0	0	0	137	2.9
Mixed yard waste	0	0	0	0	0	7	885	892	18.7
OTHER ORGANIC									
Food	267	25	293	39	9	0	0	341	7.2
Tires	0	3	3	0	0	0	4	7	0.1
Rubber	5	0	5	8	24	0	0	37	0.8
Wood waste	14	3	17	31	7	0	0	55	1.1
Wood (press board, etc.)	33	1	33	2	0	0	0	35	0.7
Ag crop residue	0	0	0	0	0	0	0	0	0.0
Manure	33	0	33	0	0	0	0	33	0.7
Disposable diapers	71	11	81	11	0	0	0	93	1.9
Textiles, leather	34	9	43	20	0	0	0	63	1.3
OTHER WASTE									
Asphalt	0	0	0	0	0	0	0	0	0.0
Concrete	9	0	9	0	0	0	0	9	0.2
Inert solids	70	0	70	14	7	0	0	91	1.9
Composite materials	35	12	47	12	0	0	0	59	1.2
HHW matl/container	13	0	13	3	0	0	0	16	0.3
Misc.	64	8	72	31	9	248	0	360	7.6
SPECIAL WASTE									
Ash	0	0	0	0	0	0	0	0	0.0
Medical waste	0	0	0	0	0	0	0	0	0.0
Auto shredder	0	0	0	0	0	0	0	0	0.0
Auto bodies	0	0	0	0	0	0	0	0	0.0
Bulky waste	0	0	0	3	0	12	0	15	0.3
Other special	0	0	0	0	0	0	0	0	0.0
Construction/Demolition	0	0	0	0	0	406	0	406	8.5
TOTAL	1,800	211	2,011	866	290	663	889	4,759	100.0

Table 3-11
Disposal Rate by Volume - City of Winters, 1990
(all figures in cubic yards)

WASTE TYPE	TOTAL WASTE (TONS/YEAR)	VOLUME GENERATED (YD^3/YEAR)	PERCENT BY VOLUME
PAPER			
Newspaper	157	262	3.30
Corrugated	233	388	4.90
High-Grade	38	64	0.80
Mixed	330	550	6.94
Cont. Paper	408	680	8.57
PLASTIC		0	
PET	7	12	0.16
HDPE	19	32	0.40
Pigmented HDPE	18	29	0.37
PS	14	23	0.29
Film	165	276	3.47
Other Plastic	121	202	2.55
GLASS		0	
CA redemption	62	103	1.30
Other recyclable	98	163	2.06
Non-recyclable	4	6	0.08
METAL		0	
Aluminum cans	7	12	0.15
Bi-metal/tin	68	113	1.42
Ferrous metal	81	135	1.70
Non-ferrous metal	34	57	0.72
White goods	10	17	0.21
YARD WASTE		0	
Grass, leaves	236	393	4.95
Prunnings	137	229	2.89
Mixed yard waste	892	1,486	18.74
OTHER ORGANIC		0	
Food	341	568	7.17
Tires	7	11	0.14
Rubber	37	62	0.78
Wood waste	55	91	1.15
Wood (press board, etc.)	35	59	0.74
Ag crop residue	0	0	0.00
Manure	33	56	0.70
Disposable diapers	93	154	1.95
Textiles, leather	63	105	1.32
OTHER WASTE		0	
Asphalt	0	0	0.00
Concrete	9	15	0.19
Inert solids	91	152	1.91
Composite materials	59	99	1.25
HHW matl/container	16	26	0.33
Misc.	360	599	7.56
SPECIAL WASTE		0	
Ash	0	0	0.00
Medical waste	0	0	0.01
Auto shredder	0	0	0.00
Auto bodies	0	0	0.00
Bulky waste	15	25	0.31
Other special	0	0	0.00
Construction/Demolition	406	677	8.54
TOTAL	4,760	7,933	100.0

3.3.2.2 Seasonal Variations

Seasonal variations in monthly refuse disposal quantities were tabulated for each jurisdiction in Yolo County, including Winters. This included waste generated from residential, commercial, and industrial waste sources. This information was used to provide an indication of the variability of the waste stream for the City, and is presented in Section 3.2.6 of the Solid Waste Generation Study.

During the months of March through August, waste disposal was greater than 250 tons per month, with July and August being the peak disposal months. December and February were the months with the lowest disposal rates, accounting for the seasonal change to winter. A sharp spike can be seen in January, accounting for post Christmas disposal of packaging and related items such as Christmas trees. February was the month with the lowest disposal rate, less than 190 tons per month.

3.4 WASTE DIVERSION CHARACTERIZATION

The Waste Diversion Characterization study provides estimates of the composition and quantity of solid waste diverted (recycled, composted, transformed) during the year 1990. The quantity of waste which is diverted is applied to the overall waste diversion goals of 25 and 50 percent. Only those wastes which are normally disposed of at permitted solid waste disposal facilities are included. Waste diverted to transformation (incineration) facilities is not applicable for the short term 25 percent goal, but may account for up to 10 percent of the medium term 50 percent diversion goal.

3.4.1. Project Approach

The quantity of waste diverted through source reduction, recycling, composting, and transformation was estimated through a combination of available waste diversion data and recycling surveys. Recyclable material brokers, certified recycling centers, major employers, grocery operations, diaper services, and tire retailers were surveyed to identify existing waste diversion. The quantity of waste diverted through certified recycling centers was based on information provided by the Department of Conservation - Division of Recycling. Information with respect to City sponsored recycling programs were obtained through formal surveys.

The quantity of wood and yard waste diverted at YCCL was estimated through available tonnage records and a survey of self-haul sources. Clean loads of wood and yard waste delivered to YCCL are currently diverted and processed as wood fuel. The total quantity of waste processed at the facility during 1990 was approximately 7,000 tons. During the period of April 1 through June 1, 1991, YCCL personnel surveyed 478 individuals hauling wood and yard waste to the recovery facility to determine the jurisdiction from which the waste originated.

The quantity of inert waste diverted for landfill construction purposes was estimated through available YCCL tonnage data. The quantity of inert waste allocated to Winters was based on the proportion of Winters' population to the rest of the County.

The quantity of waste diverted by the use of diaper services was estimated through a phone survey of diaper service companies servicing the City. Based on the number of clients per week and the average number of diapers used per client, the quantity of waste diverted through this source reduction activity was estimated.

Estimates of waste diversion for Winters are summarized in Table 3-13. Table 3-16 presents estimates of the total waste generated and percent diverted.

Table 3-13
City of Winters Waste Diversion, 1990

Waste Type	Recycling (Residential) (TPY)	Recycling (Commercial) (TPY)	Transformation (TPY)
Newspaper		58.4	
Cardboard		26.4	
High-grade		0.3	
Mixed Paper		0.8	
PET		2.0	
HDPE		0.3	
CA Glass		52.1	
Other glass		20.3	
Aluminum		28.0	
Food		3.0	
Tires			6.0
Inert waste		861	
Wood waste			101.8
Total		1,052.6	107.8

* not acceptable towards diversion until after 1995

Based upon the information in the Waste Generation Study, the following materials will be targeted for diversion through the programs outlined in this SRRE.

Table 3-14
Waste Types to Be Targeted for Diversion

Waste Type	Example Material
Paper	Old corrugated cardboard (OCC), kraft liner board, mixed paper, newsprint, high-grade paper, and other paper products
Plastics	HDPE, PET, polystyrene, film
Glass	Redeemable beverage, nonredeemable beverage, other recyclable glass
Metals	Bimetal/steel food and beverage cans, aluminum cans, other ferrous, nonferrous and aluminum scrap, appliances/ white goods
Yard waste	Leaves, grass, prunings,
Other organics	Food waste, tires/rubber, wood wastes
Other wastes	Inert solids (rock, concrete, brick, sand, soil, fines, asphalt, sheetrock), household hazardous waste (including waste oil and car batteries)
Special wastes	Used tires, sewage sludge

3.4.3. Waste Types Which Cannot Easily Be Diverted

Not all waste types are easily diverted from the waste stream through source reduction, recycling, or composting programs. Waste types that are particularly difficult to divert are listed in Table 3-15. Each waste material is accompanied by an explanation of why it is currently not feasible to divert that material.

Table 3-15
Waste Types That Are Difficult to Divert

Waste Type	Problem
Textiles/leather	No available markets in the area
Medical waste	Potentially hazardous
Contaminated paper	This material type is not acceptable for recycling
Composite materials	Due to their nature, they are often difficult to recycle
Other plastic	These plastics currently have no market
Non-recyclable glass	This material type is not acceptable for recycling
Disposable diapers	No aftermarket

Table 3-16
Total Waste Generation Summary. City of Winters, 1990

WASTE TYPE	WASTE DISPOSED (TONS/YEAR)	WASTE DIVERTED (TONS/YEAR)	TOTAL GENERATED (TONS/YEAR)	PERCENT DIVERSION
PAPER				
Newspaper	156.9	58.4	215.3	0.99
Corrugated	233.2	26.4	259.6	0.45
High-Grade	38.3	0.3	38.6	0.01
Mixed	330.1	0.8	330.9	0.01
Cont. Paper	407.8	0.0	407.8	0.00
PLASTIC				
PET	5.8	2.0	7.8	0.03
HDPE	19.0	0.3	19.3	0.01
Pigmented HDPE	17.7	0.0	17.7	0.00
PS	13.9	0.0	13.9	0.00
Film	165.3	0.0	165.3	0.00
Other Plastic	121.2	0.0	121.2	0.00
GLASS				
CA redemption	62.4	52.1	114.5	0.88
Other recyclable	98.3	20.3	118.6	0.34
Non-recyclable	3.7	0.0	3.7	0.00
METAL				
Aluminum cans	7.0	28.0	35.0	0.47
Bi-metal/tin	67.6	0.0	67.6	0.00
Ferrous metal	81.0	0.0	81.0	0.00
Non-ferrous metal	34.3	0.0	34.3	0.00
White goods	10.2	0.0	10.2	0.00
YARD WASTE				
Grass, leaves	235.7	0.0	235.7	0.00
Prunings	137.4	0.0	137.4	0.00
Mixed yard waste	891.8	0.0	891.8	0.00
OTHER ORGANIC				
Food	341.1	3.0	344.1	0.05
Tires	12.9	0.0	12.9	0.00
Rubber	37.1	0.0	37.1	0.00
Wood waste	156.5	0.0	156.5	0.00
Wood (press board, etc.)	35.4	0.0	35.4	0.00
Ag crop residue	0.0	0.0	0.0	0.00
Manure	33.3	0.0	33.3	0.00
Disposable diapers	92.6	0.0	92.6	0.00
Textiles, leather	62.7	0.0	62.7	0.00
OTHER WASTE				
Inert solids	100.2	861.0	961.2	14.55
Composite materials	59.3	0.0	59.3	0.00
HHW mat'l/container	15.8	0.0	15.8	0.00
Misc.	359.7	0.0	359.7	0.00
SPECIAL WASTE				
Ash	0.0	0.0	0.0	0.00
Medical waste	0.0	0.0	0.2	0.00
Auto Shredder	0.0	0.0	0.0	0.00
Auto bodies	0.0	0.0	0.0	0.00
Bulky waste	14.8	0.0	14.8	0.00
Other special	0.0	0.0	0.0	0.00
Construction/Demolition	406.4	0.0	406.4	0.00
TOTALS:	4,866.6	1,052.6*	5,919.2	17.8

*Does not include 107.8 TPY of wastes which were diverted to transformation facilities

3.5 FUTURE DATA COLLECTION

The waste reporting system in the City will need to be refined to properly track generation, disposal, and diversion rates. It should be further developed to produce quarterly updates and an annual summary report. This report will summarize all solid waste activities including total waste disposed, total diverted by material type, and by generator (residential, commercial/industrial, or buy-back). This breakout includes materials recovered through recycling activities and yard waste collected and sent to the compost facility for processing. The Department of Public Works will develop a breakdown of waste generation by multi-family and commercial/industrial generators. This should be accomplished during the short-term planning period. Any commercial recycling activity (primarily corrugated cardboard from supermarkets) will be tracked through commercial waste audits and surveys by the City. Activity by the buy-back operating in the City is recorded by the Department of Conservation. This information will be requested annually by the City beginning in the short-term planning period. Summary reports of disposal and diversion activities originating from Winters at the Yolo County Central Landfill will be provided to the City by the County. Lastly, the City will attempt to track diversion activities from backyard composters via composting workshops and an annual survey of workshop participants.

3.6 WASTE GENERATION PROJECTIONS

The waste generation projections are based on population growth and estimates of tons of waste generated per capita. Waste generated per capita includes waste disposed of and diverted by residential, commercial, industrial, and other waste sources.

Projections for population growth were provided by City and County Planning Departments and are summarized in Table 3-17. The quantity of waste generated per person annually, tons per capita (TPC), is based on the quantity of waste generated during 1990. It was assumed that the per capita generation rate increases annually at a rate of 5 percent in the short-term and 6 percent thereafter. Table 3-18 presents waste generation projections for the City under existing conditions, and Table 3-19 depicts generation rates with new diversion programs in place.

Table 3-17
Population Projections

Jurisdiction	Population (1991)	Population (1995)	Annual Growth Rate (1991-1995) (%)	Population (2010)	Annual Growth Rate (1995-2010) (%)
Winters	4,693	5,800	5.0	14,000	6.0

Table 3-18 Composition of Waste Disposed, Diverted and Generated - Winters
Under Existing Conditions (Tons)

Material	1990			1991			1992		
	Disp	Divert	Gen	Disp	Divert	Gen	Disp	Divert	Gen
PAPER									
Newspaper	157	58	215	167	62	229	178	66	245
Corrugated cardboard	233	26	259	248	28	276	265	30	295
High grade paper	38	0	38	40	0	41	43	0	44
Mixed paper	330	1	331	352	1	352	375	1	376
Contaminated paper	408	0	408	435	0	435	463	0	463
PLASTIC									
PET	6	2	8	6	2	9	7	2	9
HDPE	19	0	19	20	0	21	22	0	22
Pigmented HDPE	18	0	18	19	0	19	20	0	20
Polystyrene	14	0	14	15	0	15	16	0	16
Film	165	0	165	176	0	176	187	0	187
Other plastic	121	0	121	129	0	129	137	0	137
GLASS									
CA redemption	62	52	114	66	56	122	70	59	130
Other recyclable	98	20	118	104	22	126	111	23	134
Non-recyclable	4	0	4	4	0	4	5	0	5
METALS									
Aluminum cans	7	28	35	7	30	37	8	32	40
Bi-metal/tin	68	0	68	72	0	72	77	0	77
Ferrous metal	81	0	81	86	0	86	92	0	92
Non-ferrous metal	34	0	34	36	0	36	39	0	39
White goods	10	0	10	11	0	11	11	0	11
YARD WASTE									
Grass, leaves	236	0	236	251	0	251	268	0	268
Prunings	137	0	137	146	0	146	156	0	156
Mixed yard waste	892	0	892	950	0	950	1,013	0	1,013
OTHER ORGANIC									
Food	341	3	344	363	3	366	387	3	391
Tires	7	6	13	7	6	14	8	7	15
Rubber	37	0	37	39	0	39	42	0	42
Wood waste	55	102	157	59	108	167	62	116	178
Wood (press board)	35	0	35	37	0	37	40	0	40
Ag. crop residue	0	0	0	0	0	0	0	0	0
Manure	33	0	33	35	0	35	37	0	37
Disposable diapers	93	0	93	99	0	99	106	0	106
Textiles, leather	63	0	63	67	0	67	72	0	72
OTHER WASTE									
Asphalt	0	0	0	0	0	0	0	0	0
Concrete	9	0	9	10	0	10	10	0	10
Inert solids	91	861	952	97	917	1,014	103	978	1,081
Composite materials	59	0	59	63	0	63	67	0	67
HHW matl./container	16	0	16	17	0	17	18	0	18
Misc.	360	0	360	384	0	384	409	0	409
SPECIAL WASTE									
Ash	0	0	0	0	0	0	0	0	0
Medical waste	0	0	0	0	0	0	0	0	0
Auto shredder	0	0	0	0	0	0	0	0	0
Auto bodies	0	0	0	0	0	0	0	0	0
Bulky waste	15	0	15	16	0	16	17	0	17
Other special	0	0	0	0	0	0	0	0	0
Construction/demo.	406	0	406	433	0	433	461	0	461
TOTAL	4,758	1,160	5,918	5,069	1,236	6,305	5,404	1,318	6,722

Table 3-18 Composition of Waste Disposed, Diverted and Generated - Winters (Cont.)
Under Existing Conditions (Tons)

Material	1993			1994			1995		
	Disp	Divert	Gen	Disp	Divert	Gen	Disp	Divert	Gen
PAPER									
Newspaper	190	71	261	203	75	278	216	80	296
Corrugated cardboard	282	32	314	301	34	335	320	36	357
High grade paper	46	0	46	49	0	49	52	0	53
Mixed paper	399	1	400	426	1	427	454	1	455
Contaminated paper	494	0	494	526	0	526	561	0	561
PLASTIC									
PET	7	2	10	8	3	10	8	3	11
HDPE	23	0	23	25	0	25	26	0	27
Pigmented HDPE	22	0	22	23	0	23	25	0	25
Polystyrene	17	0	17	18	0	18	19	0	19
Film	200	0	200	213	0	213	227	0	227
Other plastic	146	0	146	156	0	156	166	0	166
GLASS									
CA redemption	75	63	138	80	67	147	85	72	157
Other recyclable	119	25	143	126	26	153	135	28	163
Non-recyclable	5	0	5	5	0	5	5	0	5
METALS									
Aluminum cans	8	34	42	9	36	45	10	38	48
Bi-metal/tin	82	0	82	88	0	88	93	0	93
Ferrous metal	98	0	98	104	0	104	111	0	111
Non-ferrous metal	41	0	41	44	0	44	47	0	47
White goods	12	0	12	13	0	13	14	0	14
YARD WASTE									
Grass, leaves	286	0	286	304	0	304	324	0	324
Prunings	166	0	166	177	0	177	188	0	188
Mixed yard waste	1,080	0	1,080	1,151	0	1,151	1,226	0	1,226
OTHER ORGANIC									
Food	413	4	416	440	4	444	469	4	473
Tires	8	7	16	9	8	17	10	8	18
Rubber	45	0	45	48	0	48	51	0	51
Wood waste	67	123	190	71	131	202	76	140	216
Wood (press board)	42	0	42	45	0	45	48	0	48
Ag. crop residue	0	0	0	0	0	0	0	0	0
Manure	40	0	40	43	0	43	45	0	45
Disposable diapers	113	0	113	120	0	120	128	0	128
Textiles, leather	76	0	76	81	0	81	87	0	87
OTHER WASTE									
Asphalt	0	0	0	0	0	0	0	0	0
Concrete	11	0	11	12	0	12	12	0	12
Inert solids	110	1,042	1,152	117	1,111	1,228	125	1,183	1,309
Composite materials	71	0	71	76	0	76	81	0	81
HHW matl./container	19	0	19	21	0	21	22	0	22
Misc.	436	0	436	464	0	464	495	0	495
SPECIAL WASTE									
Ash	0	0	0	0	0	0	0	0	0
Medical waste	0	0	0	0	0	0	0	0	0
Auto shredder	0	0	0	0	0	0	0	0	0
Auto bodies	0	0	0	0	0	0	0	0	0
Bulky waste	18	0	18	19	0	19	21	0	21
Other special	0	0	0	0	0	0	0	0	0
Construction/demo.	491	0	491	524	0	524	558	0	558
TOTAL	5,760	1,405	7,164	6,138	1,497	7,635	6,540	1,595	8,135

Table 3-18 Composition of Waste Disposed, Diverted and Generated - Winters (Cont.)
Under Existing Conditions (Tons)

Material	1996			1997			1998		
	Disp	Divert	Gen	Disp	Divert	Gen	Disp	Divert	Gen
PAPER									
Newspaper	232	86	319	250	93	343	269	100	369
Corrugated cardboard	345	39	384	371	42	413	399	45	444
High grade paper	56	0	57	60	0	61	65	1	66
Mixed paper	488	1	489	525	1	526	565	1	566
Contaminated paper	604	0	604	649	0	649	699	0	699
PLASTIC									
PET	9	3	12	10	3	13	10	3	14
HDPE	28	0	29	30	0	31	33	1	33
Pigmented HDPE	27	0	27	29	0	29	31	0	31
Polystyrene	21	0	21	22	0	22	24	0	24
Film	244	0	244	263	0	263	283	0	283
Other plastic	179	0	179	193	0	193	207	0	207
GLASS									
CA redemption	92	77	169	99	83	182	106	89	195
Other recyclable	145	30	175	156	32	188	168	35	203
Non-recyclable	6	0	6	6	0	6	7	0	7
METALS									
Aluminum cans	10	41	52	11	45	56	12	48	60
Bi-metal/tin	101	0	101	108	0	108	116	0	116
Ferrous metal	120	0	120	129	0	129	139	0	139
Non-ferrous metal	50	0	50	54	0	54	58	0	58
White goods	15	0	15	16	0	16	17	0	17
YARD WASTE									
Grass, leaves	349	0	349	376	0	376	404	0	404
Prunings	203	0	203	218	0	218	235	0	235
Mixed yard waste	1,320	0	1,320	1,420	0	1,420	1,527	0	1,527
OTHER ORGANIC									
Food	504	4	509	543	5	547	584	5	589
Tires	10	9	19	11	10	21	12	10	22
Rubber	55	0	55	59	0	59	63	0	63
Wood waste	81	151	232	88	162	250	94	174	269
Wood (press board)	52	0	52	56	0	56	60	0	60
Ag. crop residue	0	0	0	0	0	0	0	0	0
Manure	49	0	49	53	0	53	57	0	57
Disposable diapers	138	0	138	148	0	148	159	0	159
Textiles, leather	93	0	93	100	0	100	108	0	108
OTHER WASTE									
Asphalt	0	0	0	0	0	0	0	0	0
Concrete	13	0	13	14	0	14	15	0	15
Inert solids	135	1,274	1,408	145	1,370	1,515	156	1,474	1,630
Composite materials	87	0	87	94	0	94	101	0	101
HHW matl./container	24	0	24	25	0	25	27	0	27
Misc.	533	0	533	573	0	573	616	0	616
SPECIAL WASTE									
Ash	0	0	0	0	0	0	0	0	0
Medical waste	0	0	0	0	0	0	0	0	0
Auto shredder	0	0	0	0	0	0	0	0	0
Auto bodies	0	0	0	0	0	0	0	0	0
Bulky waste	22	0	22	24	0	24	26	0	26
Other special	0	0	0	0	0	0	0	0	0
Construction/demo.	601	0	601	646	0	646	695	0	695
TOTAL	7,038	1,717	8,755	7,572	1,847	9,419	8,148	1,987	10,135

Table 3-18 Composition of Waste Disposed, Diverted and Generated - Winters (Cont.)
Under Existing Conditions (Tons)

Material	1999			2000			2001		
	Disp	Divert	Gen	Disp	Divert	Gen	Disp	Divert	Gen
PAPER									
Newspaper	289	108	397	311	116	427	335	125	459
Corrugated cardboard	429	49	478	462	52	514	497	56	553
High grade paper	70	1	71	75	1	76	81	1	82
Mixed paper	608	1	610	654	2	656	704	2	706
Contaminated paper	752	0	752	809	0	809	870	0	870
PLASTIC									
PET	11	4	15	12	4	16	13	4	17
HDPE	35	1	36	38	1	38	41	1	41
Pigmented HDPE	33	0	33	36	0	36	38	0	38
Polystyrene	26	0	26	28	0	28	30	0	30
Film	304	0	304	327	0	327	352	0	352
Other plastic	223	0	223	240	0	240	258	0	258
GLASS									
CA redemption	114	96	210	123	103	226	132	111	243
Other recyclable	181	37	218	194	40	235	209	43	252
Non-recyclable	7	0	7	8	0	8	9	0	9
METALS									
Aluminum cans	13	52	64	14	56	69	15	60	75
Bi-metal/tin	125	0	125	135	0	135	145	0	145
Ferrous metal	149	0	149	161	0	161	173	0	173
Non-ferrous metal	63	0	63	67	0	67	73	0	73
White goods	18	0	18	20	0	20	21	0	21
YARD WASTE									
Grass, leaves	435	0	435	468	0	468	503	0	503
Prunings	252	0	252	272	0	272	292	0	292
Mixed yard waste	1,644	0	1,644	1,768	0	1,768	1,902	0	1,902
OTHER ORGANIC									
Food	628	6	634	676	6	682	727	6	734
Tires	13	11	24	14	12	26	15	13	28
Rubber	68	0	68	73	0	73	79	0	79
Wood waste	101	188	289	109	202	311	117	217	334
Wood (press board)	64	0	64	69	0	69	75	0	75
Ag. crop residue	0	0	0	0	0	0	0	0	0
Manure	61	0	61	65	0	65	70	0	70
Disposable diapers	171	0	171	184	0	184	198	0	198
Textiles, leather	116	0	116	125	0	125	134	0	134
OTHER WASTE									
Asphalt	0	0	0	0	0	0	0	0	0
Concrete	17	0	17	18	0	18	19	0	19
Inert solids	168	1,586	1,754	180	1,707	1,887	194	1,836	2,030
Composite materials	109	0	109	117	0	117	126	0	126
HHW matl./container	29	0	29	32	0	32	34	0	34
Misc.	663	0	663	714	0	714	768	0	768
SPECIAL WASTE									
Ash	0	0	0	0	0	0	0	0	0
Medical waste	0	0	0	0	0	0	0	0	0
Auto shredder	0	0	0	0	0	0	0	0	0
Auto bodies	0	0	0	0	0	0	0	0	0
Bulky waste	28	0	28	30	0	30	32	0	32
Other special	0	0	0	0	0	0	0	0	0
Construction/demo.	748	0	748	805	0	805	866	0	866
TOTAL	8,767	2,138	10,905	9,432	2,300	11,732	10,148	2,475	12,623

Table 3-18 Composition of Waste Disposed, Diverted and Generated - Winters (Cont.)
Under Existing Conditions (Tons)

Material	2002			2003			2004		
	Disp	Divert	Gen	Disp	Divert	Gen	Disp	Divert	Gen
PAPER									
Newspaper	360	134	494	388	144	532	417	155	572
Corrugated cardboard	535	61	595	575	65	640	619	70	689
High grade paper	87	1	88	94	1	95	101	1	102
Mixed paper	757	2	759	815	2	817	877	2	879
Contaminated paper	936	0	936	1,007	0	1,007	1,084	0	1,084
PLASTIC									
PET	14	5	18	15	5	20	16	5	21
HDPE	44	1	44	47	1	48	50	1	51
Pigmented HDPE	41	0	41	44	0	44	48	0	48
Polystyrene	32	0	32	35	0	35	37	0	37
Film	379	0	379	407	0	407	438	0	438
Other plastic	278	0	278	299	0	299	321	0	321
GLASS									
CA redemption	142	120	262	153	129	282	165	138	303
Other recyclable	225	47	271	242	50	292	260	54	314
Non-recyclable	9	0	9	10	0	10	11	0	11
METALS									
Aluminum cans	16	64	80	17	69	86	19	74	93
Bi-metal/tin	156	0	156	168	0	168	181	0	181
Ferrous metal	186	0	186	200	0	200	215	0	215
Non-ferrous metal	78	0	78	84	0	84	90	0	90
White goods	23	0	23	25	0	25	27	0	27
YARD WASTE									
Grass, leaves	542	0	542	583	0	583	627	0	627
Prunings	314	0	314	338	0	338	364	0	364
Mixed yard waste	2,047	0	2,047	2,202	0	2,202	2,369	0	2,369
OTHER ORGANIC									
Food	782	7	789	842	7	849	906	8	914
Tires	16	14	30	17	15	32	19	16	35
Rubber	85	0	85	91	0	91	98	0	98
Wood waste	126	234	360	136	251	387	146	270	417
Wood (press board)	80	0	80	86	0	86	93	0	93
Ag. crop residue	0	0	0	0	0	0	0	0	0
Manure	76	0	76	81	0	81	88	0	88
Disposable diapers	213	0	213	230	0	230	247	0	247
Textiles, leather	145	0	145	156	0	156	167	0	167
OTHER WASTE									
Asphalt	0	0	0	0	0	0	0	0	0
Concrete	21	0	21	22	0	22	24	0	24
Inert solids	209	1,976	2,185	225	2,126	2,350	242	2,287	2,529
Composite materials	135	0	135	146	0	146	157	0	157
HHW matl./container	37	0	37	40	0	40	43	0	43
Misc.	826	0	826	889	0	889	956	0	956
SPECIAL WASTE									
Ash	0	0	0	0	0	0	0	0	0
Medical waste	0	0	0	0	0	0	0	0	0
Auto shredder	0	0	0	0	0	0	0	0	0
Auto bodies	0	0	0	0	0	0	0	0	0
Bulky waste	34	0	34	37	0	37	40	0	40
Other special	0	0	0	0	0	0	0	0	0
Construction/demo.	932	0	932	1,002	0	1,002	1,078	0	1,078
TOTAL	10,918	2,663	13,581	11,747	2,865	14,612	12,639	3,082	15,721

Table 3-18 Compostion of Waste Disposed, Diverted and Generated - Winters (Cont.) Under Existing Conditions (Tons)

Material	2005		
	Disp	Divert	Gen
PAPER			
Newspaper	449	167	616
Corrugated cardboard	666	75	741
High grade paper	109	1	109
Mixed paper	943	2	945
Contaminated paper	1,166	0	1,166
PLASTIC			
PET	17	6	23
HDPE	54	1	55
Pigmented HDPE	51	0	51
Polystyrene	40	0	40
Film	472	0	472
Other plastic	346	0	346
GLASS			
CA redemption	177	149	326
Other recyclable	280	58	338
Non-recyclable	11	0	11
METALS			
Aluminum cans	20	80	100
Bi-metal/tin	194	0	194
Ferrous metal	231	0	231
Non-ferrous metal	97	0	97
White goods	29	0	29
YARD WASTE			
Grass, leaves	674	0	674
Prunings	392	0	392
Mixed yard waste	2,549	0	2,549
OTHER ORGANIC			
Food	975	9	983
Tires	20	17	37
Rubber	106	0	106
Wood waste	157	291	448
Wood (press board)	100	0	100
Ag. crop residue	0	0	0
Manure	94	0	94
Disposable diapers	266	0	266
Textiles, leather	180	0	180
OTHER WASTE			
Asphalt	0	0	0
Concrete	26	0	26
Inert solids	260	2,461	2,721
Composite materials	169	0	169
HHW mat./container	46	0	46
Misc.	1,029	0	1,029
SPECIAL WASTE			
Ash	0	0	0
Medical waste	0	0	0
Auto shredder	0	0	0
Auto bodies	0	0	0
Bulky waste	43	0	43
Other special	0	0	0
Construction/demo.	1,160	0	1,160
TOTAL	13,598	3,316	16,914

Table 3-19 Composition of Waste Disposed, Diverted and Generated - Winters Under New Diversion Programs (Tons)

Material	1990			1991			1992		
	Disp	Divert	Gen	Disp	Divert	Gen	Disp	Divert	Gen
PAPER									
Newspaper	157	58	215	167	62	229	178	66	245
Corrugated	233	26	259	248	28	276	265	30	295
High-grade	38	0	38	40	0	41	43	0	44
Mixed	330	1	331	352	1	352	375	1	376
Contaminated paper	408	0	408	435	0	435	463	0	463
PLASTIC									
PET	6	2	8	6	2	9	7	2	9
HDPE	19	0	19	20	0	21	22	0	22
Pigmented HDPE	18	0	18	19	0	19	20	0	20
Polystyrene	14	0	14	15	0	15	16	0	16
Film	165	0	165	176	0	176	187	0	187
Other plastic	121	0	121	129	0	129	137	0	137
GLASS									
CA redemption	62	52	114	66	56	122	70	59	130
Other recyclable	98	20	118	104	22	126	111	23	134
Non-recyclable	4	0	4	4	0	4	5	0	5
METAL									
Aluminum cans	7	28	35	7	30	37	8	32	40
Bi-metal/tin	68	0	68	72	0	72	77	0	77
Ferrous metal	81	0	81	86	0	86	92	0	92
Non-ferrous metal	34	0	34	36	0	36	39	0	39
White Goods	10	0	10	11	0	11	11	0	11
YARD WASTE									
Grass,leaves	236	0	236	251	0	251	268	0	268
Prunings	137	0	137	146	0	146	156	0	156
Mixed yard waste	892	0	892	950	0	950	1,013	0	1,013
OTHER ORGANIC									
Food	341	3	344	363	3	366	387	3	391
Tires	7	6	13	7	6	14	8	7	15
Rubber	37	0	37	39	0	39	42	0	42
Wood waste	55	102	157	59	108	167	62	116	178
Wood (press board)	35	0	35	37	0	37	40	0	40
Ag. Crop residue	0	0	0	0	0	0	0	0	0
Manure	33	0	33	35	0	35	37	0	37
Disposable diapers	93	0	93	99	0	99	106	0	106
Textiles,leather	63	0	63	67	0	67	72	0	72
OTHER WASTE									
Asphalt	0	0	0	0	0	0	0	0	0
Concrete	9	0	9	10	0	10	10	0	10
Inert solids	91	861	952	97	917	1,014	103	978	1,081
Composite materials	59	0	59	63	0	63	67	0	67
HHW matl./container	16	0	16	17	0	17	18	0	18
Misc.	360	0	360	384	0	384	409	0	409
SPECIAL WASTE									
Ash	0	0	0	0	0	0	0	0	0
Medical waste	0	0	0	0	0	0	0	0	0
Auto shredder	0	0	0	0	0	0	0	0	0
Auto bodies	0	0	0	0	0	0	0	0	0
Bulky waste	15	0	15	16	0	16	17	0	17
Other special	0	0	0	0	0	0	0	0	0
Construction/demo.	406	0	406	433	0	433	461	0	461
	4,758	1,160	5,918	5,069	1,236	6,305	5,404	1,318	6,722

Table 3-19 Composition of Waste Disposed, Diverted and Generated - Winters (Cont.) Under New Diversion Programs (Tons)

Material	1993			1994			1995		
	Disp	Divert	Gen	Disp	Divert	Gen	Disp	Divert	Gen
PAPER									
Newspaper	201	60	261	188	90	278	144	152	296
Corrugated	279	35	314	246	89	335	189	168	357
High-grade	45	1	46	48	1	49	51	2	53
Mixed	395	5	400	382	45	427	384	71	455
Contaminated paper	494	0	494	526	0	526	561	0	561
PLASTIC									
PET	7	3	10	8	2	10	8	3	11
HDPE	18	5	23	18	7	25	19	8	27
Pigmented HDPE	22	0	22	23	0	23	25	0	25
Polystyrene	17	0	17	18	0	18	19	0	19
Film	200	0	200	213	0	213	227	0	227
Other plastic	146	0	146	156	0	156	166	0	166
GLASS									
CA redemption	78	60	138	72	75	147	37	120	157
Other recyclable	123	20	143	131	22	153	131	32	163
Non-recyclable	5	0	5	5	0	5	5	0	5
METAL									
Aluminum cans	12	30	42	10	35	45	11	37	48
Bi-metal/tin	81	1	82	80	8	88	63	30	93
Ferrous metal	89	9	98	86	18	104	79	32	111
Non-ferrous metal	41	0	41	44	0	44	47	0	47
White Goods	7	5	12	4	9	13	(0)	14	14
YARD WASTE									
Grass, leaves	161	125	286	139	165	304	89	235	324
Prunings	101	65	166	87	90	177	53	135	188
Mixed yard waste	763	317	1,080	540	611	1,151	446	780	1,226
OTHER ORGANIC									
Food	416	0	416	444	0	444	473	0	473
Tires	11	5	16	8	9	17	4	14	18
Rubber	45	0	45	48	0	48	51	0	51
Wood waste	60	130	190	47	155	202	56	160	216
Wood (press board)	42	0	42	45	0	45	48	0	48
Ag. Crop residue	0	0	0	0	0	0	0	0	0
Manure	40	0	40	43	0	43	45	0	45
Disposable diapers	113	0	113	120	0	120	128	0	128
Textiles, leather	76	0	76	81	0	81	87	0	87
OTHER WASTE									
Asphalt	0	0	0	0	0	0	0	0	0
Concrete	8	3	11	6	6	12	3	9	12
Inert solids	272	880	1,152	270	958	1,228	228	1,081	1,309
Composite materials	71	0	71	76	0	76	81	0	81
HHW matl./container	19	0	19	21	0	21	22	0	22
Misc.	436	0	436	464	0	464	495	0	495
SPECIAL WASTE									
Ash	0	0	0	0	0	0	0	0	0
Medical waste	0	0	0	0	0	0	0	0	0
Auto shredder	0	0	0	0	0	0	0	0	0
Auto bodies	0	0	0	0	0	0	0	0	0
Bulky waste	4	14	18	4	15	19	5	16	21
Other special	0	0	0	0	0	0	0	0	0
Construction/demo.	471	20	491	455	69	524	345	213	558
TOTAL	5,371	1,793	7,164	5,156	2,479	7,635	4,823	3,312	8,135

Table 3-19 Composition of Waste Disposed, Diverted and Generated - Winters (Cont.)
Under New Diversion Programs (Tons)

Material	1996			1997			1998		
	Disp	Divert	Gen	Disp	Divert	Gen	Disp	Divert	Gen
PAPER									
Newspaper	126	193	319	118	225	343	94	275	369
Corrugated	160	224	384	128	285	413	94	350	444
High-grade	43	14	57	35	26	61	28	38	66
Mixed	378	111	489	381	145	526	276	290	566
Contaminated paper	604	0	604	649	0	649	699	0	699
PLASTIC									
PET	8	4	12	8	5	13	8	6	14
HDPE	20	9	29	20	11	31	20	13	33
Pigmented HDPE	27	0	27	29	0	29	31	0	31
Polystyrene	21	0	21	22	0	22	24	0	24
Film	244	0	244	263	0	263	283	0	283
Other plastic	179	0	179	193	0	193	207	0	207
GLASS									
CA redemption	46	123	169	52	130	182	45	150	195
Other recyclable	131	44	175	108	80	188	103	100	203
Non-recyclable	6	0	6	6	0	6	7	0	7
METAL									
Aluminum cans	14	38	52	17	39	56	20	40	60
Bi-metal/tin	41	60	101	43	65	108	46	70	116
Ferrous metal	35	85	120	30	99	129	28	111	139
Non-ferrous metal	50	0	50	39	15	54	38	20	58
White Goods	0	15	15	0	16	16	0	17	17
YARD WASTE									
Grass,leaves	94	255	349	91	285	376	109	295	404
Prunings	56	147	203	52	166	218	64	171	235
Mixed yard waste	471	849	1,320	460	960	1,420	540	987	1,527
OTHER ORGANIC									
Food	509	0	509	547	0	547	589	0	589
Tires	4	15	19	5	16	21	5	17	22
Rubber	55	0	55	59	0	59	63	0	63
Wood waste	39	193	232	50	200	250	36	233	269
Wood (press board)	52	0	52	56	0	56	60	0	60
Ag. Crop residue	0	0	0	0	0	0	0	0	0
Manure	49	0	49	53	0	53	57	0	57
Disposable diapers	138	0	138	148	0	148	159	0	159
Textiles,leather	93	0	93	100	0	100	108	0	108
OTHER WASTE									
Asphalt	0	0	0	0	0	0	0	0	0
Concrete	4	9	13	4	10	14	4	11	15
Inert solids	293	1,115	1,408	290	1,225	1,515	335	1,295	1,630
Composite materials	87	0	87	94	0	94	101	0	101
HHW matl./container	24	0	24	25	0	25	27	0	27
Misc.	533	0	533	573	0	573	616	0	616
SPECIAL WASTE									
Ash	0	0	0	0	0	0	0	0	0
Medical waste	0	0	0	0	0	0	0	0	0
Auto shredder	0	0	0	0	0	0	0	0	0
Auto bodies	0	0	0	0	0	0	0	0	0
Bulky waste	4	18	22	5	19	24	6	20	26
Other special	0	0	0	0	0	0	0	0	0
Construction/demo.	339	262	601	354	292	646	309	386	695
TOTAL	4,972	3,783	8,755	5,105	4,314	9,419	5,240	4,895	10,135

Table 3-19 Composition of Waste Disposed, Diverted and Generated - Winters (Cont.)
Under New Diversion Programs (Tons)

Material	1999			2000			2001		
	Disp	Divert	Gen	Disp	Divert	Gen	Disp	Divert	Gen
PAPER									
Newspaper	88	309	397	59	368	427	63	396	459
Corrugated	93	385	478	50	464	514	54	499	553
High-grade	21	50	71	10	66	76	11	71	82
Mixed	160	450	610	181	475	656	194	511	706
Contaminated paper	752	0	752	809	0	809	870	0	870
PLASTIC									
PET	8	7	15	7	9	16	7	10	17
HDPE	21	15	36	18	20	38	20	22	41
Pigmented HDPE	33	0	33	36	0	36	38	0	38
Polystyrene	26	0	26	28	0	28	30	0	30
Film	304	0	304	327	0	327	352	0	352
Other plastic	223	0	223	240	0	240	258	0	258
GLASS									
CA redemption	50	160	210	51	175	226	55	188	243
Other recyclable	97	121	218	85	150	235	91	161	252
Non-recyclable	7	0	7	8	0	8	9	0	9
METAL									
Aluminum cans	19	45	64	10	59	69	11	63	75
Bi-metal/tin	50	75	125	53	82	135	57	88	145
Ferrous metal	29	120	149	31	130	161	33	140	173
Non-ferrous metal	33	30	63	10	57	67	11	61	73
White Goods	0	18	18	0	20	20	0	22	21
YARD WASTE									
Grass,leaves	120	315	435	105	363	468	113	391	503
Prunings	69	183	252	61	211	272	65	227	292
Mixed yard waste	508	1,136	1,644	472	1,296	1,768	508	1,394	1,902
OTHER ORGANIC									
Food	634	0	634	682	0	682	734	0	734
Tires	6	18	24	4	22	26	4	24	28
Rubber	68	0	68	73	0	73	79	0	79
Wood waste	39	250	289	31	280	311	33	301	334
Wood (press board)	64	0	64	69	0	69	75	0	75
Ag. Crop residue	0	0	0	0	0	0	0	0	0
Manure	61	0	61	65	0	65	70	0	70
Disposable diapers	171	0	171	184	0	184	198	0	198
Textiles,leather	116	0	116	125	0	125	134	0	134
OTHER WASTE									
Asphalt	0	0	0	0	0	0	0	0	0
Concrete	5	12	17	4	14	18	4	15	19
Inert solids	274	1,480	1,754	289	1,598	1,887	311	1,719	2,030
Composite materials	109	0	109	117	0	117	126	0	126
HHW matl./container	29	0	29	32	0	32	34	0	34
Misc.	663	0	663	714	0	714	768	0	768
SPECIAL WASTE									
Ash	0	0	0	0	0	0	0	0	0
Medical waste	0	0	0	0	0	0	0	0	0
Auto shredder	0	0	0	0	0	0	0	0	0
Auto bodies	0	0	0	0	0	0	0	0	0
Bulky waste	7	21	28	5	25	30	5	27	32
Other special	0	0	0	0	0	0	0	0	0
Construction/demo.	409	339	748	436	369	805	469	397	866
TOTAL	5,366	5,539	10,905	5,479	6,253	11,732	5,895	6,728	12,623

Table 3-19 Composition of Waste Disposed, Diverted and Generated - Winters (Cont.)
Under New Diversion Programs (Tons)

Material	2002			2003			2004		
	Disp	Divert	Gen	Disp	Divert	Gen	Disp	Divert	Gen
PAPER									
Newspaper	68	426	494	73	458	532	79	493	572
Corrugated	58	537	595	63	578	640	67	622	689
High-grade	11	76	88	12	82	95	13	88	102
Mixed	209	550	759	225	592	817	242	637	879
Contaminated paper	936	0	936	1,007	0	1,007	1,084	0	1,084
PLASTIC									
PET	8	10	18	9	11	20	9	12	21
HDPE	21	23	44	23	25	48	24	27	51
Pigmented HDPE	41	0	41	44	0	44	48	0	48
Polystyrene	32	0	32	35	0	35	37	0	37
Film	379	0	379	407	0	407	438	0	438
Other plastic	278	0	278	299	0	299	321	0	321
GLASS									
CA redemption	59	203	262	64	218	282	69	235	303
Other recyclable	98	174	271	105	187	292	113	201	314
Non-recyclable	9	0	9	10	0	10	11	0	11
METAL									
Aluminum cans	12	68	80	13	73	86	14	79	93
Bi-metal/tin	61	95	156	66	102	168	71	110	181
Ferrous metal	35	150	186	38	162	200	41	174	215
Non-ferrous metal	12	66	78	13	71	84	14	76	90
White Goods	0	23	23	0	25	25	0	27	27
YARD WASTE									
Grass,leaves	121	420	542	131	452	583	140	486	627
Prunings	70	244	314	75	263	338	81	283	364
Mixed yard waste	547	1,500	2,047	588	1,614	2,202	633	1,737	2,369
OTHER ORGANIC									
Food	789	0	789	849	0	849	914	0	914
Tires	4	25	30	5	27	32	5	29	35
Rubber	85	0	85	91	0	91	98	0	98
Wood waste	36	324	360	38	349	387	41	375	417
Wood (press board)	80	0	80	86	0	86	93	0	93
Ag. Crop residue	0	0	0	0	0	0	0	0	0
Manure	76	0	76	81	0	81	88	0	88
Disposable diapers	213	0	213	230	0	230	247	0	247
Textiles,leather	145	0	145	156	0	156	167	0	167
OTHER WASTE									
Asphalt	0	0	0	0	0	0	0	0	0
Concrete	4	16	21	5	17	22	5	19	24
Inert solids	335	1,850	2,185	360	1,990	2,350	387	2,141	2,529
Composite materials	135	0	135	146	0	146	157	0	157
HHW matl./container	37	0	37	40	0	40	43	0	43
Misc.	826	0	826	889	0	889	956	0	956
SPECIAL WASTE									
Ash	0	0	0	0	0	0	0	0	0
Medical waste	0	0	0	0	0	0	0	0	0
Auto shredder	0	0	0	0	0	0	0	0	0
Auto bodies	0	0	0	0	0	0	0	0	0
Bulky waste	5	29	34	6	31	37	6	34	40
Other special	0	0	0	0	0	0	0	0	0
Construction/demo.	504	427	932	543	460	1,002	584	494	1,078
TOTAL	6,342	7,238	13,581	6,824	7,788	14,612	7,342	8,379	15,721

Table 3-19 Composition of Waste Disposed, Diverted and Ge
Under New Diversion Programs (Tons)
Under Existing Conditions (Tons)

Material	2005		
	Disp	Divert	Gen
PAPER			
Newspaper	85	531	616
Corrugated	72	669	741
High-grade	14	95	109
Mixed	261	685	945
Contaminated paper	1,166	0	1,166
PLASTIC			
PET	10	13	23
HDPE	26	29	55
Pigmented HDPE	51	0	51
Polystyrene	40	0	40
Film	472	0	472
Other plastic	346	0	346
GLASS			
CA redemption	74	252	326
Other recyclable	122	216	338
Non-recyclable	11	0	11
METAL			
Aluminum cans	15	85	100
Bi-metal/tin	76	118	194
Ferrous metal	44	187	231
Non-ferrous metal	15	82	97
White Goods	0	29	29
YARD WASTE			
Grass, leaves	151	523	674
Prunings	87	304	392
Mixed yard waste	681	1,868	2,549
OTHER ORGANIC			
Food	983	0	983
Tires	5	32	37
Rubber	106	0	106
Wood waste	44	404	448
Wood (press board)	100	0	100
Ag. Crop residue	0	0	0
Manure	94	0	94
Disposable dispers	266	0	266
Textiles, leather	180	0	180
OTHER WASTE			
Asphalt	0	0	0
Concrete	6	20	26
Inert solids	417	2,304	2,721
Composite materials	169	0	169
HHW matl./container	46	0	46
Misc.	1,029	0	1,029
SPECIAL WASTE			
Ash	0	0	0
Medical waste	0	0	0
Auto shredder	0	0	0
Auto bodies	0	0	0
Bulky waste	7	36	43
Other special	0	0	0
Construction/demo.	628	532	1,160
TOTAL	7,899	9,015	16,914

3.7 WASTE TYPE DESCRIPTIONS

PAPER

Newspaper: Post consumer newspaper and shredded newsprint, including newspaper inserts such as magazine, comics, etc.

Corrugated paper: Paperboard containers fabricated from two layers of kraft linerboard sandwiched around a corrugated medium. Kraft paper was also included in this category.

High-Grade paper: Continuous form computer paper, and white and colored ledger.

Mixed paper: All other paper including envelopes, magazine, clipboard, paper packaging, etc.

Contaminated paper: Various grades of paper which had been contaminated with food waste or had a high moisture content.

PLASTIC

HDPE (high-density polyethylene) containers: Nonpigmented plastic containers for milk, water, etc.

PET (polyethylene teraphthalate) containers: Beverage containers.

Film plastics: Trash bags, grocery bags, food bags, plastic food wrap, and sheet plastic.

PS (polystyrene) plastics: Food, beverage, packaging, other product containers made of expanded and nonexpanded polystyrene.

Other plastics: Liquid containers and dispensers, food containers, disposable utensils and plates, molded products, extruded pipes, etc.

GLASS

California redemption containers: Glass bottles labeled "California Redemption Value."

Other recyclable containers: All food, beverage, and other glass containers with the exception of California redemption containers.

Other glass: Nonrecyclable glass products such as plate glass, light bulbs, mirrors, and other glass materials.

METALS

Aluminum cans: Redemption and nonredemption aluminum cans; soda, beer, and food containers.

Tin cans: Containers for food, beverage, or other products which include tin.

Ferrous metals: Metal material with magnetic properties.

Nonferrous: Nonmagnetic metals such as scrap aluminum, copper tubing, brass fixtures, aluminum furniture, aluminum foil, etc.

White goods: Large appliances such as dishwashers, hot water heaters, stoves, washer, dryers,etc.

YARD WASTE

Grass / Leaves: Grass clippings, leaves, and other organic waste resulting from landscaping activities.

Pruning: Shrub and brush pruning, small tree clippings (natural wood, up to a diameter of 8 inches), and other landscaping and gardening waste.

Mixed yard waste: Yard waste resulting from the separate yard waste collection.

OTHER ORGANIC MATERIALS

Food waste: Animal, fruit, or vegetable wastes resulting from the preparation, cooking, or handling of food.

Tires / Rubber products: Automobile tires, scrap rubber from manufacturing operations, rubber mats, etc.

Wood waste: Pallets, scrap wood, and dimensional lumber.

Wood Waste (press board, etc.): Wood which has been treated. Materials included particle board, press board, plywood, and wood which had been painted.

Agricultural crop residue: Agricultural crop residue such as rice hulls and tomato by-products from farming or food processing operations.

Manure: Animal excrement.

Disposable Diapers: All diapers consisting of plastic and paper intended for one-time-only use.

Textiles / Leather: Discarded clothing and waste from garment, rug, and leather product manufacturers.

OTHER WASTE

Asphalt waste: A tar-like substance used in paving applications.

Concrete waste: Building material made of cement, sand, gravel, and similar materials.

Other inert solids: Ceramic, rock, brick, gravel, soil, sheet rock, and other similar materials.

Composite materials: Products consisting of several different materials such as metal and plastic. Products characterized as composite materials category included TV sets, food processors, etc.

Household Hazardous Waste (HHW): Waste resulting from products purchased by the general public for household use which may pose a hazard to human health or the environment. Examples of HHW include paint, pesticides, cleaners, batteries, petroleum products, and other similar household products. Recorded weights of HHW included the weight of the containers.

Miscellaneous: A mixture of organic and inorganic materials less than two inches in diameter not easily sorted out for characterization. Contaminated waste paper from fast restaurants was also included.

SPECIAL WASTE

Ash: Waste resulting from the combustion of organic materials.

Medical Waste: Medical waste from the residential and commercial sectors included hypodermic needles, syringes, prescription drugs, bandages, etc. Medical waste disposed of by UCD during the waste characterization study included animal parts, needles, bandages, and vials of blood.

Auto shredder waste: Waste resulting from the shredding of automobiles, trucks, discarded appliances, etc., consisting of a combination of metals, plastics, glass, paints, and other non metallic materials.

Auto bodies: Discarded automobiles and trucks.

Bulky Items: Items such as discarded furniture and mattresses.

Construction / Demolition debris: Construction and demolition debris identified as being generated from self-haul sources consisted largely of wood, asphalt, inert solids, and metals.

SECTION 4

SOURCE REDUCTION COMPONENT

Source reduction is defined by the California Integrated Waste Management Board as "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. Recycling and composting are therefore addressed in separate components.

Source reduction is a process that precedes waste management and addresses how products are designed, manufactured, purchased, and used so as to reduce the quantity and toxicity of waste produced when the products are purchased, and when they reach the end of their useful lives. Technical options for communities considering source reduction include product reuse, reduced material volume and/or weight specifications, reduced toxicity, increased product lifetime, and decreased consumption.

Because source reduction is not a formal waste management practice and materials not used are not weighed or otherwise regularly quantified, it is difficult to assess the actual impact that source reduction programs will have on the waste stream. However, source reduction may be practiced at the business and household levels through selective buying patterns and extending the utilization of products and materials. Because source reduction requires changing attitudes and behavioral patterns, a major effort must focus on education. Source reduction programs could also require research, financial incentives and disincentives, regulations, and technological developments.

The Waste Generation Study for The City of Winters identified target materials available for source reduction programs as: yard waste, wood, textiles/leathers, high-grade paper, and appliances. All types of yard waste can be removed from the residential waste stream by backyard composting. The useable life of textiles, leather products, and appliances can be extended by donating them to charities and thrift shops. Extended use of high-grade paper is achieved in offices through the use of waste paper as telephone message pads and scratch paper, the use of double-sided copies, and the use of routing slips rather than memos.

4.1 GOALS AND OBJECTIVES

Source reduction is critical in the overall integrated waste management plan. By taking steps to prevent waste from entering the waste stream, the City of Winters can avoid costly programs that will recycle, compost, or transport and dispose of the material. The City must develop and implement source reduction programs which work well at the municipal level, while providing support to the activities which can best be accomplished on a larger scale at the State and Federal levels. In light of this goal, the City of Winters has adopted the following objectives for accomplishment during the short and medium term planning periods. These are:

- Educating residents and companies regarding the concept and practice of source reduction including descriptions of materials or products which are generally re-usable. Target awareness levels are 60 percent of City residents by 1995 and 90 percent by 2000.

- Devising reliable methods of quantifying source reduction by residents and businesses such as thrift shops and other commercial or industrial activities.

- Evaluate the current residential refuse rate structure to a quantity-based rate which increases as more cans are placed at the curb.

- Improving the efficiency of office paper use in City offices by 25 percent in 1995 and up to 40 percent by the year 2000.

- Raise City employee awareness of source reduction programs to 80 percent by 1995.

- Adopt City Government procurement policies to result in a 20 percent increase of the purchase of recyclable materials, reusable items, and more durable goods by 1995.

- During the short-term planning period, develop a "Master Composter" program in the City to educate residents about proper backyard composting techniques.

- Reducing the amount of yard wastes entering the waste stream by attaining a 10 percent participation rate of all City households in backyard composting in the short-term and up to 15 percent during the medium-term.

- Gain a better understanding of the commercial and industrial waste streams by performing waste audits for 90 percent of businesses producing more than 2 cubic yards of waste daily.

Priority Materials for Waste Diversion

The type and amount of materials to be targeted by source reduction activities are shown in Table 4-1.

Table 4-1
Target Materials for Source Reduction Programs

Materials	Amount Disposed (TPY)	Percentage of Disposed Waste Stream	Criteria for Selection
Corrugated containers	233	4.9	• reusable
High grade paper	38	0.8	• recycle in offices • electronic mail
Mixed paper	330	6.9	• reduced junk mail
Plastics	343	7.2	• conversion from styrene • replace disposables with reusables
Wood wastes	55	1.1	• reuse for new items
Yard waste	1,265	26.6	• backyard composting
Food waste	341	7.2	• food banks • animal feed
Tires & rubber	44	0.9	• consider life cycle when purchasing
White goods	10	0.2	• repairs, thrift shops
Textiles & Leather	63	1.3	• repairs, thrift shops
Diapers	93	1.9	• diaper services
Totals	2,815	59.0	---

4.2 EXISTING CONDITIONS

At present, there are no structured source reduction programs in the City of Winters. Source reduction, however, does take place through a diaper service, thrift stores, and backyard composting. Reliable diversion estimates for existing source reduction activities are not available, and are therefore, not included.

The City will attempt to stimulate these industries through continued public education efforts focused on source reduction. The City has no reason to believe that these existing activities will be decreased or phased out, and anticipates that they will benefit from City and County public education efforts.

4.3 EVALUATION OF ALTERNATIVES

The ten source reduction alternatives described and evaluated in this section are listed by category below:

Rate Structure Modifications

Alternative 1.	Quantity-Based Variable Rates or User Fees (selected as a contingency alternative)

Economic Incentives

Alternative 2.	Loans, Loan Guarantees, Grants and Contributions (not selected)
Alternative 3.	Commercial Business Compliance Programs (not selected)

Technical Assistance

Alternative 4.	Commercial Waste Audits (selected)
Alternative 5.	Backyard Composting Programs (selected)
Alternative 6.	Educational Efforts (selected)
Alternative 7.	Awards and Public Recognition (selected)
Alternative 8.	Government Nonprocurement Source Reduction Policies (selected)

Regulatory Programs

Alternative 9.	Government Procurement Policies (selected)
Alternative 10.	Product Bans (not selected)

These alternatives are described below and evaluated according to the California Integrated Waste Management Board specified criteria.

Alternative 1. Quantity-Based Variable Residential Refuse Rates or User Fees

Quantity-based variable rates or user fees are primarily intended to foster source reduction at residential sources, although they may also be applied to commercial (including multi-family dwellings) and industrial waste generators.

The current residential rate structure in Winters allows residents using the can rate to dispose of up to four 32 gallon cans of refuse per week for a flat monthly fee. During summer months, collection is twice weekly. Because not all of the residents will use all of the capacity at the four can per week rate, the effect of such a rate structure is that residents disposing of smaller quantities pay a higher rate per gallon.

Variable rate fees involve calculating collection and disposal fees based upon the amount of waste collected. This is similar in principle to other service-based utility charges such as water and electricity. As a result, households are charged fees according to the number of cans used, the number of bags collected, or the frequency of collection. These fees are directly proportional to actual disposal costs rather than collection and disposal costs; consequently, residents have the opportunity to reduce costs by generating less waste.

Possible variations to the rate structure alternative are:

- Use of a base subscription fee to cover fixed collection costs plus a flat per unit volume charge.
- A mini-can rate to encourage reduced volume.
- Fees that rise according to increasing volume.
- Fees that are essentially flat by volume.
- Charges based upon weight instead of volume.

Implementation of quantity-based variable rates or user fees may require the purchase of new collection equipment, including: trucks, retro-fit dumping equipment, on-board scales, bar coding equipment, stickers, bags, etc.

Most systems that currently charge a variable fee do so according to volume. The City of Seattle has a well-developed program using this approach. However, given that not every container is necessarily full and the densities of some wastes are different from others, the argument has been made that weight-based systems would be more equitable. Some communities, such as Seattle, are experimenting with these systems; they require more collection time and require the collection vehicle to have a scale and a bar-code reader to read the homeowner's account number from the container.

Cities implementing variable rate programs have frequently found that they do result in reduced quantities of waste; therefore, the revenues generated by the collection are often overestimated and insufficient to cover the fixed costs of the City. The solution to this problem is the use of a fixed subscription fee to cover fixed costs, plus a variable rate fee for the actual quantities of waste collected.

Variable rate fees that rise rapidly with increasing volume tend to place a strong economic incentive upon reducing the amount of waste. Variable rate structures thus provide an excellent impetus for participation in recycling and yard waste programs. In fact, it is very important that recycling and yard waste programs be provided in conjunction with a quantity-based collection rate structure to provide alternatives to standard waste collection and disposal. Furthermore, variable rate structures may require both anti-dumping ordinances and anti-scavenging ordinances to deter these activities as the variable rates and the recycling programs will tend to provide incentives for both dumping and scavenging.

This alternative is directed towards residential and household waste generators. Materials targeted for source reduction by this alternative include: paper and plastic packaging, disposable products (pens, diapers, etc.), food waste, yard waste, and wood.

Effectiveness

Rate structure modifications provide financial incentives to residents to reduce the amount of solid waste generated in the home. Residents will become more conscious of waste generation and may alter their habits to reduce the amount of material generated through purchasing decisions, backyard composting, product reuse, and other source reduction activities. Reduced volume through increased compacting is expected as residents increase the amount of material placed into trash containers. Additionally, variable rate structures provide an incentive for increased participation in recycling and community composting programs.

Participation and reduction rates are sensitive to the impact of other alternatives such as public education and awareness programs, expansion of curbside and commercial programs, mandatory recycling laws and separate yard waste collection.

Monitoring can be done in general terms by measuring changes in gate tonnages and by volume reduction estimates provided by the City. The quantification of diversion for specific material types through a variable rate program is generally not possible. It would be difficult at best to determine diversion for materials which would not have been generated in the first place. Therefore, no specific types of materials are targeted for measurement and no diversion credit is anticipated to be claimed through this program.

Hazards

No direct environmental hazards are associated with rate structure modifications. However, increased rates for garbage collection may result in illegal dumping, both on public property and in the disposal containers of commercial businesses. Dumping on open, private, or public

property can result in environmental and public health hazards. Further, economic incentives to participate in curbside programs may result in more unacceptable materials being placed at the curb for collection and subsequently rejected by the route collector, thereby increasing the potential for litter.

Ability to Accommodate Change

Rate structure modifications can require review, public hearings and independent cost and feasibility studies. Generally speaking, rate changes are met with public resistance. It is, therefore, in the City's interest to structure rates so as to be flexible and require review no more often than is absolutely necessary.

Consequences on Waste Stream Composition

This alternative will reduce the amount of solid waste generated, and consequently the amount of waste going to landfills. In addition, variable rate structures provide a strong incentive to separate and divert items from the waste stream when other programs are available; therefore, this alternative will be most effective in conjunction with both recycling programs and yard waste composting programs. Additionally, this alternative (if volume-based) may result in increased use of compactors, resulting in a more dense waste stream which would be more difficult to sort after collection.

Ability to be Implemented

Changes to the rate structure will require the approval of the appropriate agency such as the City Council and may require public hearings and extensive review. Implementation may take as long as 6 to 18 months from the time the decision is made to begin rate review. The review process is anticipated to begin in mid 1993, with implementation of some form of revised rate structure scheduled for the short-term planning period. Actual variable rate billing will more likely occur in the medium-term.

Need for Facilities

No additional facilities are required for implementation of this alternative. It is assumed that the present facilities will be able to include those items of additional equipment that may need to be accommodated by the program. However, recycling and composting programs that complement this alternative will require facilities.

Consistency with Local Policies, Plans, and Ordinances

While there appear to be no local policies or ordinances prohibiting a change in the rate structure, should the City choose to franchise waste collection to the private sector, an agreement with the waste hauler may require amendments or renegotiation.

Institutional Barriers to Implementation

No institutional barriers exist which would pose a barrier to implementation.

Costs
Implementation of this alternative requires (1) a rate study to determine appropriate rate structures for achieving the desired level of source reduction; (2) a determination of whether the proposed rate would support the fixed and variable costs of collection and disposal, once source reduction has begun; (3) review and approval by the regulatory bodies (including a public hearing); (4) generation of informational and educational materials; and (5) modification of existing billing operations.

Estimated costs could range between $25,000 and $40,000 for a rate study and program design. In addition, information explaining the rate structure changes will have to be distributed to educate the public about the new rates and the availability of recycling alternatives. An estimated 80-120 hours of staff time will also need to be allocated to develop, implement, and monitor the rate increases. Finally, should a variable can rate alternative be selected, additional costs may be required to purchase standardized refuse containers acceptable for the program. Container costs can range from $10 to $70 per container depending upon capacity and quality. Container costs could be as high as $100,000 depending upon program design.

Market Availability
Markets are not necessary for this alternative.

Public Acceptance
The change from a fixed fee system to a variable rate system, especially in conjunction with other source reduction or diversion programs (recycling and yard waste programs), will entail a great deal of effort on the part of the City to prepare the public for the new system, explain how it works, that it is both necessary and equitable, and how it can be conveniently adapted to. Initial public resistance can be mitigated if there is a strong perception that the program is necessary, fair, and results in equal or better service. If the variable rate structure is to be implemented in conjunction with recycling and yard waste programs, it is possible to make these changes in the short term and yet allow time for the public to make adjustments in their behavior.

Economic Incentives

Alternative 2. Loans, Loan Guarantees, Grants and Contributions

Loans, loan guarantees, grants, and contributions enhance the effectiveness of other programs and alternatives. Under this alternative, the City would provide loan guarantees or actual loans or grants to encourage the economic development of businesses, nonprofit groups, or associations that promote source reduction or otherwise encourage waste reduction. In addition, the city can also lend its support in exploring and developing other funding sources such as grants, industry financial support, in-kind support (donations of composting bins or use of facilities for workshop seminars), and private foundation contributions to be used in developing

and implementing source reduction methods.

The City may determine that a particular entity qualifies for financial assistance if that entity's program(s) will further the interests of local source reduction efforts. The entity in question might fulfill a role within the community that supports other community programs such as public education, source reduction awareness efforts, and any other aspect or component of the overall waste reduction effort. For example, a community could provide a grant to the local chapter of the Boy Scouts or a community recycling organization to develop and implement composting workshops. These workshops could be scheduled one weekend a month and be timed to coincide with the beginning of other programs and alternatives, such as variable disposal rates and backyard composting programs. The community could also provide funding and meeting rooms for workshops on source reduction techniques given by local chapters of conservation groups for the managers of commercial procurement programs.

This alternative emphasizes the provision of nominal amounts of support to facilitate the primarily volunteer efforts of local or regional groups and associations seeking to foster source reduction efforts at the community level. The City can provide both physical resources and financial assistance to defray some of the costs of providing technical assistance and public education offered by these groups. Through this alternative the City can forge a relationship and working partnership with volunteer and community interest groups and associations who seek to further community waste management goals and objectives. This alternative enables the city to take advantage of the expertise and resources of what are essentially volunteer groups.

Effectiveness

This alternative can be highly effective because (1) it requires relatively small financial outlays from the City for staff and physical resources; (2) it makes use of the in-house expertise and skill of the City staff in researching and developing other funding sources for volunteer or community groups; and (3) it allows the City to better utilize the existing resources of the community in terms of expertise and organizational support for community source reduction efforts and policies. In the field of waste management, and especially in changing individual generator and household behavior, this kind of an alliance between community groups and waste management authorities is invaluable.

Hazards

No environmental hazards are created by this alternative.

Ability to Accommodate Change

This alternative can be developed and/or administered to be very flexible because it relies on existing community groups that are interested in promoting source reduction efforts through public awareness and technical assistance. As the community, the waste management system, and the waste stream change over time, the expertise and ability of these groups will change also. New techniques and approaches will become available to the City by virtue of the informal relationship between the public agencies and these community groups. This alternative's funding

mechanism seeks to capitalize upon the stock of community knowledge and expertise existing at any point in time. Thus, this alternative is easily adaptable to change as new methods and programs are developed.

Consequences on Waste Stream Composition

Direct community support for carefully implemented programs will reduce the amount of solid waste discarded. Changes in the waste stream composition will depend on the materials targeted for reduction by the programs supported and implemented. The most likely candidates for the support provided by this alternative are backyard composting programs, commercial purchasing and procurement programs, office source reduction programs, and consumer purchasing awareness programs. The waste stream materials affected by these types of programs are yard wastes and wood cuttings, office paper and plastic packaging, corrugated cardboard, and other packaging products.

Ability to be Implemented

This alternative can be implemented within the short-term planning period.

Need for Facilities

No facilities are required for this alternative.

Consistency with Local Policies, Plans, or Ordinances

This alternative presents no direct conflicts with current policies, nonfinancial related plans, or ordinances.

Institutional Barriers to Implementation

No institutional barriers exist which would limit implementation of this alternative.

Costs

The costs of this alternative would involve the use of City staff resources to develop and administer the program. The program is assumed to fund at most ten loans, grants, etc. each year. Staff time of approximately 120 hours per year might be required to develop, approve, implement, and administer each community project funded. For projects in which staff assist community groups to obtain alternative funding from other sources (State, trade associations, foundations), an additional 80 hours might be required. Other costs include the direct dollar amount of any grants or funding provided by the City. Generally, these operating grants might provide funds anywhere from $1,000 to $2,500 and would not be expected to exceed a maximum of $4,500. Total cost for this option is from $4,000 to $7,500 per grant or loan.

Market Availability

No markets are required for this alternative.

Public Acceptance
High profile and high impact programs using well-known and respected community groups may gain rapid public acceptance and promote public involvement.

Regional Applicability
This alternative lends itself particularly well to a regional approach. This would allow for an excellent working and problem-solving relationship to develop, and would take advantage of the presence of many community groups in the County.

Alternative 3. Commercial Business Compliance Programs

Under this alternative the City would require the development and implementation of source reduction programs and practices in local businesses by requiring businesses to complete a short document providing data and information on their waste streams and outlining their present and proposed source reduction practices as part of their business license application. Technical assistance could be provided to businesses for this program in the form of a pamphlet and informational flyer describing the kinds of data and information sought by the City and the financial and other benefits, i.e., health of worker environment, that could accrue to the business.

Through this alternative the City could require waste reduction planning and reporting requirements for large commercial or institutional waste generators that are similar to what the State of California has required of Cities and Counties. Thus the City would delegate the responsibility for implementing source reduction programs to the larger waste generators in the community. These entities would be held responsible for developing and implementing a plan that reduces the amount of waste generated through source reduction (as well as recycling and composting) that helps the City satisfy the required diversion requirements of AB 939. Like the City itself, these businesses would report their progress regularly through business license renewal or means.

Effectiveness
This alternative could be very effective as it would eventually assess a penalty on businesses that do not participate in waste reduction efforts, thus providing an economic incentive to develop and implement a source reduction program.

Hazards
No hazards are associated with this alternative.

Ability to Accommodate Change
This alternative is readily adaptable to changes in available source reduction technologies and applications. As newer types of manufacturing, processing equipment, packaging or new formats for marketing products become available, this alternative allows businesses to take

advantage of them in their procurement planning. As waste reduction practices and waste streams change over time, this alternative will incorporate those changes readily and with little additional effort on the part of either the public or private sector.

Consequences on Waste Stream Composition

Carefully implemented programs will reduce the amount of solid waste disposed of at landfills. Changes in the waste stream composition will depend on the types of businesses that comply and the materials targeted for reduction by the programs they implement. Changes in the waste stream composition will also depend on the availability of alternative products and on the effectiveness of these procurement programs on the materials targeted for reduction. The most likely materials targeted for reduction are paper and corrugated cardboard packaging, plastic packaging material, and other packaging products.

Ability to be Implemented

This alternative could be implemented in the short-term planning period.

Need for Facilities

No facilities are required by the City for this alternative. The extent that businesses would require additional or modified facilities to comply with the program cannot be determined at this time.

Consistency with Local Policies, Plans, and Ordinances

This alternative would require new City policies or ordinances.

Institutional Barriers to Implementation

Implementing a program to penalize businesses not complying with waste reduction and planning requirements of this alternative would probably require the involvement of more than one public agency within the City. For example, the agency collecting the fees might be different from the agency tracking the forms themselves. This could delay implementation and lead to additional cost and administrative burden. Some degree of coordination between public agencies would be necessary to ensure that businesses not filing forms were assessed the fine and that businesses attempting to comply with the reporting requirements could do so in the course of making regular business filings and payments.

Costs

The costs associated with this alternative will be primarily staff time on the part of the businesses necessary to develop and administer the program. Potentially this program could require staffing by the City. Costs for the businesses required to evaluate their waste stream and develop and implement source reduction programs cannot be determined at this time. However, businesses will benefit from these efforts as a result of lower disposal costs as well as potential cost savings in procurement. Estimated program costs range from $15,000 to $20,000 per year to develop and maintain this program.

Fees can be collected by staff who currently collect business license fees. The tracking of the waste reduction and planning forms could be adapted to the processes currently used to monitor business compliance with other local regulations.

Market Availability
Markets are not required for this alternative.

Public Acceptance
This type of program may be accepted by the public, and the business community in particular, if the program requirements are presented as part of the cost of responsible business practices. Therefore, those being penalized are assumed not to be in compliance with responsible waste management practices. Furthermore, every effort should be made to ensure that the reporting process is brief, provides only the level of data and detail useful to the City, and is easily complied with through regular channels between businesses and the City.

Technical Assistance

Alternative 4. Commercial Waste Audits

This alternative requires the City to assist selected, larger, commercial/industrial generators in the community to conduct waste audits to identify what types and amounts of wastes are being generated and to assist them in identifying and implementing waste minimization techniques. Waste audits might be restricted to certain categories of commercial generators according to the Standard Industrial Code, employee size, or by the quantity and type of wastes known to be generated by those enterprises. Restricting, or selecting, the number of entities that must complete these evaluations allows the community to reduce the administrative burden and cost to both the public and private sectors. Additionally, restricting the scope of this program enables the community to ensure greater compliance by focusing on larger generators contributing significantly to the waste stream.

Data collected from the waste audits could be used for several purposes: (1) assessing proper waste disposal fees; (2) controlling the disposal of banned wastes into the waste stream; and (3) establishing a waste generation database from which to measure future progress in waste reduction. These evaluations could be required periodically to provide information on the generator's progress.

This alternative could be required of the selected waste generators as a provision of their permitting, licensing or waste disposal contract (i.e., waste haulers would not be allowed to collect or dispose of wastes generated by entities not meeting certain criteria after a given date). The program could also be voluntary. The waste audits could be funded by the generator or be partially funded by the community as a service or through a grant program (see Alternative 2). The primary purpose of the waste evaluation alternative is to increase commercial/industrial

awareness of the need for, and benefits of, waste reduction programs and to assist businesses to design and implement programs reducing waste generation.

Effectiveness
This alternative can be effective because it seeks to target a limited number of large waste generators. This alternative reinforces other educational and awareness programs and will generate baseline data on commercial wastes in the community. Furthermore, because of the smaller number of entities and the high contribution to the waste stream, the impact of source reduction programs aimed at these entities can be significant while the administrative burden and cost minimal.

The effectiveness of this alternative would be based on the criteria that the City uses to select the participants and the materials generated by each facility. As such, the effectiveness of this alternative is difficult to quantify.

Hazards
No hazards are created by this alternative.

Ability to Accommodate Change
This alternative readily accommodates change in the stock of generators, the types and quantities of wastes generated, and in the City who would administer the program. This alternative provides a mechanism for measuring change in the waste stream and the impact of source reduction programs on commercial generators. This alternative also develops baseline data on commercial wastes and allows public agencies to make decisions based upon the impact of local programs.

Consequences on Waste Stream Composition
This alternative has no direct effect on the waste stream. However, the alternative provides the data and awareness necessary to implement commercial source reduction programs. The secondary impact of this alternative, therefore, may be a reduction of the materials cited above as being most likely to respond to source reduction efforts.

Ability to be Implemented
This alternative can be implemented in the short term planning period.

Need for Facilities
No facilities are required for this alternative.

Consistency with Local Policies, Plans, and Ordinances
This alternative presents no direct conflicts with current policies, plans, and ordinances.

Institutional Barriers to Implementation

To require the waste audits, the City must ensure that it has the proper authority to do so, including making the audit a part of either the business license renewal or the waste disposal contract for the generator. Additionally, a public agency and staff must be designated to oversee the program, ensure compliance, and collect and process the resulting data.

Costs

The costs for this alternative depend on the level of information collected in the waste audit. Requiring a full-scale waste characterization study by the larger commercial generators would be prohibitively expensive and probably unnecessary. The wealth of data generated by such an effort might not be required to meet the main goals of this alternative, which are to increase awareness of the need for commercial source reduction efforts and to generate data on local commercial waste streams. The City should structure the requirements of this alternative so that target generators can conduct the waste audit using in-house staff and expertise, if possible. If necessary, resources may be required for outside consultant services. The overall costs of this alternative should be in the range of 40 to 80 hours for one member of the generator's staff and two to four hours of a City staff member's time. Additional staff time would be needed to process the data from the waste evaluation. Total costs should not exceed $5,000/generator.

Market Availability

Markets are not necessary for this alternative.

Alternative 5. Backyard Composting Programs

This alternative involves developing programs to encourage backyard composting of yard and food waste by homeowners. Food wastes are a significant component of the residential waste stream; therefore, source reduction programs targeting food and yard wastes can significantly affect the amount of waste going to landfills.

This alternative focuses on residential yard and food waste (green waste) composting programs, defined as composting activity taking place on the property of homeowners. This alternative could also focus on commercial and institutional generators of yard waste, including public agencies. Although residential generators contribute a significant proportion of green waste to the waste stream, they are also more numerous and may require regulatory and economic incentives as well as educational and technical assistance programs to encourage participation. Institutional generators, however, are fewer in number and often have commercial grounds management services to whom yard waste responsibilities could be delegated.

This program would encourage all generators of yard wastes, especially homeowners, to separate their food and yard wastes from the waste stream and reuse these wastes through composting. The City can foster this approach through a number of activities designed to support backyard composting, as illustrated in the following examples.

- Develop a "Master Composter" program establishing a network of community volunteers to provide workshops and increase awareness of backyard composting.

- Provide yard waste generators with low-cost bins designed for composting and a flyer describing how to compost.

- Enact an ordinance banning green wastes from the waste stream.

- Require all grounds-keeping and other landscape maintenance companies operating within the City to provide a composting service to their customers.

The fundamental premise of this alternative is that yard waste does not enter the waste stream at any time.

Effectiveness

It is estimated that relatively few households will participate in a backyard composting program. A successful, well run program is targeted to attract a 10 percent participation; however, those households that do compost yard and food wastes will probably achieve high reduction rates (90 percent). Based upon these figures, the following table presents the estimated diversion through backyard composting:

Table 4-2
Expected Diversion of Residential and Self-Haul Wastes Through Backyard Composting

Material	Amount Generated (TPY)	Participation Rate (%)	Capture Rate (%)	Diversion* (%)	Diversion (TPY)
Yard Wastes	300.0	10	90	9.0	27.0
Food	293.0	10	50	5.0	14.7
Total	593.0	---	---	---	41.7

* Participation Rate * Capture Rate = Diversion %

If a community-wide composting program is implemented, it will result in an estimated reduction of 41.7 TPY or 0.7 percent of the total waste stream during the short-term. This diversion may be expected to increase somewhat during the planning period. However, it should be kept in mind that the promotion of backyard composting may affect other composting programs discussed in the Composting Component (Section 6) of this SRRE.

Established backyard composting programs have existed in the United States for several years, although quantification of diverted weight has not yet been effectively measured. Therefore, the

estimates presented are only forecasts of expected diversion.

Hazards
The City may seek to ensure through educational programs that proper composting techniques are used so that no public health or fire hazards are created. For example, if backyard composting is encouraged, especially with food wastes, the potential exists for rodents, odors, and other health concerns. Education programs will have to be undertaken to ensure proper composting methods are used.

Ability to Accommodate Change
This alternative can easily be changed to meet new conditions and situations. This alternative could be adopted and developed and then subsequently changed in size and scope to accommodate changing needs for yard waste reduction and ability to support technical assistance and education programs.

Consequences on Waste Stream Composition
This alternative will alter the mix of organic material in the waste stream as well as the total quantity of waste discarded. The amount of yard waste in the waste stream could decrease by as much as 20 percent, depending on the effectiveness of the yard waste program. The Btu value and the biodegradability of the waste stream may be reduced, potentially effecting possible future incineration options and/or methane production.

Ability to be Implemented
This alternative could be implemented in the short-term planning period. Combining disposal/dumping bans, fees, and public education and technical assistance programs could result in a highly effective program within one year.

Need for Facilities
There are no facility requirements for this alternative.

Consistency with Local Policies, Plans, and Ordinances
This alternative presents no direct conflicts with current policies, plans, or ordinances.

Institutional Barriers to Implementation
There are no institutional barriers to the implementation of this alternative.

Costs
The costs of this alternative include the expenses for a public awareness and technical assistance program, as well as a subsidy for part of the cost of composting bins to homeowners (perhaps $20 per bin).

Public awareness program costs would vary depending on the scope of the program and the tools used to convey the message. Program expenditures might include:

- Pamphlets and flyers for each household (10 to 25 cents each).
- Door hangers (10 to 25 cents each).
- Public service notices placed on utility bills.
- Staff resources to develop, implement, and monitor the program (80 hours).

Market Availability
It is assumed that the compost is used by the generator.

Alternative 6. Educational Efforts (Also refer to public education component)

This alternative involves (1) educating the public about the need for, and the benefits of, source reduction, and (2) providing information to the public on ways to actually implement source reduction techniques in their personal and business activities. This alternative involves developing and/or sponsoring consumer awareness programs, school curricula, seminars, and public forums that will increase awareness of the solid waste problem, the economic and environmental benefits of source reduction programs, and of any regulatory requirements that require certain types of source reduction activities. For example, this alternative may also seek to change consumer purchasing patterns to reflect source reduction concerns, by introducing the concepts of "bulk shopping" and "product substitution" to the community.

This alternative requires the City to act as a catalyst for source reduction efforts within the community. The City would serve as a clearinghouse for information on source reduction techniques and provide a means for different segments of the community (public and private, residential, and commercial) to gain structured access to each other to promote the rapid and effective expansion of source reduction activities. For example, the City could provide businesses with specific methods and techniques on how to reduce waste disposal by creating office procedures which minimize the amount of waste paper generated. Source reduction pointers ranging from procurement practices to the use of double-sided copying and using waste paper as scratch paper, could also be provided to the community. Consumer organizations could be encouraged to meet with businesses to develop different approaches to product retailing. Businesses engaged in promoting source reduction (such as bulk-purchase stores or stores catering to yard waste composting activities) could be offered the opportunity to conduct a workshop or seminar.

This alternative is vital to the success of other source reduction alternatives, such as yard waste composting, and is linked in scope and purpose to Alternative 2 on grant funding for community groups seeking to participate in the community's source reduction efforts.

Educational efforts should target all waste generators within the City, including businesses, homeowners, and the general public. Materials targeted for source reduction include: paper products and packaging, plastic products and packaging, food waste, yard waste, wood, nonrecyclable packaging and containers, disposable products such as pens, razors, cameras, beverage containers, disposable diapers, car tires, batteries, and appliances.

Effectiveness

Education can be highly effective relative to dollars spent because (1) it potentially requires only nominal financial outlays from the City and (2) it allows the City to fully utilize the existing resources of the community in terms of expertise and organizational support for community source reduction efforts and policies. In the field of waste management, and especially in changing individual generator and household behavior, this kind of cooperative support between public agencies, community groups, households, and commercial waste generators is invaluable.

Educational programs alone can produce source reduction results; however, such programs are most effective when used to enhance the effectiveness of other source reduction programs in the community.

Hazards

No hazards are created by this alternative.

Ability to Accommodate Change

This alternative is very flexible because it relies on existing community resources in encouraging source reduction efforts through public awareness and technical assistance. As the community, the waste management system, and the waste stream itself change over time, the expertise and abilities of community resources will change also. New techniques and approaches will become available to the City by virtue of the informal relationship between public agencies, businesses, households, and community groups. This alternative is easily adaptable to change as new methods and programs are developed.

This alternative also readily accommodates changes in the waste stream as well as changes in consumer purchasing behavior and available products and alternatives. Indeed, once the public is sensitized to the City's program of heightened environmental awareness, it may in fact be easier to introduce new concepts to further change public behavior.

Consequences on Waste Stream Composition

Direct community and business involvement and participation in carefully implemented programs will reduce the amount of solid waste discarded. Changes in waste stream composition will depend on the effectiveness of the public education effort and on the materials targeted for reduction by those responding to the message of these programs. The most likely areas for significant impact would be programs aimed at backyard composting, commercial purchasing and procurement programs, office source reduction, and consumer purchasing awareness. The waste stream materials that are anticipated to be most affected by these types of programs are

yard wastes and wood cuttings, office paper, plastic packaging, corrugated cardboard, other packaging products, and disposable products.

Ability to be Implemented
This alternative can provide a range of options with respect to the scope and duration of the public education effort. Therefore, initial public education efforts can be implemented in the short term. These might include public forums, workshops, flyers, and doorhangers. More involved programs, such as school curricula, could be developed and implemented over the medium term.

Need for Facilities
This alternative requires no facilities.

Consistency with Local Policies, Plans, and Ordinances
This alternative presents no direct conflicts with current policies, plans, or ordinances.

Institutional Barriers to Implementation
This alternative presents no institutional barriers.

Costs
The cost of this alternative will vary dramatically depending upon the scope of implementation. However, many of the other source reduction alternatives, as well as recycling and community composting programs, will depend upon an aggressive and successful public education program. The costs of this alternative would include the use of City staff resources to develop and administer the program. In addition, there will be costs associated with promotional brochures, pamphlets, flyers, doorhangers, and production costs for any use of the media or outside consultants. For a more detailed analysis of costs, please refer to the Education Component (Section 8) of this SRRE. Source reduction public education costs and staff time are estimated to be atleast $10,000.

Market Availability
Markets are not required for this program.

Regional Applicability
Public education programs may be appropriately implemented regionally. For example, elements of a source reduction awareness program might include public service messages on radio or television stations; advertisements and press releases might be included in publications with a circulation covering the City and the area surrounding Winters.

Alternative 7. Awards and Public Recognition

This alternative involves generating public support for source reduction efforts on the part of business and private individuals by recognizing individuals, groups, or businesses that actively engage in source reduction and/or minimization efforts and that support the community's source reduction programs. This alternative serves as a complement to other source reduction alternatives such as public education, technical assistance, and grant programs and may involve other local community organizations such as the Boy Scouts, Girl Scouts, Rotary Club, Lions' Club, the PTA, and local police and fire fighters youth associations.

Effectiveness
No diversion occurs directly as a result of this program. However, the effectiveness of other diversion programs may be increased slightly.

Hazards
No hazards are created by this alternative.

Ability to Accommodate Change
This alternative easily adapts to new circumstances within the City. Programs for public recognition, local pride, and environmental awareness can all be readily changed in their focus, scope, and intensity to accommodate changes in local waste management programs, changes in the waste stream, seasonal variations in waste characteristics, and other factors.

Consequences on Waste Stream Composition
This alternative will have negligible consequences on the waste stream.

Ability to be Implemented
This alternative can be implemented in the short-term planning period.

Need for Facilities
This alternative requires no facilities.

Consistency with Local Policies, Plans, and Ordinances
This alternative presents no direct conflicts with current policies, plans, or ordinances.

Institutional Barriers to Implementation
There are no institutional barriers to implementation of this alternative.

Costs
This alternative may involve publicity and public relations costs associated with awarding recognition and highlighting specific activities within the community. These costs will most likely take the form of expenses for printed media publicity. Some of the exposure necessary for these kinds of recognition programs can be gained free in the form of press coverage of

officially sanctioned events sponsored by the City. If awards or prizes of any inherent value are planned (e.g., cash awards), these costs will need to be considered also. In addition, the sponsoring agency for the programs under this alternative will incur the cost of developing and administering the programs. This option can be implemented for the cost of a plaque and staff time to issue a press release and award the plaque. Costs are estimated to be atleast $500 - $1,000.

Market Availability
Markets are not required for this alternative.

Public Acceptance
Public recognition programs are an accepted means of generating public support for, and greater awareness of a community campaign. This is a common tactic in campaigns focusing on health and welfare issues such as blood drives, donations for homeless and indigent citizens, and support for populations such as children or the elderly. Programs to achieve similar results for source reduction programs will find a high degree of public acceptance.

Regional Applicability
Public recognition programs may be appropriately implemented over a regional area encompassing the City. For example, a regional recognition program for businesses implementing source reduction programs might include public service messages on radio or television stations; awards, announcements, and press releases might be included in publications with a circulation covering the City. Both of these examples would make it worthwhile for the City to combine their efforts for these elements of their programs.

Alternative 8. Nonprocurement Source Reduction Programs By Local Government

Nonprocurement programs involve all methods to implement source reduction that are not associated with purchasing decisions. This alternative requires the City government to undertake a number of programs aimed at altering the behavior of personnel and the operations to reduce the amount of waste generated on a day-to-day basis. These programs could include education programs familiarizing people with source reduction practices such as: double-sided copying, increasing the use of scratch paper, making fewer drafts of reports, using electronic mail, and so on. This alternative provides an opportunity for the City itself to develop and implement a model source reduction program that can be used as an example for private, public, and commercial entities in the area.

This alternative targets the City's administrative offices and their use of paper; however, other materials may be targeted as well.

Effectiveness
The waste generation study does not provide waste data for governmental offices and operations

in the City; however, it is reasonable to assume that these wastes are paper and that the source reduction programs outlined above could reduce this amount by up to 20 percent.

Hazards
No hazards are associated with this alternative.

Ability to Accommodate Change
This alternative is readily adaptable to change. In-house source reduction policies and programs for the City can be altered to accommodate changes in available source reduction technologies and processes (procurement programs), changes in the waste stream itself (shifts in the ratio of paper to plastic, etc.), and changes in the emphasis of various source reduction programs by the City.

Consequences on Waste Stream Composition
Direct support by the City for carefully implemented programs will reduce the amount of solid waste discarded. Changes in waste stream composition will depend on the effectiveness of employee education efforts and on the materials targeted for reduction. The most likely areas for significant impact would be from programs aimed at office source reduction programs, primarily paper. The waste stream materials affected by these types of programs are yard wastes and wood cuttings, office paper and plastic packaging, corrugated cardboard, and other packaging products.

Ability to be Implemented
This alternative can be implemented within the short-term planning period.

Need for Facilities
This alternative requires no facilities.

Consistency with Local Policies, Plans, and Ordinances
This alternative presents no direct conflicts with current policies, plans, or ordinances.

Institutional Barriers to Implementation
No institutional barriers are associated with this alternative.

Costs
The primary cost will be for staff time to develop and implement a source reduction policy and program for the City. Some costs will be incurred in preparing and disseminating informational materials to staff, perhaps in the form of pamphlets or flyers posted at appropriate places in the work place. The primary emphasis of this nonprocurement alternative is to change government employee behavior mainly with respect to the use and disposal of paper, plastic, and cardboard products. The costs associated with this alternative are therefore similar to those for developing and implementing any kind of awareness program within an institutional setting, and are assumed to be relatively small. The City would prove valuable in taking the lead in such a program.

Program costs are estimated to be atleast $1,000.

Market Availability
Markets are not required for this alternative.

Regulatory Programs

Alternative 9. Adoption of Government Procurement Policies

This alternative involves the City adopting procurement policies that include the following criteria for purchasing decisions: durability, recyclability, reusability, and recycled material content. The City could adopt purchasing preferences for recycled products as a part of this program; however, this would not qualify as "source reduction."

This alternative targets the materials used by administrative offices, as well as equipment purchased by other operations such as police, public works, etc. Materials that will be diverted through source reduction include: paper products and packaging, plastic products and packaging, all disposable items, stationery, office supplies, tires, batteries, and food service items.

Effectiveness
The waste generation study does not provide waste data for governmental offices and operations in the City; however, it is reasonable to assume that these wastes are paper and that the source reduction programs outlined above could reduce this amount by up to 20 percent.

Hazards
No hazards are anticipated by implementation of this alternative.

Ability to Accommodate Change
This alternative is readily adaptable to changes in available source reduction technologies and target materials. As new, more environmentally sound, products and packaging become available, the City will be able to take advantage of them, setting an example for the community.

Consequences on Waste Stream Composition
Direct participation by the City in a carefully implemented procurement program will reduce the amount of solid waste generated. Changes in waste stream composition will depend on targeted materials and the availability of alternative products. The most likely materials reduced in the waste stream would be paper and corrugated cardboard packaging, plastic packaging material, other packaging materials, disposable products, and products with relatively short useful lives.

Ability to be Implemented
This alternative can begin to be implemented relatively quickly, although full implementation will require the development of a detailed policy which identifies target materials, product

criteria, and suggested product options and alternatives.

Need for Facilities
No facilities are required for this alternative.

Consistency with Local Policies, Plans, and Ordinances
This alternative would require the adoption of a City procurement ordinance or policy.

Institutional Barriers to Implementation
Purchasing and procurement programs within the City's many public agencies will require coordination in order to achieve city-wide source reduction. While purchasing itself is often centralized within a City's operations, the individual agencies receiving or consuming the goods and services purchased must be fully aware of the program's purpose and assist in identifying products and materials for which alternatives are available. Again, the City could take the lead in the coordination of purchasing policies.

Costs
The costs for this alternative are primarily in staff time to develop purchasing guidelines and identify appropriate substitute products. Additional primary expenditures will be significant in the initial purchasing with more durable, more expensive products to replace those currently in use. These expenditures, however, impact cash flow and can be budgeted to be recouped. Staff costs are estimated to be atleast $1,000.

Market Availability
Markets are not required for this alternative.

Alternative 10. Product Bans

The City may ban targeted products and packaging techniques to reduce waste at the source and provide a net environmental benefit. Bans might be considered on products and packaging that do not lend themselves to recycling or source reduction. The criteria for product bans are similar to those used to determine the applicability of advance disposal fees; the product must be disposable or difficult to reuse or recycle and must have environmentally sound substitutes (such as disposable razors, nonrefillable pens, nonreusable beverage containers). For example, some communities (Berkeley, California) have banned polystyrene foam packaging from fast food restaurants. Other communities have banned items such as nonrecyclable beverage containers. Communities that pursue this kind of alternative often adopt a time limit or phase-out period for the ban to take effect, providing time for residential and commercial consumers to adjust to the policy and identify substitutes.

Effectiveness
Product bans are generally not effective or well received on a local level as residents see them as intrusive and will therefore simply drive to a neighboring jurisdiction to buy the banned product.

Hazards
This alternative presents no known environmental hazards, although it is critical that the substitute for a banned product has a less significant environmental impact than the banned product.

Ability to Accommodate Change
A product ban, while it is in force, can not respond to changes in the market. Additionally, a product ban clearly forces manufacturers, retailers, and consumers to search for alternatives to the banned product. This can take a significant amount of time. Once in place, banned products will have lost their place in the market or will not likely be brought back if the ban were to be removed.

Consequences on Waste Stream Composition
A product ban may significantly reduce the quantities of the banned product in the waste stream. However, the ban may also increase the presence of product substitutes in the waste stream. The effect of product substitutes must be carefully considered. When implementing a product ban, it is important to ensure that the substitutes do not themselves present problems involving increased volumes or toxicities of wastes going into landfills.

Ability to be Implemented
A product ban can be implemented in the short term. However, the surrounding body must allow for some period of time for consumers, producers, and retailers to adjust to the effects of the ban.

Need for Facilities
No facilities are required for this alternative.

Consistency with Local Policies, Plans, and Ordinances
This alternative may conflict with prevailing local policies.

Institutional Barriers to Implementation
No institutional barriers are presented by this alternative, although there may be legal ramifications associated with excluding a product from the market through a product ban.

Costs
The cost of this alternative includes staff time necessary to develop, review, and present for approval by the appropriate forum, the details associated with implementation of a product ban. Costs to local merchants, consumers, and producers are unknown. Staff costs are estimated to

be atleast $1,000.

Market Availability
No markets are required for this alternative.

Public Acceptance
A product ban can meet with significant resistance if the proposal is not carefully designed and implemented. This alternative not only involves changing behavior on the part of the consumer, but also changing the manufacture and marketing of a product or its substitute. These changes can result in real costs to retailers, manufacturers, and consumers, and these costs will have to be carefully explained and justified. The City should be able to clearly identify the environmental benefits to the community from this type of regulatory alternative before implementation.

Regional Applicability
Because of the broad nature of this alternative and the impact it has on an entire market area for a product, it is often more effective to implement a product ban on a larger geographic scale such as a region or a county. When considering this alternative, the City should investigate implementing such a program in conjunction with neighboring jurisdictions.

4.4 SELECTION OF PROGRAMS

This section summarizes the programs selected by the City for implementation during the short and medium term planning periods. Program selection decisions are based upon discussions with City personnel and the programs applicability to the City of Winters. A discussion of each of the alternatives is provided below:

4.4.1 Selected Programs

Existing Programs

The existing programs include source reduction activity occurring within businesses. These activities are expected to continue throughout the planning period. While the City does not have direct control over these types of facilities, the City will devise methods to quantify the waste currently diverted through source reduction.

Alternative 1. Quantity Based Variable Rates or User Fees

This alternative has been selected for implementation as a contingency measure in the event that the City falls short of meeting its diversion goals. Because the City's current refuse collection rate is incorporated into a larger utility user fee and is not variable, a rate study will first be

conducted to determine the impact of severing the refuse fee from the utility rate. Because many steps are involved in such a rate restructuring and the short term integrated waste management costs are as yet undetermined, the City will examine the feasibility of implementation in the medium-term planning period with attention to the introduction of a mini-can rate for the highly successful recyclers, composters and source reducers.

Alternative 4. Commercial Waste Audits

This alternative is selected for the short-term planning period due to its anticipated effectiveness in diversion, comparative ease of implementation, and potential effect upon the commercial and industrial waste streams. Waste audits will be performed by the Recycling Coordinator for the City for 90 percent of businesses generating 2 cubic yards or more of waste daily. The City's policy will be to encourage but not enforce waste evaluations. If sufficient participation in voluntary efforts does not take place, the City will investigate mandatory waste evaluations - perhaps as part of the business licensing process.

Alternative 5. Backyard Composting

Backyard composting is selected for short-term implementation as a source reduction program. The City will seek to attain a 10 percent participation rate by all City residents. Expected diversion is anticipated to be approximately 0.7 percent of the total waste stream. Backyard composting will be promoted through public education, yard waste collection program information, and the Master Composter Program to assist in education, training and monitoring of diversion.

Alternative 6. Educational Programs

This alternative has been selected for implementation in the short-term. As goals, the City will target source reduction awareness levels of 60 percent of City residents and businesses by 1995 and 90 percent by the year 2000. Source reduction options for residential and commercial waste generators will be incorporated into education and public information materials. See Section 8 - Education and Public Information Component.

Alternative 7. Awards and Public Recognition

The City will recognize an awards program and will work in conjunction with the Chamber of Commerce and other civic groups to actively give out awards. The City will take an active role in developing awards criteria and presentations.

Alternative 8. Government Non-Procurement Source Reduction Policies

This alternative has been selected for implementation in the short term planning period and will target materials in the local government's waste streams. The primary goal will be to improve the efficiency of office paper use by 25 percent in 1995 and 40 percent by the year 2000. This alternative will allow the City to take the lead in setting an example for source reduction programs.

Alternative 9. Government Procurement Policies

This alternative has been selected for implementation in the short term. The City will pass an ordinance mandating that City procurement practices consider durability, recyclability, recycled content and environmental impact on all purchasing decisions.

4.4.2 Programs Not Selected

Alternative 2. Loans, Loan Guarantees, Grants, and Contributions

This alternative was not selected as the City does not have the staff or fiscal resources required to pursue these options.

Alternative 3. Commercial Business Compliance Programs

This alternative has been rejected by the City as its regulatory nature will make it difficult to implement and enforce.

Alternative 10. Product Bans

This alternative was not selected. The development and enforcement of effective bans would be difficult because the design and implementation is generally beyond the scope of the City. Any effective product bans would have to be regional, if not state or nation-wide.

4.4.3 Anticipated Diversion Through Source Reduction Program Implementation

With the exception of Backyard Composting the quantity of waste which can be diverted through selected source reduction programs cannot be quantified with available information. Estimates of the quantity of waste diverted through backyard composting programs are approximately 1.0 and 1.5 percent of waste disposed in the short and medium-term planning periods.

4.5 PROGRAM IMPLEMENTATION

This section describes the implementation of the selected alternatives including designation of the persons or agencies responsible, the tasks to be undertaken, the time schedule, and funding required. The City Recycling Coordinator will take primary responsibility in developing, implementing, and monitoring selected alternatives.

4.5.1 Existing Programs

The primary goal of evaluating existing source reduction activities (thrift stores, diaper services, etc.) will be to establish methods to quantify materials diverted through source reduction activity and to investigate methods of promoting business activities as source reduction alternatives to the community.

Table 4-3
Implementation Schedule for Existing Programs Evaluation

Task	Responsible Entity	Start Date	Completion Date	Estimated Cost	Funding Source
Identify source reduction activities	Recycling Coordinator	7/93	9/93	Staff time @ 40 hours = $800	Refuse Fund
Quantify diversion activities	Recycling Coordinator/Business Owners	9/93	Ongoing	Staff time @ 40 hours = $800	Refuse Fund
Total Cost	---	---	---	$1,600	---

* Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).

4.5.2 Quantity-Based Variable Rates for Residential Waste Generators (Alternative 1)

This alternative is selected for medium-term implementation as a contingency measure should the City not meet the 25 percent diversion goal set for 1995, and it appear that the City will not meet the year 2000 goal of 50 percent.

Table 4-4
Implementation Schedule for Quantity-Based Variable Rates for Residential Waste Generators

Task	Responsible Entity	Start Date	Completion Date	Estimated Cost	Funding Source
Determine total revenues required from garbage rate	Recycling Coordinator/Dept. of Public Works	7/95	6/96	Staff time @ 40 hours = $800	Refuse Fund
Perform rate review and program feasibility study	Consultant/Recycling Coordinator/Dept. of Public Works	7/96	12/96	$5,000	Refuse Fund
Develop new rate structure program	Consultant/Recycling Coordinator/Dept. of Public Works	1/97	6/97	$5,000	Refuse Fund
Develop education program	Recycling Coordinator	7/97	12/97	Staff time @ 40 hours = $800	Refuse Fund
Public hearing	City Council	1/98	4/98	N/A	N/A
Procure necessary equipment, materials	Dept. of Public Works	7/98	10/98	$25,000	Refuse Fund
Provide promotion & education	Recycling Coordinator	11/98	6/99	$2,500	Refuse Fund
Begin full scale operations	Dept. of Public Works	7/99	Ongoing	N/A	Refuse Fund
Monitor and evaluate	Recycling Coordinator	7/99	Ongoing	Staff time @ 160 hours = $3,200	Refuse Fund
Total Cost	---	---	---	$42,300	---

* Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).

4.5.3 Commercial Waste Audits (Alternative 4)

The Recycling Coordinator will develop this program in conjunction with the Dept of Public Works and direct it towards commercial/industrial waste generators which produce more than 2 cubic yards of waste daily. With the assistance of the business owners or managers, the waste hauler will then fill out the evaluations and receive advice from the City regarding methods of source reduction and recycling. The evaluations will be useful in gaining a better understanding of the commercial waste stream.

Table 4-5
Implementation Schedule for Commercial Waste Audits

Task	Responsible Entity	Start Date	Completion Date	Estimated Cost	Funding Source
Create questionnaire and initial database from contacts with targeted business	Recycling Coordinator	7/93	9/93	Staff time @ 40 hours = $800	Refuse Fund
Distribute questionnaire and instructions on how to conduct the evaluation	Recycling Coordinator	10/93	12/93	Staff time @ 40 hours = $800	Refuse Fund
Expand database	Recycling Coordinator	1/94	3/94	Staff time @ 40 hours = $800	Refuse Fund
Coordinate waste evaluations and advise businesses on source reduction methods	Recycling Coordinator/ Business Owners & Managers	4/94	Ongoing	Staff time @ 80 hours = $1,600	Refuse Fund
Monitor & evaluate	Recycling Coordinator	4/94	Ongoing	Staff time @ 40 hours = $800	Refuse Fund
Total Cost	---	---	---	$4,800	---

* Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).

4.5.4 Backyard Composting (Alternative 5)

This alternative will involve determining the scope of the program and the type of the technology to be used for an effective program. Since other backyard composting programs are underway in other communities, the City will utilize the knowledge derived from these programs to develop an educational program for City residents.

Table 4-6
Implementation Schedule for Backyard Composting

Task	Responsible Entity	Start Date	Completion Date	Estimated Cost	Funding Source
Develop program	Recycling Coordinator	7/93	9/93	Staff time @ 80 hours = $1,600	Refuse Fund
Develop public information literature	Recycling Coordinator	10/93	12/93	$2,500 (Included in Public Education Costs)	Refuse Fund
Provide public workshops including Master Composter program	Recycling Coordinator	1/94	6/94, ongoing bi-annually	Staff time @ 80 hours = $1,600	Refuse Fund
Develop public demonstration project	Recycling Coordinator	7/94	Ongoing	Staff time @ 40 hours = $800	Refuse Fund
Develop and distribute press releases	Recycling Coordinator	7/94	Ongoing, bi-annually	Staff time @ 8 hours = $160	Refuse Fund
Monitor and evaluate	Recycling Coordinator	7/94	Ongoing, bi-annually	Staff time @ 40 hours = $800	Refuse Fund
Total Cost	---	---	---	$7,460	---

* Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).

4.5.5 Educational Programs

For a detailed implementation table for this alternative, please see the Education and Public Information Component.

4.5.6 Awards and Public Recognition Program (Alternative 7)

The Recycling Coordinator will work with the City and local organizations such as the Chamber of Commerce to develop Awards and Public Recognition Programs. Program development will include choosing a suitable forum(s) to present the awards along with development of criteria for selecting who will be distinguished.

Table 4-7
Implementation Schedule for Awards and Public Recognition

Task	Responsible Entity	Start Date	Completion Date	Estimated Cost	Funding Source
Develop formal recognition program	Recycling Coordinator	7/93	9/93	Staff time @ 40 hours = $800	Refuse Fund
Select recipient	Recycling Coordinator	10/93	Ongoing annually	Staff time @ 8 hours = $160	Refuse Fund
Award Plaque, Trophy, etc.	Recycling Coordinator	12/93	Ongoing annually	Staff time @ 8 hours = $160	Refuse Fund
Monitor & evaluate	Recycling Coordinator	12/93	Ongoing annually	Staff time @ 8 hours = $160	Refuse Fund
Total Cost	---	---	---	$1,280	---

* Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).

4.5.7 Government Non-Procurement Source Reduction Policies (Alternative 8)

Implementation involves determining what source reduction activities will be effective and then educating City government employees about these options.

Table 4-8
Implementation Schedule for Non-Procurement Source Reduction Policies

Task	Responsible Entity	Start Date	Completion Date	Estimated Cost	Funding Source
Develop program	Recycling Coordinator/City Departmental Managers	7/93	9/93	Staff time @ 80 hours = $1,600	Refuse Fund
Implement program at City Hall	Recycling Coordinator/City Departmental Managers	10/93	Ongoing	Staff time @ 40 hours = $800	Refuse Fund
Promote program as a model for business community	Recycling Coordinator	1/94	Ongoing	Staff time @ 40 hours = $800	Refuse Fund
Monitor and evaluate program effectiveness	Recycling Coordinator	1/94	Ongoing	Staff time @ 10 hours = $200	Refuse Fund
Total Cost	---	---	---	$3,400	---

* Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).

4.5.8 Adoption of Government Procurement Policies (Alternative 9)

This program involves the design of an effective, implementable program. It is entirely dependent upon the City government to develop and adopt it.

Table 4-9
Implementation Schedule for Government Procurement Policies

Task	Responsible Entity	Start Date	Completion Date	Estimated Cost	Funding Source
Identify substitute products and areas of waste	Recycling Coordinator	7/93	Ongoing	Staff time @ 80 hours = $1,600	Refuse Fund
Create new purchasing guidelines	Recycling Coordinator/ City Council	10/93	12/93	Staff time @ 40 hours = $800	Refuse Fund
Implement program	Recycling Coordinator	1/94	Ongoing	Staff time @ 80 hours = $1,600	Refuse Fund
Monitor & evaluate program effectiveness	Recycling Coordinator	1/94	Ongoing	Staff time @ 40 hours = $800	Refuse Fund
Total Cost	—	—	—	$4,800	—

* Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).

4.6 MONITORING AND EVALUATION

This section summarizes how selected programs will be monitored and evaluated. Monitoring and evaluation is necessary to measure the success of selected programs and to provide a measure by which adjustments can be made to increase program effectiveness if diversion goals will not be met.

In general, reporting for most programs will be compiled by City staff and the Recycling Coordinator on a quarterly basis.

Existing Programs

Objective
The objective of this alternative will be to devise a reporting methodology to determine and track existing source reduction activities in the City (including thrift shops, diaper services and any other activities discovered during the course of the survey).

Criteria/Methods for Evaluation
The method for quantifying results of source reduction activity through existing activities will result from the reporting methods (including surveys and telephone interviews) the Recycling Coordinator will undertake.

Responsible Entity
This data will be summarized annually by the Recycling Coordinator.

Contingency Plan if Shortfall
At this time, no diversion goals have been set for existing programs. Shortfalls include a lack of response to the surveys. Should this occur, the Recycling Coordinator will re-contact the business to answer any questions and to verbally undertake the survey when practical.

Alternative 1: Quantity Based Variable Rates or User Fees

Objective
To implement a variable rate structure in the medium-term as a contingency measure in the event that the City fails to meet its diversion goals.

Criteria/Method for Evaluation
At the time of the first update to this document, the City will evaluate the progress made towards achievement of projected diversion goals and determine if a variable rate structure shall be implemented.

Responsible Entities
The Recycling Coordinator will make a recommendation to the Department of Public Works which will begin the rate review process to determine the future variable rate structure.

Contingency Plan if Shortfall
This is a shortfall contingency plan.

Alternative 4: Commercial Waste Audits

Objectives
Have commercial waste audits performed by the waste hauler for 90 percent of the businesses generating 2 cubic yards or more of waste daily.

Criteria/Method of Evaluation
The Recycling Coordinator will create a data base identifying firms which have had an audit performed, and the results of the audit. Periodically, updates will be performed and waste diversion success at each business evaluated.

Responsible Entity
he Recycling Coordinator shall be responsible for coordinating commercial waste audits with local businesses.

Contingency Plan if Shortfall
If the City fails to meet anticipated commercial waste sector diversion goals, then a mandatory commercial recycling program will be considered.

Alternative 5: Backyard Composting

Objective
To achieve a participation level of 10 percent of the detached single-family residents in the City in the short-term and up to 25 percent by the medium-term.

Criteria/Method for Evaluation
The Recycling Coordinator shall maintain written records describing the total number of residents attending backyard composting workshops. As part of an bi-annual recycling/source reduction survey to conducted by the Recycling Coordinator, the level of participation and volume of materials being composted shall be estimated. The findings of the survey shall be compared to the objectives stated above.

Responsible Entities
Implementation of the workshops shall be shared by both the City and presenting organizations. Documenting the number of participants and quantities of materials being composted shall be completed by the Recycling Coordinator in conjunction with City staff.

Contingency Plan if Shortfall
In the event of a shortfall, the following actions shall be considered:

- Increase costs of curbside collection of yard waste.
- Increase costs of garbage service.
- Increased public information and education efforts targeted at backyard composting.

Alternative 6: Education Efforts

Objectives
To create an overall awareness of source reduction programs being practiced by the City by 60 percent of its residents by 1995 and 90 percent of the population by the year 2000.

Criteria/Method of Evaluation
The criteria is the achievement of a level of awareness among the City's residents as described above. This shall be evaluated through a yearly survey conducted by the Recycling Coordinator and City staff asking questions on recycling, source reduction and composting practices currently being done.

Responsible Entity
The Recycling Coordinator shall be the responsible for evaluating education efforts directed at source reduction. This shall be done in conjunction with the Public Information and Education Component of this element. Please refer to this component for further details.

Contingency Plan if Shortfall
Please refer to the Public Information and Education Component of this element.

Alternative 7: Awards and Public Recognition Program

Objective
To encourage and stimulate source reduction activities through public recognition and promotion.

Criteria/Methods for Evaluation
Outstanding waste reduction programs will be recognized through citizen nomination and by the Recycling Coordinator. Commercial waste audits will serve as a primary monitoring tool.

Responsible Entity
The Recycling Coordinator will coordinate this program.

Contingency Plan if Shortfall
This program will continue to recognize successful waste reduction programs regardless of overall program achievement.

Alternative 8: Non-Procurement Source Reduction Programs by the City Government

Objective
The City will adopt and implement non-procurement programs within its offices and facilities and achieve a level of understanding and participation among 80 percent of its employees by 1995.

Criteria/Methods for Evaluation
The effectiveness of this program is difficult to quantify. Practices and methods of doing business will be documented through administrative directives or policies issued by the City Council and/or various department managers. The level of understanding and participation among employees can be seen through the production of work and change in office practices. However, it is doubtful that a measurable change in diversion that can be accredited to this alternative alone.

Responsible Entity
City government.

Contingency Plan if Shortfall
Continue to remind employees of the non-procurement policies implemented by the City and its' facilities. This will be done through employee meetings and written memos.

Alternative 9: Adoption of Local Government Procurement Policies

Objective
To adopt procurement policies resulting in a 20 percent increase in the purchase of recyclable materials, reusable goods and more durable goods by 1995.

Criteria/Methods of Evaluation
Evaluation of program effectiveness will be based on the following criteria:

- Annual accounting of purchases and awards for contract services which include specifications for supplies and materials meeting recycled content standards.
- Analysis of fiscal impacts of program.
- Estimates of the quantity of waste reduction.

Responsible Entity
City government.

Contingency Plan if Shortfall
Review adopted policies and determine if they are being followed. If they are not being followed, determine if it is because they are not feasible or due to a lack of understanding on the employees part. Revise policies to address shortfall and findings after reviewing the past year's procurement activities.

4.6.1 Funding

Monitoring costs primarily include staff hours on the part of the Recycling Coordinator and City staff. Estimated staff hours for monitoring are included in program costs summarized in Section 4.5. The funding source will be the Refuse Fund.

SECTION 5

RECYCLING COMPONENT

Recycling is the process of collecting, sorting, cleansing, treating, and reconstituting materials that would otherwise become solid waste; and then returning them to the economic mainstream in the form of raw material for new products that meet the quality standards established by the marketplace.

The purpose of the Recycling Component is to identify, evaluate, select, and establish an implementation plan for residential, industrial, and institutional recycling programs that will contribute towards meeting and exceeding the required short- and medium-term diversion goals of 25 percent and 50 percent respectively.

The source of statistical information in this component is derived from the Waste Generation Study which describes the waste characterization for the City of Winters. The tonnages are expected to grow proportionately with community size.

5.1 GOALS AND OBJECTIVES

This section identifies the City's objectives for the short- and medium-term planning periods. The objectives will identify waste diversion goals based on the results of the Waste Generation Study and the recycling alternatives selected by the City.

5.1.1 Program Goals and Objectives

A survey of several businesses in the City indicates that several companies have successful commercial recycling programs. Diversion programs which have been selected by the City are designed to create new recycling opportunities for the residents of Winters, and to increase the levels of existing recycling taking place. Objectives to be accomplished in the short- and medium-term planning periods are the following:

- Establish residential curbside recycling in the City of Winters by the end of 1993;
- Establish a convenient drop-off/buy-back location for both residential and commercial generators by the end of 1993;
- Promote and expand current commercial/industrial recycling through the efforts of the City in the short and medium-term planning periods;

- Increase levels of commercial/industrial waste diversion through the rerouting of collection vehicles in the medium-term planning period to reduce material contamination and increase material recovery rates at the mixed waste MRF proposed for the Yolo County Central Landfill;

- Participate in regional County integrated waste management programs to take advantage of economies of scale and provide consistent waste management programs throughout the region. Specifically, participate in the County's mixed waste processing program through the diversion of commercial/industrial wastes to the regional materials recovery facility proposed for the County in the medium-term planning period; and

- Divert through recycling approximately 492 tons per year (TPY), 6.1 percent of total waste generated in the short-term and 2,338 TPY, 19.9 percent, in the medium-term planning period.

5.1.2 Market Development Goals and Objectives

In addition to the above goals and objectives, the following market development alternatives have been identified as ongoing measures to assure that markets are available for materials recovered by waste diversion programs.

- Identify materials where market demand is exceptionally weak and develop procurement policies, legislation, or economic development efforts to diversify markets for such materials.

- Identify alternative uses for materials with weak market potential. Material types to be considered will include all grades of waste paper, yard waste, and plastics.

- Identify industries which utilize high volumes of postconsumer or secondary materials, prioritize the list of industries, and prepare a work plan targeting those companies for post-consumer materials market development.

- Determine the feasibility of regional buying pools with other local governments and industry for recycled materials or products.

- Develop an implementation plan for establishing recycling plants and businesses which utilize secondary materials as feedstock (i.e., mixed plastics recycling, paper mills).

- Identify and implement incentives to promote consumer purchasing of products with recycled material content.

5.1.3 Targeted Materials

The Waste Generation Study identified materials disposed of in the landfill by the City. Based upon the results of the Waste Generation Study and the availability of markets for recovered materials, target materials available for diversion through recycling have been defined as:

- Paper products (newsprint, corrugated cardboard, kraft paper, high-grade and mixed paper) - 15.9 percent by weight of the total waste disposed
- Plastics (HDPE & PET for the short-term) - .9 percent by weight of the total waste disposed
- Plastics (HDPE, PET, films, and polystyrene for the medium-term) - 4.7 percent by weight of the total waste disposed
- Metals (aluminum, tin cans, and other metals) - 3.9 percent of the total waste disposed by weight
- Glass (CA Redemption and other recyclable) - 3.4 percent by weight of the total waste disposed

Materials such as Food, Wood, White Goods and Inert Materials (Dirt, Asphalt, Concrete) represent materials for which there already exists source reduction or other diversion activity. These categories are listed under the Existing Conditions of other components (Source Reduction, Composting, and Special Waste) in this SRRE.

5.2 EXISTING CONDITIONS

During 1991, 17.9 percent or 1,058 TPY of Winters' waste stream was diverted through two primary recycling alternatives. 861 TPY, or 81 percent was recycling of concrete, asphalt and inert solids used for road base at YCCL. Another 197 tons was diverted through private commercial recycling programs established by business owners in the City. This information was gathered through an extensive survey process. The City of Winters is the current waste hauler and is drafting this plan with the intention of implementing residential recycling collection programs through the City Department of Public Works. However, the City will review all possible options in 1993 to determine the most efficient way to implement AB 939 mandated programs. The following is a summary of recycling programs that were in existence in 1991, the base year for this document.

Buy-Back Center

In 1991, there was a buy-back operation in the City. This operation closed as of May 1991. A new buy-back operated by USA Recyclers is now in place at the Town and Country Market on Highway 128. This program will be discussed in the first update to this document.

Drop-Off Recycling Center

The City maintains a drop-off for cardboard and newspaper. The YCCL has operated a drop-off recycling center since 1981. Receptacles are available for the following products:

- glass
- aluminum and steel cans; aluminum scrap
- newspaper and white office paper
- automobile batteries and waste oil
- plastic (PET, HDPE, and PVC pipe)
- automobile tires

There is no fee for using the drop-off center except for tires which can cost up to $4 depending on rim size. The Drop-Off Recycling Center is open:

Monday - Saturday	7:00 a.m. - 4:00 p.m.
Sunday	9:00 a.m. - 4:00 p.m.

Commercial/Industrial Recycling

Commercial/industrial recycling was, and still is, a private sector operation implemented by individual business owners.

RFP for Waste Services

The City of Winters, issued a RFP for refuse and recycling service to local and regional waste haulers. Subsequently, a waste hauler was selected, but this decision was met with considerable resistance by the citizens of Winters. Appropriately, the City chose to postpone the decision of whether to contract out the service or continue to operate these programs in-house until the completion of this plan to better identify the full scope of services needed and the costs associated with each program.

5.2.1 Anticipated Decrease of Recycling Activities

The City anticipates that there may be less drop-off activity as curbside recycling comes on-line. Inerts will continue to be routed to the YCCL and be separated there by county staff. Buy-back activity is market driven and should maintain current levels of operation. As the proposed MRF develops, it is anticipated that some private commercial establishments will maintain their current

programs while others will chose to allow the MRF to capture these materials. This will be determined through the Commercial Waste Audit program detailed in the Source Reduction Component.

5.3 EVALUATION OF ALTERNATIVES

The City of Winters is primarily a rural residential community. There is very little commercial activity in the City that warrants designing a specific program to target these establishments. Therefore, there are a limited number of programs appropriate for the City given it's demographics. Six recycling program alternatives have been considered for recovering recyclable materials from the waste stream. These include:

Alternative 1.	Residential Curbside Recycling Collection (selected)
Alternative 2.	Multi-Unit Residential Recycling (selected)
Alternative 3.	Source Separated Commercial/Industrial Recycling Collection (selected in conjunction with Alternative 6)
Alternative 4.	Drop-Off/Buy-Back Recycling (selected)
Alternative 5.	Mandatory Recycling Law (selected as a contingency measure)
Alternative 6.	Regional Materials Recovery Facility (selected)

Using the evaluations listed on the following pages, the City will select the programs that will be most effective and appropriate to its needs.

Alternative 1. Residential Curbside Collection Program

Curbside collection of recyclable materials typically involves the source separation (by residents) of recyclables into well-marked containers which are regularly brought out to the curb for collection by specially designed vehicles and trained personnel (usually one or two man crews per vehicle). A single-family curbside collection program serves residences that can easily move recyclables to the curbside such as single-family homes, mobile homes, two to four-unit dwellings, and townhomes.

Materials generally collected by this sort of program include newspaper, glass, aluminum, steel food and beverage cans, and plastic. Once collected, the recyclables are delivered to a processing facility for further separation (if not pre-sorted at the curb) and preparation for sale to brokers or directly to manufacturers who use the recyclables as a raw material in creating new products.

Participation rates in curbside programs typically tends to average 60 to 80 percent. The participation rate is a measure of the number of households participating once per month divided by the total number of households eligible to participate in the program. Participation could become mandatory as determined by local government officials if recycling goals are not being

achieved.

This program would be directed towards residents receiving regular weekly service. This would include all single-family homes in the City.

Effectiveness

Curbside recycling programs generally divert between 3 and 6 percent of the total waste generated in any given municipality. The anticipated effectiveness of curbside recycling in the City of Winters is 3.2 percent diversion of the waste generated in the short-term and 5.9 percent in the medium-term, based on high participation and capture rates for the materials targeted.

The materials to be targeted are: CA redemption and other recyclable container glass, aluminum, tin and bi-metal food and beverage cans, PET, HDPE, and newspaper and mixed paper.

Table 5-1
Projected Amounts of Residential Waste to be Diverted by Curbside Recycling Program

Material	Amount Currently Disposed (TPY)	Anticipated Short-Term Diversion (% of Total Waste Stream)	Anticipated Short-Term Diversion (TPY)	Anticipated Medium-Term Diversion (% of Total Waste Stream)	Anticipated Medium-Term Diversion (TPY)
Newsprint	91	.9	55	1.2	73
Mixed Paper	171	--	0	2.0	120
HDPE, PET	23	.2	14	.3	17
Aluminum cans	2	.03	2	.03	2
Bi-metal/tin cans	51	.8	46	.8	46
Glass	122	1.2	73	1.6	92
Totals	460	3.2	190	5.9	350

* Diversion projections are based upon 1990 data. Cumulative effects projected in Section 5.4.1 are based upon 1995 and 2000 waste generation projections and will vary accordingly.

Hazards
A curbside collection program poses no significant environmental, health, or safety hazards, but may create a slight increase in traffic, noise, and litter. Containers left at the curbside may be a concern to some residents.

Ability to Accommodate Change
A curbside collection program can easily adapt to changing economic and technological conditions. As the value of recyclable materials changes, new materials may be added to the program. Further, as processing technologies improve, the collection method may be changed to commingled.

Consequences on Waste Stream Composition
An effective curbside collection program will result in a reduction of newsprint, plastic, aluminum, tin, and bi-metal food and beverage cans, and glass entering the waste stream and being landfilled.

Ability to be Implemented
Once the decision is made to provide curbside collection service, most residential curbside recycling collection programs can be implemented in six to 12 months. This time frame does not include establishment of markets for the materials recovered or development of a materials processing facility.

Need for Facilities
A curbside collection program for the City of Winters will require a materials recovery facility to receive, separate, crush/compact, bale, and prepare the recyclables for sale to markets in accordance with the material quality specifications required by the buyer. In the abscence of such facilities, collected materials can brokered to service providers who operate intermrdiate processing facilities.

Consistency with Local Policies, Plans, and Ordinances
Development of a curbside collection program does not conflict with any local policies, plans, or ordinances.

Institutional Barriers to Implementation
There are no institutional barriers that would prevent implementing a curbside collection program.

Costs
A curbside collection program involves capital expenditures and operation and maintenance costs. Assuming that the City will provide the curbside collection program to the residents, the City will have to either raise fees to pay for the program or tap revenues already allocated to other programs. For a detailed analysis of the City's options for funding the implementation and operation of this program, see the Funding Component.

Generally, curbside recycling services provided by a contract hauler cost between $1.00 and $3.00 per household per month, depending upon, but not limited to, the materials collected, demographic characteristics, the extent of services provided, and the haulers ability to allocate the actual costs associated with their residential programs across their commercial client base and other services they provide. A fully allocated City operated program could range from $5.00 to $20.00 per household per month.

Market Availability
The materials to be collected by the curbside collection program include newspaper, PET and HDPE, aluminum, tin and bi-metal food and beverage cans, and glass. Currently there is a market for all of these materials through salvage companies, brokers, and manufacturers.

Public vs. Private Operation
The program is designed with the City as operator. However, this program may be implemented by a private contractor. No formal decision is anticipated until later in 1993.

Technical Reliability/Public Acceptance
Curbside collection programs provide a great opportunity for recovering recyclable materials from the residential waste stream, as demonstrated in over 250 programs currently in operation nationwide.

Alternative 2. Multi-Unit Residential Recycling

This alternative has the City developing and implementing a multi-unit residential recycling program which will accept all of the materials accepted in the curbside program. Unlike a curbside program, in which residents place their materials at the curb for collection, a multi-unit program provides large containers that building tenants use in common and has the collector retrieve and replace the containers.

Effectiveness
While multi-unit residential recycling programs tend to collect far less material per unit than curbside programs, they are nonetheless effective at diverting material from the waste stream. A multi-unit program will typically divert half of the material per unit of a curbside program.

Table 5-2
Projected Amounts of Residential Waste to be Diverted by Multi-unit Residential Recycling

Material	Amount Currently Disposed (TPY)	Anticipated Short-Term Diversion (% of Total Waste Stream)	Anticipated Short-Term Diversion (TPY)	Anticipated Medium-Term Diversion (% of Total Waste Stream)	Anticipated Medium-Term Diversion (TPY)
Newsprint	18	.08	5	.2	11
Mixed paper	20	.08	5	.2	10
HDPE, PET	3	.01	1	.03	2
Aluminum cans	1	--	0	.01	1
Bi-metal/tin cans	5	.03	2	.05	3
Glass	13	.06	4	.14	8
Totals	40	.3	17	.6	35

* Diversion projections are based upon 1990 data. Cumulative effects projected in Section 5.4.1 are based upon 1995 and 2000 waste generation projections and will vary accordingly.

Hazards

Multi-unit residential recycling programs do not pose any significant environmental, health, or safety hazards.

Ability to Accommodate Change

A multi-unit residential collection program tends to be less adaptable to changing economic and technological conditions than a curbside program as it is usually more difficult to communicate with tenants in an apartment building than with the residents of a single-family house. However, multi-unit residential collection programs are similar enough that sufficient additional effort by the program operator, property manager, and/or the City to communicate with the tenants will generally produce tangible results.

Consequences on Waste Stream Composition

A multi-unit residential collection program will reduce the amount of aluminum cans, newsprint and mixed paper, glass, and plastic soft drink bottles being landfilled.

Ability to be Implemented
Creating a multi-unit residential recycling collection program for Winters will be relatively uncomplicated as there are very few eligible buildings in the City. The program can be developed and implemented in tandem with the curbside program, within six to 12 months.

Need for Facilities
Creating a multi-unit residential recycling collection program and a curbside collection program will necessitate brokering collected materials to an intermediate processing facility or a MRF.

Consistency with Local Policies, Plans, and Ordinances
A multi-unit residential collection program does not conflict with local policies, plans, or ordinances. Possible revisions to building codes may be necessary to ensure adequate recycling space both inside the apartment unit and at the buildings disposal area.

Institutional Barriers to Implementation
From the perspective of the City government, there are no institutional barriers that would prevent implementation of a multi-unit residential collection program.

Costs
Costs associated with a City operated program are unknown at this time. Costs per unit per month for a private hauler operated program, including materials processing and marketing, can range form approximately $1.00 to $5.00.

Market Availability
Materials to be collected by the multi-unit residential collection program include mixed paper, phone books, magazines, tin food and beverage cans, aluminum foil and HDPE in addition to newspaper, container glass, and CRV aluminum and plastic. Currently there are markets for all of these materials through salvage companies that act as brokers, or through manufacturers that purchase the materials directly and use them in their manufacturing processes.

Public vs. Private Operation
The program is designed with the City as operator. However, this program may be implemented by a private contractor. No formal decision is anticipated until later in 1993.

Technical Reliability/Public Acceptance
Multi-unit residential recycling programs generally are received well by the public. Property managers and owners are often not interested in participation as they see the programs as a burden, yet they do not actively oppose the program.

Alternative 3. Source Separated Commercial/Industrial Recycling Collection

Some existing commercial/industrial diversion currently takes place in private company operated programs. These programs will likely continue until the proposed MRF comes on-line. The City will focus on the commercial/industrial sector for participation in the county's program to divert commercial/industrial loads to the proposed MRF to be located at the YCCL. In pursuit of these goals, the City may consider a number of options for collection and/or rerouting of collection vehicles. In the abscence of a MRF targeting mixed commercial/industrial loads, the source separated commercial collection program would continue, but the City would have to divert the collected materials to another facility.

Effectiveness

Commercial recycling programs are highly effective at diverting targeted wastes from the waste stream. Levels of contamination may be higher than in curbside programs as materials are collected in large increments and usually cannot be thoroughly inspected before consolidation with other materials already in the truck. To minimize contamination, rerouting of collection vehicles is highly recommended.

Table 5-3
Projected Amounts of Commercial/Industrial Waste to be Diverted by Commercial Recycling Program

Material	Amount Currently Disposed (TPY)	Anticipated Short-Term Diversion (% of Total Waste Stream)	Anticipated Short-term Diversion (TPY)	Anticipated Medium-Term Diversion (% of Total Waste Stream)	Anticipated Medium-Term Diversion (TPY)
Newsprint	48	.3	19	.5	29
Mixed paper	139	--	0	1.7	97
Cardboard	138	1.2	69	1.8	104
High-grade paper	30	--	0	.3	18
Glass	27	.2	11	.2	16
Aluminum cans	4	.02	1	.03	2
Bi-metal/tin cans	11	.05	3	.1	7
HDPE, PET	18	.06	4	.08	5
Totals	415	1.8	107	4.7	278

* Diversion projections are based upon 1990 data. Cumulative effects projected in Section 5.4.1 are based upon 1995 and 2000 waste generation projections and will vary accordingly.

Hazards
An increase in commercial collection activity will not pose any significant environmental, health, or safety hazards. However, the program could create minimal additional traffic and noise problems. Individual businesses or industries may encounter hazards in locating containers of recyclables for pickup.

Costs
The costs for this program would be borne entirely by the commercial waste generators in the City of Winters and would be paid through the commercial garbage rate, which is regulated by the City. This rate will likely increase as tipping fees at YCCL increase to cover the costs of the proposed MRF.

Ability to Accommodate Change
This alternative is very flexible as the program operator will be able to add materials to the list of those collected or change collection operations as processing technologies change.

Consequences on Waste Stream Composition
An effective commercial/industrial recycling program may remove significant percentages of paper, aluminum, plastic, metals and glass from the waste stream.

Ability to be Implemented
This alternative can be implemented in the short-term, but will likely wait until the proposed MRF comes on-line in the medium-term.

Need for Facilities
Facilities are required for implementation of this alternative. Materials will need to be sorted, baled, crushed, or otherwise bulked, weighed, manifested and shipped.

Consistency with Local Policies, Plans, and Ordinances
This alternative is consistent with local policies, plans, and ordinances. Possible revisions to building codes may be necessary to ensure adequate space for recycling containers.

Institutional Barriers to Implementation
There are no institutional barriers that would prevent the implementation of a commercial/industrial recycling program.

Market Availability
No materials will be collected for which markets do not exist.

Public vs. Private Operation
The program is designed with the City as operator. However, this program would likely be implemented by a private contractor. No formal decision is anticipated until later in 1993.

Technical Reliability/Public Acceptance
The source separated collection of commercial wastes is a highly technically reliable option and will receive public acceptance both from the residents of Winters and the business community members if it is perceived as fair and not highly intrusive.

Alternative 4. Drop-off/Buy-back Recycling

The City of Winters will ensure that a buy-back facility is available in the City. This facility will both buy and accept as drop-off California redemption materials, used motor oil, and a limited list of as yet unspecified other recyclable materials. The drop off/buy back facility will likely consist of a 40 cubic yard covered container staffed part time with extra bins outside for materials dropped off. No specific site has yet to be selected.

Effectiveness
In a community that does not have a curbside recycling and/or commercial recycling program, this alternative can be highly effective.

Generally, drop-off programs do not work efficiently in conjunction with other programs if they do not target self-haul refuse or materials that are not targeted in the curbside and any commercial/industrial programs. A drop-off/buy-back facility located in Winters would not target self-haul refuse as that is done only at the landfill. It will, however, accept materials not accepted in the curbside program, such as high grade paper and cardboard, and may therefore be highly effective at diverting those materials.

The buy-back programs will serve a different function than drop-off in that it will allow residents to redeem their recyclables for cash, a necessary alternative to curbside recycling as waste handling and recycling costs per household rise.

Table 5-4
Projected Amounts of Waste to be Diverted by Drop-off/Buy-back Centers

Material	Total Amount Currently Disposed (TPY)	Anticipated Short-Term Diversion (% of Total Waste Stream)	Anticipated Short-term Diversion (TPY)	Anticipated Medium-Term Diversion (% of Total Waste Stream)	Anticipated Medium-Term Diversion (TPY)
Newsprint	157	.1	6	.2	12
Mixed paper	330	.3	17	.6	34
Cardboard	233	.2	12	.4	24
High-grade paper	36	.03	2	.06	4
Glass	158	.1	6	.2	12
Aluminum cans	7	--	--	--	--
Bi-metal/tin cans	66	.05	3	.1	6
HDPE, PET	43	.03	2	.06	4
Totals	1,030	.8	48	1.6	96

* Diversion projections are based upon 1990 data. Cumulative effects projected in Section 5.4.1 are based upon 1995 and 2000 waste generation projections and will vary accordingly.

Hazards

A drop-off/buy-back site may create slight traffic congestion, noise, and litter. Also, illegal scavenging of materials placed out for curbside recycling may become endemic if buy-back services are available at which to redeem the pilfered materials. The hazard associated with scavenging is late night noise in residential areas from glass and aluminum handling.

Ability to Accommodate Change

Staffed facilities are highly adaptable. Unstaffed facilities, however, are less adaptable as users may not read the signage and instructions, and may deliberately dump general refuse, bulky goods, et. al.

Consequences on Waste Stream Composition

Drop-off centers generally remove paper from the waste stream; buy-back centers remove mostly California Redemption materials (glass, aluminum cans and PET bottles) from the waste stream.

Ability to be Implemented

Implementation could be accomplished within 3 months to 2 years depending upon siting, design, necessity of CEQA documentation, and local permitting procedures.

Need for Facilities

A drop-off/buy-back center will require access to a processing facility where materials can be sorted and prepared for sale to brokers or end-users. This will be the responsibility of the operator and such a facility will not be located in the City of Winters.

Consistency with Local Policies, Plans, and Ordinances

A drop-off/buy-back recycling program does not conflict with local policies, plans, or ordinances; however, for a site located within the City, zoning issues may have to be addressed.

Institutional Barriers to Implementation

There are no identifiable barriers that would prevent implementation of this program.

Costs

The costs associated with this alternative are largely indeterminable as buy-back facilities generally pay for themselves and drop-off facilities do not. The mixture of use, the materials accepted as drop-off, and the degree to which sorting will be required all effect the cost of the facility. A facility limited in scope and not staffed more than 30 hours per week should range in cost from $5,000 to $10,000 per year.

Market Availability

Markets would be available for all of the materials recovered through this program.

Public vs. Private Operation

This alternative is designed to be implemented by a private contractor.

Technical Reliability/Public Acceptance

Drop-off/buy-back recycling programs are highly reliable, yet limited if not implemented at a transfer station or landfill while operated in conjunction with commercial and residential source separated recycling programs. In all cases, however, they enjoy a high degree of public acceptance.

Alternative 5. Institution of Mandatory Recycling Laws

This option would have the City issue ordinances banning from the waste stream those materials that are included in the curbside program and commercial programs, for residences and businesses, respectively.

Effectiveness
The effectiveness of this option may largely depend on the enforcement clause of the ordinance and the level of promotion and enforcement dictated by the City. Assuming active promotion and enforcement, such an ordinance may substantially increase participation in curbside and commercial programs. Without enforcement, this alternative will nonetheless serve as a strong statement from City government regarding the City's commitment to recycling.

Hazards
There are no identifiable hazards associated with this option other than political fall out.

Ability to Accommodate Change
This option is very flexible as it affords the City the ability to add to its list of prohibited items.

Consequences on Waste Stream Composition
Increased recycling as a response to mandatory recycling laws will help the City realize its AB 939 goals by reducing the amount of recyclable materials in the waste stream.

Ability to be Implemented
This alternative will require at least two months for research, writing of the ordinance, and the public hearing.

Should the City choose to enforce its ordinance, enforcement mechanisms will be required, perhaps requiring additional staff, computer programming, et.al. These additional tasks may require up to two years to accomplish.

Need For Facilities
No facilities are required.

Consistency with Local Policies, Plans and Ordinances
This alternative, if implemented as a short-fall measure to mitigate the City's non-compliance with AB 939 diversion mandates, will be consistent with local policy. Were this alternative to be implemented without the City's being in danger of non-compliance, opposition within the City would likely surface.

Institutional Barriers to Implementation
This alternative will require an ordinance and possible CEQA work.

Market Availability
Markets are not required for this alternative.

Public v Private Operation
This ordinance would be presented and passed by a government body; enforcement would be provided by the City.

Costs
The costs of the option range from $500 to $2,000 for implementation of the Ordinance. The costs for enforcement vary from $0 per year to in excess of $20,000 per year, depending on fines and other funding mechanisms.

Technical Reliability/Public Acceptance
As long as any law mandating recycling is perceived as fair, it will likely be broadly accepted, although some members of the community may oppose it as intrusive. Without an enforcement clause such a law will likely be seen as benign and will serve primarily as a statement by the City of Winters on the importance of resource conservation. With an enforcement clause, however, the ordinance may face considerable opposition from some community organizations.

Alternative 6. Automated Materials Recovery Facility

Automated MRFs are centralized distribution points that receive, separate, process, and market recyclable materials directly from the general waste stream. They are capable of processing mixed municipal waste without prior sorting and remove targeted recyclable items. In addition, they may be operated in conjunction with drop-off, curbside collection, and commercial/industrial collection programs, processing either separated or commingled recyclables. The primary advantage of a mixed waste MRF is the ability to combine and uniformly process a large percentage of materials from a municipality or a region, meeting quantity and quality requirements imposed by material buyers.

An automated MRF can receive the waste stream as it is disposed without the need for prior separation. This ability removes the burden of source separation from the waste generator and the need for any separate collection system for source-separated materials such as curbside programs. Mixed waste processing involves a combination of manual and mechanical sorting and processing operations. Waste processing begins when the load arrives on the tipping floor where the load is inspected for any potentially hazardous materials. Non-compacted loads from self-haul and roll-off sources can be off-loaded on the tipping floor for separation of wood, dirt, asphalt, cement, yard debris and recyclables by hand and with heavy equipment.

General compacted refuse is deposited onto a tipping floor and ultimately to a conveyor system for both mechanized and manual separation of recyclable materials. Mechanized separation might consist of passing the load over a shaker screen to sort out fine materials, a magnetic

separator to remove ferrous items, or air classification for targeted light materials. Manual separation involves sorters removing targeted items as they pass over the conveyor and placing these items into separate bins for further processing.

Materials are generally processed in the following ways:

- Paper, which often will arrive commingled, is pulled off the production line at various points depending on the types of paper accepted, the system used, and the baler. This material is then baled for shipment to a broker/processor.

- Steel cans are pulled from the system using a magnet and shredded or baled depending on the market.

- Light aluminum and plastic is separated from glass using either air classification or inclined sorting equipment.

- Glass is manually separated by color, then crushed and stored for the market.

Any residual materials at the end of the conveyor may be diverted to composting programs, Refuse Derived Fuel (RDF), the transfer station, or the landfill for disposal.

Effectiveness

In general, mixed waste MRFs have a diversion potential of 30 percent to 40 percent of the total waste stream. Once a given material has been targeted, a 60 to 80 percent total diversion rate for that material can be realized. That includes all source separated programs with the MRF capturing those residual materials remaining in the waste stream. It is projected that the MRF as it is currently proposed will actually contribute an additional 7 percent to the total diversion rate. The effectiveness of an automated MRF is at its highest when recyclable-rich loads are processed. The most effective use of a MRF is as a sorting facility for selected commercial waste loads when residential wastes have been recycled through source separated collection programs. Table 5-5 summarizes the levels of diversion that can be achieved through this alternative.

Table 5-5
Estimate of Waste Diversion Through Mixed Waste Processing

Material	Current Amount Available (TPY)	Recovery Rate (% of Available Materials)	Anticipated Medium-Term Diversion (% of Total Waste Stream)	Anticipated Medium-Term Diversion (TPY)
Newsprint	157	80	2.1	126
Cardboard	233	80	3.1	186
High-grade	36	80	.5	29
Mixed paper	330	80	4.5	264
HDPE, PET	43	80	.6	35
Film	165	60	1.7	99
Glass	158	80	2.1	126
Aluminum	7	80	.1	6
Ferrous	81	80	1.1	65
Bi-metal/tin cans	68	90	1.0	54
Non-ferrous	34	80	.5	27
Total	1,312	77	17.3	1,016

* Diversion projections are based upon 1990 data. Cumulative effects projected in Section 5.4.1 are based upon 1995 and 2000 waste generation projections and will vary accordingly. The recovery rates presented above represent total diversion for those material types including the processing of source separated recyclables collected in residential curbside and commercial/industrial collection programs.

Hazards

As in all working situations where large machinery and equipment are used, health and safety policies at a MRF should be developed and followed by all employees. Possible hazards associated with a facility are noise, litter, odor, and traffic. Facility design should mitigate many of these problems.

Ability to Accommodate Change

Changes in the waste stream may require alteration of the operation to accommodate different materials. In a mixed waste MRF, these changes may require alteration of the existing equipment; however, in most cases, the system can be adjusted to address changes in the composition of the waste stream.

Consequences on Waste Stream Composition
A mixed waste MRF will target materials generated from the commercial/industrial waste stream, increasing the percentage of nonrecyclable materials to be landfilled. This diversion may have positive affects on the life of the landfill due to the diversion of high volume materials such as corrugated cardboard and plastics.

Ability to be Implemented
Implementation of a mixed waste MRF can be accomplished in 30 to 36 months. An in-line material recovery system is scheduled for implementation by the County during the medium-term planning period. A feasibility study will be initiated as part of the CoIWMP process as a first step towards implementation.

Need for Facilities
A mixed waste MRF would require site and facility development. Specific capacity requirements of the facility have not been determined at this time. The facility would be located at the YCCL processing commercial/industrial wastes generated from the Cities of Winters, West Sacramento, and Woodland.

Consistency with Local Policies, Plans, and Ordinances
Development of a automated MRF does not conflict with local policies, plans, or ordinances.

Institutional Barriers to Implementation
There are no institutional barriers to implementation of this alternative.

Costs
Based on the County SRRE for unincorporated Yolo County, capital cost for the facility is estimated to range between $10 and $15 million. Operations and maintenance costs could range between $20 to $40 per ton depending on the degree on manual versus mechanical processing. Costs incurred in the planning, development and operation of the facility will be funded through recovered material revenues and the County Sanitation Enterprise Fund.

Market Availability
Markets are currently available for the materials to be recovered. A summary of markets is presented in Appendix B.

Public vs. Private Operation
The facility would likely be integrated into existing landfill operations. The facility could be operated by the County or through an operations contract with a private contractor.

5.4. SELECTION OF PROGRAMS

Summarized below are the alternative programs selected for implementation by the City of Winters. The selections are based on meetings and conversations with City personnel during the development of the draft SRRE.

5.4.1 Selected Alternatives

Alternative 1. Residential Curbside Collection Program

This alternative has been selected for implementation in the short-term planning period. The program will collect recyclable glass, aluminum, tin and bi-metal cans, PET & HDPE, newspaper and mixed paper. Mixed paper will be added in the medium-term. The program will be implemented and operated by either the City or a private contractor.

Alternative 2. Multi-Unit Residential Recycling

This alternative has been selected for implementation in the short-term. The program will collect recyclable glass, aluminum, tin and bi-metal cans, PET & HDPE, newspaper and mixed paper. Mixed paper will be added in the medium-term. The program will be implemented and operated by either the City or a private contractor. During the short-term planning period, the City will redefine building code requirements for MFD's to allow for addition storage space for locating refuse and recyclable material collection containers.

Alternative 3. Commercial/Industrial Collection Programs

This alternative has been selected for implementation in the medium-term planning period. The City's Recycling Coordinator will assume responsibility for implementation of the program.

Through this alternative, the City's Recycling Coordinator will facilitate commercial/industrial waste diversion through program promotion and in-person contact with prospective Winters businesses. The Recycling Coordinator will facilitate the development of company in-house programs; however, site specific program development will ultimately be the responsibility of the hauler. Commercial/industrial recycling programs will likely target materials with readily available markets. Material types to be targeted will include restaurant and bar glass, cardboard and high-grade paper. Other materials may be targeted on a site specific basis.

The refuse collection crew will also be directed in the short-term planning period to collect restaurant and other food waste refuse separately for disposal at YCCL. This will result in a reduction of material contamination in mixed waste loads and will facilitate waste recovery at the proposed MRF.

Alternative 4. Drop-off/Buy-back Center

This alternative has been selected for implementation in the short-term and will be implemented by a private service provider. Currently, there is an operation at the Town and Country Market which will probably remain as the selected site.

Alternative 5. Mandatory Recycling Laws

This alternative has been selected for implementation in the medium-term as a short-fall mitigation effort for source separated residential and commercial/industrial collection programs should it become apparent that the City will not meet its AB 939 mandates for the year 2000.

Alternative 6. Automated Material Recovery Facility

This alternative has been selected by the City for implementation in the medium-term planning period in a cooperative effort by Yolo County and the Cities of West Sacramento and Woodland. The proposed facility is to be sited at the YCCL. The Cities of Woodland, West Sacramento, and Winters have agreed in principle to commit their non-source separated commercial/industrial waste streams to the facility. Specific waste types to be targeted will be determined based on available markets, market specifications, and material availability.

A feasibility study is scheduled to be undertaken by the Yolo County Department of Public Works and Transportation to determine facility parameters, economics, and targeted waste streams for the proposed facility. At this time, policy issues will be developed to determine the County's role in facility ownership and operation, and waste flow controls. Construction of the facility is not expected to take place until 1996. The cost of development, construction, and operation of the facility will be funded through the County Sanitation Enterprise Fund.

5.4.2 Cumulative Integrated Effect of the Programs

Estimates of waste diversion through the selected programs are estimated to be 6.1 percent and 25.4 percent for the short and medium-term planning periods respectively. Tables 5-6 and 5-7 present estimates of material diversion through the selected programs. These estimates are based on the quantity and composition of solid waste identified in the SWGS.

Table 5-6
Summary of Waste Diversion Through Selected Alternatives in the Short-Term Planning Period as Measured in Tons Per Year (TPY)

Material	1995 Available Tonnage (TPY)	Amount Diverted Through Programs					Total Diverted
		Curbside	Multi-Family	Commercial/ Industrial	Drop-off/ Buy-back	Mixed Waste MRF	
Newspaper	296	73	7	24	8	–	112
Cardboard	357	–	–	98	16	–	114
High Grade	53	–	–	–	2	–	2
Mixed Paper	455	–	7	–	24	–	31
HDPE, PET	62	16	1	5	3	–	25
Plastic Film	227	–	–	–	–	–	–
Glass	320	98	5	16	8	–	127
Aluminum cans	48	3	–	2	–	–	5
Bi-metal/tin cans	93	65	3	4	4	–	76
Ferrous metals	111	–	–	–	–	–	–
Non-ferrous metals	47	–	–	–	–	–	–
Total	2,069	255	23	149	65	–	492
Total Waste Stream Diversion %	–	3.2	.3	1.8	.8	–	6.1

* Total waste stream generation projected for 1995 is approximately 8,136 TPY.

Table 5-7
Summary of Waste Diversion Through Selected Alternatives in the Medium-Term Planning Period as Measured in Tons Per Year (TPY)

Material	2000 Available Tonnage (TPY)	Amount Diverted Through Programs					Total Diverted (TPY)
		Curbside	Multi-Family	Commercial/ Industrial	Drop-off/ Buy-back	Mixed Waste MRF	
Newspaper	427	141	23	59	23	96	342
Cardboard	514	–	–	211	47	153	411
High Grade	76	–	–	35	7	19	61
Mixed Paper	656	235	23	199	70	–	527
HDPE, PET	88	35	4	9	7	16	71
Plastic Film	326	–	–	–	–	196	196
Glass	462	188	16	23	23	120	370
Aluminum cans	69	4	1	4	–	46	55
Bi-metal/tin cans	134	94	6	12	11	–	123
Ferrous metals	161	–	–	–	–	129	129
Non-ferrous metals	66	–	–	–	–	53	53
Total	2,979	697	73	552	188	828	2338
Total Waste Stream Diversion %	–	5.9	.6	4.7	1.6	7.1	19.9

* Total waste stream generation projected for 2000 is approximately 11,732 TPY.

5.4.3 End-Markets and Contingency Measures for Diverted Recyclable Materials

A summary of end-uses for diverted materials is located in Table 5-8.

Table 5-8
End-Uses for Recycled Materials

Materials	Markets	Uses
Kraft paper/corrugated cardboard	Brokers	Paper products
Mixed paper	Brokers	Paper and building products
Newsprint	Brokers	Paper and building products
High-grade paper	Brokers, Mills	Paper and building products
Plastic film	Mills	Plastic products
HDPE plastic	Mills	Plastic products
PET plastic	Mills	New PET bottles/plastic products
Polystyrene	Mills	Plastic products
Tin food and beverage cans	Mills	Steel products/precipitation mining agent
Other ferrous metals	Brokers	Metal products
Aluminum cans	Mills	New aluminum cans
Nonferrous metals	Brokers	Metal products
Redeemable glass	Mills	New glass containers
Other recyclable glass	Mills	New glass containers
Other glass	End Users	Road aggregate
Chipped wood	End Users	Boiler fuel

A listing of end-markets for diverted materials is located in Appendix B. Of the materials targeted for diversion, or possible diversion, only HDPE, polystyrene, and polyethylene film are likely to be subject to market conditions so unfavorable as to require implementation of short-fall management practices.

HDPE, collected through source-separated programs, can be baled and stored space-efficiently for up to six months.

Plastic film collected through the automated material recovery facility can be stored space efficiently for up to two months. If no space and no market outlets are available, the plastic film may need to be landfilled.

Polystyrene, collected through the automated MRF, and possibly the drop-off center, is too bulky to be stored for any appreciable period of time. Dissolution of stable markets for this material may force the collector/processor to divert it directly to landfill.

5.5 PROGRAM IMPLEMENTATION

The following section describes the implementation of the selected recycling programs.

5.5.1 Entities Responsible to Implement Programs

The Public Works Director, the Recycling Coordinator, and City staff will take primary responsibility to implement the programs listed above. Throughout the process the Recycling Coordinator and the Department of Public Works will work in tandem. Ultimately, the City Council will have the final word on all programs.

5.5.2 Implementation Tasks - Residential Curbside Recycling Program

The Recycling Coordinator will work in conjunction with the Department of Public Works to evaluate the program, and how it should be implemented. When the program is implemented, the Recycling Coordinator and the waste hauling staff will keep the Director of Public Works appraised quarterly, and the City Council annually of the program results.

Table 5-9
Implementation Schedule for Curbside Recycling Program

Task	Responsible Entity	Start Date	Completion Date	Estimated Cost	Funding Source
Develop program	Dept. of Public Works/Recycling Coordinator	7/93	8/93	Staff time @ 160 hours = $3,200	Refuse Fund
Purchase bins	Dept. of Public Works	8/93	9/93	$35,000	Refuse Fund
Order and purchase truck(s)	Dept. of Public Works	8/93	9/93	$100,000	Refuse Fund
Develop and distribute public education and information materials	Dept. of Public Works/Recycling Coordinator	9/93	10/93	Staff time @ 80 hours = $1,600 + $3,000 for materials	Refuse Fund
Distribute bins and begin full operations	Dept. of Public Works	11/93	Ongoing	Not available at this time	Refuse Fund
Monitor and evaluate program effectiveness	Dept of Public Works/Recycling Coordinator	11/93	Ongoing	Staff time @ 80 hours = $1,600	Refuse Fund
Total Cost	---	---	---	$144,400 + operating costs	---

* Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).
** Costs associated with program operations have not been quantified at this time. A determination on the number of vehicles and new refuse collection employees must be made to determine fuel, maintenance, and salary costs.

5.5.3 Implementation Tasks - Multi-Unit Residential Recycling Program

The Recycling Coordinator will work in conjunction with the Department of Public Works to evaluate the program, and how it should be implemented. When the program is implemented, the Recycling Coordinator and the waste hauling staff will keep the Director of Public Works appraised quarterly, and the City Council annually of the program results.

Table 5-10
Implementation Schedule for Multi-Unit Residential Recycling Program

Task	Responsible Entity	Start Date	Completion Date	Estimated Cost	Funding Source
Develop program	Dept. of Public Works/Recycling Coordinator	7/93	8/93	Staff time @ 40 hours = $800	Refuse Fund
Purchase bins	Dept. of Public Works	8/93	9/93	$5,000	Refuse Fund
Order and purchase truck(s)	Dept. of Public Works	8/93	9/93	Incorporated in curbside costs	Refuse Fund
Develop and distribute public education and information materials	Dept. of Public Works/Recycling Coordinator	9/93	10/93	Staff time @ 40 hours = $800 + $500 for materials	Refuse Fund
Distribute bins and begin full operations	Dept. of Public Works	11/93	Ongoing	Not available at this time	Refuse Fund
Monitor and evaluate program effectiveness	Dept of Public Works/Recycling Coordinator	11/93	Ongoing	Staff time @ 40 hours = $800	Refuse Fund
Total Cost	---	---	---	$7,900 + operating costs	---

* Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).
** Costs associated with program operations have not been quantified at this time. A determination on the number of vehicles and new refuse collection employees must be made to determine fuel, maintenance, and salary costs.

5.5.4 Implementation Tasks - Commercial/Industrial Recycling Program

The Recycling Coordinator will work in conjunction with the Department of Public Works to evaluate the program, and how it should be implemented. When the program is implemented, the Recycling Coordinator and the waste hauling staff will keep the Director of Public Works appraised quarterly, and the City Council annually of the program results. The Recycling Coordinator will implement the program from the initial study (waste audits - see Source Reduction) to business manager/owner contact, and monitoring and evaluation of the program. At this time, it is anticipated that no pilot program will be required. Some commercial/industrial recycling is currently taking place, and the City will encourage these establishments to continue recycling while stimulating others to utilize the existing drop-off/buy-back center at the Town and Country Market. Full program developemnt is closely tied to the development of the proposed County MRF scheduled for completion in 1997.

Table 5-11
Implementation Schedule for Commercial/Industrial Recycling Program

Task	Responsible Entity	Start Date	Completion Date	Estimated Cost	Funding Source
Develop program	Dept. of Public Works/Recycling Coordinator	7/96	8/96	Staff time @ 80 hours = $1,600	Refuse Fund
Purchase or lease bins	Dept. of Public Works	8/96	9/96	$25,000	Refuse Fund
Order and purchase truck(s)	Dept. of Public Works	8/96	9/96	$100,000	Refuse Fund
Develop and distribute commercial/industrial education and information materials	Dept. of Public Works/Recycling Coordinator	9/96	10/96	Staff time @ 80 hours = $1,600 + $2,000 for materials	Refuse Fund
Distribute bins and begin full operations	Dept. of Public Works	11/96	Ongoing	Not available at this time	Refuse Fund
Monitor and evaluate program effectiveness	Dept of Public Works/Recycling Coordinator	11/96	Ongoing	Staff time @ 80 hours = $1,600	Refuse Fund
Total Cost	---	---	---	$131,800 + operating costs	---

* Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).
** Costs associated with program operations have not been quantified at this time. A determination on the number of vehicles and new refuse collection employees must be made to determine fuel, maintenance, and salary costs.

5.5.5 Implementation Tasks - Drop-off/Buy-back Center

A private service provider currently operates in the City, and the Recycling Coordinator will work in conjunction with them to ensure that drop-off/buy-back service is provided to the residents and businesses of Winters. The Recycling Coordinator and the service provider will keep the Director of Public Works appraised quarterly, and the City Council annually of the program results. The Recycling Coordinator will be responsible for monitoring and evaluation of the program. Some commercial/industrial recycling is currently taking place, and the City will encourage these establishments to continue recycling while stimulating others to utilize the existing drop-off/buy-back center at the Town and Country Market.

Table 5-12
Implementation Schedule for Drop-off/Buy-back Center Program

Task	Responsible Entity	Start Date	Completion Date	Estimated Cost	Funding Source
Meet with service provider and develop monitoring program	Recycling Coordinator	7/93	8/93	Staff time @ 40 hours = $800	Refuse Fund
Develop and distribute public education and information materials	Recycling Coordinator/ service provider	9/93	Ongoing	$1,000	Refuse Fund
Monitor and evaluate program effectiveness	Recycling Coordinator	7/93	Ongoing	Staff time @ 40 hours = $800	Refuse Fund
Total Cost	---	---	---	$2,600	---

* Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).

5.5.6 Implementation Tasks - Mandatory Recycling Laws

This option is to be implemented only if the City appears to be in danger of failing to meet AB 939 mandated diversion goals. Such an ordinance would not be enacted sooner than 1998 and would require public hearings review in the drafting and adaption process. The Recycling Coordinator will keep the Director of Public Works appraised quarterly, and the City Council annually of all program results. The Recycling Coordinator will be responsible for monitoring and evaluation of all programs.

Table 5-13
Implementation Schedule for Institution of a Mandatory Recycling Ordinance

Task	Responsible Entity	Start Date	Completion Date	Estimated Cost	Funding Source
Develop draft ordinance	Dept. of Public Works/Recycling Coordinator	1/98	3/98	Staff time @ 80 hours = $1,600	Refuse Fund
Review ordinance and present to the public	Dept. of Public Works/Recycling Coordinator	4/98	5/98	Staff time @ 40 hours = $800	Refuse Fund
Enact ordinance and evaluate effectiveness	City Council/ Recycling Coordinator	6/98	Ongoing	Staff time @ 40 hours = $800	Refuse Fund
Total Cost	---	---	---	$3,200	---

* Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).

5.5.7 Implementation Tasks - Regional Materials Recovery Facility

This option will be implemented by the County Department of Public Works with cooperation from the Cities of Winters, Woodland, and West Sacramento. The Recycling Coordinator will keep the Director of Public Works appraised quarterly, and the City Council annually of program results.

Table 5-14
Yolo County Implementation Schedule for Mixed Waste MRF

Task	Responsible Entity	Start Date	Completion Date	Funding Source	Estimated Cost
Identify participating jurisdictions	County Dept. of Public Works and Transportation (DPWT)	1/92	Completed	CSEF*	Capital cost: $10 - $15 million
Through the CoIWMP process, integrate City and County SRRE's	DPWT	3/92	12/92	CSEF	
Conduct feasibility study to determine facility/system parameters, economics, and targeted waste streams	DPWT	3/92	12/92	CSEF	
Develop policy issues including county role in ownership/operation and flow control	DPWT	4/92	1/93	CSEF	
Define vendor procurement process for facility construction and operation as appropriate - select vendor	DPWT and/or private sector contractor	1/93	7/93	CSEF	
Obtain local and state reviews and permits necessary	DPWT and/or private sector contractor	1/94	1/96	CSEF	
Prepare plans and specifications for construction and operation of the facility	DPWT and/or private sector contractor	1/95	1/96	CSEF	
Construct facility, conduct start-up and performance testing	DPWT and/or private sector contractor	1/96	6/97	CSEF	
Begin operations of MRF	DPWT and/or private sector contractor	6/97	Ongoing	CSEF	

* CSEF - County Sanitation Enterprise Fund.

5.5.8 Plans to Deter Illegal Removal of Recyclables (scavenging)

The City does not currently have an anti-scavenging ordinance. If after the establishment of residential curbside and commercial/industrial collection programs in the City scavenging becomes a problem, then the City will adopt an ordinance banning the removal of recyclable materials from all formal recycling programs. The Recycling Coordinator and the refuse/recycling collection crews would then be responsible for enforcement of the ordinance.

5.6 MONITORING AND EVALUATION

This section identifies the methods that will be used by the City to monitor and evaluate the effectiveness of the selected programs relative to the stated diversion goals and objectives. Emphasis will be placed on the forecasted diversion levels projected in tables 5-6 and 5-7 of this component. Other consideration will be given to participation, quality of material received, and the quantity of waste diverted per household.

Methods to quantify program effectiveness will include:

- Gate monitoring at YCCL for changes in gross volumes and tonnage;
- Quantity of recyclable materials recovered - reported by waste type and program through the Recycling Coordinator, the Dept. of Public Works, and the MRF operator;
- Periodic waste generation studies will be conducted to help determine program effectiveness. These studies will be conducted utilizing the methodology established in the SWGS - obtaining samples from individual households;
- Records of materials diverted through mixed waste processing at the County MRF; and
- Documentation of participation in residential and commercial recycling programs;

The Recycling Coordinator and the Dept. of Public Works will be responsible for the monitoring and evaluation of all authorized recycling programs within the City.

In addition the above monitoring activities, buy-back and drop-off program operators will be required to report levels of waste diversion on a quarterly basis. Quantities of waste diverted through these programs will be verified through communications with the California Department of Conservation. The quantity of waste diverted through private sector recycling efforts will continue to be documented through telephone and written surveys.

An annual review of the SRRE goals and objectives will be conducted to determine if the objectives of the element are being met. If it is found that the SRRE is not achieving the stated goals and objectives, amendments to the element will be considered to correct the shortfall.

5.6.1 Methods to Monitor and Quantify Program Results

Alternative 1: Residential Curbside Recycling Program

Objective
To establish a residential curbside recycling program diverting approximately 3.0 percent of the total waste stream in the short-term, and 6.0 percent in the medium-term. Participation levels will be targeted to reach 80 percent.

Responsible Entities
The Recycling Coordinator and the Dept. of Public Works will be responsible to implement this program at the direction of the City Council. The contact person from the City will be the Recycling Coordinator, with the Public Works Director overseeing the program.

Criteria/Method of Evaluation
The Recycling Coordinator will be required to keep records of diverted materials and participation levels, reporting quarterly to the Public Works Director and annually to the City Council.

Contingency Plan if Shortfall
Should diversion levels fall short, the Recycling Coordinator and the Public Works Director will investigate the potential effectiveness of establishing a variable rate structure and the current education programs to stimulate participation. Residents will be surveyed to ensure that a quality service is provided. If diversion continues to fall short, then implementation of mandatory curbside recycling will also be investigated.

Alternative 2: Multi-Unit Recycling Collection Program

Objectives
To establish a multi-unit recycling program diverting approximately .3 percent of the total waste stream in the short-term, and .6 percent in the medium-term. Participation levels will be targeted to reach 80 percent.

Responsible Entity
The Recycling Coordinator and the Dept. of Public Works will be responsible to implement this program at the direction of the City Council. The contact person from the City will be the Recycling Coordinator, with the Public Works Director overseeing the program.

Criteria/Methods of Evaluation
The Recycling Coordinator will be required to keep records of diverted materials and participation levels, reporting quarterly to the Public Works Director and annually to the City Council.

Contingency Plan if Shortfall
Should diversion levels fall short, the Recycling Coordinator and the Public Works Director will investigate the potential effectiveness of establishing a variable rate structure and the current education programs to stimulate participation. Residents will be surveyed to ensure that a quality service is provided. If diversion continues to fall short, then implementation of mandatory multi-unit recycling will also be investigated.

Alternative 3: Commercial/Industrial Recycling Collection Program

Objectives
To increase current commercial/industrial waste diversion to approximately 2.0 percent of the total waste stream in the short-term planning period and 5.0 percent during the medium-term planning period. Participation levels will be targeted to reach 80 percent.

Responsible Entity
The Recycling Coordinator and the Dept. of Public Works will be responsible to implement this program at the direction of the City Council. The contact person from the City will be the Recycling Coordinator, with the Public Works Director overseeing the program.

Criteria/Methods of Evaluation
The Recycling Coordinator will be required to keep records of diverted materials and participation levels, reporting quarterly to the Public Works Director and annually to the City Council. Also, the Recycling Coordinator and the Dept. of Public Works shall report the number of new private commercial businesses establishing their own programs and the amounts and types of materials being diverted. In addition to the data recorded above, the Recycling Coordinator will conduct an annual survey to determine the level of awareness of ongoing City recycling programs.

Contingency Plan if Shortfall
Should diversion levels fall short, the Recycling Coordinator and the Public Works Director will investigate the potential effectiveness of increasing commercial disposal rates and the current education programs to stimulate participation. Businesses will be surveyed to ensure that a quality service is provided. If diversion continues to fall short, then implementation of mandatory commercial recycling will also be investigated.

Alternative 4: Drop-off/Buy-back Center Program

Objectives
To increase current drop-off/buy-back waste diversion to approximately 1.0 percent of the total waste stream in the short-term planning period and 2.0 percent during the medium-term planning period. Awareness levels will be targeted to reach 100 percent.

Responsible Entity
Private sector operators will maintain their current operation with the City lending promotional support through public education. The Recycling Coordinator will be responsible to monitor and evaluate this program at the direction of the City Council. The contact person from the City will be the Recycling Coordinator, with the Public Works Director overseeing the program.

Criteria/Methods of Evaluation
Buy-back/drop-off program operators will be required to report levels of waste diversion on a quarterly basis. Quantities of waste diverted through these programs will be verified through communications with the California Department of Conservation. The Recycling Coordinator will be required to keep records of diverted materials and participation levels, reporting quarterly to the Public Works Director and annually to the City Council. Also, the Recycling Coordinator and the Dept. of Public Works shall report the number of private commercial businesses using these facilities and the amounts and types of materials being diverted. In addition to the data recorded above, the Recycling Coordinator will conduct an annual survey to determine the level of awareness of ongoing City recycling programs.

Contingency Plan if Shortfall
Should diversion levels fall short, the Recycling Coordinator and the Public Works Director will investigate the potential effectiveness of increasing the number of drop-off/buy-back locations in the City and the current public education program to stimulate participation. If diversion continues to fall short, then implementation of mandatory community recycling will also be investigated.

Alternative 5: Mandatory Recycling Laws

Objectives
To increase participation levels in all recycling programs through a mandatory recycling ordinance. Participation levels will be targeted to reach 100 percent.

Responsible Entity
The Recycling Coordinator would draft the ordinance incorporating staff and public input. The City Council would then have to adapt the ordinance. The Recycling Coordinator and the Dept. of Public Works would be responsible to monitor and evaluate, and enforce the law.

Criteria/Methods of Evaluation
Weekly recycling pick-up would be monitored to ensure that all residents and businesses are setting out recyclables for collection. Once participation rates have been established, the Recyling Coordinator will analyze the effectiveness of all programs to develop ways to increase capture rates for recyclable materials. The Recycling Coordinator will be required to keep records of diverted materials and participation levels, reporting quarterly to the Public Works Director and annually to the City Council. In addition to the data recorded above, the Recycling Coordinator will conduct an annual survey to determine the level of awareness of ongoing City recycling programs.

Contingency Plan if Shortfall
This is a shortfall contingency program and will only be enacted if the City is in danger of failing to meet AB 939 mandated diversion goals.

Alternative 5: Mixed Waste MRF

Objective
To achieve a diversion level of approximately 7.0 percent of the residual waste stream entering the facility, and a total diversion rate including processing of all source separated recyclables collected through other City programs of approximately 20.0 percent.

Responsible Entity
The facility operator and/or the County Department of Public Works and Transportation shall be the responsible agencies for implementation and monitoring of this program. The Recycling Coordinator will be the contact person for the City, and will gather all City specific information from the MRF.

Criteria/Methods of Evaluation
The weight of materials diverted will be compared against scale records of incoming loads.

Contingency Plan if Shortfall
In the event that stated objectives are not achieved the Dept. of Public Works will revise collection routes to reduce the amount of material contamination.

5.6.2 Funding

Monitoring and evaluation activity costs are included in the Recycling Coordinators position, with funding derived from the Refuse Fund.

SECTION 6

COMPOSTING COMPONENT

This component establishes the City's composting objectives, summarizes existing conditions, describes materials available to be composted, evaluates collection options and composting processes, and establishes a short and medium-term program implementation schedule. In addition, this component estimates costs, and describes a method for monitoring and evaluating the effectiveness of the programs to be implemented.

Background

Composting is a method of solid waste treatment by which organic solid wastes are biologically degraded under controlled aerobic or anaerobic conditions. The result is a stable, decomposed material which can be sold or distributed as a soil amendment that improves the moisture retention capacity of soil, adding nutrients and erosion control. While producing a valuable resource, composting fulfills AB 939 goals by diverting a substantial volume of yard wastes and other organic materials from landfills.

Yard waste is the ideal material for composting because of its ease of separation and collection at the source. Wood waste can also be used, but it takes several years to decompose, making it more appropriate as a bulking agent in the composting of sewage sludge. Wood can be chipped and sold as mulch, soil amendment, or animal bedding which would qualify as recycling diversion credit. Wood wastes sold as boiler fuel are regarded as "transformation" and do not count in the short-term planning period towards the City's diversion goals. After 1995 transformation can provide a maximum diversion credit of 10 percent towards the 50 percent requirement.

Yard wastes are easily collected at the source (curbside collection or drop-off). This collection method produces relatively contaminant-free materials which minimizes the processing cost and produces a high quality end-product that is more easily marketed. Residential yard waste can be collected loosely at the curb, in separate containers such as paper or plastic bags; or in rigid plastic containers (30-, 60-, or 90-gallon) by a standard refuse truck. Even though curbside yard waste collection is expensive, it has a relatively high rate of participation. Drop-off collection is the least expensive method, but is expected to have a lower rate of participation. A drop-off collection facility is best used as a complement to a scheduled curbside collection program.

A variety of processing alternatives are available to the City, which include windrow composting, aerated static piles, and in-vessel systems. Windrow and aerated static piles are the least expensive methods, require more land, and take longer to produce a finished product. In-vessel systems require more capital for equipment, but process material faster, and requires less land.

The use of municipal solid waste (MSW), also referred to as mixed municipal solid waste (MMSW), involves composting the entire organic portion of the waste stream (food waste, yard waste, wood waste, and paper). Although this technology has been in use in Europe, it is not widely used in the United States. Markets for MSW compost are severely limited due to high contaminant levels.

MSW can also be co-composted with sewage sludge. This would restrict the market for the finished composting product to a higher degree than just MSW compost since sewage sludge may contain heavy metals that can end up in the final composting product. The EPA will release regulations in 1992 that may impact the use of sewage sludge composting products. It may be in the best interest of the City of Winters to avoid the use of sewage sludge in any composting operation until these regulations are released.

6.1 GOALS AND OBJECTIVES

The following objectives for the short-term (present to 1995) and medium-term (1996 to 2000) planning periods have been established for the selected composting programs.

- Divert 813 tons per year (TPY), or 13.7 percent of the City's total solid waste stream, by composting at the County's proposed regional composting facility through diverting the following materials:
  - 788 TPY of compost derived from yard waste generated by the residential sector (a 95 percent capture rate with a 70 percent compost rate and a 30 percent incineration rate).
  - 25 TPY of compost derived from yard waste generated by the commercial (a 95 percent capture rate with a 70 percent compost rate and a 30 percent incineration rate).
- Refine the yard waste collection system in the medium-term.
- Evaluate the feasibility of collecting food-waste for composting in the medium-term.
- Evaluate the feasibility of co-composting yard waste with other organic waste fractions, including food waste, and sewage sludge in the medium-term.

In addition, the following compost market development efforts will be implemented by the City:

- Expand current markets by requiring municipal departments to give preferential consideration to the use of compost in maintenance of public lands.
- Promote the use of compost through public education efforts.
- Work with regional County planning agencies to develop cooperative marketing plan for compost and other recyclable materials.
- Support State legislation approving the use of compost as daily cover when compost markets are limited or unavailable.

6.2 EXISTING CONDITIONS

There are no existing composting programs in the City of Winters other than a small amount of backyard composting by some residents. Winters currently collects source separated curbside yard waste, but that material is landfilled at the Yolo County Central Landfill. This will, however, make composting at the proposed regional composting facility at YCCL extremely easy for the City to implement as a formal collection program is already in place.

Table 6-1 below identifies by tons and percentage of total waste disposed, the compostable materials disposed from the City of Winters. The City's composting program will target only yard waste generated by the residential and commercial/industrial sectors. However, in the medium-term, the potential to add the additional materials listed in table 6-1 will be evaluated.

Table 6-1
Compostable Organic Wastes Disposed of by Winters

Material	Amount (TPY)	Percent of Total Waste Disposed
Mixed and other paper	758	15.9
Yard waste	1,265	16.6
Wood	55	1.1
Food	341	7.2
Manure	33	.7
Total	2,452	51.5

6.3 EVALUATION OF ALTERNATIVES

As mentioned, the City of Winters has a very successful residential yard waste collection system, but no composting program is in place. At present, all the collected yard waste is transported for disposal in the Yolo County Central Landfill. However, a number of alternatives are available to the City for such a program. These alternatives can be broadly classified into three categories, collection, processing, and siting. Presented below is a list of the alternatives considered within this section, followed by a thorough evaluation of each alternative.

Collection Alternatives

Alternative 1. Continue Existing Curbside Collection (selected)
Alternative 2. Continue Commercial/Industrial Collection (selected)
Alternative 3. Establish Drop-off Collection Sites (not selected)

Composting Process Alternatives

Alternative 1. Use Windrow Process (selected)
Alternative 2. Use Aerated Static Piles (not selected)
Alternative 3. Use In-vessel Composting (not selected)
Alternative 4. Use Anaerobic Composting (not selected)

Siting Alternatives

Alternative 1. Establish Local Municipal Site (not selected)
Alternative 2. Establish Centralized Regional Site (selected)
Alternative 3. Establish Private Site (not selected)

6.3.1 Collection Alternatives

Collection Alternative 1. Continue Existing Curbside Collection

Curbside collection of yard waste (leaves, tree and shrub prunings) in the City of Winters involves the source separation of this material by residents of single family dwellings into piles on the street. The yard waste is then collected weekly using a claw-equipped front loader and a dump truck with follow-up street sweeping done by a street sweeper. The material collected is delivered directly to the Yolo County Central Landfill.

In lieu of delivering the compostables to the Yolo County Central Landfill for landfilling, the trucks will dump at the proposed regional composting facility to be located at the Yolo County Central Landfill.

Effectiveness

The City of Winters' curbside collection program currently disposes of 1,265 TPY or 100 percent of all the yard waste generated by the residential sector. Of this amount, none is composted or qualifies as diversion as defined by the California IWMB for the short-term. The disposed yard waste represents 26.6 percent of the total waste disposed and 21.4 percent of the total waste generated by the City of Winters.

Were all the yard waste currently collected through the existing source separated program to be diverted to the composting facility at the Yolo County Central Landfill, after grinding and screening diversion of total waste generated would be 15 percent.

Table 6-2 below identifies by percentages, the relationship between material categories and materials targeted for diversion through composting. As can be seen in the lower right-hand corner of the table, the total countable diversion expected through residential yard waste collection will be 13.3 percent of the total waste generated.

Table 6-2
Effectiveness of Residential Yard Waste Collection and Composting

	TPY	% of Yard Waste Disposed	% of Residential Waste Disposed	% of Total Waste Disposed	% of Total Waste Generated
Waste Generated	5,919				100
Waste Disposed	4,759			100	80
Residential Waste Disposed	2,896		100	60.4	48.9
Yard Waste Disposed	1,185	100	40.9	24.9	20.0
Recoverable Yard Waste	1,126	95	38.9	23.7	19.0
Compostable	788	66.5	27.2	16.6	13.3

Hazards
Common hazards of curbside collection with no collection containers are:[1]

- Blowing yard waste
- Cars driving over yard waste and scattering it in the streets
- Automobile catalytic converters starting leaves on fire
- Sewer drain blockages
- Contamination of yard waste by gravel, glass, and oil

Ability to Accommodate Change
Any change in quantity and/or quality of source separated collection of yard wastes can be accommodated by changing collection patterns and frequency.

Consequences on Waste Stream Composition
Composting will result in less material being landfilled at Yolo County Central Landfill and a possibly reduced amount of methane production at the Yolo County Central Landfill.

Ability to be Implemented
A curbside collection of source separated yard waste is already being performed in the City of Winters.

Need for Facilities
The existing collection program is fully operational and does not require any additional facilities.

Consistency with Applicable Local Policies, Plans, and Ordinances
A curbside collection program does not conflict with local policies, plans, or ordinances.

Institutional Barriers to Implementation
There are no institutional barriers to implementation.

Costs
Operating costs for collection of yard waste vary greatly with the type of collection. General overall costs for separate containerized collection, including labor, equipment, and depreciation range between $60 and $80 per ton of yard waste collected.[2] Current costs in the City of Winters are estimated at $160 per ton.

It is not expected that the costs associated with collection will rise beyond normal, periodic adjustments for inflation or additional equipment. It is as yet unclear, however, how much, if

any, the costs for processing will effect the total cost as the end product will likely be used in daily cover at the Yolo County Central Landfill and its processing and transportation may prove to be revenue neutral after payment to the processor by Yolo County Central Landfill.

Market Availability
The yard waste that is collected will be delivered directly to the composting facility at Yolo County Central Landfill. If there is more than one private composting facility then the yard waste will be brought to the facility with the lowest tipping fee and/or the greatest ability to assure marketability and therefore diversion compliance. The end product from the Yolo County Central Landfill facility will be daily cover aggregate.

Technical Reliability/Public Acceptance
Curbside collection of yard wastes has been a reliable and proven method of collection for many communities. Changes in quantity or quality of yard waste can easily be adapted to. The existing collection programs have widespread support and participation.

Collection Alternative 2. Continue Commercial/Industrial Collection

The City's current yard waste collection and disposal system includes commercial yard waste generators. Because the volume per generator and distance between large generators is not very high, commercial businesses would be provided with the same service as the residential sector.

The self-haulers such as tree and gardening services which presently haul their yard waste to the landfill will be directed to deliver their yard waste to the proposed composting facility when they arrive at the Yolo County Central Landfill.

Table 6-3 below identifies by percentages, the relationship between material categories and material targetted for diversion through composting. As can be seen in the lower right-hand corner of the table, the total countable diversion expected through commercial yard waste collection will be .4 percent of the total waste generated.

Table 6-3
Effectiveness of Commercial Yard Waste Collection and Composting

	TPY	% of Yard Waste Disposed	% of Commercial Waste Disposed	% of Total Waste Disposed	% of Total Waste Generated
Waste Generated	5,919				100
Waste Disposed	4,759			100	80
Commercial Waste Disposed	886		100	18.6	15
Yard Waste Disposed	72	100	8.1	1.5	1.2
Recoverable Yard Waste	36	50	4	.8	.6
Compostable	25	14	2.8	.5	.4

Effectiveness
Separate collection is a very effective means of diverting yard waste. Participation rates for separate collection of yard waste range from 50 to 90 percent.

Hazards
There are no hazards associated with the separate collection of yard waste other than the normal hazards from additional truck traffic.

Ability to Accommodate Change
This alternative is highly adaptable to change.

Consequences on Waste Stream Composition
An effective source-separated containerized yard waste collection program for commercial businesses will result in less organic material in the waste stream and possibly reduced methane gas production at the Yolo County Central Landfill.

Ability to be Implemented
A source separated containerized yard waste collection program could be implemented in 6 to 12 months.

Need for Facilities
The existing collection program is fully operational and does not require any additional facilities.

Consistency with Local Policies, Plans, and Ordinances
A source-separated container collection program for yard wastes does not conflict with local policies, plans or ordinances.

Institutional Barriers to Implementation
There are no institutional barriers that would prevent implementing a containerized collection program, however, it may be difficult for some businesses to site containers on their property due to space limitations.

Costs
Costs for collection of yard waste under current system are $160 per ton. Costs for collection of containerized yard waste should range from $60 to $80 per ton.

Market Availability
Source-separated yard waste offers the best opportunity for development of markets because of its consistent quality as a result of its being free from most contaminants. Private sector end-users are landscape contractors, nurseries, agriculture, and residential users. Public sector users are parks, road and highway maintenance, and landfill cover. If there is still a surplus after the above markets have been explored then state agencies should be sought out. SB 1322 requires that the Department of General Services, the California Department of Transportation, and the Department of Forestry and Fire Protection use yard waste compost.

Technical Reliability/Public Acceptance
Source-separated collection of yard wastes has been a reliable and proven method of collection for many communities. This method can be easily adapted to changes in quantity or quality of yard waste. This alternative should readily receive public acceptance since the existing curbside collection programs have widespread support and participation.

Collection Alternative 3. Establish Drop-off Collection Sites

Drop-off sites achieve high participation rates from commercial and self-haul generators of yard waste. Drop-off collection sites vary from unattended containers to fully equipped and staffed facilities that receive and process recyclable and compostable materials. A drop-off collection program for the City of Winters could include unattended container sites, a centralized drop-off facility, or a combination of both. Drop-off facility options could include the following:

Option 1 Satellite drop-off sites with a centralized receiving area: Sites would be identified in the City for locating collection bins where commercial landscapers and businesses could transport and dispose of their yard waste. The collection bins would be serviced on a regular basis and the yard waste taken to a centralized location for preparation and processing to compost.

Option 2 Centralized drop-off/processing facility: A centralized collection facility could require all yard waste generators in the City to take their yard waste to one centralized location. The collected yard waste could then be prepared for composting and/or transferred to another site for processing. This facility could also receive other waste materials in conjunction with yard waste collection.

Option 3 Centralized drop-off/processing facility in conjunction with satellite drop-off sites: Satellite drop-off sites in conjunction with a centralized drop-off/processing facility would offer a more convenient disposal method to generators of yard waste.

Effectiveness

Voluntary drop-off programs usually generate participation rates from the residential, commercial, industrial and self-haul sectors of between 5 and 20 percent. Development of a drop-off yard waste program for commercial and industrial generators would result in the drop-off of 3.6 TPY to 14.4 TPY or between .06 and .24 percent of the total waste generated by the City of Winters, a comparatively ineffective approach.

Table 6-4 below identifies by percentages, the relationship between material categories and material targeted for diversion through composting. As can be seen in the lower right-hand corner of the table, the total countable diversion expected through a drop-off yard waste program will be between .04 and .16 percent of the total waste generated.

Table 6-4
Effectiveness of Drop-off Recycling for Commercial and Industrial Yard Waste

	TPY	% of Yard Waste Disposed	% of Commercial Waste Disposed	% of Total Waste Disposed	% of Total Waste Generated
Waste Generated	5,919	---	---	---	100
Waste Disposed	4,739	---	---	100	80
Commercial/Industrial Waste Disposed	886	---	100	18.6	15
Yard Waste Disposed	72	100	8.1	1.5	1.2
Recoverable Yard Waste	3.6 - 14.4	5-20	.4 - 1.6	.08 - .3	.06 - .24
Compostable Yard Waste	2.5 - 10	3.5 - 14.0	.28 - 1.1	.05 - .2	.04 - .16

Hazards

If yard waste is not regularly transferred to the composting facility, there may be a problem with odors from anaerobic decomposition and vector (insects, rodents, birds) control. Odors may prevent people from using the site. Unattended containers may be vandalized or contaminated with general waste.

Ability to Accommodate Change

Any change in quality/quantity of yard waste can be accommodated by changing the number, size and location of the sites. However, if economic conditions deteriorate, people may mix general waste with the yard waste. To prevent illegal dumping, site supervision may be necessary.

Consequences on the Waste Stream Composition

A drop-off center for yard waste will result in a reduction in the amount of waste disposed in the Yolo County Central Landfill and may result in reduced production of methane gas at the Yolo County Central Landfill.

Ability to be Implemented

Drop-off collection could be implemented in the short-term planning period.

Need for Facilities
Facility requirements vary depending on the selected drop-off option. A drop-off site located at a composting facility would require negligible improvements. A drop-off site located in Winters and exclusively for Winters may be nothing more than a 20 cubic yard roll-off box.

Consistency with Local Policies, Plans, and Ordinances
There are no conflicting policies, plans, or ordinances that would affect a drop-off facility.

Institutional Barriers to Implementation
Opposition to siting may be a barrier to implementation of this alternative.

Costs
Costs for a drop-off center are much less than curbside collection if a suitable site can be found. If the drop-off facility is located at the composting facility then capital costs would be negligible as no facility need be constructed. If the drop-off center has to be located elsewhere, the costs associated with the drop-off center would include the site design, site development, hauling, and possible staffing. Most drop-off sites are unattended. The City of Winters may wish to operate the site unattended to determine if the amount of contamination is acceptable. The range of capital costs for a drop-off facility can vary from $1,000 for a flat area to drop the yard waste at the composting facility to $100,000 for a site specifically designed for the collection of yard wastes. These values exclude the cost of the land. Operations and maintenance (O&M) costs, depending on the site location and method of operation, range between $2,000 to over $50,000 per year. For Winters, a simple 50 yard roll-off box in an empty lot with signage and promotion may suffice.

Market Availability
Compost produced from yard wastes left at a drop-off site will be of equal quality as compost made of source separated yard waste if the drop-off site is supervised and contaminants are kept out of the yard waste. Private sector end users are landscape contractors, nurseries, agriculture, and residential users. Public sector users are parks, road and highway maintenance, and landfill cover. If there is still a surplus after the above markets have been explored, then state agencies should be sought out. SB 1322 requires that Department of General Services, the California Department of Transportation, and the Department of Forestry and Fire Protection use yard waste compost.

Technical Reliability/Public Acceptance
As demonstrated in successful programs nationwide, development of a drop-off site will increase the amount of yard waste diverted form the landfill. Because residents may not want a drop-off facility in their neighborhood, siting the facility may involve public education to counter resistance to the facility.

6.3.2 Composting Process Alternatives

There are three composting methods in common use. They are windrows, static piles, and in-vessel. While static piles and in-vessel composting are complex procedures, the windrow option can be operated with low or high technology. Another process that is not in common use is anaerobic composting. Anaerobic composting provides energy as well as compost, but requires a large input stream. Independent of the composting method chosen, the five essential factors that control the composting process are:

- Microbial population
- Aeration
- Temperature
- Moisture content
- Carbon availability

<u>Processing Alternative 1. Windrow Process</u>

In this system, organic materials are placed in windrows (elongated piles) that are eight to 15 feet wide and 5 to 10 feet high, and usually at least 50 feet long (no maximum length). The size of the windrows depends on the technology of operation and weather conditions. In colder weather, the piles should be as large as possible to retain the heat that is internally generated. Recycled compost or wood chips can be placed over the windrows for insulation.

Windrows can be used with minimal technology or low-, medium, or high-level technology. The minimal technological process is to turn the windrows once per year. The windrows are usually about 12 feet high and 24 feet wide for this approach. The only equipment needed for the minimal technological operation is a front loader. The compost can be ready for market in one to three years, depending on the climate. This is the most economical method of composting, if space is available. This option requires a large buffer zone for odor control.

Low-level technology uses a two - or three-stage approach to composting. Initially, the waste to be composted is placed in windrows that are approximately six feet high and 12 to 14 feet wide that are turned frequently in the first month. After the first month, two windrows are combined for the second stage of composting. After ten to 11 months, this compost can be pushed to the edge of the facility for curing in the final stage of this composting process. The final product is ready for market in 16 to 18 months. This process requires a considerably smaller buffer zone than the minimal technology approach.

The intermediate-level process requires turning the windrows every week. This process will produce compost in the shortest amount of time, four to six months. The last process, referred to as the high-level process, aerates the windrows mechanically using forced air. Larger

windrows can be used in this process than in the minimal technology process. The compost product is ready in about one year.

The last approach, referred to as the high technology approach, is to aerate the windrows mechanically every few days (forced aeration). The composting product is ready in about three to five months.

Effectiveness

The windrows method is a very effective way to process yard waste. Depending on the turning energy input to the system, the time it takes to develop the final product can vary from three months to three years. Windrows can be used with a variety of technological levels and can be modified to work in any climate. This technique facilitates the composting of all of the yard waste that is delivered to the facility (see collection alternatives for specific quantities).

Hazards

The common hazards associated with composting facilities are odors, contaminants, and leachate. There is also a potential for vector problems. There can be hazards associated with equipment operation, but these will be minimized by properly training the equipment operators.

The most common complaints directed at windrow processes are odor complaints. This can be overcome by treatment, and proper site and process management. A buffer zone of approximately 1/2 mile surrounds the existing facility. Some process techniques to control odors are:

- Reduce compost activities during high odor periods
- Turn windrows during low wind conditions
- Turn windrows frequently to prevent anaerobic conditions
- Use low odor amendments

The highest correlation for odor generation is the exposed surface area to volume ratio of the windrow. To a certain extent, large windrows emit less odors than small windrows. If a windrow becomes anaerobic, it could potentially be very odorous.

The presence of contaminants in the final compost product can be disastrous to marketing efforts. This hazard can be avoided by visually screening the input waste stream for contaminants and removing them before the material is placed in windrows.

The leachate that is generated from the windrow process can potentially contaminate local water sources. This can be controlled by collecting and treating or recycling the effluent. Alternatively, the leachate can be disposed by means of an evaporation pond.

Vectors can be controlled by revising certain aspects of the windrow process. Improved turning techniques, moisture adjustments, temperature adjustments, and trapping are effective methods for vector control.

Wind-blown litter can be controlled by a chain-link fence surrounding the property. Dust can be controlled by misting the material as it is received.

Ability to Accommodate Change

Windrow composting is adaptable to many economic, technological, and social changes. The processing technology is easily changed from low to high without equipment changes. The process can be performed for any economic condition that is warranted. The process can adapt to social changes. For example, if the public does not want to see the facility, it can be enclosed.

Consequences on Waste Stream Composition

A composting facility may result in reduced amount of methane gas production at the Yolo County Central Landfill.

Ability to be Implemented

A windrow composting operation can be implemented in the short term. Approximately 18 to 24 months will be required to permit and build the facility.

Need for Facilities

A site will be necessary for the composting operation. Site improvement costs can be minimized if a site is chosen that meets the criteria given in the siting alternative section for a composting facility. The facility should be sized for at least the medium-term input stream. Approximately one acre for every 7,000 cubic yards (1,400 tons) of composting yard waste will be needed.

Consistency with Local Policies, Plans, and Ordinances

There are no conflicting policies, plans, or ordinances that would preclude a composting facility. A permit from the State Regional Water Quality Board may be required for disposal of the leachate that is generated. The California Integrated Waste Management Board (CIWMB) requires a solid waste facility permit.

Institutional Barriers to Implementation

There are no institutional barriers to composting yard waste. If the jurisdictions decide to move into sewage sludge composting in the future, there may be institutional barriers to the use of the final product. Sewage sludge composting is currently under review by the EPA. Municipal solid waste composting may lack public acceptance as the final product may be contaminated with plastics or other material difficult to compost.

Costs

Typical costs for a composting facility are in collection alternatives, processing, storage, marketing, program administration, public education, and technical assistance. These costs are offset by the benefits which include: revenues received from selling the finished compost, avoided costs from using the finished compost instead of purchasing a similar product, and avoided landfill tipping fees. Operational costs for conventional windrow processing range from $20 to $30 per ton processed.

Market Availability

The market for compost produced from Winters' yard waste will depend on several factors including: quality of product produced, demand by local government, demand by state government, and demand by local residents.

The compost product quality will be determined largely by process control, screening of the final product, and public perception of the final product (see Public Education Component). There generally exists a direct correlative relationship between the quality and marketability of municipal compost.

Contaminants can be kept to a minimum by source-separated collection. The process must be monitored regularly so that the windrows reach an internal temperature of at least 160° F. for two days or the product will be nitrogen poor and may contain weed seeds, pathogens, nondegraded pesticide residue, and odors. The optimal temperature is 132° F. The compost must be cured before marketing or it will burn out the roots of plants if used for horticultural or agricultural purposes. The end product should be tested for several parameters including pH and salt levels.

Once the product is cured it should be run through a screener to remove wood chips, plastic bags, and other contaminants that are visually unacceptable to the public.

The amount of compost screened will depend on the end-market availability. If the compost is marketed or given to the general public it must look and smell like high quality soil. If the compost is used for landfill cover then the wood chips and other large particles in the final product do not need to be screened out.

The compost can be used by both the public and private sectors. Different quality products (screened/unscreened) can be marketed to different sectors. The public will require a high quality product for horticultural use. It may be necessary to give the product away at first to build up confidence in the compost. The high quality compost can be marketed to nurseries, land developers, golf courses, and other private users.

If all the compost cannot be marketed locally then the City can explore the possibility of marketing the compost to state agencies. Senate Bill 1322 requires that the Department of

General Services, the California Department of Transportation, and the Department of Forestry and Fire Protection use yard waste compost.

Technical Reliability/Public Acceptance
Windrow composting techniques are relatively simple and reliable. If a few parameters are controlled, such as temperature, aeration, and moisture content, then the system will operate on its own and be very reliable. Windrow composting is publicly acceptable if odors are controlled.

Processing Alternative 2. Aerated Static Piles

With static pile composting, organic wastes are aerated by blowers, similar to the high technology operation of windrows. The piles can be much larger than standard windrow piles because they are not limited by the size of equipment used to turn the windrows. The blower can be controlled by timers or by a temperature feedback system. Aerated composting has less odor forming potential than conventional windrow composting. This is because the conventional windrow composting operations have a tendency to operate under anaerobic conditions. Anaerobic composting releases more odors than aerobic composting. Composting of strictly yard waste or wood with static piles is rare, aerated static piles are commonly used to compost sewage sludge.

Effectiveness
This option is effective for co-composting yard waste with sewage sludge or other organic materials, but is not recommended for composting yard waste alone. A manure/yard waste mix would be suitable for composting with an aerated static pile system. The compost process would be as effective as the collection system that feeds it (see collection alternatives for specific quantities).

Hazards
The common hazards associated with composting facilities are odors, contaminants and leachate. Vectors can be a hazard if the facility is not properly operated. There can be hazards associated with equipment operation, but these will be minimized by properly training the equipment operators.

The most common complaint direct at composting facilities is odor. Aerated static piles offer better odor control than conventional windrow processes. If the pile is aerated by pushing air up through the pile from the bottom, then the compost acts as a filter for the odors. If the air is sucked through the pile (vacuum at bottom), then the air stream can be treated before release to the atmosphere.

The presence of contaminants in the final product can be disastrous to marketing efforts. This hazard can be avoided by visually screening the input waste stream for contaminants and pulling them out before the material is placed in an aerated static pile.

The leachate that is generated from the compost process can potentially contaminate local water sources. This can be controlled by collecting and treating or recycling the effluent.

If vectors become a problem then vector control will have to be implemented. Improved aeration, temperature and moisture adjustments, or trapping can be effective.

Ability to Accommodate Changes
Aerated static pile composting is adaptable to many economic, technological, and social changes. It can easily be converted to a windrow composting facility.

Consequences on Waste Stream Composition
A composting facility may result in a decrease in the amount of methane produced at the Yolo County Central Landfill.

Ability to be Implemented
An aerated static pile composting facility can be implemented in the short term.

Need for Facilities
A composting facility will be needed.

Consistency with Local Policies, Plans, and Ordinances
There are no conflicting policies, plans, or ordinances that would interfere with the construction of a composting facility. Depending on the location, a permit from the State Regional Water Quality Board may be required for disposal of the leachate that is generated. A conditional use permit may be required depending on the local zoning ordinances. A solid waste facility permit will be required by the CIWMB.

Institutional Barriers to Implementation
There are no institutional barriers to composting yard waste. If the jurisdictions decide to move into sewage sludge composting in the future, there may be institutional barriers to the use of the final product. Sewage sludge composting is currently under review by the EPA.

Costs
Typical costs for a composting facility are in collection alternatives, processing, storage, marketing, and program administration. Revenue sources for a composting facility include: revenues from selling the finished compost; avoided costs from using the finished compost instead of purchasing similar product; and avoided landfill tipping fees. Capital costs for an aerated static pile composting facility are similar to those for windrow composting. While a

windrow turner is not needed for this process, a ventilation system is. Operational costs are approximately $30 per ton of yard waste processed.[3] This could run as high as $124,000 per year.

Market Availability
Please refer to Market Availability in Processing Alternative 1.

Technical Reliability/Public Acceptance
Aerated static pile composting techniques are relatively simple and reliable. A temperature feedback system to control aeration may be used. By controlling the temperature, aeration, and moisture content, a system can be designed that is very reliable. Aerated static pile composting is acceptable to the public because of the ease of odor control. The facility can be enclosed if there are public objections to its appearance.

Processing Alternative 3. In-Vessel Composting

This process entails the use of a fully- or partially-enclosed, often fully automated operation involving mechanical turning devices with feedback controls and/or forced aeration. Advantages of this method include rapid processing, avoidance of weather related problems and inefficiencies, more complete process and odor control, and less space required.

If the City of Winters decides to compost all of the organic material in its municipal solid waste with an in-vessel system they could divert 48.5 percent of the waste stream that is currently going to landfills. This option would make significant strides toward the state mandated diversion levels, but might significantly affect the marketability of the compost due to the quantity of the compost produced. The compost may possibly be used as landfill cover material; but may be shut out of other markets because of the expected regional availability and quantity of compost in the near future. Glut in region – yes –

Effectiveness
This option is also effective at removing compostable materials from the waste stream, but its expense and complexity will not make this a feasible option unless the input stream is large and other materials are composted with the yard waste. This compost process would be as effective as the collection system that feeds it (see collection alternatives for specific quantities).

Hazards
The common hazards associated with composting facilities are odors, contaminants and leachate. Vectors are not usually a problem with enclosed facilities. There can be hazards associated with equipment operation, but these will be minimized by properly training the equipment operators.

The most common complaint directed at composting facilities is the odor. In-vessel composting facilities offer better odor control than conventional windrow processes. Since the process is enclosed, the odors can be treated as they are released from the vessel.

The presence of contaminants in the final product can be disastrous to marketing efforts. This hazard can be avoided by visually screening the input waste stream for contaminants and pulling them out before the material is placed in the vessel.

The leachate that is generated from the compost process can potentially contaminate local water sources. This can be controlled by collecting and treating or recycling the effluent.

Vectors are usually not a problem with in-vessel systems.

Ability to Accommodate Change
Once a system is designed, it is not particularly flexible in response to changing economic, technological, or social circumstances without economic penalties.

Consequences on Waste Stream Composition
A composting facility may result in reduced amount of methane gas production at the Yolo County Central Landfill.

Ability to be Implemented
An in-vessel composting facility may be implemented in the short term. This method of composting generally is used for composting municipal solid waste. There are many plants of this type in Europe, but experience in America is very limited. This technology has been proven effective for composting municipal solid waste and sewage sludge, but has not been applied to yard waste. A pilot program should be done before committing to this option.

Need for Facilities
A site will have to be found for the composting operation. Site improvement costs can be minimized if a site is chosen that meets the criteria for a composting facility, given in the siting section. A grinder will be needed to prepare the material for composting. Conveyors may be needed to move the material from the grinder to the vessel and from the vessel to the final product area. The facility size requirements are less than the requirements for the windrow or aerated static pile processes. Approximately one acre per 2500 TPY would be needed for an in-vessel composting operation. Utility hookups will be needed.

Consistency with Local Policies, Plans, and Ordinances
There are no conflicting policies, plans, or ordinances that would affect a composting facility. Depending on the location, a permit from the State Regional Water Quality Board may be required for disposal of the leachate that is generated. The CIWMB will require a solid waste facility permit for the site.

Institutional Barriers to Implementation
There are no institutional barriers to composting yard waste. If the jurisdictions decide to move into sewage sludge composting in the future, there may be institutional barriers to the use of the final product. Sewage sludge composting is currently under review by the EPA. Contaminants in MSW compost may limit public acceptance.

Costs
Typical costs for a composting facility are in collection alternatives, processing, storage, marketing, program administration, public education and technical assistance. These costs are offset by the benefits which include: revenues received from selling the finished compost; avoided costs from using the finished compost instead of purchasing a similar product; and avoided landfill tipping fees.

Capital costs for in-vessel systems can be four to seven times higher than those for windrow or aerated static pile systems. An in-vessel system will require an initial investment or approximately $2 million. Operation and maintenance costs range between $40 and $80 per ton of yard waste processed.

Market Availability
Please refer to Market Availability under Processing Alternative 1.

Technical Reliability/Public Acceptance
Since this system is automated, there is a potential for system failure. There are many reliable technologies on the market for in-vessel compost facilities, but only a few have been built in the United States. This method is extremely acceptable to the public because the whole system is enclosed, creating minimal odor or visual problems.

Processing Alternative 4. Anaerobic Composting

Anaerobic composting is the process of producing compost without air. This process produces two products: compost and biogas. Biogas is a mixture of approximately 50 percent carbon dioxide and 50 percent methane. The biogas can be burned to generate electricity or it can be upgraded to pipeline quality natural gas and sold to utilities. The compost product that is produced is similar to that which is produced in aerobic processes.

Effectiveness
This option is also effective at removing compostable materials from the waste stream, but its expense and complexity render this option generally inapplicable to yard waste unless the input stream is at least 30 tons per day.[4] This compost process would be as effective as the collection system that feeds it (see collection alternatives for specific quantities).

Hazards
There can be hazards associated with equipment operation, but these will be minimized by properly training the equipment operators. Methane gas is explosive and must be properly controlled. Vectors are usually not a problem with enclosed systems. For a further discussion of hazards, please refer to Hazards under Processing Alternative 1.

Ability to Accommodate Change
Anaerobic composting is adaptable to many economic, technological, and social changes. It can be converted to an aerobic composting facility, though this conversion would be very costly.

Consequences on Waste Stream Composition
A composting facility may result in reduced amount of methane gas production at the Yolo County Central Landfill.

Ability to be Implemented
Approximately two to three years will be needed to permit, design, and build an anaerobic facility. A windrow composting operation can be implemented in the short term to bridge the gap until the facility will be in operation.

Need for Facilities
The proposed site can be used. A grinder will be needed to prepare the material for composting. Conveyors may be needed to move the material from the grinder to the composting location and from the composting location to the final product area. Anaerobic digesters and a methane gas control system are required. The site may be expanded in the future by increasing the energy available to the system and by the use of buffer areas which are used now for storage and curing.

Consistency with Local Policies, Plans, and Ordinances
There are no conflicting policies, plans, or ordinances that would affect a composting facility. Depending on the location, a permit from the State Regional Water Quality Board may be required for disposal of the leachate that is generated. The CIWMB will require a solid waste facility permit. A local use permit may be required.

Institutional Barriers to Implementation
There are no institutional barriers to composting yard waste. If the jurisdictions decide to move into sewage sludge composting in the future, there may be institutional barriers to the use of the final product. Sewage sludge composting is currently under review by the EPA.

Costs
Typical costs for a composting program involve collection, processing, storage, marketing, and program administration. Potential revenues and cost savings come from selling the finished compost, avoided costs from using the finished compost instead of purchasing a similar product,

avoided landfill tipping fees, and the sale of methane generated by the process.

Anaerobic composting is not widely practiced, thus no detailed costs are available. A rough estimate of processing costs is $40 to $60 per ton. Capital costs will be higher than for a windrow process due to the equipment for control of the biogas that is generated.

Market Availability

The market for compost produced by Winters will depend on several factors including: whether the facility is privately or publicly owned, demand by local government, demand by state government, demand by local residents, quantity and quality of product produced. The market for biogas is expected to climb as other fossil fuel costs increase. The biogas can be used on-site, sold to local industries, or upgraded and sold to utility companies. One use for this biogas is in an internal combustion engine to generate electrical power that can provide a revenue stream to provide support for the composting operation. For a more complete discussion of aftermarkets for compost products, please refer to Market Availability under Processing Alternatives 1. Windrows.

Technical Reliability/Public Acceptance

Anaerobic composting techniques, although not in common use, are relatively simple and reliable once the system has been designed and installed.

6.3.3 Siting Alternatives

Sites that may be appropriate as a composting facility include:

- Buffer areas around landfills
- Waste water treatment facility
- Large, unused paved areas
- Buffer area around industrial sites and institutions
- Utility rights-of-way
- Unused State or Federal lands in the area
- Privately owned land
- Municipally-owned land used for buffer areas or storage

While it may be possible to have a site to serve one jurisdiction, a centralized site for the region is generally preferred on the basis of economies of scale, space availability, and administrative convenience.

The selection of a composting site requires careful consideration of, among other parameters:

- Proximity to the waste stream
- Proximity to potential markets
- Potential for using the land at no direct cost
- Distance from residential and other sensitive land uses
- Size (area)
- Accessibility
- Public attitudes
- Physical site conditions
- Need for permits
- Availability of utilities
- Current and adjacent land uses
- Need for improvements

Three primary options for siting a composting facility are:

- A local municipal site
- A centralized county site
- A private site

A composting facility will have to go through a permitting process that may impact where the site is located. A summary of the permitting steps is as follows:

1. City/County planning departments
   - CEQA evaluation and determination
   - EIR or Negative Declaration
   - Use permit

2. Public Works Department and Waste Advisory Committee for AB 939
   - Concurrence of proposed project needed
   - No permit requirements

3. Department of Public Health
   - Solid Waste Facility Permit or exemption from permit required

4. California Integrated Waste Management Board
   - Planners review for CEQA compliance
   - Solid Waste Facility Permit via Department of Public Health

5. Regional Water Quality Control Board
   - Waste Discharge Permit: Required if there is leachate generation

6. Air Pollution Control District
   - PM-10 permit requirements: Permit required for equipment that generates dust particles of less than 10 microns

Siting Alternative 1. Establish Local Municipal Site

A composting site might be able to be developed on public land in the City of Winters to service the residents. Grinding or shredding equipment could be made available to the City by the County on a rotating basis with other composting sites in the County.

Advantages of this approach include:

- Reduced transport time and cost from collection point to processing location
- Local control over distribution of end products

One disadvantage of this approach is a lack of economies of scale, resulting in greater expenditures for equipment or for costs associated with moving shared processing equipment between composting sites throughout the county.

Effectiveness
A local site would be very effective for composting the yard waste generated in the City of Winters. This compost process would be as effective as the collection system that feeds it (see collection alternatives for specific quantities).

Hazards
Please refer to Hazards under Processing Alternatives 1.

Ability to Accommodate Change
A local composting facility is more likely to adapt to specific local changes in a community than a regional site.

Consequences on Waste Stream Composition
A composting facility will result in a reduced amount of methane gas production at the Yolo County Central Landfill.

Ability to be Implemented
A local facility should be able to be implemented in the short-term planning period, depending on the compost operation chosen and availability of land.

Need for Facilities
The composting facility will require one acre of land for every 1,400 to 2,500 TPY of material that is composted, depending on the technology chosen for operation. It may be wise to oversize the facility to provide a large buffer that can be used for future expansion if economic development is expected to occur in the area around the site. A small office will be needed. Access to utilities is preferred. An area may need to be fenced to contain the equipment used at the facility.

Consistency with Local Policies, Plans, and Ordinances
There are no conflicting policies, plans, or ordinances that would preclude a composting facility. Depending on the location, a permit from the State Regional Water Quality Board may be required for disposal of the leachate that is generated. The CIWMB will require a solid waste facility permit. A composting facility will be consistent with local policies as long as it is located in an area that has been zoned for this use.

Institutional Barriers to Implementation
People may not want a composting facility in their City, public education steps would have to be undertaken.

Costs
Site development costs are Estimated at $10,000 per acre, equipment capital costs at $600,000, and processing costs between $10 and $30 per ton.

Market Availability
Please refer to Market Availability under Processing Alternative 1.

Technical Reliability/Public Acceptance
The operation chosen will determine the technical reliability. The public may be more willing to accept a local facility if it is clean and they are educated as to the importance of composting to future waste disposal problems. The facility can be enclosed if the view is publicly unacceptable.

Siting Alternative 2. Establish Centralized Regional Site

A centralized regional composting facility provides economies of scale in processing of source separated yard waste not realized through a local facility. This is largely do to the greater quantities of yard waste that can be process resulting in lower processing costs per ton. A centralized processing facility also provides for regional marketing efforts for finished compost reducing competition among jurisdictions for limited markets. A disadvantage to a centralized site is the transport distance to discharge source separated yard waste loads.

A composting and wood utilization program, operated by Valley By-Products, is currently in

operation at the YCCL. During the short-term planning period, the County plans to assist Valley By-Products in facility permitting and in the development of strategies to increase the levels of diversion through this program.

Through this alternative the City would divert source separated yard waste, which is currently disposed of at YCCL, to the Valley By-Products facility located at YCCL. Participation in this program would not require any changes to the current yard waste collection program.

Effectiveness

A centralized regional site will be effective at composting the yard waste generated in the City of Winters as well as the yard waste generated throughout the region. It will not raise the cost of collection because current practice is to haul collected yard waste to the YCCL for disposal. Initial equipment costs will be lower as they will be shared by all jurisdictions using the facility. This compost process would be as effective as the collection system that feeds it (see collection alternatives for specific quantities).

Hazards

Please refer to Hazards on under Processing Alternative 1.

Ability to Accommodate Change

A regional center can alter operations and marketing efforts as necessary. A regional facility located at YCCL can also utilize available equipment in the event of equipment failure and expand operations as needed. In the event that markets are limited or unavailable, finished compost product can also be utilized as a component in landfill daily cover operations.

Consequences on Waste Stream Composition

A composting facility will result in reduced methane gas production at the Yolo County Central Landfill and increase landfill life.

Ability to be Implemented

Expansion of the Valley By-Products facility is expected to take place in the short-term planning period.

Need for Facilities

It may be wise to oversize the facility to provide a large buffer that can be used for future expansion if economic development is expected to occur in the area around the site. A small office will be needed. Access to utilities is preferred. An area may need to be fenced to contain the equipment used at the facility.

Consistency with Local Policies, Plans, and Ordinances

There are no conflicting policies, plans, or ordinances that would preclude a composting facility. Depending on the location, a permit from the State Regional Water Quality Board may be

required for disposal of the leachate that is generated. The CIWMB will require a solid waste facility permit. A composting facility will be consistent with local policies as long as it is located in an area that has been zoned for this use.

Institutional Barriers to Implementation
There are no institutional barriers to this alternative.

Costs
The implementation costs will vary according to the amount of material that is to be processed. Costs for the expansion of the YCCL composting operation are currently unknown. Costs for facility expansion will be funded through landfill tipping fees.

Market Availability
Please refer to Market Availability under Processing Alternative 1.

Technical Reliability/Public Acceptance
The operation chosen will determine the technical reliability. The public may be more willing to accept a facility if it is clean and they are educated as to the importance of composting to future waste disposal problems. The facility can be enclosed if its appearance is publicly unacceptable.

Siting Alternative 3. Establish Local Private Site.

A privately owned and operated local composting facility would remove the direct financial responsibility from the City.

Advantages of this approach include:

- Reduced transport time and cost from collection point to processing location
- Local control over distribution of end products

Disadvantages for this approach include:

- Rates for processing compost are not controlled by the City
- Facility can be operated to best advantage of the facility owner at any time instead of the best advantage of the City.

Effectiveness
A local site would be very effective for composting the yard waste generated in Winters. This compost process would be as effective as the collection system that feeds it (see collection

alternatives for specific quantities).

Hazards
Please refer to Hazards under the Processing Alternative 1. Windrows.

Ability to Accommodate Change
A local composting facility is more likely to adapt to specific local changes in a community than a regional site.

Consequences on Waste Stream Composition
A composting facility will result in lower methane gas production at the Yolo County Central Landfill and extended landfill life.

Ability to be Implemented
A local facility can be implemented in the short-term planning period if an owner and operator are found.

Need for Facilities
A private facility will need to be built.

Consistency with Local Policies, Plans, and Ordinances
There are no conflicting policies, plans, or ordinances that would preclude a composting facility. Depending on the location, a permit from the State Regional Water Quality Board may be required for disposal of the leachate that is generated. The CIWMB will require a solid waste facility permit which is being pursued currently.

Institutional Barriers to Implementation
People may not want a composting facility in a residential area, public education steps will have to be undertaken.

Costs
Site development costs are Estimated at $10,000 per acre, equipment capital costs at $600,000, and processing costs between $10 and $30 per ton.

Market Availability
Please refer to Market Availability under the Processing Alternative 1. Windrows.

Technical Reliability/Public Acceptance
The operation chosen will determine the technical reliability. The public may be more willing to accept a local facility if it is clean and they are educated as to the importance of composting to future waste disposal problems.

6.4 SELECTION OF PROGRAMS

Program selections by the City are based on the City's desire to provide Winters residents and businesses the opportunity to participate in waste diversion programs on a voluntary basis. Program selections are also based on providing the most cost effective programs available to achieve the City's waste diversion goals and to participate in County efforts to provide regional waste management programs. The following alternatives were selected for implementation in the short-term planning period and are expected to be in operation throughout the medium-term planning period. A specific processing alternative was not selected by the City as Winters will not operate the facility, and that decision is entirely up to the facility operator. Preliminary design specifications for the proposed facility at YCCL identify windrow processing as the preferred technology.

6.4.1 Programs Selected

Collection Alternative 1. Continue Curbside Collection Program

The City currently offers separate residential curbside collection of yard waste. This program has been very successful in the collection of yard waste and will continue through the short and medium-term planning periods. This program is currently funded through refuse collection fees.

Collection Alternative 2. Continue Commercial/Industrial Collection Program

In an effort to maximize the quantity of waste diverted and to provide commercial/industrial businesses the opportunity to participate in yard waste diversion programs, the City will continue to provide source separated yard waste collection for the commercial/industrial waste sectors. The City will actively promote this program, but not incur substantial costs in the process as commercial/industrial yard waste generation rates are minimal. The collection program will continue as is, only yard waste will now be diverted to the proposed regional composting facility at YCCL.

Facility Siting Alternative 2. Centralized Regional Site

This alternative has been selected for implementation in the short-term planning period due to the economies of scale achieved through regional programs and the lower costs associated with the expansion of the existing YCCL composting operation. This existing operation provides the City the opportunity to achieve maximum diversion levels and also the ability to participate in cooperative regional marketing efforts. Expansion of the existing facility is expected to take place in 1992. Yard waste diversion for the City is expected to begin in the Spring of 1993.

6.4.2 Programs Rejected

The following collection programs have been rejected by the City of Winters.

Collection Alternative 3. Establish Drop-off Sites

This alternative has been rejected as it is deemed less effective than the current collection program already established. Potential siting problems contributed signficantly to this decision.

Siting Alternative 1. Local Municipal Site

This alternative was rejected as the City has no desire to enter the composting business, competing directly with the private sector and the larger regional facility to be built at YCCL.

Siting Alternative 3. Private Site

This alternative has been rejected as the City does not wish to encourage development of a site to compete with the facility at Yolo County Central Landfill when the likely end-market will be the Yolo County Central Landfill.

6.4.3 Cumulative Integrated Effect of the Programs

Projected waste diversion through the selected programs is estimated to be 13.7 percent in the short and medium-term planning periods. Tables 6-5 and 6-6 present estimates of material diversion through the selected programs. These estimates are based on the quantity and composition of solid waste identified in the SWGS, and the projected capture rates presented in the evaluation discussions for each selected program (see Section 6.3, Evaluation of Alternatives).

Table 6-5
Summary of Waste Diversion Through Selected Alternatives in the Short-Term Planning Period as Measured in Tons Per Year (TPY)

Material	1995 Available Tonnage (TPY)	Amount Diverted Through Programs				Total Diverted
		Residential Curbside Collection	Commercial/ Industrial Collection	Regional Composting Facility	Windrow Processing	
Yard waste	1,739	1,082	33	–	–	1,115
Total	1,739	1,082	33	–	–	1,115
Total Waste Stream Diversion %	–	13.3	.4	–	–	13.7

* Total waste stream generation projected for 1995 is approximately 8,136 TPY.

Table 6-6
Summary of Waste Diversion Through Selected Alternatives in the Medium-Term Planning Period as Measured in Tons Per Year (TPY)

Material	2000 Available Tonnage (TPY)	Amount Diverted Through Programs				Total Diverted
		Residential Curbside Collection	Commercial/ Industrial Collection	Regional Composting Facility	Windrow Processing	
Yard waste	2,505	1,560	47	–	–	1,607
Total	2,505	1,560	47	–	–	1,607
Total Waste Stream Diversion %	–	13.3	.4	–	–	13.7

* Total waste stream generation projected for 2000 is approximately 11,732 TPY.

6.4.4 End-Markets and Contingency Measures for Diverted Compostable Materials

A listing of end-markets for diverted materials is located in Appendix B. The City will use finished compost whenever possible in Public Works projects, and work with local builders to incorporate the use of compost in their building specifications as new structures are built in the City. Agricultural interests in and around the City will also be encouraged to use compost on their fields. The local schools will also be asked to use compost on their grounds. The City will actively support lobbying efforts at the State level to see a wider range of uses mandated in State projects such as road improvement and land reclamation.

The Yolo County Central Landfill has as a contingency measure gained permission from the State to use compost as daily cover in the event markets are unavailable or too expensive to access.

6.5 PROGRAM IMPLEMENTATION

Implementation schedules which include responsible entities, costs, and funding sources, for the selected collection programs are summarized in Tables 6-7 and 6-8. Implementation of the regional composting facility is expected to take place in 1992 and will be responsibility of the Yolo County Public Works Department. Funding for that program will be through the County Sanitation Enterprise Fund.

6.5.1 Entities Responsible to Implement Programs

The Public Works Director, the Recycling Coordinator, City staff, and the County will take primary responsibility to implement the programs listed above. Throughout the process the Recycling Coordinator and the Department of Public Works will work in tandem with the County. Ultimately, the City Council will have the final word on all programs that the City of Winters participates in.

6.5.2 Implementation Tasks - Residential Curbside Yard Waste Collection Program

The Recycling Coordinator will work in conjunction with the Department of Public Works to monitor and evaluate the current program, and develop ways to make it more efficient. The Recycling Coordinator and the waste hauling staff will keep the Director of Public Works appraised quarterly, and the City Council annually of the program results.

Table 6-7
Implementation Schedule for Residential Curbside Yard Waste Collection

Task	Responsible Entity	Start Date	Completion Date	Estimated Cost	Funding Source
Continue existing residential yard waste collection	Dept. of Public Works/Recycling Coordinator	Ongoing	Ongoing	$60,600*	Refuse Fund
Begin composting at regional site (YCCL)	County PWD	10/92	Ongoing	$59,510**	Refuse Fund
Monitor program effectiveness	Recycling Coordinator	7/93	Ongoing	Staff time @ 40 hours = $800	Refuse Fund
Total Cost	---	---	---	$120,910	---

* Approximately $3.50 per unit per month for 1,444 units.
** Approximately $55.00 per ton for 1,082 TPY (projected for 1995).
*** Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).

6.5.3 Implementation Tasks - Commercial/Industrial Yard Waste Collection Program

The Recycling Coordinator will work in conjunction with the Department of Public Works to monitor and evaluate the current program, and develop ways to make it more efficient. The Recycling Coordinator and the waste hauling staff will keep the Director of Public Works appraised quarterly, and the City Council annually of the program results.

Table 6-8
Implementation Schedule for Commercial/Industrial Yard Waste Collection

Task	Responsible Entity	Start Date	Completion Date	Estimates Cost	Funding Source
Identify commercial/ industrial yard waste generators not participating in current collection program	Dept. of Public Works/Recycling Coordinator	7/93	Ongoing	Staff time @ 40 hours = $800	Refuse Fund
Promote program to target firms	Recycling Coordinator	8/93	Ongoing	Staff time @ 80 hours = $1,600	Refuse Fund
Expand commercial/ industrial yard waste collection	Dept. of Public Works/Recycling Coordinator	10/93	Ongoing	Staff time @ 80 hours = $1,600 + increased operations costs (not available)	Refuse Fund
Monitor program effectiveness	Recycling Coordinator	7/93	Ongoing	Staff time @ 40 hours = $800	Refuse Fund
Total Cost	---	---	---	$4,800 + increased operations costs (not available)	---

* Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).

6.6 MONITORING AND EVALUATION

To ensure that the composting program is meeting its goals and objectives, the program will be monitored and evaluated on a regular basis. Monitoring will include the following measures:

- Recording by the City or its agent of the estimated cubic yards of materials accepted for processing at the composting site, on a daily basis
- Recording by the City or its agent of the estimated cubic yards or tons of reject materials that require disposal after pre- or post-processing, as applicable.
- Other supplementary measures as deemed necessary or desirable

An evaluation of the Waste Generation Study should be undertaken by Winters, to evaluate changes in the disposal levels of materials targeted or that could be targeted by the composting program. Data gathered in the waste generation study should be compared with data gathered in the 1991 study conducted for the City.

6.6.1 Methods to Monitor and Quantify Program Results

Collection Alternative 1: Residential Curbside Yard Waste Collection

Objective
The objective of this alternative will be to continue to collect source separated yard waste at curbside in the short and medium-term planning periods. The SWGS indicates that a limited amount of yard waste is currently disposed with normal residential refuse. City goals will also be to promote participation in the collection program and to reduce the quantity of yard waste in the disposed waste stream.

Responsible Entities
Recycling Coordinator and the Dept. of Public Works.

Criteria/Methods of Evaluation
The City will periodically monitor the quantity of yard waste disposed with normal refuse. This monitoring program is scheduled to begin in the fall of 1993 and 1994. The criteria utilized to determine the level of program effectiveness will be based on the pounds per household discarded.

Contingency Plan If Shortfall
Should monitoring indicate that the quantity of yard waste discarded per household is at unacceptable levels, refuse collection rates will be evaluated and may be revised to encourage source separation.

Collection Alternative 2: Commercial/Industrial Yard Waste Collection

Objective
Program objectives are to divert approximately .4 percent of the total waste stream by 1995, continuing through the year 2000 through the source separation and collection of yard waste generated from the commercial/industrial waste sectors. To achieve these goals, the Dept. of Public Works will offer yard waste collection services to specified commercial/industrial accounts throughout the short and medium-term planning periods.

Responsible Entities
Recycling Coordinator and the Dept. of Public Works.

Criteria/Methods of Evaluation
Criteria to be utilized to evaluate program success will be based on the number of commercial/industrial accounts which are appropriate for this program. This baseline number of accounts will be established in the short-term planning period. Program success will be measured by the number of accounts contacted and the number of company programs established to divert yard waste through source separation collection. Target goals will be set annually to increase the number of accounts utilizing this service.

Contingency Plan if Shortfall
Should the City fall short in meeting annual target goals, the City will increase it's efforts to contact commercial/industrial accounts through the City Recycling Coordinator. Commercial refuse collection rates may be evaluated to increase participation in the program.

Facility Siting Alternative 2. Centralized Regional Site

Objective
The City has selected the centralized regional processing facility option for the composting of source separated yard waste. The main objective for the City will be to deliver source separated yard waste with as little contamination as possible.

Responsible Entities
The responsible entities will be the City Recycling Coordinator and the Dept. of Pblic Works.

Criteria/Methods of Evaluation
The criteria to be utilized to measure program effectiveness will be based on the percent contamination of yard waste received at the regional processing facility. Levels of contamination will also be observed by the Dept. of Public Works as source separated yard waste is collected for diversion.

Contingency Plan If Shortfall
The City will evaluate alternative composting sites for its yard waste if the YCCL facility proves to be inefficient in its processing and marketing functions.

6.6.2 Funding

Monitoring and evaluation activity costs are included in the Recycling Coordinators position with funding derived from the Refuse Fund.

FOOTNOTES

1. Mark D. Selby, June 1989, Yard Waste Collection, *BioCycle*, pp. 52-54.

2. Los Angeles Department of Public Works, April 1989, Recycling Implementation Plan Appendices, p. D-74.

3. Los Angeles Department of Public Works, April 1989, Recycling Implementation Plan Appendices, p. D-74.

4. Gene Logsdon, October 1990, Anaerobic Composting Gains Greater Support, *BioCycle*, pp. 42-48.

SECTION 7

SPECIAL WASTE COMPONENT

Special wastes are any solid wastes that present a hazard to human health or the environment if not properly handled or wastes that require unique handling or disposal methods because of physical characteristics. Handling and disposal of special wastes may also require permits from one or more state agencies. The California Integrated Waste Management Board defines special wastes as the following:

- Ash
- Nonhazardous sewage sludge
- Nonhazardous industrial sludge
- Asbestos
- Auto shredder waste
- Automobile bodies
- Other special wastes
- Tire Waste

Other special wastes can include bulky and hard-to-handle wastes such as furniture, refrigerators, and tires as well as potentially hazardous materials such as biomedical wastes generated by medical facilities. Special wastes generated in the City of Winters and addressed in this component are the following:

- Sewage sludge
- Industrial sludge
- Infectious wastes
- Tire waste
- White goods
- Concrete
- Asphalt
- Inert solids
- Wood waste

Sewage sludge

Sewage sludge is the waste derived from the treatment of waste water by water pollution control plants. Depending on its content, sewage sludge may be classified as hazardous or nonhazardous. If dewatered sewage sludge meets the nonhazardous criteria of the State Water Resources Control Board, it may be disposed of in a municipal landfill. If the sewage sludge contains significant levels of heavy metals (i.e., copper, cadmium, chromium, lead, nickel, mercury, or zinc), it is considered hazardous and must be disposed of accordingly.

Industrial sludge
Industrial sludge is generated by industries that operate pretreatment programs for industrial waste water. Such pretreatment is usually required when the waste water contains materials that can pose a hazard to the safe and effective operation of publicly-owned treatment plants. Industrial sludge may contain constituents that require it to be classified as a hazardous waste, thus requiring disposal at a Class I landfill.

Infectious wastes
Infectious wastes or biomedical wastes are classified as hazardous wastes and include:

- Wastes from biological laboratories and medical clinics
- Pathological specimens such as human and animal tissues
- Contaminated medical equipment such as syringes, needles, bags, bottles, etc.
- Human dialysis waste
- Infected animal carcasses
- Any other contaminated material which presents a significant danger of infection

Tire waste
Tire waste consists of used tires, an inert waste that may legally be disposed of in any type of landfill. Landfilling tires presents some special difficulties because tires are resilient and have a tendency to "float" to the landfill surface where they can become vector habitats.

White goods
White goods are large household and industrial appliances, such as stoves, refrigerators, and clothes washers and dryers. These items cannot be compacted and present a space problem at landfills. In addition, refrigeration units contain freon, a material that is hazardous when vaporized.

Concrete
Concrete is a material used in construction and road work. Concrete is a product of sand, gravel, and cement.

Asphalt
Asphalt is a mixture of petroleum by-product and aggregate (rock) and is most frequently used as a paving material.

Inert solids
Inert solids are considered herein as a mixture of concrete, rock, dirt, and asphalt. It is used most frequently as road base.

Wood waste
Wood waste refers to pallets, wood crates, and scrap wood.

7.1 GOALS AND OBJECTIVES

Diversion alternatives selected to target special wastes involve participation by the City in the County's integrated waste management programs to target self-haul waste generators and construction and demolition contractors. Through these programs, the City will promote the source separation of asphalt and concrete at construction sites and promote the use of the County's "self-haul bin transfer" program to Winters residents.

Specific goals and objectives include:

- Divert through the above programs approximately 17 percent of the total waste stream in the short and medium-term planning periods.

- Promote the use of the YCCL self-haul waste recovery program and encourage the residents of Winters to divert 100 percent of their white goods, and 80 percent of all other wastes not targeted through current diversion programs through this alternative.

- Promote the source separation of inert wastes through public education efforts in the short-term to achieve a 70 percent diversion rate for these materials.

- Assist the County in regional market development efforts and consider revising current City construction specifications requiring a specified percentage of recovered asphalt and concrete materials be used in new construction.

Table 7-1 presents special waste disposal data for the City of Winters. All of these materials have the potential to be diverted through through special waste diversion programs. Materials identified as construction/demolition debris in the SWGS were sorted, and a representative composition was developed. Only those components that represent a significant percentage of the construction/demolition debris waste stream are shown in Table 7-1 as noted in the footnote to the table.

Table 7-1
Summary of Special Wastes and Construction/Demolition Debris Available For Diversion

Waste Type	Amount Currently Generated (1990 TPY)	Amount Available Short-Term (1995 TPY)	Amount Available Medium-Term (2000 TPY)
Cardboard*	13	17	25
Ferrous metals*	30	40	57
White goods	10	14	20
Bulky waste	12	20	29
Plastic film*	11	15	21
Grass, leaves*	10	14	20
Prunings*	22	30	44
Tires	10	18	25
Wood*	209**	361	521
Wood (pressed board)*	42	57	82
Asphalt*	57	78	112
Concrete	9	13	18
Inert solids*	940***	1,417	2,043
Total	1,375	2,094	3,017

* Significant construction/demolition debris constituents were identified on a regional basis to comprise the following percentages of the construction/demolition debris waste stream. Total construction/demolition debris disposed in Winters was 408 tons.

- Cardboard @ 3.1 percent
- Plastic film @ 2.6 percent
- Ferrous metal @ 7.1 percent
- Grass and leaves @ 2.5 percent
- Wood waste @ 26.2 percent
- Wood (pressed board) @ 10.2 percent
- Asphalt @ 13.9 percent
- Inert solids @ 19.3 percent
- Prunings @ 5.4 percent

** Inlcudes 102 tons of recycled materials.

*** Includes 861 tons of recycled materials.

7.2 EXISTING CONDITIONS

This section provides a description of the current practices within the City of Winters for each waste type generated. None of the programs outlined below are expected to decrease or be phased out during the planning period. Applicable regulatory requirements are also included.

Sewage sludge

The City of Winters Water Pollution Control Plant is located on County Road 33. SOCI is under contract with the City of Winters to operate the treatment plant. The waste water receives treatment utilizing an aerated pond system. Septic waste is not accepted for disposal. The ponds are periodically drained and the settled sludge is dredged. The sludge is spread to air dry, and, following a laboratory analysis for metals, the sludge is disced into the soil.[1]

Industrial sludge

Nonhazardous industrial sludge is regulated by a city ordinance requiring that a pretreatment system, which usually consists of a clarifier/interceptor on the discharge line, be in place to trap grease and solids. The nonhazardous industrial sludge is pumped by specially equipped trucks and brought to the Sacramento Regional Treatment Plant for disposal and treatment. The grease is usually pumped by a regional rendering service and recycled. SOCI is under contract with the City of Winters to prepare and implement an industrial waste monitoring program.[2]

Infectious waste

Infectious (biomedical) wastes are generated by the medical facilities located in the City of Winters. Current disposal practices include shipment of "sharps" in pre-approved packaging, which meets the criteria of the Department of Health Services and the United States Postal Service, to a nearby licensed hazardous waste disposal company which does not offer a pickup service to the Winters area.[3]

Tire waste

Based on the waste generation analysis, 13 TPY of discarded tires account for approximately 0.2 percent of the wastes generated from the residential and commercial/industrial waste sectors. Current tire disposal fees at the Yolo County Landfill range from $1 to $3 per tire or $60 per ton. The landfill operates an effective salvaging program whereby tires are placed in a designated area and periodically transported for shredding and temporary landfilling. These landfilled tire shreds will potentially by recovered and incinerated. Waste tires generated by commercial dealers in the City are diverted from disposal by contracting with a tire recycling company for regular tire pickup service.

White goods

The Waste Generation Study indicates that 10 TPY of white goods originating in the City of Winters were landfilled in 1990. No recycling of white goods was detected during the Waste Generation Study. The City of Winters does not provide white goods pick-up service as part of its residential refuse collection service.

Concrete, asphalt and other inert solids
The Waste Generation Study indicates that approximately 1,006 tons of concrete, asphalt and other inert solids are taken to Yolo County Landfill annually. Of this, 85 percent (861 TPY) is used as road base for the landfill's wet weather pad. Were this material to be landfilled rather than used as a wet weather pad, virgin materials would be imported for the same purpose.

Wood waste
The wood waste generated in the City of Winters is generally from construction activity. Of the 209 TPY currently generated in Winters, 48 percent (102 TPY) is chipped and sold as boiler fuel for biomass plants.

7.3 EVALUATION OF ALTERNATIVES

Special wastes which can be targeted for waste diversion include concrete and asphalt generated from industrial sources, white goods, wood wastes, and construction and demolition debris generated from self-haul sources. The following recovery alternatives to landfilling these materials are described and evaluated in this section:

Alternative 1. Self-Haul Bin Transfer Operation (selected)
Alternative 2. Concrete, Asphalt, and Inert Solids Recycling (selected)

Alternative 1. Self-Haul Bin Transfer Operations

"Self-haul bin transfer operations" (landfill salvaging) involves the manual sorting of refuse to recover reusable materials from the mixed waste stream. The County Department of Public Works is currently developing a "self haul bin transfer operation" at YCCL to target wastes generated from self-haul sources - waste generators hauling their own waste to the landfill. Through this alternative the City would participate in this regional County waste management program by promoting the use of this facility by City residents and other Winters waste generators.

Materials targeted from self-haul sources would include but are not limited to:

- White goods;
- Concrete, asphalt and inert solids;
- Wood waste;
- Construction and demolition (C/D) debris.

White goods
Approximately 10 tons of white goods are taken to the Yolo County Landfill each year. All of these items are readily recyclable through scrap metal dealers.

Concrete, asphalt and inert solids

The Waste Generation Study identified 1,006 tons of concrete, asphalt and inert solids generated annually. Of this amount, 861 TPY is being recycled as a wet weather pad that would otherwise be constructed of imported, likely virgin, materials. The remaining 145 TPY, that which is not recycled, is excess for which Yolo County Central Landfill currently has no need. This material, if source separated, can be used as road base if crushed, or even remade into its original form. Water districts also use these materials as fill (riprap).

Wood waste

The Waste Generation Study indicates that approximately 250 tons of wood waste were landfilled in 1990. Of this, approximately 200 TPY is transformable as boiler fuel, with the remaining materials being too contaminated.

Construction/demolition debris

Construction and demolition debris generated from self-haul sources consists of a variety of waste types such as cardboard, wood waste, yard waste, asphalt and concrete, and other materials. These factors have been incorporated into the tonnage references mentioned above.

Effectiveness

Targeting special wastes and other materials through the County's self-haul bin transfer program will result in a material recovery rate of approximately 255 TPY or 4.3 percent of the waste generated based on 1990 data. Estimated of waste diversion through this program is summarized in Table 7-2.

Table 7-2
Projected Amounts Diverted Through Self-Haul Bin Transfer by Material Type

Waste Type	1990 Tonnage Available (TPY)	Diversion Rate (%)	Amount Diverted (TPY)
Cardboard*	13	80.0	10.4
Ferrous metals*	30	80.0	24
White goods	10	100.0	10
Grass & leaves*	10	80.0	8
Prunings*	22	80.0	17.6
Bulky waste	12	80.0	9.6
Tires	10	80.0	8
Wood*	209	80.0	167.2
Total	358	71.0	254.8

* Available through self-haul construction and demolition debris.

Hazards
Health and safety hazards associated with salvaging are similar to those inherent in all landfill operations, such as the dangers of working in close proximity to large equipment and machinery.

Ability to Accommodate Change
Salvaging in this type of program is very adaptable to changing economic and technological conditions. Targeted material types can be changed based on market availability.

Consequences on Waste Stream Composition
This program will reduce the volume of white goods, yard waste, and construction and demolition debris in the waste stream, leaving a greater amount of non-recyclable materials to be landfilled.

Ability to be Implemented
This program can be implemented at the landfill in less than six months, within the short-term planning period.

Need for Facilities
This alternative uses existing facilities at the landfill. Some minor modifications of those facilities may be required.

Consistency with Local Policies, Plans, and Ordinances
This program does not conflict with local policies, plans, or ordinances.

Institutional Barriers to Implementation
There are no institutional barriers preventing implementation of this alternative.

Costs
This program would use equipment already available at the landfill; however, additional equipment may be necessary. The program may also require additional staff/management to sort and prepare recovered materials to market specifications.

According to the Yolo County SRRE, the estimated implementation costs for the self-haul bin transfer operation is approximately $280,000. Annual operations and maintenance cost is estimated to be $125,000. Funding for this program will be the County's Sanitation Enterprise Fund.

Market Availability
Markets are available for the materials recovered in this collection program. Specific buyers are provided in Appendix B. Additional markets may be available.

Alternative 2. Asphalt, Concrete, and Inert Solids Recycling

Asphalt and concrete (A/C) generated from construction and demolition activities which is separated from other refuse at the point of generation can provide an effective means to diverting these materials from the waste stream. This source separation effort can be facilitated through City promotion efforts and landfill tipping fees set to encourage source separation. Source separated A/C can easily be diverted at YCCL for use as wet weather pads and road base materials as well as other road base uses in the region. The County will be exploring processing options for these materials in the short-term planning period.

Through this alternative the City could encourage source separation of inert wastes through program promotion and also assist in regional marketing efforts to divert these materials. The City could also work with the County, if only to lend support, in the development of a County ordinance mandating the source separation of inert wastes.

Effectiveness
As indicated in Table 7-3, this alternative may result in additional diversion of up to 704 TPY in the short-term planning period, or approximately 11.8 percent of the total waste stream based on 1990 data.

Table 7-3
Effectiveness of Concrete, Asphalt, and Inert Solids Recycling

Waste Type	1990 Tonnage Available (TPY)	Diversion Rate (%)	Amount Diverted (TPY)
Asphalt	57	70	40
Concrete	9	70	6
Inert solids	940	70	658
Total	1,006	70	704

Hazards
There are no identifiable hazards associated with this alternative.

Ability to Accommodate Change
This alternative is highly adaptable to changing market conditions.

Consequences on Waste Stream Composition
This alternative reduces the quantity of inert waste currently disposed.

Ability to be Implemented
This alternative would be implemented in within 4 to 8 months - the short-term planning period.

Need for Facilities
Implementation of this alternative at YCCL will require available space for the receipt of wastes and material processing operations. Construction and demolition contractors would require additional containers for the source separation of materials.

Consistency with Local Policies, Plans, and Ordinances
This type of program does not conflict with local policies, plans, and ordinances.

Institutional Barriers to Implementation
There are no institutional barriers to the implementation of this alternative.

Costs
Cost to the City of Winters for this program would be limited to the development and distribution of public information materials to promoting the source separation of inert materials.

Market Availability
Recycled asphalt and concrete could be used by the County DPW as road base at the landfill or for public roadways. Additional markets could be facilitated by requiring a percentage of

recovered inert wastes in City building and roadway construction specifications

7.4 SELECTION OF PROGRAMS

7.4.1 Programs Selected

In keeping with the City's policy to participate in regional County integrated waste management programs, the City has selected both alternatives described in this component. Participation in these programs allows the City to take full advantage of economies of scale in the development of regional processing facilities and to provide consistent waste management programs throughout the County. This regional integrated approach will result in a commonality in waste management practices and will benefit the entire County waste management system.

The following is a brief summary of selected programs.

Alternative 1. Self-Haul Bin Transfer Operations

The YCCL is currently in the process of developing a "self-haul bin transfer operation" recovering white goods, wood waste, yard waste and other materials which are in sufficient quantity to target for diversion. The operation is scheduled to commence operations in the 4th quarter of 1992. Through this alternative the City will promote the use of this facility and encourage residents of Winters to divert white goods and other wastes not targeted through current diversion programs to this recovery operation.

Alternative 2. Concrete, Asphalt, and Inert Solids Recycling

The City will require all large municipal and private construction contracts to include source separated disposal of concrete and asphalt for recycling. Because the Yolo County Central Landfill does not use all inert solids received, the contractor or City will be required to check with the YCCL before removing the waste, assuring that if it is removed to the YCCL that it will ultimately be recycled as road base and not disposed along with the other refuse. Once the YCCL has accumulated its reserves of inerts for the year, the generators will need to take their materials elsewhere. The City will promote the source separation of inert wastes through public education efforts. Promotions may be in the form of brochures or in-person contact with construction/demolition companies doing work in the City of Winters. The City will also support County efforts in the development of an ordinance to mandate source separation of inert solids and other wastes. The City will also assist the County in regional market development efforts and will consider revising current City construction specifications requiring specified percentages of recovered concrete and asphalt materials for new construction.

7.4.2 Cumulative Integrated Effect of the Programs

Tables 7-4 and 7-5 below summarize estimated diversion rates through programs selected in this component. These programs may result in of diversion rate of 4.4 percent in the short and medium-term planning periods.

Table 7-4
Projected Amounts of Materials to be Diverted in the Short-Term Planning Period

Waste Type	1995 Available Tonnage (TPY)	Amount Diverted Through Programs		Total Diverted (TPY)
		Self-Haul Bin Transfer Operation (TPY)	Concrete, Asphalt, and Inert Solids Recycling (TPY)	
Cardboard	17	14	---	14
Ferrous metals	40	32	---	32
White goods	14	14	---	14
Bulky waste	20	16	---	16
Grass & leaves	14	11	---	11
Prunings	30	24	---	24
Tires	18	14	---	14
Wood	361	289	---	289
Asphalt	78	---	55	55
Concrete	13	---	9	9
Inert solids	1,417	---	992	992
Total	2,022	414	1,006	1,470
Total Waste Stream Diversion %	---	5.0	12.4	17.4

* Total waste stream generation projected for 1995 is approximately 8,136 tons.

Table 7-5
Projected Amounts of Materials to be Diverted in the Medium-Term Planning Period

Waste Type	2000 Available Tonnage (TPY)	Amount Diverted Through Programs		Total Diverted (TPY)
		Self-Haul Bin Transfer Operation (TPY)	Concrete, Asphalt, and Inert Solids Recycling (TPY)	
Cardboard	25	20	---	20
Ferrous metals	57	66	---	66
White goods	20	20	---	20
Bulky waste	29	23	---	23
Grass & leaves	20	16	---	16
Prunings	44	35	---	35
Tires	25	20	---	20
Wood	521	417	---	417
Asphalt	112		78	78
Concrete	18		13	13
Inert solids	2,043		1,430	1,430
Total	2,914	617	1,521	2,138
Total Waste Stream Diversion %	---	5.3	12.9	18.2

* Total waste stream generation projected for 2000 is approximately 11,732 tons.

7.4.3 End-Uses and Contingency Measures for Diverted Recyclable Materials

The Recycling and Composting Components discuss end uses and contingency measures for materials targeted by those programs. The construction and demolition debris waste stream, targeted by the self-haul bin transfer operation, is comprised of many of those same materials with the same end markets and handling procedures. Materials which are distinctive to the Special Waste Component are wood, white goods, bulky waste, tires, concrete, asphalt, and inert solids. Handling procedures for each of these materials is discussed below.

Wood

This material is classified as a special waste because of its bulky nature. Pieces suitable for composting or mulch will be separated by size and diverted to the appropriate area. All other large pieces will be processed into hog fuel. All wood wastes will be ground for more efficient handling.

White Goods

White goods must be diverted from the landfill because many contain toxic fluids which contribute to leachate problems. These materials will hauled off by a contractor to properly separate motors, generators, and other components of a hazardous nature for proper disposal. The remaining metal will be salvaged and remanufactured into various metal products.

Bulky Waste

This waste stream is generally thought of as old furniture, but can include wood and other hard to handle construction and demolition debris. These materials will be separated for reuse or recycling if possible. Residual materials will be landfilled.

Tires

Tires can be reused as retreads or processed into fuel chips or rubberized asphalt. All suitable materials will be separated and diverted to their most appropriate use based on the quality of the tire.

Concrete, Asphalt, and Inert Solids

These materials are most readily recycled as road base at the YCCL. Remaining materials can be processed by outside contractors for use in similar applications or as rip-rap along river banks. YCCL will continually accept all materials it needs to complete road base operations, and will notify haulers when they have received adequate materials so that these materials can be diverted to other end users or disposal.

7.5 PROGRAM IMPLEMENTATION

The following tables outline the implementation schedules for the alternatives selected by the City of Winters. Projected costs, funding sources, and entities responsible for implementation are also summarized.

Table 7-6
Implementation Schedule for the Self-Haul Bin Transfer Operation

Task	Responsible Entity	Start Date	Completion Date	Estimated Cost	Funding Source
Prepare engineering design and specifications	County DPW	9/91	1/92	$25,000	CSEF*
Obtain required permits	County DPW	9/91	3/92	$10,000	CSEF
Construct facility	County DPW	7/92	9/92	$245,000	CSEF
Retain contractor for operations	County DPW	9/92	9/92	---	CSEF
Commence operations	Contractor/ County DPW	10/92	Ongoing	$125,000 (annually)	CSEF
Monitor program effectiveness	County DPW/ Recycling Coordinator	12/92	Ongoing	Staff time @ 20 hours = $400	CSEF
Total Cost	---	---	---	$405,400	---

* CSEF - County Sanitation Enterprise Fund.
** Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).

Table 7-7
Implementation Schedule for Concrete, Asphalt, and Inert Solids Recycling

Task	Responsible Entity	Start Date	Completion Date	Estimated Cost	Funding Source
Identify contractors in the City which generate asphalt and concrete (A/C)	Dept. of Public Works/Recycling Coordinator	7/93	Ongoing	Staff time @ 20 hours = $400	Refuse Fund
Promote source separation of A/C at construction sites	Dept. of Public Works/Recycling Coordinator	7/93	Ongoing	Staff time @ 20 hours = $400	Refuse Fund
Assist County efforts in A/C market development	Dept. of Public Works/Recycling Coordinator	7/93	Ongoing	Staff time @ 40 hours = $800	Refuse Fund
City review of current construction specifications	Dept. of Public Works/Recycling Coordinator	7/93	9/93	Staff time @ 20 hours = $400	Refuse Fund
Support revised tipping fees to encourage source separation	Dept. of Public Works/Recycling Coordinator	7/93	9/93	Staff time @ 20 hours = $400	Refuse Fund
Monitor program effectiveness	Dept. of Public Works/Recycling Coordinator	12/93	Ongoing	Staff time @ 40 hours = $800	Refuse Fund
Total Cost	—	—	—	$3,200	—

* Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).

7.6 MONITORING AND EVALUATION

Summarized in this section are the methods to be utilized for monitoring and evaluating selected programs. Special waste programs will be individually monitored and evaluated relative to the targeted diversion goals as presented in Tables 7-4 and 7-5.

7.6.1 Methods to Monitor and Quantify Program Results

Alternative 1: Self-Haul Bin Transfer

Objective
The objectives will be to divert the amounts of materials as presented in Table 7-4 and 7-5 for construction and demolition debris, yard waste, and white goods.

Responsible Entity
The landfill operator (the County) will keep records and report diversion quarterly to the Recycling Coordinator.

Criteria/Methods of Evaluation
White goods will be individually counted and recorded by daily landfill gate tabulation. A specific fee is charged for these items. Construction and demolition debris will be directed to a special tipping area for separation and handling. Weights of materials will be recorded and compared against weight tickets from recyclers.

Contingency Plan if Shortfall
Should diversion levels fall short, the City will verify the quantity of white goods, yard wastes, and other materials in the self-haul waste stream to assure that available materials are being diverted.

Alternative 2: Concrete and Asphalt Recycling

Objective
To divert 70 percent of the concrete, asphalt, and inert solids currently landfilled during the short-term and medium-term planning periods.

Responsible Entity
The waste hauler and the Recycling Coordinator will be responsible for the development and implementation of this program. The County will be responsible to maintain current diversion activities at the YCCL.

Criteria/Methods of Evaluation
Gate attendants at the landfill will monitor activity by checking and tabulating debris boxes full of concrete and asphalt when they arrive at the gate. The County DPW will also keep records

of inert materials re-used in road projects and at the landfill. These records will be tabulated on a cubic yard basis and reported to the Recycling Coordinator on a quarterly basis.

Contingency Plan if Shortfall

Should diversion levels fall short, the City will first investigate overall construction and road building activity in the City. Should the decrease be a direct result of a drop in building activity, then the goals for that year will be re-evaluated. If the decrease is a result of a lack of awareness or participation, levels of program promotion will be increased.

7.6.2 Funding

It is estimated that the primary expenditures for monitoring and evaluation will be additional time required by City Staff to evaluate and produce a summary report to the City Council annually. Total estimated staff hours are estimated to not exceed 60 hours annually for the programs outlined above. The source of funding will be the City's Refuse Fund.

FOOTNOTES

1. Mike Hedenland, SOCI Wastewater Operator, 5/16/91, oral communication.

2. Joe Iolati, SOCI Regional Office, 5/22/91, oral communication.

3. Dennis W. Hiramatsu DDS, 5/21,91, oral communication.
   Marian Kammerer, Winters Medical and Dental Center, 5/21/91, oral communication.

SECTION 8

EDUCATION AND PUBLIC INFORMATION COMPONENT

This section describes the various education and public information programs to be developed in support of the specific alternatives selected by the City of Winters to meet its waste diversion goals. The success of this component is necessary if the City is to succeed in achieving the objectives of the other, more technical, alternatives. Through education and public information, all participants (individuals, households, businesses and institutions) will gain the knowledge, understanding and hopefully, the desire to actively contribute in meeting the City of Winters's environmental goals.

8.1 GOALS AND OBJECTIVES

Based upon data from the Waste Generation Study and in conjunction with the combined goals of the other components, the short-term goal of this component is to provide the education and public information support necessary to achieve an overall 25 percent diversion by 1995 and a 50 percent diversion by the year 2000. In order to accomplish this, the following objectives have been established.

- Hire a City Recycling Coordinator by mid-year, 1993 to oversee and implement the City's programs outlined herein. This position will be full-time with a percentage of time charged to refuse functions in the short term. It is anticipated that in the medium-term, all time will be charged to recycling functions.

- Create an awareness level of 60 percent by all Winters residents regarding the City's recycling, composting and waste reduction efforts by 1995 and a 90 percent awareness level by the year 2000.

- Develop and have in place, recycling, composting and source reduction educational curricula utilized by 50 percent of all local schools by 1995 and 100 percent by the year 2000.

- Establish with the Winters Chamber of Commerce a commercial recyclers forum and a source reduction and recycling awards recognition program for local businesses.

- By 1994, create a centralized theme and recycling program identity.

8.2 EXISTING CONDITIONS

The following provides a description of the existing education and public information programs and activities currently in place in the City of Winters.

City Activities

The State certified recycling redemption centers benefit from the promotion and media campaigns administered by the Division of Recycling, Department of Conservation. Local businesses promote the locations as part of the requirements of the law (AB-2020).

The local drop-off center is promoted through local media releases.

At the present time, the City is evaluating the issue of public vs. private refuse and recycling collection to determine the most economic and efficient way to implement these services. One of the criterion used to determine the appropriate course of action will be the ability of the selected contractor to take an active role in all promotion, publicity, and educational information programs. It is anticipated the City Department of Public Works will develop and implement the business audits and recycling programs. Presentations to service clubs, schools, and civic events will be done by the Recycling Coordinator. However, if the City determines that contracting for refuse and recycling collection is in the best interest of the City of Winters, the selected service provider will be responsible to provide the same services as the City. Final responsibility and approval of activities and materials will remain with the Public Works Department.

Schools

Periodically, some Winters schools conduct their own newspaper recycling programs. Education and information materials are developed and transmitted within each institution.

Media

Local media have been supportive of Winters recycling activities drawing from support information provided by the City.

8.3 PROGRAM ALTERNATIVES

The following alternatives for the Winters education and public information component were selected for two key purposes:

- To increase overall awareness regarding all source reduction, recycling, and composting efforts in the City of Winters;
- To develop specific programs targeted at critical generators .

City Recycling Coordinator

In order to ensure continuity in Public Education and promotion from the City, the City will hire a Recycling Coordinator to work with the public, the County, and neighboring jurisdictions. The position will be part-time in the short-term and may become full-time or three-quarter-time in the medium-term.

Source Reduction Programs

Source reduction programs are a critical part of all integrated solid waste management techniques. Source Reduction is the phrase applied to those procedures which prevent goods and materials from entering the waste stream. Simply put, if there is no waste generated, then there is no waste to manage, thus eliminating the necessity of identifying recycling, reuse or disposal options for materials. Source reduction is perhaps the component most directly dependent upon, and effected by, education and public information programs. However, source reduction requires long-term changes in consumer habits and product purchasing patterns; therefore, an immediate impact on waste generation may not be expected.

Residential Sector Promotional Campaign

Instructional/information brochures will be developed. They will be given to every resident, clearly explaining how to participate in Winter's residential waste diversion programs, including curbside colection for recyclables and green waste. These brochures will also serve as handouts at presentations to service clubs and civic organizations prior to, and after the recycling programs are operating.

School Curriculum

In cooperation with Winters Unified School District, the City will select and assist in the implementation of specific educational programs for all elementary grades (K-6). Although packaged programs are available from the CIWMB and other sources, it will be imperative that materials be adapted to focus on Winters's specific recycling programs. It is possible a co-sponsor would participate with the City and/or School District to purchase and offset some of

the expenses associated with this program.

School Tours

In cooperation with the Yolo County Department of Public Works, tours will be arranged to provide students the opportunity to visit the nearby Yolo County Central Landfill and Recycling Processing Facilities. Student understanding of the technical and operational aspects of the recycling and composting process is important, not only for their benefit, but to arm them with accurate information as they share their knowledge with parents and friends. Additional student tours can be set up with local businesses and institutions which have special recycling programs or process recycled materials.

Commercial/Industrial (Business) Recycling

As part of the recycling component, the City will assist in the design, development, and implementation of specific business recycling programs. As audits are completed and individual programs are developed for businesses, the City will provide back-up support in the form of informational materials and suggested implementation plans. The collection and processing of materials will be the responsibility of the Department of Public Works.

Business Recognition Program

The City, in cooperation with the Winters Chamber of Commerce or other business organizations, will establish recycling recognition events. A full spectrum of awards can be presented to those firms establishing recycling and source reduction programs, with special acknowledgements going to major diversion efforts or other significant achievements.

Media Advertising

On a regular basis, the City will advertise in the Winters Express to show the progress and success of the various recycling and source reduction programs. These "thermometer" type of ads provide an ongoing indication of a program's achievement, while maintaining the peer pressure awareness so important in obtaining citizen participation.

Media Releases

In addition to the paid advertising campaign, the City will produce and transmit appropriate releases to all media throughout the Winters area regarding the various aspects of the recycling and source reduction programs.

Community Events

The City will actively promote recycling at community events and other local activities. In most cases, promotional information will be offered to attendees.

8.4 PROGRAM SELECTION

Based on data from the Waste Generation Study, targeted waste generators were selected for the design and development of the education and public information programs. Based on the type and quantity of waste generated, the following were selected:

- Single family residents
- Multi-family residents
- Commercial/Industrial generators
- Institutions

All alternatives described in Section 8.3 are selected for implementation.

8.5 PROGRAM IMPLEMENTATION

Table 8-1 presents the implementation schedule for the selected alternatives.

Table 8-1
Education and Public Information Implementation Schedule

Alternative	Responsible Entity	Tasks	Start Date	Completion Date	Estimated Cost	Funding Source
Recycling Coordinator	Dept. of Public Works/Recycling Coordinator	• Write job description • Interview • Hire	7/93	Ongoing	$20,000 - $42,000	Refuse Fund
Source Reduction Programs	Dept. of Public Works/Recycling Coordinator	• Develop promotional materials	9/93	Ongoing	$2,500	Refuse Fund
Residential Sector Promotional Campaign	Dept. of Public Works/Recycling Coordinator	• Develop promotional materials for all programs targeting the residential sector	9/93	Ongoing	$5,000	Refuse Fund
School Curriculum	Dept. of Public Works/Recycling Coordinator	• Meet w/schools • Purchase and deliver materials	9/93	12/93	$10,000	Refuse Fund
Commercial/Industrial Business Programs	Dept. of Public Works/Recycling Coordinator	• Develop promotional materials • Develop and plan annual awards event as part of the business recognition program	9/93	Ongoing	$3,000	Refuse Fund
Community Events	Dept. of Public Works/Recycling Coordinator	• Develop promotional materials • Prepare display • Participate in events	9/93	Ongoing	$5,000	Refuse Fund
Media Advertising and Releases	Dept. of Public Works/Recycling Coordinator	• Develop ads • Schedule & buy media time or space	9/93	Ongoing	$ 5,000	Refuse Fund
Total Cost	—	—	—	—	$30,500 (excluding Recycling Coordinator salary)	—

* Recycling Coordinators salary ($30,000), plus benefits (40% of salary) estimated at $42,000/yr. ($20.00/hr.).

8.6 MONITORING AND EVALUATION

The Recycling Coordinator for the City of Winters will be responsible for the monitoring and evaluation of all programs associated with achieving its desired diversion goals. An annual survey will be conducted and the results presented to the City Council each December as part of the regular reporting schedule.

In particular, the attainment of the education and public information objectives will be addressed in two basic methods:

- Surveys to assess the awareness level of the community regarding the various recycling and source reduction programs within the City of Winters;
- The gathering of specific data to determine the effectiveness of selected alternatives to meet their objectives.

Telephone sample surveys will be conducted annually by the Recycling Coordinator to determine the awareness level of Winters citizens regarding community recycling and source reduction activities. When the selected alternatives are in place, the surveys will attempt to relate citizen awareness to actual participation in the programs. It is important for the City to have a true picture of the relationship between simple awareness and actual participation. For example, the random telephone sampling will indicate awareness as follows:

Awareness	Effectiveness
0 percent - 25 percent	Not effective
26 percent - 50 percent	Somewhat effective
51 percent - 75 percent	Effective
76 percent - 100 percent	Very effective

Similarly, data gathered from actual citizen participation information should signify certain relationships between the programs and citizen awareness. As a guide, participation will be evaluated as follows:

Awareness	Effectiveness
0 percent - 25 percent	Not effective
26 percent - 50 percent	Somewhat effective
51 percent - 75 percent	Effective
76 percent - 100 percent	Very effective

It is important to assess the relationship between the two areas of awareness and participation.

- A high awareness and low participation would indicate a weakness in the operational structure of a program;
- Low awareness and low participation indicates an ineffective education and/or informational program.

The following monitoring plans will be utilized on an annual basis to audit each of the specific education and public information programs in order to determine their effectiveness in achieving desired goals:

Backyard Composting Program

- Number of households participating
- Number of new participants in program
- Level of complaints regarding odors (indicating proper composting techniques)

Residential Sector Programs

- Overall participation in programs
- Amount of non-targeted materials rejected at the processing facilities
- Overall awareness of waste diversion opportunities as a result of surveys
- Level of activity at buy-backs

Commercial/Industrial Recycling and Awards Programs

- Name and number of commercial/industrial recycling programs established.
- Specific diversion data (from hauler) of construction demolition debris programs.
- Awards presented and details of event
- Plans for ongoing continuity
- Number of businesses nominated
- Number of businesses eligible for consideration

School Curriculum & Tours

- Name and number of schools utilizing materials
- Number of classes within each school (Grade Levels)
- Number of students in each class
- Total number of students exposed to program
- Total number of students taking field trips

Media Programs

- Number of newspaper articles published annually
- Number of TV ads on the local Public Access Channel
- Billboard advertising

Community Events

- Overall interest and awareness of individuals
- Number of enquiries regarding recycling programs
- Number of Woodland residents at the events

8.6.1 Contingency Measures

Should the monitoring of diversion objectives indicate a shortfall, the following measures will be implemented.

Source Reduction Programs
Determine which sector(s) is experiencing shortfalls. Determine reason. Direct added attention to that sector through education programs.

Backyard Composting Program
Determine how to increase awareness of program. Increase advertising. Contact current composters to see if new participants can be attracted.

Residential Sector Programs
Increase education programs to increase awareness and participation.

Commercial/Industrial Programs
As part of the City's overall diversion goals and objectives Commercial/Industrial Recycling is a major factor. Should the efforts of this component fall short, a variety of plans will take effect.

- Organization of a volunteer group of business leaders will be sought to work directly with the City to develop and expand programs.
- Evaluation of rate structures to encourage recycling.
- Evaluation of business licensing and fee structures.
- Ongoing advertising campaign to recognize leading business recycling programs.

School Curriculum & Tours
Through informal surveys and from data provided by the California Division of Recycling, it appears there is high level of interest by schools wanting materials for classroom use. Should

the City's objectives fall short, meetings will be set with teachers and school administrators to evaluate and redesign the program and/or materials in order to reach desired objectives.

If desired objectives for school tours fall short, meetings will be set with school teachers and administrators to determine reasons why site tours are not meeting objectives. If transportation costs become a factor, the City will seek funding from available resources or possibly business/community support.

Awards Program
Should the awareness and recognition levels for the awards program fall short, the Recycling Coordinator will adopt the following measures:

- Increase advertising and awareness of awards program
- Seek increased participation from other civic groups
- Seek other venues which will increase awareness of program

Media Programs
The City will investigate the effectiveness of media programs and determine how they may be made more effective. In addition, alternate forms of the media will be investigated for utilization by the City to increase overall awareness.

Community Events
Should overall awareness and participation in waste diversion programs not be attained, the Recycling Coordinator will seek other venues to present waste diversion information.

8.6.2 Funding for Monitoring & Evaluation

Monitoring and evaluation of education programs will be performed by the Recycling Coordinator. Activities will primarily revolve around utilizing staff time to conduct telephone surveys and to develop an annual report of effectiveness for the City Council each December. Funding for the monitoring and evaluation of education programs will come primarily from the Refuse Fund.

SECTION 9

FACILITY CAPACITY COMPONENT

The Facility Capacity Component describes the waste disposal facilities utilized by the City of Winters, projects the future waste capacity needs of the City, and identifies what Yolo County will do to meet future capacity demands. In addition, a description of solid waste facilities that will be closed, expanded, or established in the 15-year planning period is included. At the outset of this component it is important to note that there are no waste disposal facilities within the City; all waste is exported to the County landfill located in the Unincorporated Area of the County.

9.1 EXISTING CONDITIONS OF DISPOSAL FACILITIES

One-hundred percent of the waste disposed of by the City is sent to the Yolo County Central Landfill (YCCL) located off County Road 28H, near the intersection with County Road 104. The landfill is owned and operated by the Yolo County Department of Public Works and Transportation. Daily refuse placement and cover is provided by Earthco through a contract with the County.

The disposal fees at the landfill, as of July 1, 1991, are listed below. Since 1991, fees have increased as much as 70% for some material types. The YCCL fee schedule will be revised in the first update to this plan.

Commercial loads	$17.75 per ton
Commercial loads (imported)	$21.25 per ton
Noncommercial autos	$ 2.00 each
Noncommercial pickups and small trailers (8 feet or less)	$ 4.00 each
Noncommercial small trailers or pickups (8 feet or less) with loads greater than three feet above the bed	$ 6.00 each
Bulky wastes	$63.75 per ton
Auto tires	$ 2.00 each
Truck tires (16 to 22 inch)	$ 3.00
Tractor tires (24 inch and larger)	$ 4.00
Bulk tires	
(whole)	$78.00 per ton
(split)	$53.00 per ton
(Shredded)	$28.00 per ton
Household appliances	$ 3.00 each
Clean soil, unmixed concrete or asphalt chunks two feet or less in greatest dimension	$ 0

Mixtures with soil, gravel, and asphalt or large chunks of concrete or asphalt	$ 9.00 per ton
Septic, cannery, and similar liquid wastes	$34.00 per ton
Truck wash-out	$50.00 each
Minimum cash fee for weighed materials	$ 7.00
Separated recoverable materials	$ 0

The landfill hours of operation are:

Monday through Saturday	6:00 am to 5:00 pm
Sunday	7:00 am to 6:00 pm

The facility is open to the public from 6:30 am to 4:00 pm Monday through Saturday and 9:00 am to 5:00 pm on Sundays. The facility is closed on New Years Day, Easter Sunday, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day.

The landfill had a remaining capacity of 11,250,000 tons of waste as of January, 1991 and is expected to reach 100 percent capacity in 2025 with no diversion of the future waste stream. The Recycling, Composting, Source Reduction, and other programs that will satisfy the goals of AB 939 will prolong the life expectancy of the landfill.

The landfill is located on a 722.37 acre parcel of which 640 acres are permitted by the California Integrated Waste Management Board (CIWMB) under Solid Waste Facility Permit 57-AA-001. Under the existing permit, the facility is allowed to receive 1,500 tons per day of refuse for 360 days per year. The landfill currently receives approximately 750 tons per day of refuse of which approximately 35 percent is imported from Sacramento County.

Table 9-1 summarizes waste generation, disposal, and diversion data for the City of Winters.

Table 9-1.
Summary of Solid Waste Disposal, Diversion and Generation Rates in 1990

Waste Type (Major Categories)	Generated (TPY)	Diverted (TPY)	Incinerated (TPY)	Total Disposed (TPY)	Diversion Rate (% of total waste generated)
Paper	1,252.2	85.9	---	1,166.3	1.5
Plastic	345.2	2.3	---	342.9	---
Glass	236.8	72.4	---	164.4	1.2
Metal	228.1	28.0	---	200.1	0.5
Yard Waste	1,264.9	---	---	1,264.9	---
Other Organic Waste	774.6	3.0	107.8	771.6	0.1
Other Non-Organic Waste	1,396.0	861.0	---	535.0	14.6
Special Waste	421.4	---	---	421.4	---
Total	5,919.2	1,052.6	107.8	4,866.6	17.8

9.2 ADDITIONAL CAPACITY REQUIREMENTS

Additional capacity requirements for a 15-year planning period are calculated using the following formula from the CIWMB planning guidelines and procedures for preparing, revising, and amending county-wide integrated waste management plans:

$$AC_n = [(G+I) - (D+TC+LF+E)]_n$$

where:

AC	=	Additional capacity required in year n.
G	=	The amount of solid waste projected to be generated in the jurisdiction (from Waste Generation Study).
I	=	The amount of solid waste expected to be imported to the jurisdiction for disposal in permitted solid waste disposal facilities through interjurisdictional agreement(s) with other cities or counties, or through agreements with solid waste enterprises, as defined in Section 40193 of the Public Resources Code.
D	=	The amount diverted through successful implementation of proposed source reduction, recycling, and composting programs (from the Waste Generation Study and the Integration Component).
TC	=	The amount of volume reduction occurring through available, permitted transformation facilities.
LF	=	The amount of permitted solid waste disposal capacity which is available for disposal in the jurisdiction.
E	=	The amount of solid waste generated in the jurisdiction which is exported to solid waste disposal facilities through interjurisdictional agreement(s) with other cities or counties, or through agreements with solid waste enterprises, as defined in Section 40193 of the Public Resources Code.
n	=	Each year of a 15-year period commencing in 1991 (iterative in one-year increments).

Because the City of Winters does not have a formal export agreement with the County of Yolo for waste disposal at the Yolo County Central Landfill, Table 9-2 below indicates that the City needs additional waste disposal capacity. In reality, the City will continue to dispose of its refuse at the Yolo County Central Landfill, which has ample capacity for well beyond the 15 years projected waste disposal in this component, and will, if necessary, sign an export

agreement with the County. Once this agreement is signed, the City will have ample available landfill capacity.

Table 9-2
Additional Capacity Requirements for the City of Winters

Year	AC (yd)[1]	AC (TPY)	G[2] (TPY)	I (TPY)	D (%)	D[3] (TPY)	TC (TPY)	LF (TPY)	E (TPY)
1990	10,119	4,865	5,919	0	17.8	1,054	0	0	0
1991	10,785	5,185	6,308	0	17.8	1,123	0	0	0
1992	11,494	5,526	6,723	0	17.8	1,197	0	0	0
1993	11,174	5,372	7,165	0	25.03	1,793	0	0	0
1994	10,727	5,157	7,636	0	32.46	2,479	0	0	0
1995	10,038	4,826	8,138	0	40.7	3,312	0	0	0
1996	10,344	4,973	8,756	0	43.2	3,783	0	0	0
1997	10,620	5,106	9,420	0	45.8	4,314	0	0	0
1998	10,899	5,240	10,135	0	48.3	4,895	0	0	0
1999	11,161	5,366	10,905	0	50.8	5,539	0	0	0
2000	11,396	5,479	11,732	0	53.3	6,253	0	0	0
2001	12,262	5,895	12,623	0	53.3	6,728	0	0	0
2002	13,191	6,342	13,581	0	53.3	7,239	0	0	0
2003	14,194	6,824	14,612	0	53.3	7,788	0	0	0
2004	15,271	7,342	15,721	0	53.3	8,379	0	0	0
2005	16,430	7,899	16,914	0	53.3	9,015	0	0	0
Total	190,105	91,397	166,288	0	---	74,891	0	0	0

Notes: Heading abbreviations are defined on page 9-4.
TPY = Tons per year.

9.3 PLANS FOR FACILITY EXPANSIONS AND NEW SOLID WASTE FACILITIES

A wood processing facility is located adjacent to the YCCL. This facility is proposed to expand to wood and yard waste processing. The wood waste will be processed into fuel, mulch, and humus. The green waste will be processed into compost, possibly for use as an alternative daily cover at the landfill when compost markets are weak.

In addition, anaerobic composting in a designated landfill cell has been proposed for the generation of methane and for volume reduction of the waste.

No new or expanded facilities are proposed within the City of Winters.

FOOTNOTES

1. In-place volume calculation based on in-place density of 1200 pounds per cubic yards and cover ratio of 4:1.

2. See Footnote #1.

3. Ibid.

SECTION 10

FUNDING COMPONENT

This Source Reduction and Recycling Element describes the programs that the City of Winters will implement to meet the required diversion goals as mandated by AB 939. In order to accomplish the City's goals and objectives, sufficient funding must be available for program planning and development. This section describes the current funding sources, provides cost estimates and City staffing requirements for the planning, development, implementation, and monitoring and evaluation of selected programs, and identifies primary and contingency funding sources for the City.

10.1 CURRENT FUNDING SOURCES

Current funding is derived from the Refuse Fund, with limited assistance from the General Fund. The Refuse Fund is supported entirely by refuse service rate charges. Past rate increases were never implemented, resulting in a significant deficit in the City's budget, and placing a substantial burden on the Refuse Fund. The refuse collection rate will be adjusted to reflect current service charges as detailed in the City's rate fee schedule. Recycling and yard waste collection rates will be structured to fully reimburse the Refuse Fund for all funding allocations. Program costs will be recovered entirely from the Refuse Fund. Program administration, including the salary of the Recycling Coordinator and public education expenses, will also be included in the rate structure. In the medium-term, a quantity-based variable rate structure will be evaluated as a means of efficiently allocating solid waste management costs among the residents and businesses of Winters.

10.2 ESTIMATED PROGRAM COSTS

Program implementation costs for the City are expected to result from staffing and coordination efforts by City personnel, a feasibility study to evaluate the implementation of a variable refuse collection rate structure, and expenditures for vehicles, equipment, and public information and education materials. The City's integrated waste management plan will be funded through the Refuse Fund and tipping fees, and reimbursed by refuse, recycling, and yard waste collection fees. Tables 10-1 through 10-5 identify by component the projected costs of program implementation and operation for all SRRE selected alternatives through 1996 in 1993 dollars.

Does the Winters City Council have the political will to raise refuse rates to fully fund Recy Coord + all other costs? Based on their past it seems this could be a problem?

Table 10-1
Estimated Program Costs of Selected Alternatives in Source Reduction

Programs	1991	1992	1993	1994	1995	1996
Existing Programs Evaluation	---	---	$1,600	$800	$800	$800
Quantity-Based Variable Rates or User Fees	---	---	---	---	$800	$5,000
Commercial Waste Audits	---	---	$1,600	$3,200	$2,400	$2,400
Backyard Composting	---	---	$4,100	$3,360	$3,360	$3,360
Awards & Public Recognition	---	---	$1,280	$480	$480	$480
Non-procurement Source Reduction	---	---	$2,400	$1,000	$1,000	$1,000
Government Procurement Policies	---	---	$2,400	$2,400	$2,400	$2,400
Total Cost	---	---	$13,380	$11,240	$11,240	$15,440

Table 10-2
Estimated Program Costs of Selected Recycling Alternatives

Program	1991	1992	1993	1994	1995	1996
Residential Curbside Recycling	---	---	$144,400 + operating costs	$1,600 + operating costs	$1,600 + operating costs	$1,600 + operating costs
Multi-Unit Residential Recycling	---	---	$7,900 + operating costs	$800 + operating costs	$800 + operating costs	$800 + operating costs
Commercial/Industrial Recycling	---	---	---	---	---	$131,800 + operating costs
Buy-back/Drop-off Center	---	---	$2,600	$800	$800	$800
Mandatory Recycling Ordinance	---	---	---	---	---	---
Automated Materials Recovery Facility (MRF)	---	---	---	---	---	---
Total Cost*	---	---	$154,900 + operating costs	$3,200 + operating costs	$3,200 + operating costs	$135,000 + operating costs

* 1993 and 1996 reflect captial expenditures and start-up costs for residential curbside recycling and commercial/industrial recycling, respectively.

Table 10-3
Estimated Program Costs of Selected Alternatives in Composting

Program	1991	1992	1993	1994	1995	1996
Residential Curbside Yard Waste Collection	---	$60,600	$61,400	$61,400	$61,400	$61,400
Commercial/Industrial Yard Waste Collection	---	---	$4,800 + operating costs	$800 + operating costs	$800 + operating costs	$800 + operating costs
Processing	---	---	$61,325	$61,325	$61,325	$61,325
Total Cost	---	$60,600	$127,525 + operating costs	$123,525 + operating costs	$123,525 + operating costs	$123,525 + operating costs

Table 10-4
Estimated Program Costs of Selected Alternatives in Special Wastes

Program	1991	1992	1993	1994	1995	1996
Self-Haul Bin Transfer Operation	---	---	$400	$400	$400	$400
Concrete, Asphalt, and Inert Solids Recycling	---	---	$3,200	$800	$800	$800
Total Cost	---	---	$3,600	$1,200	$1,200	$1,200

Table 10-5
Estimated Program Costs of Selected Public Education Alternatives

Program	1991	1992	1993	1994	1995	1996
Recycling Coordinator	---	---	$20,000 - $42,000	$20,000 - $42,000	$20,000 - $42,000	$20,000 - $42,000
Source Reduction programs	---	---	$2,500	$2,500	$2,500	$2,500
Residential Sector Promotional Campaign	---	---	$5,000	$5,000	$5,000	$5,000
School Curriculum	---	---	$10,000	$1,500	$1,500	$1,500
Commercial/Industrial Business Program	---	---	$3,000	$3,000	$3,000	$3,000
Community events	---	---	$5,000	$5,000	$5,000	$5,000
Media Advertising and Releases	---	---	$5,000	$5,000	$5,000	$5,000
Total Cost	---	---	$50,500 - $72,500	$42,000 - $64,000	$42,000 - $64,000	$42,000 - $64,000

Table 10-6
Summary of Estimated Program Costs for All Components

Component	1991	1992	1993	1994	1995	1996
Source Reduction	---	---	$13,380	$11,240	$11,240	$11,240
Recycling	---	---	$154,900 + operating costs	$3,200 + operating costs	$3,200 + operating costs	$135,000 + operating costs
Composting	---	$60,600	$127,525 + operating costs	$123,525 + operating costs	$123,525 + operating costs	$123,525 + operating costs
Special Wastes	---	---	$3,600	$1,200	$1,200	$1,200
Education and Public Information	---	---	$50,500 - $72,500	$42,000 - $64,000	$42,000 - $64,000	$42,000 - $64,000
Total Cost*	---	$60,600	$349,905 - $371,905 + operating costs	$181,165 - $203,165 + operating costs	$181,165 - $203,165 + operating costs	$312,965 - $334,965 + operating costs

* Operating costs include maintenance, gas, equipment and bin replacement, insurance, etc.

10.3 CONTINGENCY FUNDING MECHANISMS

As stated in Section 10-1, all costs for solid waste management in the City of Winters will be recovered through the refuse and recycling rates charged to the residents and businesses of Winters. Should the Refuse Fund prove to be inadequate for funding the cost of selected programs, the City may consider the following contingency funding alternatives.

Raising of Refuse Rates

As the general refuse and recyclingrate is planned to be the sole revenue source for AB 939 program funding, the City will look first to a rate increase in the event of funding shortfall. Thereafter, the following sources will be explored:

User Fees

User fees offer a fair means of cost allocation for waste collection and disposal. User fees assess the actual generator based on weight and/or volume of waste produced, or number of containers collected, instead of a flat fee and local tax-financial systems. The variable rate fee structure selected as a source reduction contingency measure is an example a user fee system.

County Service Areas

County service areas are a means of funding certain services for local government. A county service area is a geographic section of a county on which special assessments of the property tax are levied for services to that area.

Joint Powers Agreement

A Joint Powers Agreement (JPA) is an agreement between two (or more) different government bodies to pool their financial resources. This offers the advantage of having more than one source of funding (i.e., City of Winters and Yolo County). Is there serious talk of a JPA?

Developer's Fees

As an alternative means of financing, fees could be charged to developers for solid waste management services when they submit their plans to develop a housing and/or industrial community. However, developers may pass such costs on to the home buyer. Overall fees could be reduced by an incentive program; for example, the developers could agree to institute source reduction and recycling programs or other innovations in their developments.

10.3.1 Tax Exempt Financing

General Obligation Bonds

These types of bonds can be used for any type of local government related projects and are secured by the local government issuer. These bonds are considered to offer the greatest security and lowest interest rates of tax-exempt securities. Bond payments to investors would be made directly from the General Fund. The City would repay this debt by levying taxes or through refuse collection fees. These bonds tend to have a low interest rate but are more difficult to issue since they are limited to 3.75 percent of the City's net value and must have two-thirds voter approval prior to issuance.

Revenue Bonds

Revenue bonds are limited security financing instruments which tie bond payments to the revenue generated through the operations of the project which they finance. Solid waste and recycling projects are eligible for such financing.

Revenue Bonds have been used in California (and elsewhere) for many years to finance a variety of revenue-producing public facilities. Most commonly these bonds are issued under the provision of the Revenue Bond Law of 1941; commencing with Section 54300 of the California Government Code. Under this Act, the issuance of the bonds must be authorized by a simple majority of those voting at an election on the question of incurring the indebtedness. The bonds are secured solely by the pledged revenues derived from the facilities financed with bond proceeds or from an entire "enterprise" of which such facilities comprise an integral component (such as the tipping fees derived from landfill operations).

The limited security for revenue bonds (i.e., pledged revenues), and their marketability depends on a demonstrated revenue stream sufficient to cover debt service by 1.10 to 1.35 times available for debt service coverage, after payment of maintenance and operation costs (exclusive of depreciation). Also, a debt service reserve equal to the lesser of 10 percent of the par amount of the issue or maximum annual debt service is usually funded from bond proceeds. In addition, interest on the revenue bonds during construction and development of the facilities may be funded from their proceeds. If a project is to be financed in phases through the issuance of a series of revenue bonds, it is necessary to demonstrate that net revenues from historical operations and projected operations (discounted in the later instance) will cover debt service on the outstanding and proposed revenue bonds by a least the coverage factor (the "earnings test").

For a completely new start-up enterprise it is difficult, if not impossible, to market an issue of revenue bonds without an historical revenue experience. This may be overcome in one or both of two principal ways:

(1) If two or more public agencies presently operate similar facilities that are to be combined under a joint exercise of powers agreement, historical net revenues from the respective facilities may, if a binding revenue pledge can be effected, be used to demonstrate coverage. As an example, the revenue history of a closing landfill would thus be utilized to substantiate the projected revenues from a new landfill serving the same or expanded geographic radius.

(2) If jurisdictionally, politically, and financially feasible, one or more public agencies may issue Certificates of Participation (COPS) that are primarily general fund obligations supplementally supported by net revenues of the facilities. To the extent that net revenues do not cover debt service on the COPS, a general fund appropriation would be required. This approach eliminates the public voting requirement for revenue bonds, the coverage factor, and the earnings test for issuance of additional parity obligations. It is possible to issue revenue-secured COPS, but only the revenue bond public vote requirement can be avoided; the other revenue bond structuring provisions would still apply.

Community Facilities Projects

A Community Facilities District (CFD) is a special financing entity 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. Facilities which are typically financed are limited to: police protection and court services; fire protection, ambulance and paramedic services; recreation programs; libraries; and parks. A recent amendment to the Mello-Roos Act (upon which CFD's are based), is the 1990 Assembly Bill 2610 (AB 2610). AB 2610 extends the programs which may be financed through CFD's to include solid and hazardous waste projects. Under this act, the CFD may finance the purchase, construction, expansion, improvement, or rehabilitation of any real or tangible solid waste related project or remediation with an expected life of at least five years.

A unique feature of structuring under Mello-Roos is that the sites designated to be included within one CFD do not have to be contiguous. Multiple non-contiguous projects could be included within a single CFD and could span a large geographic radius, such as a city-wide or county-wide CFD. Joint Power Agreements can also be utilized to link separate jurisdictions in forming a cooperative CFD. These features afford local governments and/or developers extreme flexibility in structuring CFD to meet the site specific needs of the community. Because of the 2/3 voting requirement, these CFD could be difficult to form.

Formation of a Community Facilities District may be initiated by the governing body of the local public agency or by petition of registered voters or landowners. The governing body then adopts a resolution of intention to form the District, describes the proposed boundaries of the District, and calls for a report on the public hearing on the formation. At the public hearing, a majority of the registered voters or the owners of more than one-half of the land area within the proposed district may file written protests to the formation, which then stops further proceedings for no less than one year. If a majority protest is not received, the District calls an election on the special tax and the setting of an appropriations limit (pursuant to the provision of Proposition 4, now Article XIIIB of the California Constitution).

The Act leaves the method of apportionment of the special tax to the discretion of the legislative body. Pursuant to Article XIIIA of the Constitution, the tax may not be in proportion to the value of real property, but may be structured on the basis of density of development, square footage of construction, flat acreage, or some other reasonable basis. The computation of the special tax is quite flexible, and is usually prepared by a tax consultant based on an approved formula. Each year the special tax is established in accordance with the formula. This is particularly important in development projects where the tax can be apportioned annually against raw land on one basis and against developed property on another, with the effect of reducing the tax burden borne by the undeveloped property while in the raw state. Of course the special tax formula may be developed on any other reasonable basis.

The Special Tax Bonds are secured by and payable from the proceeds of the special tax. The Community Facilities Act permits great flexibility in the structure of such an issue, so that the repayment provisions can be tailored to match a build-out schedule and any intricacies of the special tax formula. Typically, a debt service reserve fund equal to 10 percent of the par amount of the issue is created from bond proceeds. Also, bond proceeds may include interest that will be due during construction of the facilities plus one year (which delays the imposition of the special tax for an equivalent period).

The use of the Mello-Roos Community Facilities Act to finance facilities and services is still relatively new and is evolving. It has been amended in several areas to make it more workable and to require disclosure of the special tax lien to potential purchasers of improved property. The disclosure requirements may be expected to alleviate, to some extent, the annual public hearing problems encountered by a growing number of public agencies. However, the special tax formulas, which must stay intact for the entire term of a bond issue may be flawed in some respect or not be responsive to changed circumstances (such as changes in land use or failure to complete a development). One alternative is to sell Special Tax Bonds, for raw land development projects in particular, into a Public Financing Authority bond pool (described under the heading of "The Marks-Roos Local Bond Pooling Act of 1985"). As the owner of 100 percent of a Mello-Roos Special Tax bond issue, the Public Financing Authority may amend the applicable bond resolution or indenture to cure any deficiencies or flaws, as long as such amendments do not jeopardize the security for its own bonds. In any event, the formation of Community Facilities Districts for the purpose of issuing Special Tax Bonds has been growing

in recent years, with over $2 billion in debt having been issued under this Act. It is expected to remain as a strongly attractive method of financing public infrastructure for new development projects and is now greatly enhanced by its ability to finance the rehabilitation of environmentally impaired property.

Private Activity Bonds

These types of bonds are available to private businesses to finance projects including solid waste and or recycling related projects. The obligation to service debt from the bond is passed through to the private business. The City or local government guarantor would offer security to debt holders. Examples of this type of financing include bonds issued by the California Pollution Control Financing Authority (CPCFA).

10.3.2 Grants and Financial Assistance

California Department of Conservation

This state agency has established a $2 million annual fund to finance litter abatement and or recycling projects including curbside and public education materials. In general, most projects are only available for financing up to $50,000. Applications are due to the Department by January 31, annually.

California Resources Agency

The funding which this agency provides is derived from the Environmental License Plate Fund. Grants are provided mainly for education and public information purposes.

California Integrated Waste Management Board (Recycling Market Development Zones)

The CIWMB is currently investigating the establishment of Market Development Zones to provide funding and other incentives to cities and regions for recycling-related projects.

SECTION 11

INTEGRATION COMPONENT

The Integration Component summarizes the Source Reduction and Recycling Element and demonstrates how the various waste management programs will be implemented to achieve the state mandated goals of 25 percent diversion by 1995 and 50 percent diversion by the year 2000. In addition, the component provides an overall implementation schedule which illustrates when each of the selected programs will be developed and brought into operation and the amount of anticipated diversion attributable to each alternative.

11.1 PLANNED SOLID WASTE MANAGEMENT PROGRAMS

Due to its size, The City of Winters is unable to support the solid waste facilities necessary to the implementation of its selected programs without additional feedstock for those facilities. The City is therefore planning to seek regional solutions, joining with other jurisdictions and the County to realize economies of scale in materials handling, marketing, and public education.

11.1.1 Source Reduction

Source reduction programs involve efforts which are designed to prevent waste from being generated in the first place. These types of programs are of the highest priority in the waste diversion hierarchy, according to the California State Integrated Waste Management Board, since they prevent material from entering the waste stream, and thus eliminate the need for disposal or recycling of the material altogether. These programs also serve to conserve valuable natural resources.

However, it is very difficult to quantify the amount of diverted material associated with source reduction programs since the quantity "not generated" is a theoretical value that presumes what would have occurred had the program not been in place. Further, the cumulative contribution that source reduction programs will make towards the state mandated diversion goals is not expected to be large (at least in the short term) due to the difficulty associated with changing the waste generation behavior of individuals as well as business (which is what these programs are designed to do).

These types of programs are, however, very important in the overall waste management plan.

The eight source reduction programs chosen by Winters are:

- Existing Programs
- Quantity-based Variable (refuse) Rates or User Fees
- Commercial Waste Audits
- Backyard Composting
- Educational Programs
- Awards and Public Recognition
- Local Government Non-procurement Source Reduction Programs
- Local Government Procurement Programs

Monitoring and evaluation efforts will be focused on backyard composting as this alternative is the easiest to quantify. Diversion rates are projected to be approximately 1.0 percent in the short-term, and 1.5 percent in the medium-term. Surveys will be used to identify additional diversion through other selected alternatives.

11.1.2 Recycling

Recycling programs involve the removal and collection of certain types of materials from the waste stream. These materials are then reprocessed and reused in the manufacture of new products. The actual process of removing the material from the waste stream and separating it by waste type can be done at the source by the generator, or be done at a materials recovery facility. Winters has elected to employ a combination of both, using source separated programs in the short-term and introducing MRF processing in the medium-term to target materials not cost-effectively targeted with source separated programs.

Listed below are the recycling programs that have been selected for implementation. Each of these programs is explained in detail in Section 5.

- Residential Curbside Recycling
- Multi-Unit Residential Recycling
- Commercial/Industrial Recycling
- Drop-off/Buy-back Recycling
- Mandatory Recycling Laws
- Material Recovery Facility (MRF)

Tables 11-1 and 11-2 estimate projected diversion by selected recycling alternatives for the short- and medium-term planning periods.

Table 11-1
Summary of Waste Diversion Through Selected Recycling Alternatives in the Short-Term Planning Period as Measured in Tons Per Year (TPY)

Material	1995 Available Tonnage (TPY)	Amount Diverted Through Programs					Total Diverted
		Curbside	Multi-Family	Commercial/ Industrial	Drop-off/ Buy-back	Mixed Waste MRF	
Newspaper	296	73	7	24	8	–	112
Cardboard	357	–	–	98	16	–	114
High Grade	53	–	–	–	2	–	2
Mixed Paper	455	–	7	–	24	–	31
HDPE, PET	62	16	1	5	3	–	25
Plastic Film	227	–	–	–	–	–	–
Glass	320	98	5	16	8	–	127
Aluminum cans	48	3	–	2	–	–	5
Bi-metal/tin cans	93	65	3	4	4	–	76
Ferrous metals	111	–	–	–	–	–	–
Non-ferrous metals	47	–	–	–	–	–	–
Total	2,069	255	23	149	65	–	492
Total Waste Stream Diversion %	–	3.2	.3	1.8	.8	–	6.1

* Total waste stream generation projected for 1995 is approximately 8,136 TPY.

Table 11-2
Summary of Waste Diversion Through Selected Recycling Alternatives in the Medium-Term Planning Period as Measured in Tons Per Year (TPY)

Material	2000 Available Tonnage (TPY)	Amount Diverted Through Programs					Total Diverted (TPY)
		Curbside	Multi-Family	Commercial/ Industrial	Drop-off/ Buy-back	Mixed Waste MRF	
Newspaper	427	141	23	59	23	96	342
Cardboard	514	–	–	211	47	153	411
High Grade	76	–	–	35	7	19	61
Mixed Paper	656	235	23	199	70	–	527
HDPE, PET	88	35	4	9	7	16	71
Plastic Film	326	–	–	–	–	196	196
Glass	462	188	16	23	23	120	370
Aluminum cans	69	4	1	4	–	46	55
Bi-metal/tin cans	134	94	6	12	11	–	123
Ferrous metals	161	–	–	–	–	129	129
Non-ferrous metals	66	–	–	–	–	53	53
Total	2,979	697	73	552	188	828	2338
Total Waste Stream Diversion %	–	5.9	.6	4.7	1.6	7.1	19.9

* Total waste stream generation projected for 2000 is approximately 11,732 TPY.

11.1.3 Composting

Composting is a biological process by which plant and other organic wastes decompose under controlled aerobic or anaerobic conditions. Typically, composting programs involve the collection of yard wastes which are then processed at a composting facility and turned into a useable soil amendment for residential and commercial landscaping, as well as agricultural purposes. Yard waste is by far the largest single material type found in Winters' waste stream (18.7 percent of waste disposed). Consequently, the City has elected to establish a highly effective collection and processing program that will divert a large amount of this material from the landfill.

Listed below are the composting programs that have been selected for implementation by the City. Each of these programs is explained in detail in Section 6.

- Residential Curbside Collection of Yard Waste
- Commercial Collection of Yard Waste
- Regional Composting Facility Serving Multiple Jurisdictions

Tables 11-3 and 11-4 estimate projected diversion by selected composting alternatives for the short-term and medium-term planning periods.

Table 11-3
Summary of Waste Diversion Through Selected Composting Alternatives in the Short-Term Planning Period as Measured in Tons Per Year (TPY)

Material	1995 Available Tonnage (TPY)	Amount Diverted Through Programs				Total Diverted
		Residential Curbside Collection	Commercial/ Industrial Collection	Regional Composting Facility	Windrow Processing	
Yard waste	1,739	1,082	33	–	–	1,115
Total	1,739	1,082	33	–	–	1,115
Total Waste Stream Diversion %	–	13.3	.4	–	–	13.7

* Total waste stream generation projected for 1995 is approximately 8,136 TPY.

Table 11-4
Summary of Waste Diversion Through Selected Composting Alternatives in the Medium-Term Planning Period as Measured in Tons Per Year (TPY)

Material	2000 Available Tonnage (TPY)	Amount Diverted Through Programs				Total Diverted
		Residential Curbside Collection	Commercial/ Industrial Collection	Regional Composting Facility	Windrow Processing	
Yard waste	2,505	1,560	47	–	–	1,607
Total	2,505	1,560	47	–	–	1,607
Total Waste Stream Diversion %	–	13.3	.4	–	–	13.7

* Total waste stream generation projected for 2000 is approximately 11,732 TPY.

11.1.4 Special Wastes

Special wastes are wastes that require special handling practices and consequently are not normally collected with other municipal solid wastes. Typically, these types of wastes present unique diversion opportunities that are outside of the scope of normal recycling and composting programs. In Winters, the special wastes that are present in the waste stream in significant amounts are tires, appliances, wood waste, concrete, asphalt and inert solids.

Listed below are the special waste programs that have been selected for implementation by Winters. Each of these programs is explained in detail in Section 9.

- Self-Haul Bin Transfer Operation
- Concrete, Asphalt, and Inert Solids Recycling

Tables 11-5 and 11-6 estimate projected diversion by selected special waste alternatives for the short-term and medium-term planning periods.

Table 11-5
Summary of Waste Diversion Through Selected Special Waste Alternatives in the Short-Term Planning Period as Measured in Tons Per Year (TPY)

Waste Type	1995 Available Tonnage (TPY)	Amount Diverted Through Programs		Total Diverted (TPY)
		Self-Haul Bin Transfer Operation (TPY)	Concrete, Asphalt, and Inert Solids Recycling (TPY)	
Cardboard	17	14	—	14
Ferrous metals	40	32	—	32
White goods	14	14	—	14
Bulky waste	20	16	—	16
Grass & leaves	14	11	—	11
Prunings	30	24	—	24
Tires	18	14	—	14
Wood	361	289	—	289
Asphalt	78	—	55	55
Concrete	13	—	9	9
Inert solids	1,417	—	992	992
Total	2,022	414	1,006	1,470
Total Waste Stream Diversion %	—	5.0	12.4	17.4

* Total waste stream generation projected for 1995 is approximately 8,136 tons.

Table 11-6
Summary of Waste Diversion Through Selected Special Waste Alternatives in the Medium-Term Planning Period as Measured in Tons Per Year (TPY)

Waste Type	2000 Available Tonnage (TPY)	Amount Diverted Through Programs		Total Diverted (TPY)
		Self-Haul Bin Transfer Operation (TPY)	Concrete, Asphalt, and Inert Solids Recycling (TPY)	
Cardboard	25	20	—	20
Ferrous metals	57	66	—	66
White goods	20	20	—	20
Bulky waste	29	23	—	23
Grass & leaves	20	16	—	16
Prunings	44	35	—	35
Tires	25	20	—	20
Wood	521	417	—	417
Asphalt	112		78	78
Concrete	18		13	13
Inert solids	2,043		1,430	1,430
Total	2,914	617	1,521	2,138
Total Waste Stream Diversion %	—	5.3	12.9	18.2

* Total waste stream generation projected for 2000 is approximately 11,732 tons.

11.2 PROGRAM IMPLEMENTATION

All of the selected programs will be implemented during the short- and medium-term planning periods in the most cost effective manner possible. In addition, programs will be implemented to ensure that Winters is in compliance with the state mandated diversion goals. Some programs are already in operation and will continue in their present form. Other programs can be developed with minimal capital expense and will require little implementation time. These types of programs will be the first new programs to be brought on-line. Those programs which involve large capital investments, as well as additional study and analysis, will require much more time before actual operation can begin.

The following section provides details regarding which agencies will be responsible for program development and implementation. In addition, the associated implementation timetable is presented in Section 11.2.3.

11.2.1 Responsible Agency

Because Winters is a small City with limited capital resources, the City has elected to implement its waste management programs in partnership with the County.

The City of Winters will assume the lead role in overseeing the development and implementation of the waste diversion programs that involve the residents, businesses, and public agencies within the City limits. In most cases the actual "hands-on" implementation work will be performed by the Department of Public Works refuse crew. The County will provide the composting facility and the materials recovery facility. Public education, promotion, and technical assistance will be provided by the Recycling Coordinator for the City of Winters.

11.3 DIVERSION RATE PROJECTIONS

Each of the programs selected for implementation during the short- and medium-term planning periods is intended to reduce the amount of solid waste that must be landfilled. The cumulative impact of these programs will achieve a net diversion rate of 25 percent or greater by 1995, and 50 percent or greater by the year 2000. Summarized in Table 11-7 are the cumulative diversion rate projections for all of the selected programs.

Table 11-7
Cumulative Diversion Rates For All Programs

Programs	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Source Reduction										
Existing Programs	—	—	—	—	—	—	—	—	—	—
Quantity-Based Variable Rates	—	—	—	—	—	—	—	—	—	—
Commercial Waste Audits	—	—	—	—	—	—	—	—	—	—
Backyard Composting	—	—	.33	.66	1.0	1.1	1.2	1.3	1.4	1.5
Educational Programs	—	—	—	—	—	—	—	—	—	—
Awards and Public Recognition	—	—	—	—	—	—	—	—	—	—
Local Government Non-Procurement Source Reduction Programs	—	—	—	—	—	—	—	—	—	—
Local Government Procurement Programs	—	—	—	—	—	—	—	—	—	—
Recycling										
Residential Curbside Recycling	—	—	1.6	3.2	3.2	3.7	4.2	4.7	5.2	5.9
Multi-Unit Residential Recycling	—	—	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.6
Commercial/Industrial Recycling	—	—	0.7	1.4	1.8	2.4	3.0	3.6	4.2	4.7
Drop-off/Buy-back Recycling	—	—	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.6
Mandatory Recycling Laws	—	—	—	—	—	—	—	—	—	—
Automated Material Recovery Facility	—	—	—	—	2.5	3.4	4.3	5.2	6.1	7.1
Composting										
Residential Curbside Collection of Yard Waste	—	—	12.5	13.0	13.3	13.3	13.3	13.3	13.3	13.3
Commercial Collection of Yard Waste	—	—	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Regional Composting Facility	—	—	—	—	—	—	—	—	—	—
Special Waste										
Self-Haul Bin Transfer Operation	—	—	3.0	4.0	5.0	5.0	5.1	5.1	5.2	5.3
Concrete, Asphalt, and Inerts Solids Recycling	—	—	6.0	9.0	12.4	12.5	12.6	12.7	12.8	12.9
Total	17.8*	17.8*	25.03	32.46	40.7	43.2	45.8	48.3	50.8	53.3

* Existing diversion as measured in the Waste Generation Study conducted in 1991, and assumed constant for 1992.

Appendix A

GLOSSARY OF TERMS

The following definitions shall apply to terminology contained in this Source Reduction Recycling Element.

Agricultural Wastes
"Agricultural wastes" means 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. Agricultural refers to SIC Codes 011 through 0291.

Aluminum can or aluminum container
"Aluminum can" or "aluminum container" means any food or beverage container that is composed of at least 94 percent aluminum.

Asbestos
"Asbestos" means 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
"Ash" or "ashes" means the residue from the combustion of any solid or liquid material.

Bi-metal container
"Bi-metal container" means any metal container composed of at least two different types of metals, such as a steel container with an aluminum top.

Best readily available and applicable data or representative data
"Best readily available and applicable data" or "representative data" means information that is available to a jurisdiction from published sources, field sampling, the Board, or other identifiable entities which is the most current data and which addresses the situation being examined.

Buy-back recycling center
"Buy-back recycling center" means a 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.

Capital Costs
"Capital costs" means those direct costs incurred in order to acquire real property assets such as land, buildings and building additions; site improvements; machinery; and equipment

Commercial solid wastes
"Commercial solid wastes" means 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 waste refers to SIC Codes 401 through 4939, 4961, and 4971 (transportation, communications and certain utilities), 501 through 5999 (wholesale and retail trade), 601 through 6799 (finance, insurance and real estate), 701 through 8748 (public and private service industries such as hospitals and hotels), and 911 through 9721 (public administration). Commercial solid wastes do not include construction and demolition waste.

Commercial Unit
"Commercial Unit" means a site zoned for a commercial business and which generates commercial solid wastes.

Composition
"Composition" means a set of identified solid waste materials, categorized into waste categories and waste types pursuant to sections 18722(i) and (j) of Article 6.1 of this Chapter.

Composting
"Composting' means a method of waste treatment which produced a product meeting the definition of "compost" in Public Resources Code section 40116.

Composting facility
"Composting facility" means a permitted solid waste facility at which composting is conducted and which produced a product meeting the definition of "compost" in Public Resources Code section 40116.

Construction and demolition waste
"Construction and demolition waste" includes solid wastes, such as building materials; and packaging and rubble resulting from construction, remodeling, repair and demolition operations on pavements, houses, commercial buildings, and other structures. Construction refers to SIC Codes 152 through 1794, 1796, and 1799. Demolition refers to SIC Code 1795.

CCCSWA
Central Contra Costa Solid Waste Authority
Formed on August 3, 1990, the Authority has broad exercise of powers which gives it purview over transfer stations, resource recovery facilities, recycling facilities, including composting, household hazardous waste facilities and landfills. It allows for public ownership of said facilities and it allows for other joint efforts as regards handling and disposal of the solid waste stream. While membership in the Authority is open to entities in Central County which franchise the collection and disposal of solid waste, its current membership is comprised of Central Contra Costa Sanitary District (which franchises for Danville, Lafayette, Moraga, Orinda and the unincorporated areas of Alamo, Blackhawk, Pacheco/Clyde, Roundhill and Walnut Creek), the City of San Ramon and the City of Walnut Creek. It is currently negotiating

a membership agreement with Contra Costa County in concert with potentially acquiring the Acme Transfer Station to use as a Materials Recovery Facility. This facility would be used to facilitate meeting the diversion requirements of AB 939 and AB 2707.

Corrugated Container
"Corrugated container" means 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 semichemical wood pulps, straw or reclaimed paper stock, and folded to form permanent corrugations. Corrugated container refers to SIC Code 2653.

Cost-effective
"Cost-effective" means a measurement of cost compared to an unvalued output (e.g., the cost per ton of solid waste collected) such that the lower the cost, the more cost-effective the action.

Disposal
"Disposal" means the management of solid waste through landfilling or transformation at permitted solid waste facilities.

Disposal capacity
"Disposal capacity" means 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 Alternative
"Diversion alternative" means 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.

Drop-off recycling center
"Drop-off recycling center" means 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 organizations, such as charitable groups, is included in this definition.

Durability
"Durability" means the ability of a product to be used for its intended purpose for a period greater than the mean useful product lifespan of similar products.

End market or end use
"End market" or "end use" means the use or uses of a diverted material or product which has been returned to the economic mainstream, whether or not this return is through sale of the material or product. The material or product can have a value which is less than the solid waste disposal cost.

Feasible
"Feasible" means that a specified program, method, or other activity can, on the basis of cost, technical requirements and time frame for accomplishment, be undertaken to achieve the objectives and tasks identified by a jurisdiction in a Countywide Integrated Waste Management Plan.

Ferrous metals
"Ferrous metals" means any iron or steel scrap which has an iron content sufficient for magnetic separation.

Food waste
"Food waste" means all animal and vegetable solid wastes generated by food facilities, as defined in California Health and Safety Code section 27521, or from residences, that results from the storage, preparation, cooking, or handling of food.

Hazard
"Hazard" means having one or more of the characteristics that cause a substance or combination of substances to qualify as a hazardous material, as defined by section 66084 of Title 22 of the California Code of Regulations.

Household hazardous waste
"Household hazardous wastes" are those 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.

Household hazardous waste collection
"Household hazardous waste collection" means a program activity in which household hazardous wastes are brought to a designated collection point where the household hazardous wastes are separated for temporary storage and ultimate recycling, treatment, or disposal.

Implementation
"Implementation" means the accomplishment of the program tasks as identified in each component required by section 18733 of this Chapter.

Industrial solid waste
"Industrial solid waste" means solid waste originating from mechanized manufacturing facilities, factories, refineries, construction and demolition projects, and publicly operated treatment works, and/or solid wastes placed in debris boxes.

Industrial unit
"Industrial unit" means a site zoned for an industrial business and which generates industrial solid wastes.

Inert solids or inert waste
"Inert solids" or "inert waste" means 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.

Jurisdiction
"Jurisdiction" means the city or county responsible for preparing any one or all of the following: the Countywide Integrated Waste Management Plan, or the Countywide Siting Element, or the SIR Element.

Marine wastes
"Marine wastes" means solid wastes generated form marine vessels and ocean work platforms, solid wastes washed onto ocean beaches, and litter discarded on ocean beaches.

Market development
"Market development" means a method of increasing the demand for recovered materials so that end markets for the materials are established, improved or stabilized and thereby become more reliable.

Materials recovery facility
"Materials recovery facility" means a permitted solid waste 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.

Medium-term planning period
"Medium-term planning period" means a period beginning in the year 1996 and ending in the year 2000.

Mixed paper
"Mixed paper" means 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.

Model component format
"Model component format" means that format described in section 18733.1 through 18733.6 of Article 6.2 of this Chapter which shall be used for preparation of several of the individual components of a SIR Element.

Municipal solid waste or MSW
"Municipal solid waste" or "MSW" means 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 (SIC Codes 071 through 0724, 0751, animal manures (SIC Code 0751), mining waste and fuel extraction waste (SIC Codes 101 through 1499), forestry wastes (SIC Codes 081 through 0851, 2411 and 2421), and ash from industrial boilers, furnaces and incinerators.

Non-ferrous metals
"Non-ferrous metals" means 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
"Non-recyclable paper" means discarded paper which has no market value because of its physical or chemical or biological characteristics or properties.

Non-renewable resource
"Non-renewable resource" means a resource which cannot be replenished, such as those resources derived form fossil fuels.

Normally disposed of
"Normally disposed of" refers to those waste categories and/or waste types which: have been demonstrated by the Solid Waste Generation Study, conducted pursuant to section 18722 of this Chapter, to constitute at least 0.001 percent of the total weight of solid wastes disposed in a solid waste stream attributed to the jurisdiction as of January 1, 1990; which are deposited at permitted solid waste landfills or transformation facilities subsequent to any recycling or composting activities at those solid waste facilities; and which are allowed to be considered in the establishment of the base amount of solid waste from which source reduction, recycling, and composting levels shall be calculated, pursuant to the limitations listed in Public Resources Code section 41781(b).

Old newspaper
"Old newspaper" means 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.

Operational Costs
"Operational costs" means those direct costs incurred in maintaining the ongoing operation of a program or facility. Operational costs do not include capital costs.

Organic waste
"Organic waste" means solid wastes originated from living organisms and their metabolic waste products, and form petroleum, which contain naturally produced organic compounds, and which are biologically decomposable by microbial and final action into the constituent compounds of water, carbon dioxide, and other simpler organic compounds.

Other plastics
"Other plastics' means all waste plastics except polyethylene terephthalate (PET) containers, film plastics, and high density polyethylene (HDPE) containers.

Permitted capacity
"Permitted capacity" means that 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
"Permitted landfill" means 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
"Permitted solid waste facility" means 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.

Plan or Countywide Integrated Waste Management Plan
"Plan" or "Countywide Integrated Waste Management Plan" means the Countywide Integrated Waste Management Plan as defined in section 41750 of the Public Resources Code.

Program
"Program" means the full range of source reduction, recycling, composting, special waste, or household hazardous waste activities undertaken by or in the jurisdiction or relating to management of the jurisdiction's waste stream to achieve the objectives identified in the Source Reduction, Recycling, Composting, Special Waste, and Household Hazardous Waste components, respectively.

Purchase preference
"Purchase preference' means a preference provided to a wholesale or retail commodity dealer which is based upon the percentage amount that the costs of products made from recycled materials may exceed that of similar non-recycled products and still be deemed the lowest bid.

Rate structure
"Rate structure" means that set of prices established by a jurisdiction, special district (as defined in Government Code section 56036), or other rate setting authority to compensate the jurisdiction, special district or rate setting authority for the partial or full costs of the collection, processing, recycling, composting, and/or transformation or landfill disposal of solid wastes.\

Recovered material
"Recovered material" means material which has been retrieved or diverted from disposal or transformation for the purpose of recycling, reuse or composting. "Recovered material" does not include those materials generated from and reused on site for manufacturing purposes.

Region
"Region" means the combined geographic area of two or more incorporated area; two or more unincorporated area; or any combination of incorporated and unincorporated ares.

Repairability
"Repairability" means the ability of a product or package to be restored to a working or usable state at a cost which is less than the replacement cost of the product or package.

Residential solid waste
"Residential solid waste" means solid waste originating from single-family or multiple family dwellings.

Residential unit
"Residential unit" means a site occupied by a building which is zoned for residential occupation and whose occupants generate residential solid wastes.

Reusability
"Reusability" means the ability of a product or package to be used more than once in its same form.

Re-use
"Re-use" means the use, in the same form as it was produced, of a material which might otherwise be discarded.

Rubber
"Rubber" means an amorphous polymer of isoprene derived from natural latex of certain tropical plants or from petroleum.

Salvage
"Salvage" means the controlled removal of solid waste materials at a permitted solid waste facility for recycling, reuse, composting, or transformation.

Seasonal
"Seasonal" means those periods of time during the calendar year which are identifiable by distinct cyclical patterns of local climate, demography, trade or commerce.

Sewage sludge
"Sewage sludge" means residual solids and semi-solids resulting from the treatment of waste water, but does not include waste water effluent discharged from such treatment processes.

Short-term planning period
"Short-term planning period" means a period beginning in the year 1991 and ending in the 1995.

SIC Code
"SIC Code" means the standards published in the U.S. Standard Industrial Classification Manual (1987), which is herein incorporated by reference.

Sludge
"Sludge" means 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 Generation Study
"Solid Waste Generation Study" means the study undertaken by a jurisdiction to characterize its solid waste stream and comply with all the requirements of section 18722 of this Chapter.

Source Reduction and Recycling Element or SIR Element
"Source Reduction and Recycling Element" or "SIR Element" means the source reduction and recycling element required pursuant to Public Resources Code sections 41000 and 41300.

Source separated
"Source separated' describes the segregation, by the generator, of materials designated for separate collection for some form of materials recovery or special handling.

Special waste
"Special waste" means 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.

Statistically representative
"Statistically representative" means representative and random samples of units that are taken from a population sample, pursuant to the procedures given in Appendix 1 of Article 6.1 of this Chapter. For the purposes of this definition, population sample includes, but is not limited to, a sample from a population of solid waste generation sites, solid waste facilities and recycling facilities, or a population of items or materials and solid wastes in a refuse vehicle load of solid waste.

Tin can or tin container
"Tin can" or "tin container" means any food or beverage container that is composed of steel with a tin coating.

Ton
"Ton" means a unit of weight in the U.S. Customary System of Measurement, an avoirdupois unit equal to 2,000 pounds. Also called short ton or net ton.

Transformation facility
"Transformation facility" means 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.

Volume
"Volume" means a three dimensional measurement of the capacity of a region of space or a container. Volume is commonly expressed in terms of cubic yards or cubic meters. volume is not expressed in terms of mass or weight.

Waste categories
"Waste categories" means the grouping of solid wastes with similar properties into major solid waste classes, such as grouping together office, corrugated and newspaper as a paper waste category, as identified by the solid waste classification system contained in section 18722 of Article 6.1 of this Chapter, except where a component-specific requirement provides alternative means of classification.

Waste diversion
"Waste diversion" means to divert solid waste, in accordance with all applicable federal, state and local requirements, from disposal at solid waste landfills or transformation facilities through source reduction, recycling or transformation facilities through source reduction, recycling or composting.

Waste generator
"Waste generator" means any person, ad defined by section 40170 of the Public Resources Code, whose act or process produces solid waste as defined in Public Resources Code section 40191, or whose act first causes solid waste to become subject to regulation.

Waste type
"Waste type" means identified wastes having the features of a group or class of wastes which are distinguishable from any other waste type, as identified by the waste classification system contained in section 18722 of Article 6.1 of this Chapter, except where a component-specific requirement provides alternative means of classification.

White goods
"White goods" means discarded, enamel-coated major appliances, such as washing machines, clothes dryers, hot water heaters, stoves and refrigerators.

Wood waste
"Wood waste" means solid waste consisting of wood pieces of particles which are generated form the manufacturing or production of wood products, harvesting, processing or storage of raw wood materials, or construction and demolition activities.

Yard waste
"Yard waste" means 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.

NOTE: Authority cited: Sections 40502 and 41824, Public Resources Code. Reference: Sections 41000, 41300 and 41823, Public Resources Code.

Appendix B

MATERIALS MARKETS

Paper Markets

Independent Paper Stock 4800 Florin-Perkins Road Sacramento, California	Accepts newspaper, cardboard, high-grade paper and other mixed grades. Aluminum and metal cans, sorted glass, and PET is also accepted.
Weyerhaeuser Company 50 South River Road West Sacramento, California	Accepts 14 different grades of waste paper.
Keyes Fiber Company 8450 Gerber Road Sacramento, Calfornia	Accepts newspaper as a raw material in the manufacturing of packaging materials.
Gold Bond Building Products 800 West Church Street Stockton, California	Accepts cardboard, high-grade paper, and mixed paper for product manufactor.

Metals Markets

Proler International 15332 South McKinley Avenue Lathrop, California	Accepts tin and ferrous materials only.
Reynolds Aluminum 777 Arden Way Sacramento, California	Accepts CA Redemption containers, copper, and scrap aluminum.

C & C Metals 11320 Dismantle Court Rancho Cordova, California	Accepts CA Redemption containers, copper, scrap aluminum, ferrous metals, and white goods.
Schnitzer Steel 12000 Folsom Blvd. Rancho Cordova, California	Accepts ferrous metals, white goods, non-ferrous metals, and tin cans.
Altas Metals 30 Arden Way Sacramento, California	Accepts scrap aluminum.
Barbary Coast Steel 4300 E. Shore Hwy. Emeryville, California	Accepts ferrous metals.

Glass Markets

Anchor Glass Container 1400 W. 4th St. Antioch, California	Accepts flint cullet only.
Anchor Glass Container P.O. Box 3427 22302 Hathaway Ave. Hayward, California	Accepts green and flint cullet only.

Plastics Markets

Bags Again, Inc. 1300 South El Camino Real, Suite 300 San Mateo, California	Accepts post consumer Low Density Polyethylene (LDPE)

Bay Polymer Corporation 44530 Grimmer Blvd. Fremont, California	Accepts post consumer HDPE, LDPE, PS, PVC, and PP.
Certified Polymer Processors, Inc. 540 Stone Road, Unit J Benicia, California	Accepts post consumer HDPE.
Deer Polymer Corporation 3410 Geary Blvd. San Francisco, California	Accepts post consumer LDPE, PET, PP, PS, PVC, and other plastics (Resin Broker)
Engineered Resource Recovery Inc. P.O. Box 1226 Lafayette, California	Accepts post consumer LDPE and PET.
Joe's Plastics, Inc. 7065 Paramount Blvd. Pico Rivera, California	Accepts HDPE, LDPE, PP, and PS.
Marketing Associates Inc. 1818 N. Orangethorpe Park Anahiem, California	Accepts all post consumer plastics.
Talco Plastics Inc. 11550 Burke St. Whittier, California	Accepts post consumer HDPE, LDPE, PET, PP, PS.
Tech Polymers P.O. Box 4429 Berkeley, California	Accepts all post consumer plastics. (Resin Broker)

White Goods

C&C Metals 11320 Dismantle Court Rancho Cordova, California	Accepts delivery of white goods; compressors must be removed; no freezers. No minimum required.
Schnitzer Steel 12000 Folsom Blvd. Rancho Cordova, California	Accepts delivery of all white goods, as-is. No minimum required.
LMC Metals 130 North 12th Sacramento, California	Accepts delivery of white goods; motors and compressors must be removed. 200 lb. minimum.

Wood Waste

Wood Fuel Processing Company 5079 South Township Road Yuba City, California	Processes olive pits, olive oil, and prune pits. Uses almond, walnut and prune brush to produce barbecue briquets. Processes mill-in waste less than 2 feet, trip ends from molding plants, and 2x4s any length.
Thermo Electron Company Woodland Biomass East Kentucky Street between Road 101 and 102 Woodland, California	Processes hogged or chipped brush chips, almond hulls, olive pits, peach pits, walnut shells and rice hulls.

Wheelbrator Shasta Energy Company, Inc. 20811 Industry Road Anderson, California	Processes almond and walnut shells, and orchard prunings. Equipment on site available to chip branches. Processes trim ends from molding plants, 3-inch (minus bark) sawmill waste, cull logs up to 72 inches in diameter, whole tree chips, chipped logging slash, and processed log yard waste.

Concrete and Asphalt

Harbor Sand and Gravel North End 28th Street/American River Levee/across from Sacramento River	Takes materials free of charge. Recycles clean concrete, concrete with small amount of rebar (sheared off), and asphalt. Size limit 2 feet x 2 feet x 6 inches. Produces roadbase from recycled product.

Appendix C

RESPONSE TO COMMENTS FROM THE CALIFORNIA INTEGRATED WASTE MANAGEMENT BOARD ON THE SOURCE REDUCTION AND RECYCLING ELEMENT FOR THE CITY OF WINTERS

GENERAL COMMENTS

1. Specific City agencies have been identified, and their roles clarified in implementing and monitoring the effectiveness of this plan.

2. Where possible, material specific diversion estimates have been quantified.

COMMENTS ON THE WASTE GENERATION STUDY

3. Yolo County Central Landfill periodically performs density compaction studies. The County has provided three references which provide approximate in-place density estimates.

1) Earthco. Yolo County Central Landfill Quarterly Compaction Study. Earthco Company, January 1990.

- Estimates an in-place density of 1,250 pounds per cubic yard.

2) Blue Ridge Services. Yolo County Central Landfill Quarterly Compaction Study. Blue Ridge Services, June 1991.

- Estimates an in-place density of 1,230 pounds per cubic yard.

3) Yolo County Central Landfill Contract Plan and Specifications. March 1991 through March 1998.

- Specifies an in-place density of 1,200 pounds per cubic yard. This value was used to estimate landfill volume requirements.

4a. In an effort to determine the number of samples to be taken for a statistically representative sampling, the percentage of waste paper expected to be found in the waste stream was estimated to be 35 percent. Waste paper includes all paper disposed. Sampling programs conducted in Culver City, Glendale, Sante Fe Springs, Santa Clara County, and other regions indicate that the percentage of waste paper in the residential waste stream varies between 30 and

40 percent. Thirty-five percent was used as a baseline to determine the number of samples necessary to achieve desired precision levels.

The number of samples selected for residential and commercial, and industrial sources was based on the degree of accuracy sought as well as the availability of samples during the sampling period.

4b. The precision level used to estimate the waste composition for residential, commercial, industrial waste sources for the City of Winters ranged between 3 to 7 percent.

4c. Sample Size Calculation

The formula utilized for sample size calculations was the following:

$$n = (z*s/q)^2$$

where

n = number of samples
z = normal standard deviate for 90 percent confidence interval
s = sample standard deviation
q = transformed value of sensitivity

Example Calculation:

Assuming a mean value for mixed waste paper of 35 percent and precision levels of 3, 5, and 7 percent, the calculation of the number of samples necessary for representative sampling are summarized as follows:

- Precision level of 3 percent.

$$q = [1.3284 - 1.266] = 0.0623$$

$$n = (1.645*0.1632/0.0623)^2 = 18$$

- Precision level of 5 percent.

$$q = [1.3694 - 1.2661] = 0.1033$$

$$n = (1.645*0.1632/0.1033)^2 = 6.8$$

- Precision level of 7 percent.

$$q = [1.4101 - 1.266] = 0.1440$$

$$n = (1.645*0.1632/0.1440)^2 = 3.5$$

5a. The number of samples taken and average weight per sample for the City of Winters are summarized below.

City of Winters Sampling Summary

Source	Number of Samples	Average Sample Weight
Residential SFD	29	50.3
Residential MFD (Regional)	6	217.5
Commercial	6	311.4
Industrial	1	246.2

5b. Residential data collected from the cities of West Sacramento, Winters, and Woodland were combined to arrive at an overall estimate of HHW generated on a regional basis and served to estimate the quantity of HHW generated from these cities only.

Samples obtained from these cities were selected at random. Samples were taken from low, medium, and high income areas (identified by the jurisdiction), for each day of refuse collection. Collection routes were identified and households were selected for sampling based on random number generation.

The estimate of the quantity of HHW generated from the unincorporated residential areas of the County was based on samples taken from residential waste generated in the unincorporated area.

HHW diversion in the County was not counted towards waste diversion.

6. The number of samples taken was largely based on the availability of samples which were strictly MFD in origin over the duration of the sampling period.

These samples were not considered to be representative of the entire County, but representative of the cities of Winters, Woodland, and West Sacramento and the Unincorporated Area. Separate samples were obtained from the City of Davis due to the fact that recycling services are offered to MFD communities.

These samples were considered to be representative largely due to the fact that recycling services were not being offered to MFD's in the sampled jurisdictions. Vehicles selected for sampling were specifically targeted (based on communications with contract haulers) to obtain samples of waste which were MFD in origin.

7. The number of samples taken and average sample weight from each jurisdiction and sources of generation (i.e, residential, commercial, and industrial) are summarized on each waste composition table in the Final SWGS.

Samples of waste from commercial and industrial sources were obtained from randomly selected vehicle loads at the point of disposal. Vehicle loads which were selected at random and found to contain mixed refuse from residential, commercial, or industrial sources were either discarded or sampled if representative samples of commercial or industrial waste could be obtained.

Samples were determined to be representative of commercial and industrial sources based on the types of wastes, generator addresses, or other information found in the sample which indicated the source of generation.

8a. Visual observations of self-haul waste being disposed of indicated that the waste types identified above were the predominant materials observed in the self-haul waste stream. The predominant waste types indicated were white goods, mixed yard waste, bulky waste, construction and demolition debris, and miscellaneous waste. Categorization of waste into the waste type of "construction and demolition waste" was in error, however; a separate waste composition estimate for construction and demolition waste generated for the County has been included in the final SWGS.

Miscellaneous wastes consisted of various waste types which could not be easily quantified such as residential refuse. Bulky wastes consisted of waste items such as household furniture and mattresses.

8b. Source: Wilson, David Gordan. Handbook of Solid Waste Management. Van Nostrand Rienhald Company. Pages 42-43. 1977.

9a. Surveys were not distributed on a random basis. Companies which were identified as being "major employers" in the jurisdiction were sent a written survey to identify the quantity of waste diverted from waste disposal. Several companies which were targeted through the written survey were also telephoned to increase the level of response. Small grocery stores, tire retailers, and large tire users were also contacted by phone.

The quantity of waste diverted through certified recycling centers was based on information provided by the Department of Conservation - Division of Recycling.

The quantities of waste claimed for diversion were quantities of waste reported by those

companies which responded to the survey.

9b. The transformation of waste generated in the City of Winters is limited to wood and tire waste. Wood waste diversion is achieved through wood waste processing at the Central Landfill where wood is chipped and diverted as wood fuel to Woodland Biomass and Rockland Biomass transformation facilities. Tires are largely diverted to Oxford Energy for transformation. Quantities of waste diverted are included in Section 4 of the SWGS.

Materials diverted for transformation are a fuel source and are processed or separated from other waste prior to transformation. Ash generated from the Woodland and Rockland biomass facilities is tested and ultimately used as soil amendment.

9c. Source reduction activities were not identified in the jurisdiction.

10. Table 5-4 projects the total quantity of waste generated in the jurisdiction under current conditions. Units are in tons per year. Fifteen year waste projections under current conditions and under conditions set forth in the SRRE are provided in Section 3 of the SRRE.

11. The SWGS indicates the quantity of waste disposed in terms of volume (cubic yards) in Table 3-21; however, the materials currently diverted through transformation were not included. The volume of waste currently being disposed is estimated to be 7,933 cubic yards. The volume of waste disposed including waste transformed is estimated to be a total of 7,997 cubic yards. The conversion factor used to arrive at these estimates was 1,200 pounds per cubic yard. This conversion factor was based on Yolo County Central Landfill Contract Plans and Specifications - March 1991 through March 1998.

12. Fifteen year waste disposal and diversion projections under current conditions and under conditions set forth in the SRRE are provided in the SRRE.

13. Information with respect to seasonal variations of the diverted waste stream from the City of Winters is not available. However, information is available as to seasonal variations for selected waste types diverted from the City of Davis during 1990 and may serve as an indicator of seasonal variability in the region. Data provided for newspaper, cardboard, and glass are summarized as follows:

Newspaper--

Peak levels of diversion for newspaper during 1990 occurred during the months of May, November, and December. Minimum diversion rates occurred during the months of February and October. Monthly diversion rates were relatively constant during the remainder of the year.

Cardboard--

Diversion rates for cardboard remained relatively constant during the period of January through May with diversion rates increasing from June through December.

Glass--

Peak diversion rates for glass occurred in May and November. Diversion rates for glass remained relatively constant throughout the year with the exception of April when the lowest diversion rate was recorded.

14. The inclusion of inert solids for waste diversion meet both of these criteria. An active waste diversion program is currently in place at Yolo County Central Landfill targeting inert solids for construction related purposes. The SWGS also indicated that inert solids are currently generated from the City of Winters and disposed of at the Yolo County Central Landfill.

15. The City Recycling Coordinator will oversee all monitoring and evaluation efforts for private sector and City operated programs. Surveys and reporting documentation will be developed, and the City will monitor all weight tickets from the Yolo County Central Landfill for refuse , recyclables, and green waste delivered to the facility. The County will be responsible for supplying weight tickets for materials delivered to the Self-Haul Bin Transfer Operation and the Concrete, Asphalt, and Inert Solids Recycling Program. The City is evaluating the effectiveness of using Waste Generation Studies to monitor and evaluate diversion pending soon to be released regulations relating to disposal based diversion monitoring.

COMMENTS ON THE SOURCE REDUCTION AND RECYCLING ELEMENT

16. All goals and objectives have been identified and quantified at the beginning of each component. Waste diversion projections are summarized in the Integration Component and in the Executive Summary.

Comments on the Waste Characterization Component

17. This section appears to meet regulation requirements.

Comments on the Source Reduction Component

18. It is extremely difficult to project the effectiveness of source reduction activities, however, the City has attempted to specify diversion estimates. For example, to estimate the effectiveness of an office paper source reduction program, you would first have to know how much office paper is initially being generated to establish a baseline by which to judge the program. The City has attempted to satisfy the "letter" of the law, and feels that the stated goals and objectives are well within the "intent" of the law.

19a. At present, there are no structured source reduction programs in the City of Winters. Source reduction, however, does take place through a diaper service, thrift stores, and backyard composting. Reliable diversion estimates for existing source reduction activities are not available, and are therefore, not included.

19b. The City will attempt to stimulate these industries through continued public education efforts focused on source reduction. The City has no reason to believe that these existing activities will be decreased or phased out, and anticipates that they will benefit from City and County public education efforts.

20a. Dollar amount estimates have been added to all evaluated alternatives.

20b. The rate review process is anticipated to occur in mid 1993, with some form of new rate structure resulting. A variable rate structure as described in the Source Reduction Component is viewed as a contingency measure to be used if diversion programs prove to be ineffective.

21a. Program selection decisions are based upon discussions with City personnel and the programs applicability to the City of Winters as determined in the evaluation processs.

21b. With the exception of Backyard Composting the quantity of waste which can be diverted through selected source reduction programs cannot be quantified with available information. Estimates of the quantity of waste diverted through backyard composting programs are approximately 1.0 and 1.5 percent of waste disposed in the short and medium-term planning periods.

22a. The City is the current hauler and has drafted this plan accordingly. However, the City may consider a franchise agreement for the collection of refuse and recyclables. This is a hotly contested issue in the City, and will not be decided until mid 1993.

22b. The number of awards and public recognition events is a function of budget constraints. The program is scheduled to be an annual avent, but may be increased as funds become available.

23a. Monitoring and evaluation goals and objectives, criteria and methods of evaluation, the responsible agency, and contingency plans in the event of shortfall have been identified for each alternative.

23b. Section 4.6.1 has been established identifying the monitoring and evaluation funding source.

Comments on the Recycling Component

24. 17.9 percent, or 1,058 TPY, of Winters' waste stream is currently diverted through two primary recycling alternatives. 861 TPY, or 81 percent of current recycling is concrete, asphalt and inert solids used for road base at YCCL. Another 197 tons is diverted through private commercial recycling programs established by business owners in the City. This information was gathered through an extensive survey process.

25a. It is likely that the commercial garbage rate will increase as tipping fees at YCCL increase to cover the costs associated with the proposeed MRF.

25b. The public vs. private ownership issue is currently subject to much political debate and is intentionally left vague until such time as the City sorts out the issue.

26a. Comment noted.

26b. Comment noted.

26c. Comment noted.

26d. Comment noted.

26e. Comment noted.

26f. Comment noted.

26g. Comment noted.

27. A discussion of landfill salvaging was not presented as the City does not operate a landfill, nor does it have the authority to create such a program at YCCL.

28. Language has been added to the multi-family and commercial recycling discussions which will most directly benefit fron zoning ordinance changes.

29a. A new Table 5-10 has been added to identify expected diversion by waste type.

29b. Handling and disposal of collected materials will be the responsibility of the hauler. At this time, it is unknown who will operate the program, and therefore, handling and disposal procedures are yet to be determined.

29c. Again, until the City makes a decision as to what they intend to do, any discussion of facilities is premature.

30. Section 5.5.1, Government Agencies Responsible to Implement Programs identifies the Recycling Coordinator and the City Department of Public Works as the responsible City agency. The waste hauler issue has yet to be determined.

31. The Recycling Coordinator and the Department of Public Works will be responsible for the monitoring and evaluation of selected programs. Funding requirements and shortfall measures are identified.

Comments on the Composting Component

32. Clarifying language has been added identifying yard waste as the targeted waste type for composting with the possibility of adding additional materials listed in table 6-1 in the medium-term if determined to be appropriate.

33. Further detailing of costs requires a Feasibility Study be completed including a review of all CEQA compliance requirements and engineering constraints. This is beyond the scope of this document, as well as the financial capabilities of the City of Winters at this time. Sufficient coverage has been given to this issue in the various processing alternative discussions and estimates are now provided in the text.

34a. Apprpriate language has been added to the component.

34b. Table 6-5 and 6-6 present the requested information.

34c. That strategy has been abandoned. The City will not develop its own composting facility in the medium-term..

34d. Section 6.4.4, End-Markets and Contingency Measures for Diverted Recyclable Materials has been added discussing these issues.

35. Implementation tables have been updated as requested.

36a. The Recycling Coordinator and the Dept. of Public Works will be the responsible entities.

36b. Section 6.6.2, Funding has been added.

Comments on the Special Waste Component

37. Specific diversion targets have been added to the goals and objectives section.

38. None of the exisiting programs outlined in Section 7.2, Existing Conditions are expected to decrease or be phased out during the planning period.

39. All references have been changed.

40a. Comment noted. Accurate records will be kept to ensure proper diversion credit.

40b. Tables 7-4 and 7-5 have beeen created which show diversion by program and material type.

40c. A discussion of end uses, and handling and disposal methods has been added in Section 7.4.3, End-Markets and Contingency Measures for Diverted Recyclable Materials.

41. The appropriate responsible agencies and individuals have been identified and the implementation schedules revised.

42a. The monitoring and evaluation section has been revised.

42b. The monitoring and evaluation section has been revised. Costs are identified in the implementation schedules.

Comments on the Education and Public Information Component

43. The implementation schedule has been revised.

44a. Monitoring and evaluation funding requirements have been identified in the Recycling Coordinators salary.

44b. Shortfall measures have been identified for all education and public information alternatives.

Comments on the Facility Capacity Component

45. Comment noted.

Comments on the Funding Component

46a. A rate review for the City of Winters is anticipated to commence in conjunction with an assessment of public vs. private operation of refuse collection and selected waste diversion programs. At this time, projecting the adequacy of the Refuse Fund to fund selected programs is premature. This discussion will be included in the first update to the SRRE.

46b. As stated in the previous response, the City is not prepared to respond to this issue at this time, but is progressing along a defined strategic plan to determine the best way to implement and fund AB 939 mandated programs.

Comments on the Integration Component

47. All implementation schedules have been provided in the various components of the SRRE. It is redundant and unnecessary to reproduce these tables again in the Integration Component. The Recycling Copordinator and the City Department of Public Works have been identified as the responsible City agency and hauler in every component of the SRRE and in Section 11.2.1. Public education implementation timelines have been identified in the Education and Public Information Component. Table 11-4 is intended to be an integrated summary of the selected programs for the City of Winters, showing start dates and anticipated diversion. Please see the implementation schedules within each component for detailed implementation timelines.

STATE OF CALIFORNIA

Pete Wilson, Governor

CALIFORNIA INTEGRATED WASTE MANAGEMENT BOARD
8800 Cal Center Drive
Sacramento, California 95826

FEB 28 1992

Amelia Hutchinson
Public Works Coordinator
318 First Street
Winters, CA. 95694

Subject: Review of the Preliminary Draft Source Reduction and Recycling Element

Dear Ms. Hutchinson:

California Integrated Waste Management Board (Board) staff commend the City of Winters on submitting its Draft Source Reduction and Recycling Element (SRRE). Board staff have reviewed the SRRE for compliance with Chapter 9, Title 14 of the California Code of Regulations (CCR), Planning Guidelines and Procedures for Preparing and Revising Countywide Integrated Waste Management Plans (Guidelines). General comments on the SRRE are provided in this letter. Specific comments on the Element regarding compliance with the Guidelines can be found in the attachment.

General Comments

1. Identification of the City agency responsible for implementing the selected program and its monitoring should be provided in the appropriate sections. Generally, the draft states City staff will perform these duties but this does not meet regulation requirements.

2. Also, diversion must be reported by waste type and quantity for each selected program. Typically, the selection sections provide diversion by alternative and the percentage each will contribute toward the diversion goals of 25 and 50%. However, the quantities (volume or weight) for diverted waste types must be also included.

Please note in the attachment those comments on the SRRE which include a reference to CCR concern regulatory requirements and should be fully addressed in the revised Element. Other comments are staff suggestions based on technical review and are provided for the City's consideration. The exception would be a request

for missing information or a definition of a term; this type of comment should also be fully addressed.

If you have any questions, please call me at (916) 255-2305 or Catherine Donahue, Local Assistance, at (916) 255-2315.

Sincerely

Dianne Range

Dianne Range, Manager
Local Assistance Branch, North
Planning and Assistance Division

Comment attachment

Amelia Hutchinson
City of Winters
SRRE Comments

COMMENTS ON THE WASTE GENERATION STUDY

The following are Board staff's comments on the City of Winter's waste generation study. These comments are based on the final SRRE regulations, as filed with the Secretary of State on 11 July 1991 and are to be incorporated into the Solid Waste Characterization Component of the SRRE.

Pages 3-2 and 3-3, Yolo County Central Landfill Density Study

3. The last paragraph on page 3-2 and the first complete paragraph on page 3-3 reference a density study conducted by Yolo County Central Landfill. The final SWGS should provide the complete reference source for the study (i.e., author, title, publisher, place of publication, page number and year published) [CCR section 18722(f)(1)].

Page 3-3, Waste Composition

4a. The second paragraph under this heading identifies the largest waste category found in the jurisdiction's waste stream as waste paper. The final SWGS should cite the study from which this waste category was determined.

b. The table found under this heading identifies several precision levels and the corresponding number of samples required to be taken to achieve said levels. The final SWGS should identify which precision level was ultimately used.

c. This section should also show all calculations used to determine the number of samples to be taken.

Page 3-4, Single-Family Dwellings Waste Composition

5a. The first paragraph identifies a total of "147 residential samples . . . obtained from single-family dwellings from the study jurisdictions." The final SWGS should identify the number of samples taken in each of the Cities and the unincorporated portion of the County. The final SWGS should also include the weight of each of the samples taken.

b. The second paragraph states: "residential samples collected from the Cities of West Sacramento, Winters, and Woodland were combined for statistical analysis . . . of household hazardous waste generated on a regional basis." This statement appears to imply that the data collected from these three cities was

considered representative of the entire County and was, therefore, used to estimate HHW generated in the County. The final SWGS should include an explanation of the method used to determine that the samples taken were random and representative of the waste stream for the entire County [CCR section 18722(h)]. Please note: Household hazardous waste which is diverted from disposal cannot be counted toward meeting waste diversion goals [CCR section 18720(a)44)].

Page 3-4, Multi-Family Dwelling Waste Composition

6. The first paragraph states: "A total of 6 samples, averaging 218 pounds, were obtained . . . from the Cities of Winters and Woodland. These samples were combined for statistical analysis and . . . considered as being representative for multi-family dwellings in the Cities of Winters, Woodland, West Sacramento, and the Unincorporated Area." The final SWGS should include an explanation of the method used to determine that the samples taken were random and representative of the waste stream for the entire County [CCR section 18722(h)].

Page 3-5, Commercial/Industrial/Institutional Waste Sources

7. The first paragraph includes the statement: "A total of 94 samples were obtained from commercial, industrial, and institutional sources." The final SWGS should identify the number of samples taken in each of the Cities and the unincorporated portion of the County and how these samples were determined to be both random and representative [CCR section 18722(h)].

Page 3-5, Self-Haul Waste Sources.

8a. This item states: "125 self-haul vehicles were visually surveyed . . . for white goods, mixed yard waste, bulky wastes, and construction and demolition debris, with the remaining refuse characterized as miscellaneous waste." The final SWGS should explain why only these solid waste types were used as opposed to those required pursuant to CCR Section 18722(j). This apparent limitation on waste type identification may make it difficult for the jurisdiction to accurately quantify disposal and anticipated diversion quantities for each of the required waste types without study data which disaggregates to the required solid waste types.

b. This same item references "'loose' volume/weight conversion factors". The final SWGS should reference the source for said conversion factors (i.e., author, title, publisher, place of

publication, page number and year published) [CCR section 18722(f)(1)].

Page 4-1, Waste Diversion Characterization

The second paragraph under this heading includes the statement: "the quantity of waste diverted through source reduction, recycling, composting, and transformation was estimated through . . . recycling surveys." The final SWGS should include the following information regarding the surveys conducted to determine quantity of waste diverted from disposal:

9a.
- Complete references for information taken from existing published data [CCR sections 18722(l)(3) and 18724(c)].
- Description of the sampling method used and how it was determined to be random and representative.
- All calculations and discussions thereof explaining how the number of units to be surveyed was determined.
- The number of people (or businesses) surveyed, the number of people (or businesses) that responded, and the survey procedure used.

It would also be helpful if copies of all survey forms used (with a discussion of how and for whom they were used) were included in the final SWGS.

The final SWGS should also describe and quantify all transformation which is being counted toward achievement of diversion goals. Please be aware that transformation quantities can only be applied toward the achievement of diversion goals <u>after</u> January 1, 1995 <u>and</u> may only be applied toward meeting 10 percent of the 50 percent diversion requirements [Public Resources Code (PRC) section 41783]. In addition, transformation can only be counted toward meeting diversion requirements if the transformation project meets certain standards as specified in PRC section 41783.

b.

The final SWGS should also describe and quantify all source reduction which is being counted toward achievement of diversion goals (CCR section 18734.2).

c.

Page 5-4, Table 5-4, Waste Generation Projections

This table does not identify the units of measure used for projected waste generation nor does it specify whether it is intended to project disposal under current conditions or under conditions set forth by the SRRE when alternatives are

10.

implemented. The final SWGS should provide this information. In addition, pursuant to CCR Section 18722(c), the final SWGS should include 15 year projections of waste disposed, by waste category and type, both under current conditions and under conditions created when SRRE programs are implemented.

Units of Measurement

The final SWGS should include the quantity of wastes disposed and/or transformed in terms of volume. The volume measurement given for solid waste disposed should be expressed in terms of in-place volume, after compaction, in the landfill [CCR section 18722(f)(4)]. Volume measurements need only be reported for 11. total quantities (instead of by individual waste type) of waste disposed and/or transformed. Please be certain to reference (i.e., author, title, publisher, place of publication, page number and year published) all conversion factors used [CCR section 18722(f)(1)].

15-Year Waste Diversion Projections

The final SWGS should include 15-year projections of the quantity of wastes diverted and generated both under current conditions and under conditions when the SRRE programs are implemented, by 12. waste category and type. Each projection should be listed on a year-by-year basis [CCR section 18722(c)].

Seasonal Variations for Solid Waste Diversion

The final SWGS should include a discussion of the effect of seasonal waste stream variation on the quantity of waste diverted [CCR section 18722 (i)(2)]. The discussion should also include 13. any assumptions made about the presence or lack of seasonal impact on the quantity of wastes diverted.

Diversion of Inert Wastes

Please recall that inert solids, scrap metals, white goods and agricultural wastes cannot be counted toward waste diversion goals unless the following conditions were met as of January 1, 1990 (Public Resources Code section 41781):

14.
- A waste diversion program was in place for this waste type, and;
- This waste type was normally disposed at a permitted solid waste disposal facility used by the City.

Accuracy of Data

15. The final Study should include a description of the procedures to be used to quantify future data on wastes disposed, transformed and diverted [CCR section 18722(o)]. This discussion should include how often and from whom reports will be expected.

COMMENTS ON THE SOURCE REDUCTION AND RECYCLING COMPONENT

I. Statement of Goals and Objectives

16. It appears the draft did not include all the requirements of this section. CCR section 18731 requires a statement of goals and objectives for the short and medium term planning period. Each objective should be measurable and include a time by which it will be achieved. This section is also required to provide a summary of the percentages to be diverted through each component program. These were found in the Executive Summary. Please provide specific objectives in the final draft.

II. Solid Waste Generation Analysis

17. This section appears to meet regulation requirements (CCR section 18732).

III. Source Reduction Component

Objectives

18. CCR section 18733.2(a) requires identification of specific and quantifiable objectives. Objectives such as "reducing the amount of residential yard wastes entering the waste stream" could be changed to "reducing the amount of residential yard wastes entering the waste stream by 20% by 1995". Please provide this type of objective in the final draft.

Existing Conditions

19a. Please provide the quantities for of diverted materials for each existing source reduction alternative, as required by CCR section 18733.2(a)(2). Diversion quantities are only provided for pallet repair.

b. Please state whether any of the existing alternatives will

decrease in scope or be phased out during the short or medium term planning period (CCR section 18733,2(a)(3)).

Evaluation of Alternatives

20a. As per the requirements of CCR section 18733.3(b)(3), please provide the implementation costs for each alternative. The draft discusses costs in general terms or staff hours for several alternatives, but does not provide dollar amounts. Please provide dollar amounts in the final draft.

b. Alternative 1, Quantity Based Variable Rates
Please discuss whether this alternative can be implemented in short or medium term planning period (CCR section 18733.3(a)(5)). On page 4, Ability to be Implemented, the draft states that it may take as long as 6 months after the decision is made to start rate review to implement the new rates, but this does not state when implementation will be accomplished.

Selection of Program

21a. Please discuss why the alternatives were selected, based on the evaluations and the waste generation study, as required by CCR section 18733.4(a).

b. Also, please provide the estimate of diversion quantities, by waste type in volume or weight, as required by CCR section 18733.4(b). Table 4-1 only shows the expected percentages for each of the alternatives in the short and medium term. Waste types and quantities need to be added to the table.

Implementation

22a. Please identify the waste haulers and City agency in the implementation schedules, as required by CCR section 18733.5(a).

b. Table 4-6 shows an awards event occurring in the second quarter of 1993. But there is no indication of how often this event will take place. This type of event, which repeats, should be indicated on the schedules. Please provide this in the final draft.

Monitoring and Evaluation

23a. Written criteria have been provided for Alternative 2 Loans, but criteria has not been provided for the other alternatives as required by CCR section 18733.6(c)(1). Also, please identify the

City agency responsible for the monitoring and evaluation program, as required by 18733.6(c)(2).

b. Please provide the monitoring and evaluation funding requirements, as required by CCR section 18733.6(c)(3).

IV. Recycling Component

Existing Conditions

24. This section contains information on the quantities of materials diverted but this information is not supported by descriptions of the activities which divert the materials. Please provide descriptions of these activities in the final draft so that the City may obtain diversion credit. Also, inert recycling should be discussed in the Special Waste Component.

Evaluation of Alternatives

25a. On page 5-13, please provide a discussion of whether the commercial garbage rate will increase to cover the additional costs.

b. Please analyze the recycling alternatives affecting residential, commercial, and industrial wastes and address the advantages/disadvantages of public versus private ownership of the operations or facilities (CCR Section 18735.3).

Market Development Comments

The following suggestions are for recycling market development activities the jurisdiction can consider:

26a. Include information on the Board's Material Exchange program in your Public Information and Education efforts. This free program (referred to as CALMAX) is analogous to a classified ads listing for "waste" materials available and wanted throughout California. For more information, contact Joyce Mason at (916)255-2369 or the Board's Hotline at (800) 553-2962.

b. Any community that plans to become a Recycling Market Development Zone must state so in the Recycling Component. This disclosure is necessary to be able to apply for the program with the California Integrated Waste Management Board.

c. It is a good idea for local jurisdictions to identify local businesses that use recycled materials in their business and work with them to expand their operations. Also, jurisdictions could work with businesses not currently using recycled material and show them ways they could utilize recycled materials or recycle materials in their waste stream.

d. Promote the idea of buying recycled in addition to recycling to businesses and schools to teach the idea that buying recycled closes the loop in recycling. Jurisdictions should set an example to others by establishing policies to expand and create materials markets to complement their diversion programs.

e. Identify those who need to be involved in market development decisions. These could include economic development professionals, representatives from manufacturers, finance community, and local chambers of commerce.

f. Join forces with other jurisdictions to develop market, being sure to described the role of your jurisdictions in the cooperative effort.

g. Develop financial incentives to attract recycling businesses. Incentives such as tax incentives, loans, grants, or other types of incentives may be used to draw recycling businesses into your area.

27. Alternative 9, Landfill salvaging This alternative was not evaluated, as required by CCR section 18735.3(a)(6).

28. Please include in the final draft consideration of changing zoning and building codes to encourage recycling, and methods to increase markets, as required by CCR section 18735.3(b & d).

Selection

29a. In the final draft, please provide expected diversion by waste type, in volume or weight, as required by CCR section 18733.4(b). This information could be added to Table 5-10 to meet regulation requirements.

b. Also, please describe the proposed methods for handling and disposal of materials, as required by CCR section 18733.4(d).

c. Please include in the final draft a description of the facilities

needed for the selected program, as required by CCR section 18733.4(e).

Implementation

30. Please identify the waste haulers and city agency in the implementation schedules, as required by CCR section 18733.5(a). It appears from the information in Table 5-18 that the MRF is a county alternative which the City will participate in. The City's role in the MRF needs to be discussed. This could be a statement indicating that the City's role is limited to paying tipping fees at the MRF or that the City is involved in every aspect of the MRF from design, financing, construction, and operation. Please include this discussion in the final draft.

Monitoring and Evaluation

31. Please identify the City agency which is responsible for the monitoring program (CCR section 18733.6(c)(2)). Also, please identify the known monitoring and evaluation funding requirements (CCR section 18733.6(c)(3)), and the measures to be taken if there is a shortfall in attaining the objectives (CCR section 18733.6(c)(4)).

V. Composting Component

Objectives

32. Please clarify in the final draft if Table 6-1 represents the targeted wastes for diversion, as required by CCR section 18733.1(b).

Evaluation of Alternatives

33. <u>Siting Alternative 1, Establish Local Municipal Site</u>
Please include all the costs as if this alternative was implemented, required by CCR section 18733.3(b)(3).

Selection of Program

34a. Please describe each of the selected alternatives, as required by CCR section 18733.4(a). The description should include the collection methods, the composting method (the draft does not identify this), and the composting site, including site size, processing capability, and necessary equipment (CCR section 18733.4(e). Also, include why the alternatives were chosen, based

on the data in the waste generation study and the evaluation criteria.

b. Please provide the anticipated diversion quantities by waste type, in volume or weight, for the short and medium term planning period, as required by CCR section 18733.4(b). Please include the percentages the program will contribute toward the diversion goals.

c. Please discuss why the City would consider developing their own composting facility in the medium term planning period when they plan on using the County's facility in the short term planning period.

d. CCR section 18736.4 requires a discussion of market development for the composting program. Please provide the markets to be secured and the planned market development in the local jurisdiction in the short term planning period. Include in the discussion the methods which will be used to secure markets for the composted materials. Also, describe the measures the City will take if unfavorable market conditions should occur.

Implementation

35. Please identify the city agency and the waste haulers in the implementation schedule, Table 6-5, as required by CCR section 18733.5(a). Also, each task should be assigned an implementation date, as required by CCR section 18733.5(c).

Monitoring and Evaluation

36.a. Please identify the City agency which will be responsible for evaluating the effectiveness of the program (CCR section 18733.6(c)(2)).

b. Please identify the revenue sources for monitoring and evaluation of the program (CCR section 18733.6(c)(3)).

VI. Special Waste Component

Objectives

37. The City should provide specific objectives which can be measured when monitoring the diversion (CCR sections 18733.1(a), 18737.1 and 18733.6). The objectives provided could be changed from "remove and recycle bulky waste from the landfill" to "divert 80%

of the mattresses, furniture, and appliances from the landfill by 1995." Please provide this kind of objective in the final draft.

Existing Conditions Description

38 Please describe the alternatives which will be decreased or phased out (CCR section 18733.2(a)(3)).

Evaluation of Alternatives

39 The appendix referred to in this section is not Appendix B but Appendix A. Please change this in the final draft.

Selection of Program

40a The concrete and asphalt recycling alternative is described as using the material as road base at the county landfill. However, once the landfill has sufficient inerts for the year, generators in Winters will be required to haul their inerts "elsewhere." Please be aware that materials taken elsewhere for disposal do not count as diversion. The City should be aware of the final disposition of these materials if the City plans on counting them for diversion.

b Please provide the diverted materials by waste type, in volume or weight, as required by CCR section 18733.4(b). Table 7-3 provides diversion percentages for each alternative in the short and medium term planning periods but diversion should also be shown by waste types and the quantity of each waste type diverted.

c Please describe the end uses for diverted materials (salvaged materials and bulky items) and the proposed handling methods and, also, any necessary disposal methods which are required for diverted materials (CCR section 18733.4(d)).

Program Implementation

41 Please identify the City agency and hauler in the implementation schedule, pursuant to CCR section 18733.5(a). The task to begin bulky items collection is not complete. Tasks which reoccur need to indicate the frequency of occurrence. Please provide a revised schedule in the final draft.

Monitoring and Evaluation

42a Please explain what is meant by the annual evaluation of the waste characterization study. Does this mean the City will

perform an annual waste characterization study? Please identify the methods to evaluate the selected program, as required by CCR section 18733.6(a).

Please identify the following requirements of CCR section 18733.6(c)

b.
- written criteria which will be used to evaluate the effectiveness of the program,
- City agency responsible for monitoring the program,
- known monitoring and evaluation costs, and
- measures the City will take if a shortfall in attaining the objectives occurs.

VII. Education and Public Information Component

Implementation

43. Please identify the City agency and hauler in the implementation schedule, pursuant to CCR section 18733.5(a). Also, reoccurring tasks do not appear to be indicated. For example, the Awards program shows one awards event in 9/92 and is indicated as ongoing. How often will this occur? Please be sure tasks such as this indicate the frequency with which they will occur, as required by CCR section 18740(d)(3). Please provide a revised schedule in the final draft.

Monitoring and Evaluation

44a. Please identify known monitoring and evaluation funding requirements (CCR Section 18740(e)(4).

b. Some alternatives have shortfall measures identified; however, these measures do not include all the alternatives. Please identify shortfall measures for the entire selected program (CCR section 18740(e)(5)).

VIII. Disposal Capacity Component

45. This section appears to meet regulation requirements.

IX. Funding Component

46a. The funding component appears to identify all program costs and revenue sources for planning, development, and implementation. A summary of the estimated costs is shown in Tables 10-6. However,

the revenues sufficient to cover these costs have not been demonstrated. Section 10.1 briefly discusses revenue sources. Table 10-6 should include the projected amounts anticipated from these revenue sources so that sufficient funding can be demonstrated (CCR section 18746(c)). Please provide this in the final draft.

46b. The discussion regarding the county's contingency funding should include the anticipated amount which may be obtained from these various funding sources (CCR section 18746(d)).

X. Integration Component

47. It does not appear that the Integration schedule fully complies with the requirements of CCR Section 18748(b). The schedule should include the city agency and hauler identity. Also, the implementation schedule for the Education and Public Information Component should be included. Please provide these requirements in the final draft SRRE.