

Prepared for:

**City of Rawlins**  
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**Rawlins, WY 82301**

## ***Integrated Solid Waste Management Plan***



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12914-CE

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# Integrated Solid Waste Management Plan

## Table of Contents

<b>Section 1. Executive Summary .....</b>	<b>1</b>
1.1. Introduction.....	1
1.2. Purpose of the Integrated Solid Waste Management Plan (ISWMP) .....	2
1.3. Description of the Planning Area .....	2
1.4. Description of the Planning Process and Public Participation .....	3
1.5. Summary of the Contents of the Plan .....	3
<b>Section 2. Existing Solid Waste System.....</b>	<b>4</b>
2.1. Overview .....	4
2.2. Landfill.....	4
2.2.1. Facility Description .....	4
2.2.2. Capacity .....	4
2.2.3. Ownership, Operation, Permit Status .....	4
2.2.4. Budget, Rates and Funding.....	5
2.3. Transfer.....	5
2.4. Collection .....	5
2.5. Recycling.....	6
2.6. Composting .....	6
2.7. Construction & Demolition Waste .....	6
2.8. Electronic Waste.....	6
2.9. Household Hazardous Waste .....	6
2.10. Special Wastes (tires, dead animals, treated wood, other) .....	7
2.11. Promotion and Education .....	7
2.12. Regulations, Codes, Ordinances .....	7
<b>Section 3. Waste Volume Projections.....</b>	<b>8</b>
3.1. Overview .....	8
3.2. Current and Future Population and Economy .....	8
3.3. Current and Projected Quantities and Types of Disposed and Diverted Wastes..	8
<b>Section 4. Alternative Solid Waste Management Facilities and Services..</b>	<b>10</b>
4.1. Overview .....	10
4.2. Goals and Priorities .....	10
4.3. Description of Preliminary Alternatives .....	10
<b>Section 5. Selected Solid Waste Management Facilities and Services .....</b>	<b>19</b>
5.1. Overview .....	19
5.2. Landfill.....	19
5.3. Transfer.....	19
5.4. Collection .....	20

# Integrated Solid Waste Management Plan Table of Contents

5.5.	Recycling.....	20
	5.5.1. Residential Recycling Collection Options.....	20
	5.5.2. Commercial Recycling Collection Options .....	22
5.6.	Composting Alternatives.....	24
5.7.	Construction and Demolition Debris.....	25
5.8.	Household Hazardous Waste (HHW) .....	26
5.9.	Electronic Waste (E-Waste).....	27
5.10.	Special Wastes.....	27
5.11.	Public Policy Alternatives.....	28
5.12.	Promotion and Education Alternatives .....	31
5.13.	Funding Alternatives.....	32
5.14.	Evaluation of Alternatives .....	32
 <b>Section 6. Implementation Plan .....</b>		<b>45</b>
6.1.	Overview .....	45

## List of Tables

1. City of Rawlins Solid Waste Management Operations FY 2006-2007
2. Rawlins Area Population Estimates 2007-2025
3. Quantities of Waste Disposed in Tons by Source and Type at City of Rawlins Landfill 2007-2025
4. Quantities of Waste Recycled in Tons by Type 2005-2008
5. Rawlins Potential Quantities in Tons of Waste Diversion 2010-2016
6. Summary Comparison of Costs for Alternatives, City of Rawlins
7. New Residential Recycling Collection Program Options
8. New Commercial Recycling Collection Program Options
9. General Cost Ranges for Evaluation of Solid Waste Management Alternatives
10. General Time Frames for Evaluation of Solid Waste Management Alternatives
11. Solid Waste Management Facilities and Services Alternatives
12. City of Rawlins 20-Year Implementation Plan for Solid Waste Management

## List of Appendices

- |   |  |
|---|--|
| A | Economic Analysis, September 29, 2008  |
| B | Summary of Alternatives Cost Estimates |
| C | C&D Debris Diversion Ordinances        |
| D | Composting Animal Carcasses            |
| E | PAYT Case Studies                      |
| F | Resolution Approving ISWMP             |

# Integrated Solid Waste Management Plan

## City of Rawlins

### June 26, 2009

## Section 1. Executive Summary

### 1.1. Introduction

This Integrated Solid Waste Management Plan (ISWMP) has been prepared by Inberg-Miller Engineers in association with Kies Strategies, Bell & Associates, Inc. and Tabor Consulting Group. Development of the Plan has been accomplished with the direction and cooperation of the City of Rawlins.

This Plan identifies continuing and new services, which the City, working in partnership with recycling service providers, waste haulers and other interested parties, may offer to address the management of solid waste in the region. While it is understood that changes may occur during implementation, for the purposes of this Plan, the City intends to:

- Close the landfill for municipal solid waste (MSW). Transport MSW to the Casper Regional Landfill. Negotiate a long-term (10+-year) agreement with the City of Casper for disposal at the regional landfill.
- Re-permit the existing landfill to dispose of construction and demolition (C&D) waste in unlined cells. Implement a system to segregate and inspect C&D loads to meet Wyoming Department of Environmental Quality (WDEQ) screening criteria for unlined C&D landfills. Separate metal and wood from mixed C&D loads at the landfill for recycling.
- Expand and upgrade the existing baler building to operate as a transfer station to transport baled and bagged MSW to the Casper Regional Landfill. Staff facilities when open to manage the site, monitor waste disposal and recycling, and collect fees.
- Upgrade existing baler and/or purchase new baler equipped to compact and wrap MSW in plastic prior to transportation to the Casper Regional Landfill.
- Site a Recycling Center at the transfer station for residents and businesses. Maintain existing drop-site and add drop-sites in convenient locations.
- Investigate residential and commercial recycling collection options such as encouraging private collection, contracting with a hauler, or implementing a municipal collection program.
- Participate in the regional solid waste management programs and services provided through the Casper Regional Solid Waste Facility. Services include a once a year residential electronics and hazardous waste collection event, wood chips for animal carcass composting, and the option to participate in the City of Casper's once a year grinding of tree trimmings and clean wood for a flat fee.
- Enhance existing composting program for yard debris and clean wood waste by implementing programs to segregate untreated wood from mixed loads for grinding and composting. Research improvements to increase quality of products and distribution opportunities.
- Consider implementing new diversion and public policy alternatives such as franchised garbage and recycling collection service, a "Pay-As-You-Throw" variable rate policy, C&D recycling ordinance, and a landfill ban on cardboard.
- Provide an electronic waste collection program at the transfer station to support the Casper Regional Landfill ban on disposal and promote participation in an annual collection event offered through regional solid waste and recycling services.
- Collect lower hazard waste at the transfer station including paint, batteries, oil, and antifreeze.
- Investigate options for the disposal of animal carcasses including a special cell at the C&D landfill or composting

Solid waste management services as described in this Plan are projected to require approximately \$1,535,142 in Year One (2010) for transfer and landfill capital and operations costs. The average annual capital and operating costs of transfer and landfill during the first five years of operation are estimated at \$1,632,629 per year. Actual costs are highly dependent on program participation and volumes of wastes collected, and thus may be higher or lower than estimated.

Projected costs do not include estimates for expanded education and programs for recycling, composting, and construction and demolition debris recycling and reuse. These costs and program details will be developed for the City Council's consideration at the time implementation is considered.

The program is funded through tipping fees at the landfill and a monthly landfill utility fee charged to all residents and businesses. To offset any potential deficit that may result from implementing new services; provide stable, long-term funding for the solid waste system; and support the City's goal to promote and provide incentives to separate, reduce, reuse, recycle and compost, the following options may be considered for implementation:

- Continue to charge monthly landfill utility fees while working on operational and cost efficiencies. Increase fees as appropriate to cover the cost of new services.
- Continue to assess tipping fees for accepting waste at the landfill while working on operational and cost efficiencies. Increase fees as appropriate to cover the cost of new services.
- Identify loan opportunities, eligibility requirements, and funding cycles and prepare applications for special projects as time and resources allow.
- Identify grant opportunities, eligibility requirements, and funding cycles and prepare applications for special projects as time and resources allow. Consider hiring grants writer for solid waste and recycling grant applications and proposals.

This Plan also includes several efficiencies to reduce overall program costs. These include focusing on recycling collection and education to divert certain items from the waste stream; considering re-using some wastes where appropriate and convenient; promoting waste prevention; and utilizing partnerships with other organizations to conduct promotion and education activities.

## 1.2. Purpose of the Integrated Solid Waste Management Plan (ISWMP)

This Integrated Solid Waste Management Plan (hereafter ISWMP or "Plan") has been prepared as a road map to develop and implement an effective integrated solid waste management program specific to the conditions of the City of Rawlins. It was developed in fulfillment of the requirements of the Integrated Solid Waste Management Planning portion of Wyoming State Senate File 38 (§ 35-11-1901 through 1904), commonly referred to as the Solid Waste Management Legislation.

## 1.3. Description of the Planning Area

The City of Rawlins is located in Carbon County and serves as the County seat. The County, which encompasses 7,964 square miles, is situated in south-central Wyoming and borders the state of Colorado. The City of Rawlins is approximately 120 miles south of Casper. Interstate 80 approaches the City from the East and West and is a main avenue of transportation to and from the City.

The estimated 2007 population of the County is 15,490. Over 8,700 residents live in Rawlins. Other towns in Carbon County include Baggs, Dixon, Elk Mountain, Grand Encampment, Hanna, Medicine Bow, Riverside, Saratoga, and Sinclair. Unincorporated areas include Savery and Walcott.

#### 1.4. Description of the Planning Process and Public Participation

This ISWMP has been prepared by the Inberg-Miller Engineers team of consultants for the City of Rawlins. The consultants have worked closely with the City Council, the City Manager, staff, and members of the public to establish goals and priorities, identify alternatives for further study, and select reasonable alternatives for economic analysis.

Meetings with City staff were held on October 16, 2007, October 14, 2008, and July 24, 2008. Meetings with the City Council in public work sessions were held on March 17 and March 30, 2009. The local commercial haulers were present at the March 30, 2009 meeting. Members of City staff and City Council attended a field workshop at the City of Casper Balefill and City of Casper representatives on April 6, 2009. The City Council approved the ISWMP Plan at a special meeting on July 23, 2009.

A companion document to this Plan, *Economic Analysis, September 29, 2008* (Appendix A) discusses the need for improved management of solid waste in Rawlins, and evaluates in detail the preliminary alternatives to improve the solid waste management system including a detailed economic analysis.

Based on review and discussion of the detailed economic analysis prepared, the City chose preferred alternatives as the basis for development of this Plan. Cost adjustments have been made as the planning process has progressed. Population and tonnage assumptions have been updated and details of alternatives have been revised.

#### 1.5. Summary of the Contents of the Plan

This Plan identifies continuing and new services for the City, working in partnership with recycling service providers, waste haulers and other interested parties. In addition, this Plan addresses the management of solid waste. The Plan includes identification of existing solid waste practices, policies, and facilities; an assessment of needs; and program design, implementation, and monitoring recommendations. It covers essential aspects of solid waste management including collection, transfer, storage, disposal, recycling, promotion / education, organization / administration, and budgeting / financing.

## Section 2. Existing Solid Waste System

### 2.1. Overview

The Solid Waste Division of the Rawlins Public Works Department owns and operates a landfill and baler facility. The landfill is located 3 miles northeast of the City. In 1996, the City converted the standard trench fill operation to a balefill operation for municipal solid waste. At that time, a new building was constructed and a baler was installed. The conversion extended the life of the landfill an estimated 25 years. Materials are accepted for recycling at the landfill and the Rawlins Recycling Center. Two private companies offer waste collection from households and businesses.

### 2.2. Landfill

#### 2.2.1. Facility Description

The City of Rawlins operates a landfill and baler facility. A Mosley-Badger baler is located inside an 80' x 125' building. Municipal solid waste is dumped inside this building and pushed to a conveyor that feeds the baler. The baler produces bound units that are nearly 2 cubic-yards and weigh a little over one ton. The bales are stacked in prepared cells. Working cells are lined with a single-liner.

The landfill accepts waste from within the City and including the Town of Sinclair. The oil refinery in Sinclair has its own landfill. The types of waste received for disposal or recycling include residential, industrial, building construction, used motor oil, ash, large animals, tires, car bodies, large appliances, lead-acid and other household batteries, wood waste and yard debris. Scales are used to weigh incoming loads for disposal.

#### 2.2.2. Capacity

The City is permitted to operate the landfill on a 44.5-acre site. Current operations consume 25 acres leaving 19.5 permitted acres for expansion. As listed on the Solid Waste Facility Permit dated August 16, 1999, the total capacity of the landfill is 556,862 tons. Remaining capacity is currently estimated at 4 to 7 years.

Disposal data from fiscal year 2006-2007 indicates that a total of 20,761.54 tons of material was delivered to the landfill. Excluding household hazardous waste and bio-solids, 37% (7,752.27 tons) was municipal solid waste and 63% (12,597.62) was construction and demolition waste.

Expansion at the landfill is limited by the availability of land and the groundwater level. The City of Rawlins has been negotiating with the United States Department of Interior to lease or purchase 100 acres of adjacent property. This would allow for expansion of the landfill to the north. Negotiations have been impacted by concerns over the apparent groundwater contamination at the landfill. There is also a shortage of cover materials on the site for daily and final landfill covers.

Vertical expansion has been restricted by shallow groundwater in the area. Cell depth is limited to ten feet in order to maintain the required separation from groundwater.

#### 2.2.3. Ownership, Operation, Permit Status

The landfill and baler facility is owned by the City of Rawlins. It is operated by the Solid Waste Division of the Public Works Department. Six staff are involved in landfill operations including one supervisor, one foreman, three equipment operators, and a scale operator.

The Wyoming Department of Environmental Quality (WDEQ) issued a three-year extension of the Solid and Hazardous Waste Division Chapter 2 Permit, which was originally issued for the facility on August 22, 2001, extended on January 5, 2005, and was set to expire on August 22, 2007. The permit for the facility now extends through July 1, 2010.

**2.2.4. Budget, Rates and Funding**

The program is funded through tipping fees at the landfill and a monthly landfill utility fee charged to all residents and businesses. The tipping fee for MSW was \$60.00 per ton in 2008. The fee charged for disposing of C&D waste was \$7.10 per yard.

The actual year-to-date figures for FY 2006-2007 from the Solid Waste Fund show it cost \$612,115 to operate the landfill. Labor costs represent \$329,065 of the total and operational costs represent \$283,050. The total cost to operate the recycling center in 2007 was \$58,255 with \$38,920 in labor costs and \$19,335 in operational costs.

The table below presents a summary of the cost of solid waste management operations for FY 2006-2007.

**TABLE 1. City of Rawlins Solid Waste Management Operations, FY 2006-2007.**

	<b>Current Landfill Operations FY 07-08</b>
<b>Total Tons / Year</b>	20,350
<b>Total Landfill, Composting, Recycling and Special Wastes Operational Cost / Year</b>	\$ 670,370
<b>Operational Cost per Ton</b>	\$ 32.94

The City has an annual clean-up period when the landfill accepts C&D waste, yard debris, tree limbs, and brush at no charge from residents. The clean-up period lasts two to three months. During this time, there is still a charge for residential waste and C&D waste delivered by a hauler.

Landfill fees are also waived for waste generated by state highway and city street-improvement projects within the City limits.

**2.3. Transfer**

Currently there are no transfer facilities or activities. All waste is disposed of at the landfill.

**2.4. Collection**

Collection is done by private competitive contractors. Currently, two private haulers offer collection of household and business waste. Private haulers also collect construction and demolition waste. People can choose to contract with a private hauler or take their own waste to the landfill.

The City does not regulate collection or set rates. The establishment and collection of hauling fees is the responsibility of the contractor.

All haulers are required to obtain a license from the City to collect waste and pay an annual fee of \$250. The City of Rawlins Municipal Code contains rules and regulations to govern the operation of private haulers to promote health, safety, and general welfare.

## 2.5. Recycling

The landfill accepts all large metal objects (autos, refrigerators, stoves), lead-acid batteries, household and rechargeable batteries, and motor oil for recycling. The Rawlins Recycling Center, located at the Parks Department, accepts aluminum cans, newspapers, magazines and catalogs, #1 and #2 plastics, clear and brown glass, steel cans, office pack paper, computer and copier paper, and corrugated cardboard.

The Rawlins Recycling Center is a staffed facility that is open Tuesday through Friday from 9:00 a.m. until 6:00 p.m. and Saturday from 9:00 a.m. until 1:00 p.m. Recyclables are accepted free of charge from residents and businesses. The Center is located at the Parks Department. It consists of a small building with roll-up doors, a loading dock big enough for two trailers, and an office. Equipment includes two balers and a forklift. The balers are used for cardboard and plastic bottles.

Ark Regional Services in Laramie transports and markets the materials collected at the Recycling Center. Full gaylord boxes and baled material are loaded onto trailers provided by Ark. The trailers are staged at the Center and hauled to Laramie when they are full. The revenue from the sale of the recyclables is applied towards the cost of transportation. Metal collected at the landfill is marketed to S&S Tin Baling and the batteries are marketed to Interstate Batteries. Quantity and financial information about the recycling program is included in the Appendices.

A private individual collects cardboard from several businesses in the City. He is interested in expanding service to include more materials, increase the number of businesses he serves, and possibly provide residential service.

## 2.6. Composting

Tree limbs, branches, and yard debris are accepted at the Rawlins Recycling Center free of charge. A chipper is located at the Recycling Center, which shares space with the Parks Department. Tree limbs and branches are chipped at this location and made available free of charge. Yard debris is also composted at this location and made available free of charge. There is no water available for the composting process. Tree limbs and branches accepted at the landfill are burned approximately twice a year.

A private individual has recently started a vermicomposting program for food waste.

## 2.7. Construction & Demolition Waste

Construction and demolition waste is accepted at the landfill for disposal. Some metal is manually separated for recycling. Concrete is currently landfilled or stockpiled because the City does not have a crusher and the staff has not been able to find a vendor to cost effectively crush material.

## 2.8. Electronic Waste

Currently, there is no program to recycle electronic waste.

## 2.9. Household Hazardous Waste

Motor oil, lead-acid batteries, household and rechargeable batteries are accepted at the landfill. Materials are collected on a regular basis by outside entities such as Safety Kleen for recycling.

## 2.10. Special Wastes (tires, dead animals, treated wood, other)

Tires are accepted at the landfill and stockpiled. Many tires are full of dirt, which prohibits grinding or shredding. The City does not own a grinder or shredder; however, the tires are stockpiled and periodically picked up by a recycler. The costs to have the tires removed are not covered by user fees.

Dead animals are accepted at the landfill, baled, and buried with MSW.

## 2.11. Promotion and Education

Programs are promoted through the daily newspaper, public access television, and presentations to local groups such as the Lions Club and Rotary. The City also has a community relations program similar to the one in Casper. There is a flyer to promote the Rawlins Recycling Center. There is limited information listed on the City's website.

## 2.12. Regulations, Codes, Ordinances

The City of Rawlins Municipal Code contains rules and regulations governing the collection and disposal of waste. Chapter 8.08, Garbage and Refuse, can be found on the City's website at [www.rawlins-wyoming.com/Code/08.htm](http://www.rawlins-wyoming.com/Code/08.htm)

## Section 3. Waste Volume Projections

### 3.1. Overview

This Chapter of the Plan looks at the overall amount and types of waste generated in the Rawlins area. To provide a plan for the future, it is necessary to review waste characterization studies, population, and other data that affects waste generation. This will assist in determining how much solid waste needs to be handled, and what programs, policies, facilities, and other infrastructure are required for managing anticipated waste quantities.

### 3.2. Current and Future Population and Economy

The State of Wyoming Department of Administration and Information has projected an increase of 10.7%, or 630 people, for the Rawlins area by the year 2025.<sup>1</sup> The table below presents current population estimates and projects expected changes through the year 2025.

**TABLE 2. Rawlins Area Population Estimates, 2007 - 2025.**

	2007	2010	2013	2016	2019	2022	2025
Rawlins	8,685	9,063	9,327	9,467	9,618	9,641	9,613
Sinclair	405	423	435	441	449	450	448
Total Population	9,090	9,486	9,762	9,908	10,067	10,090	10,061

### 3.3. Current and Projected Quantities and Types of Disposed and Diverted Wastes

Waste tons for the City of Rawlins are projected based on tons delivered to the landfill in 2007 and multiplied by the increased population growth. The following table details the current and projected tonnage estimates by source and material type over the planning period.

**TABLE 3. Quantities of Waste Disposed in Tons by Source and Type at City of Rawlins Landfill, 2007 – 2025.**

Year	2007	2010	2013	2016	2019	2022	2025
MSW tons	7,753	8,090	8,325	8,451	8,586	8,606	8,581
C&D tons	12,598	13,146	13,528	13,732	13,951	13,984	13,943
Total Tons	20,350	21,236	21,854	22,182	22,537	22,590	22,524
Weekly MSW	149	156	160	163	165	165	165
Weekly C&D	242	253	260	264	268	269	268

According to the latest publication from the US EPA describing the national waste stream, organic materials are the largest component of municipal solid waste (MSW)<sup>2</sup>. Paper and paperboard account for 33 percent, with yard trimmings and food scraps accounting for 25 percent. Plastics comprise 12 percent; metals make up 8 percent; and rubber, leather, and textiles account for almost 8 percent. Wood follows at around 6 percent and glass at 5 percent. Other miscellaneous wastes make up approximately 3 percent of the MSW generated in 2007.

The same US EPA publication reports that the overall recycling and composting rate in the United States in 2007 was over 33 percent. Paper and paperboard recovery was over 54 percent, and 64 percent of

<sup>1</sup> Population for Wyoming, Counties, Cities, and Towns: 2000 to 2030, Wyoming State Department of Administration and Information, Economic Analysis Division, July 2008, <<http://eadiv.state.wy.us/pop/wyc&sc30.htm>>.

<sup>2</sup> Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2007, U.S. EPA, <http://www.epa.gov/osw/nonhaz/municipal/pubs/msw07-fs.pdf>.

yard trimmings were recovered. Metals (which include aluminum, steel, and mixed metal) were recycled at a rate of almost 35 percent.

The City of Rawlins Landfill accepts all large metal objects (autos, refrigerators, stoves), lead-acid batteries, household and rechargeable batteries, and motor oil for recycling. The Rawlins Recycling Center, located at the Parks Department, accepts aluminum cans, newspapers, magazines and catalogs, #1 and #2 plastics, clear and brown glass, steel cans, office pack paper, computer and copier paper, and corrugated cardboard. There is also some commercial collection of cardboard.

The following table details the quantities of recyclable materials collected from 2004 through 2008. The diversion percentage for 2007 was approximately 5% of the MSW generated.

**TABLE 4. Quantities of Waste Recycled in Tons by Type, 2005 – 2008.**

Year	2005	2006	2007	2008
Aluminum Cans	11.3	11.2	18.6	13.9
Steel Cans	2.0	2.4	3.6	3.4
Office Pack	15.4	15.9	34.5	32.2
Newsprint & Magazines	89.8	125.7	184.9	141.8
Cardboard	31.0	48.1	130.4	110.2
Glass	9.9	12.6	17.8	15.1
Plastic (1 & 2)	2.7	3.4	6.5	6.4
<b>Total Tons</b>	<b>162.1</b>	<b>219.4</b>	<b>396.2</b>	<b>323.1</b>

Expected diversion of materials from any future program can be estimated as a percentage of waste generation. The table below estimates the potential total amount of waste to be diverted using the estimated waste tonnage generated in 2010.

**TABLE 5. Rawlins Potential Quantities in Tons of Waste Diversion, 2010 to 2016.**

Year	2010	2013	2016
Waste Tons	21,236	21,854	22,182
<b>Expected Diversion Tonnage Amounts</b>			
5% diversion	1,062	1,093	1,109
10% diversion	2,124	2,185	2,218
15% diversion	3,185	3,278	3,327
20% diversion	4,247	4,371	4,436
25% diversion	5,309	5,463	5,546
30% diversion	6,371	6,556	6,655

## **Section 4. Alternative Solid Waste Management Facilities and Services**

### **4.1. Overview**

This Chapter of the Plan provides a description of potential goals and priorities, alternative solid waste systems, and planning level cost estimates for the alternatives.

### **4.2. Goals and Priorities**

The goals of an Integrated Solid Waste Management Plan (ISWMP) give direction for implementing programs to provide cost-effective and environmentally acceptable management and disposal options. The goals that have been determined by the City of Rawlins include the following:

- Operate an efficient, cost effective, reliable, and environmentally sound Integrated Solid Waste Management System now and in the future.
- Continue to comply with local, state, and federal solid waste laws and regulations to minimize risk and liability exposures.
- Maintain a funding structure that allows for progressive planning and solvency.
- Provide easily available and convenient recycling opportunities for residents and businesses.
- Educate and involve citizens in waste reduction and recycling efforts and in responsible waste management.
- Continue to build cooperative relationships among the City, waste collection and disposal companies, the agricultural and natural resource communities, school districts, fire districts, retailers, business groups, community organizations, the Conservation District, Wyoming Department of Environmental Quality, and other State and Federal agencies.
- Coordinate solid waste management planning and development efforts in cooperation with the City, unincorporated communities, citizens, commercial businesses, public institutions, collection services, and the state.

### **4.3. Description of Preliminary Alternatives**

This section provides a description of specific alternatives that the City of Rawlins considered for improving the solid waste management system. The alternatives were developed based on the expressed goals and policies of the City of Rawlins, review of existing conditions, and analysis of the key challenges facing the City. These alternatives were selected after consideration of many alternatives.

For the City of Rawlins, the following four (4) alternatives have been identified:

1. Construct and operate a transfer station. Haul baled and bagged municipal solid waste to the Casper Regional Landfill on flatbed trailers. Dispose of construction and demolition debris in the Rawlins Landfill in unlined cells.
2. Construct and operate a transfer station. Haul loose municipal solid waste to the Casper Regional Landfill in enclosed transfer trailers. Dispose of construction and demolition debris in the Rawlins Landfill in unlined cells.

3. Construct a new landfill with lined cells on the existing landfill site for municipal solid waste and construction and demolition debris.
4. Construct a new landfill with lined cells in a different location than the existing Rawlins Landfill for municipal solid waste and construction and demolition debris.

These alternatives are more fully described below. Key advantages and disadvantages of each alternative are described.

***Alternative 1: Transfer Baled and Bagged MSW to Casper Landfill; C&D Waste in Unlined Cells at Rawlins Landfill***

The City would expand and upgrade the existing baler building to operate a transfer station. A new baler would be utilized to compact municipal solid waste (MSW) prior to transportation to the Casper Regional Landfill. The new baler would be equipped to wrap the compacted waste in plastic. A flatbed trailer would be used to transport baled waste. The facility might also provide room for recycling drop-off, baling, and storage. Baled recyclables could also be loaded onto the trailers for transport to market.

The existing landfill would be converted to an unlined construction and demolition (C&D) landfill. Continuing to dispose of C&D debris in unlined cells would require inspection and segregation of C&D loads to meet Wyoming Department of Environmental Quality (WDEQ) screening criteria for unlined C&D landfills. For example, unacceptable material such as treated wood would need to be separated and properly disposed in a lined cell.

Some separation of C&D waste could occur to remove metal and wood for recycling.

Major Advantages

- Fewer operational changes needed for baler, transfer station and transportation operations compared to constructing and operating a lined landfill.
- Decreased permitting requirements for a transfer station compared to a lined landfill including no reporting of leachate generation, leachate inspections, liner inspections, no groundwater monitoring requirements (for the transfer station only).
- Lower one-time capital cost to design and construct a transfer station compared to ongoing capital expenditures for lining each new landfill cell.
- Reduced environmental liability to operate a waste transfer station and unlined C&D landfill compared to long-term risk of operating a lined landfill including damage to liners and groundwater contamination.
- Opportunity to participate in other regional solid waste management programs and services such as an annual electronics and hazardous waste collection event and access to reuse and recycling service at the Casper Regional Solid Waste Facility.
- An agreement with the City of Casper for disposal at the regional landfill would include a clause for guaranteeing waste disposal for a minimum of ten years. For debris resulting from natural disasters such as tornadoes, there would be guaranteed landfill space for disposal at Casper's Regional Landfill.

Major Disadvantages

- Operational changes including screening and segregating non-allowable materials from transport to the regional landfill and from disposal in the unlined C&D cells.

- Increased groundwater monitoring over that required a transfer station only to operate unlined C&D cells.
- No control of transportation costs such as fluctuating fuel prices and delays due to bad weather.
- Potential increase in repair and maintenance costs associated with the baler.

***Alternative 2: Transfer Loose MSW to Casper Landfill; C&D Waste in Unlined Cells at Rawlins Landfill***

The City would utilize the existing baler building as a transfer station, but would discontinue using the baler for Municipal Solid Waste (MSW). New equipment would include a front loader, stationary crane, and walking floor trailers. MSW would be loaded into the open top of a walking floor trailer for transportation to the regional landfill in Casper for disposal. The facility might also provide room for recycling drop-off and storage. Recyclables could also be loaded onto the trailers for transport to market.

The existing landfill would be converted to an unlined construction and demolition (C&D) landfill. Continuing to dispose of C&D debris in unlined cells would require inspection and segregation of C&D loads to meet Wyoming Department of Environmental Quality (WDEQ) screening criteria for unlined C&D landfills. For example, unacceptable material such as treated wood would need to be separated and properly disposed in a lined cell.

Some separation of C&D waste could occur to remove metal and wood for recycling.

Major Advantages

- Fewer operational changes needed for transfer station and transportation operations compared to constructing and operating a lined landfill.
- Decreased permitting requirements for a transfer station compared to a lined landfill including no reporting of leachate generation, leachate inspections, liner inspections, no groundwater monitoring requirements (for the transfer station only).
- Lower one-time capital cost for transfer station equipment compared to ongoing capital expenditures for lining each new landfill cell. No additional capital cost to expand existing baler building.
- Elimination of costs to operate and maintain baler system.
- Reduced environmental liability to operate a waste transfer station and unlined C&D landfill compared to long-term risk of operating a lined landfill including damage to liners and groundwater contamination.
- Opportunity to participate in other regional solid waste management programs and services such as an annual electronics and hazardous waste collection event and access to reuse and recycling service at the Casper Regional Solid Waste Facility.
- An agreement with the City of Casper for disposal at the regional landfill would include a clause for guaranteeing waste disposal for a minimum of ten years. For debris resulting from natural disasters such as tornadoes, there would be guaranteed landfill space for disposal at Casper's Regional Landfill.

### Major Disadvantages

- Operational changes including screening and segregating non-allowable materials from transport to the regional landfill and from disposal in the unlined C&D cells.
- Increased groundwater monitoring over that required a transfer station only to operate unlined C&D cells.
- Reduced efficiency in compaction of MSW resulting in more trips to Regional Landfill compared to baled waste alternative.
- No control of transportation costs such as fluctuating fuel prices and delays due to bad weather.

### ***Alternative 3: Construct New Landfill with Lined Cells for MSW and C&D Waste at the Existing Landfill Site***

The City would construct a new landfill for municipal solid waste (MSW) and construction and demolition (C&D) waste at the site of the existing Rawlins Landfill. New lined cells would be constructed with a leachate treatment system to treat the water collected from the lined cells. For the purposes of this alternative, C&D waste would not be disposed of in a separate, unlined landfill.

### Major Advantages

- Lower operational costs compared to hauling MSW to a regional landfill (avoids transportation costs and tipping fees charged by a regional landfill).
- Potential to accept waste from neighboring cities and towns such as Hanna, Saratoga, and others to stabilize tipping fees with economies of scale.

### Major Disadvantages

- Significantly increased permitting and construction costs. Construction of lined cells on existing site would require larger cells because of shallow groundwater that would limit the depth of cell excavation to gain maximum volume per square foot of liner.
- Significant operational changes for a lined landfill compared to current operations including increased training requirements and more complex job duties and responsibilities to manage, treat, and dispose of leachate from the lined landfill, for example.
- Increased permitting requirements including reporting of leachate generation, leachate inspections, liner inspections, additional groundwater monitoring requirements, and a public participation process for permitting a lined landfill.
- Higher capital cost to design and install liners and leachate treatment system compared to capital expenditures for a transfer station and equipment. Recurring costs to build additional lined cells in the future.
- Increased environmental liability compared to operating a transfer station, particularly for potential groundwater impacts if the liner is compromised.
- Less opportunities to participate in other regional solid waste management programs and services like collection events for electronics and hazardous waste.

#### ***Alternative 4: Construct New Landfill with Lined Cells for MSW and C&D Waste in New Location***

The City would construct a new landfill for municipal solid waste (MSW) and construction and demolition (C&D) waste at a different location than the existing Rawlins Landfill. New lined cells would be constructed with a leachate treatment system to treat the water collected from the lined cells. For the purposes of this alternative, C&D waste would not be disposed of in a separate, unlined landfill.

The viability of this option depends on the ability to procure land suitable for landfill construction and operations. The current location and adjacent lands are restricted by relatively shallow groundwater that would limit the depth of cell excavation to gain maximum volume per square foot of liner.

#### **Major Advantages**

- Lower operational costs compared to hauling MSW to a regional landfill (avoids transportation costs and tipping fees charged by a regional landfill).
- Potential to accept waste from neighboring cities and towns such as Hanna, Saratoga, and others to stabilize tipping fees with economies of scale.

#### **Major Disadvantages**

- Will require the search, negotiation and purchase or lease of new site. Construction of lined cells on existing or adjacent site would require larger cells because of shallow groundwater, and significantly increase development costs.
- Additional transportation costs from existing baler operation to new landfill, depending on location.
- Significant operational changes for a lined landfill compared to current operations including increased training requirements and more complex job duties and responsibilities to manage, treat, and dispose of leachate from the lined landfill, for example.
- Increased permitting requirements including reporting of leachate generation, leachate inspections, liner inspections, additional groundwater monitoring requirements, and a public participation process for permitting a lined landfill.
- Higher capital cost to design and install liners and leachate treatment system compared to capital expenditures for a transfer station and equipment. Recurring costs to build additional lined cells in the future.
- Increased environmental liability compared to operating a transfer station, particularly for potential groundwater impacts if the liner is compromised.
- Less opportunities to participate in other regional solid waste management programs and services like collection events for electronics and hazardous waste.

#### ***Additional Program Options***

In order to reduce landfill disposal of the solid waste stream, the following waste reduction and recycling options have also been identified:

- Composting Yard Waste and Wood Waste
  - Bulk haul yard waste to Casper and backhaul compost
  - Grind and haul to Casper and backhaul compost (purchase a grinder)
  - Compost on site (purchase necessary equipment and identify a water source)
- Wood Waste and Tires
  - Purchase a grinder/shredder
  - Lease a grinder/shredder
  - Cooperatively purchase a grinder/shredder with other jurisdictions
- C&D Waste
  - See above for wood waste
  - Continue current program for metal, look at going out for bid on collection service
  - Separate metal and wood from mixed C&D loads at the landfill
  - See below for reusable building materials
- Commercial Recycling
  - Encourage/support/promote private collection of recyclables from businesses, government offices, the hospital and other institutions/agencies
  - Contract with hauler to run a commercial recycling collection route
  - Purchase equipment and run a municipal commercial recycling collection route
- Residential Recycling
  - Set up a recycling depot for drop off of recyclables
  - Contract with hauler to run a residential recycling collection route
  - Purchase equipment and run a municipal residential recycling collection route
- Increase recycling education
  - Target schools
- Electronic Waste (E-Waste)
  - Start an electronic waste collection program at the transfer station
  - Bid or negotiate cooperative agreement with other jurisdictions for collection and recycling services
- Household Hazardous Waste (HHW)

- Collect lower hazard wastes including paint
  - Continue to partner with the Conservation District for collection events
- Medical Waste
  - Incineration or other existing and improved options for management
- Animal Carcasses
  - Investigate special cell at C&D Landfill, composting or incineration
- Reuse of Materials
  - Drop and swap at transfer station
  - Work with a local non-profit such as Habitat for Humanity to capture reusable building materials

### 3.1 Planning Level Economic Analysis of Alternatives

Order-of-magnitude pro forma cost estimates have been prepared to evaluate the financial impact of the waste transfer and disposal alternatives. They are only intended to show the estimated magnitude of costs of the alternatives and to compare relative costs between the alternatives and current operations. Actual costs are highly dependent on program participation and volumes of wastes collected, and thus may be higher or lower than estimated.

The estimated cost of services for Alternatives 1, 2, 3 and 4 are presented in the table below. Please see Appendix B for more detail on the cost estimates and assumptions.

**TABLE 6. Summary Comparison of Costs for Alternatives, City of Rawlins.**

	<b>Alternative 1 Transfer Baled and Bagged MSW to Casper Landfill; Unlined Cells for C&amp;D</b>	<b>Alternative 2 Transfer Loose MSW to Casper Landfill; Unlined Cells for C&amp;D at Rawlins Landfill</b>	<b>Alternative 3 Construct Landfill with Lined Cells for MSW and C&amp;D on Existing Site</b>	<b>Alternative 4 Construct New Landfill with Lined Cells for MSW and C&amp;D on BLM Site or Other New Location</b>
<b>Estimated Time to Implement</b>	1 – 2 Years	1 – 2 Years	3 – 5 Years	5+ Years
<b>Total Tons/Year (2010 for 1 &amp; 2; 2011 for 3 &amp; 4)</b>	MSW 8,090 C&D 13,146 21,236	MSW 8,090 C&D 13,146 21,236	21,545	21,545
<b>Total Capital Cost</b>	Baler Building Expansion: \$350,000  New Baler: \$443,750  MSW Transportation Capital: \$392,286  Unfunded Closure Costs: \$1,060,900  \$2,246,936	Transfer Equipment: \$300,000  MSW Transportation Capital: \$486,247  Unfunded Closure Costs: \$1,060,900  \$1,847,147	Permitting/Construction: \$6,307,571  Baler Building Upgrade: \$470,774  Unfunded Closure Costs: \$1,060,900  Future Cell Expansion (2018): \$6,826,115 (not included in total capital cost, but included in total cost/ton below-\$6,826,115 / 176,290 total tons=\$38.72 /ton)  \$7,839,245	Permitting/Construction: \$2,860,856  New Baler and Building: \$5,272,673  Unfunded Closure Costs: \$1,060,900  Future Cell Expansion (2020): \$2,181,907 (not included in total capital cost, but included in total cost/ton below-\$2,181,907 / 195,446 total tons=\$11.16 /ton)  \$9,194,429
<b>Annual Capital Cost</b>	Baler Building Expansion & Upgrade: \$98,761  MSW Transportation Capital: \$39,229  Unfunded Closure Costs: \$53,045 \$190,989	Transfer Equipment: \$30,000  MSW Transportation Capital: \$48,625  Unfunded Closure Costs: \$53,045  \$131,670	Permitting/Construction: \$855,074  Baler Upgrade: \$52,429  Unfunded Closure Costs: \$53,045  \$960,549	Permitting/Construction: \$318,935  Baler Upgrade: \$587,210  Unfunded Closure Costs: \$53,045  \$959,189

Continued next page

**TABLE 6. Summary Comparison of Costs for Alternatives, City of Rawlins, continued**

	<b>Alternative 1 Transfer Baled and Bagged MSW to Casper Landfill; Unlined Cells for C&amp;D</b>	<b>Alternative 2 Transfer Loose MSW to Casper Landfill; Unlined Cells for C&amp;D at Rawlins Landfill</b>	<b>Alternative 3 Construct Landfill with Lined Cells for MSW and C&amp;D on Existing Site</b>	<b>Alternative 4 Construct New Landfill with Lined Cells for MSW and C&amp;D on BLM Site or Other New Location</b>
<b>Annual Operations Cost</b>	MSW Transportation Operations: \$115,184  MSW Disposal: \$380,239  Transfer/C&D Landfill Operations: \$728,854  Envirobale Ops/Supplies: \$64,721  Closure Costs (C&D): \$55,154 \$1,344,152	MSW Transportation Operations: \$164,694  MSW Disposal: \$436,870  Transfer/C&D Landfill Operations: \$728,854  Closure Costs (C&D): \$55,154  \$1,385,571	Landfill Operations: \$754,507  Closure Costs: \$232,710    \$987,218	Landfill Operations: \$754,507  Closure Costs: \$68,531    \$823,039
<b>Total Cost/Ton (MSW&amp;CD)</b>	\$63.30	\$65.25	\$129.13	\$95.84

## Section 5. Selected Solid Waste Management Facilities and Services

### 5.1. Overview

The alternative selected to improve the City's solid waste management system for the next 20 years is Alternative 1: Transfer baled and bagged municipal solid waste (MSW) to Casper Regional Landfill and dispose of construction and demolition (C&D) waste in unlined cells at the existing Rawlins Landfill. This alternative was selected based on the expressed goals and policies of the City, review of existing landfilling and environmental conditions, and analysis of the key waste management challenges facing the City. This alternative was selected after consideration of many alternatives identified, screened, and evaluated by the City.

### 5.2. Landfill

The following alternative meets the Legislative requirements for 20 years of life for waste disposal.

- Close the Rawlins Landfill for MSW. Transport baled and bagged MSW to the Casper Regional Landfill.
- Re-permit the exiting landfill to dispose of C&D waste in unlined cells.
- Include a system to segregate and inspect C&D loads to meet Wyoming Department of Environmental Quality (WDEQ) screening criteria for unlined C&D landfills.
- Negotiate a long-term (10+-year) agreement with the City of Casper for disposal at the regional landfill.

The Casper Regional Solid Waste Facility provides a variety of regional solid waste management programs such as a once a year residential electronics and hazardous waste collection event, wood chips for animal carcass composting, and the option to participate in the City of Casper's once a year grinding of tree trimmings and clean wood for a flat fee. These services and others are described in more detail in the following sections.

### 5.3. Transfer

- Expand and upgrade the existing baler building to operate as a transfer station to transport baled and bagged MSW to the Casper Regional Landfill. Staff facilities when open to manage the site, monitor waste disposal and recycling, and collect fees.
- Upgrade the existing baler and/or purchase a new baler to compact municipal solid waste (MSW) prior to transportation to the Casper Regional Landfill. The baler would be equipped to wrap the compacted waste in plastic.
- Baled waste will be transported to the Casper Regional Landfill on a flatbed trailer. The City will contract for hauling.

The transfer station will be designed and permitted to include the following:

- An outdoor area to store yard waste such as branches, grass and leaves for composting
- An outdoor area to compost animal carcasses
- An outdoor area to store metals for recycling and clean wood for grinding
- Scale House
- An indoor area to sort, process, and store recyclable materials

#### 5.4. Collection

While it is understood that changes may occur during implementation, for the purposes of this Plan, the City and its partners will, at a minimum, maintain the current collection system as described in Section 2.4.

#### 5.5. Recycling

In order to reduce landfill disposal of the solid waste stream, several waste reduction and recycling options have been identified. While it is understood that changes may occur during implementation, for the purposes of this Plan, the City and its partners will expand on the existing services described in Section 2.5 to increase the diversion rate of recyclable material.

New activities that may be implemented are described in this section.

##### 5.5.1. Residential Recycling Collection Options

Recycling services can be provided to residents in many ways. A variety of options exists from drop-off areas to curbside collection. These services may be voluntary or mandatory. The City of Rawlins would continue to maintain and enhance the existing drop-off sites in the City.

Options for new activities include the following:

##### ***Option 1***

***Enhance Existing Drop Off Recycling Opportunities.*** Enhance drop-off recycling opportunities by accepting more materials, siting more locations in the City, and/or cooperatively siting depots, for example. Establish and operate a recycling drop-off at the site of the existing landfill including segregating, processing, and marketing recyclables, yard waste, electronics waste, scrap metal, and appliances.

##### ***Option 2***

***Curbside Collection Is Provided Through Contracted Services.*** Residents are responsible for placing their recyclables at curbside for collection on their assigned days. A contracted hauler(s) collects and transports the recyclables to an appropriate area market(s) or the existing recycling drop-off site or the main recycling area located at the existing landfill to sort, process, and store prior to marketing. The City may consider implementing a pilot project to gauge the interest, participation level, necessary outreach and education, labor and equipment requirements, processing and marketing options, and costs associated with curbside recycling. It is important to carefully plan any pilot project in order to track pertinent information to assist in planning future programs.

##### ***Option 3***

***Curbside Collection Is Provided Through Municipal Services.*** Residents are responsible for placing their recyclables at curbside for collection on their assigned days. A City employee(s) collects and transports the recyclables to the existing recycling drop-off site or main recycling area located at the existing landfill to sort, process, and store prior to marketing. The City may consider implementing a pilot project as described in *Option 2* above.

**All Options**

**Ongoing Evaluation.** Continue ongoing evaluation of recycling program efficiencies and improvements for changes in program design to achieve higher recycling or lower costs (improving sustainability). Factors to consider for improving cost-effectiveness include single stream, larger containers, less frequent collection, automation, and rate incentives, for example.

**Policy and Education/Outreach.** A variety of policy and education/outreach activities can influence participation in residential recycling. Following are some examples:

**Rate Incentives for Residential Recycling:** Require that garbage plus recycling cannot be more expensive than garbage service alone – perhaps by embedding recycling costs in the garbage fee for areas where services are offered by the same firms. Alternatively, require that specified recycling services be offered for free or at discounted rates (so that garbage and recycling is cheaper than garbage only).

**Provide Recycling Containers:** Purchase and distribute uniform recycling containers to all residents as part of the recycling program. The containers provide a convenient place to sort and store recycles for collection. They also provide an identity for the program and serve as a visible reminder to recycle.

**Other Incentives:** Implement incentive programs to encourage residents to recycle such as gift certificates, one-month free trash collection services, and/or other incentives.

New recycling collection programs that may be implemented for residents are described in the table below. Participation in recycling programs will be voluntary but encouraged with education and outreach. Expanded promotion and education programs can promote participation and proper separation for recycling and reuse.

**TABLE 7: New Residential Recycling Collection Program Options.**

<b>Type of Program</b>	<b>Short Term (1-10 Years)</b>	<b>Long Term (11-20 Years)</b>	<b>Types of Materials Collected</b>	<b>Service Provider</b>
Drop Off at Locations in the City and the Existing Landfill	Yes	Yes	Expand types of material accepted which currently includes: Paper, Cardboard, Aluminum Cans, Glass Bottles & Jars, Plastics #1&2, Steel and Tin Cans, Yard Debris, Metals, Tires	Municipal
Curbside Collection	Yes	Yes	Cardboard, Paper, Aluminum Cans, Glass Bottles & Jars, Plastics #1&2, Steel and Tin Cans, and Yard Debris	Contractor or Municipal

Cities and towns that choose to enter into an agreement to dispose of waste at the Casper Regional Solid Waste Facility will be eligible to take advantage of new regional solid waste services. New regional solid waste services will include access free of charge to the recycling drop-off area at the Casper Regional

Solid Waste Facility for vehicle and rechargeable batteries, electronic waste, metals, hazardous waste, cooking oil, used oil, plastics numbers 1 through 7, cardboard, white paper, magazines, aluminum cans, yard waste, fluorescent light bulbs, and newspapers. In addition, residents of cities and towns participating in the regional program may use the Special Waste Reuse Shop and Solid Waste Reuse Area at the Casper Regional Solid Waste Facility.

### 5.5.2. Commercial Recycling Collection Options

Commercial waste can be a significant portion of the waste stream. Due to the large amounts of materials generated from commercial businesses, large waste and recycling containers are needed to accommodate materials. It is more convenient to provide designated containers adjacent to the commercial business (i.e., cardboard container next to convenience market) to accommodate the large amount of materials generated and make it convenient for businesses to participate in the recycling program. Participation can be voluntary or mandatory.

The options for the City include the following:

#### ***Option 1***

**Encourage/Support/Promote Private Collection.** Private companies and non-profit organizations provide collection of recyclables in some areas including the City of Rawlins. These companies generally provide containers and collection of materials. The City would identify private collection companies and promote the services to businesses. Businesses are responsible for negotiating/coordinating service and placing their recyclables in designated collection containers, typically located adjacent to their building. A private hauler collects and transports the recyclables to an appropriate processing facility.

#### ***Option 2***

**Collection Is Provided Through Contracted Services.** Businesses are responsible for placing their recyclables in a designated collection container, typically located adjacent to their building. A contracted hauler collects and transports the recyclables to an appropriate processing facility or the existing drop-off site or main recycling area located at the existing landfill to sort, process, and store prior to marketing.

#### ***Option 3***

**Collection Is Provided Through Municipal Services.** Businesses are responsible for placing their recyclables in a designated collection container, typically located adjacent to their building. A City employee(s) collects and transports the recyclables to the existing drop-off site or main recycling area located at the existing landfill to sort, process, and store prior to marketing.

#### ***All Options***

**Continue Ongoing Evaluation.** Continue ongoing evaluation of recycling program efficiencies and improvements for changes in program design to achieve higher recycling or lower costs (improving sustainability). Factors to consider for improving cost-effectiveness include larger containers, less frequent collection, automation, and rate incentives, for example.

**Policy and Education/Outreach.** A variety of policy and education/outreach activities can influence participation in commercial recycling. Following are some examples:

Rate Incentives for Commercial Recycling: Require that garbage plus recycling cannot be more expensive than garbage service alone – perhaps by embedding recycling costs in the garbage fee for areas where services are offered by the same firms. Alternatively, require that specified recycling services be offered for free or at discounted rates (so that garbage and recycling is cheaper than garbage only).

Recycling in City Owned and Operated Buildings: Require that all City-owned and operated buildings set-up and maintain recycling programs for designated recyclable materials.

Multi-Resource Audits for Businesses: Offer waste audits to businesses to identify waste streams and make recycling program recommendations. Waste audits can help develop tailored recommendations to increase recycling and reduce costs. Instead of waste audits only, work with energy utilities, water utilities and others to provide audits that help save multiple resources and save costs for the audits and provide a more useful combined audit for buildings and businesses.

Business Recycling Recognition Program: Recognize businesses that set-up and maintain successful recycling programs. Establish criteria for recognition program and consider partnering with local business groups such as the Chamber of Commerce to promote and present the awards. Consider coordinating recognition program with waste audits described above.

Leases with Recycling Clauses: Encourage or require buildings to incorporate recycling requirements for tenant businesses or units into leases. This is a particularly good tool for public projects.

Mandatory Business Recycling Service: Require buildings or businesses to keep designated recyclable materials separate from wastes.

Mandatory Recycling / Diversion Goals for Businesses: Require buildings / businesses to meet recycling or diversion goals.

Small Business Recycling Services: Offer similar curbside collection to small businesses as that offered to residents for those businesses that produce the same type and amount of materials as residents, those receiving garbage service in cans/containers (or non-dumpsters), and/or those convenient to residential recycling routes.

Public Areas and Events Recycling: Provide outreach, centralized drop-off recycling, and/or recycling containers near garbage containers for parallel access. Education, financial incentives, and equal convenience for recycling and garbage service are key to encouraging recycling.

Contracted Processing: Continue current marketing of recyclables through contracted services.

Municipal Processing: Construct Materials Recovery Facility (MRF) for on-site sorting, processing, and storage prior to marketing. Transport recyclables to brokers and/or end users.

Reuse: Research possible waste prevention and reuse opportunities such as periodic “swap days” or maintain space for reusable items. Develop a C&D reuse area to collect reusable building materials.

New recycling collection programs that may be implemented for businesses are described in the table below. Participation in recycling programs will be voluntary but encouraged with education and outreach.

**TABLE 8: New Commercial Recycling Collection Program Options.**

Type of Program	Short Term (1-10 Years)	Long Term (11-20 Years)	Types of Materials Collected	Service Provider
Curbside Collection	Yes	Yes	Paper and Cardboard	Private, Contractor, or Municipal

5.6. Composting Alternatives

The City may improve services described in Section 2.6 to increase the diversion rate of yard waste, wood waste, and other organic, compostable materials. The City would continue current composting operations and enhance services to include clean wood waste and food waste. Composting of animal carcasses on-site may also be considered using wood chips as cover and to assist in the decomposition process. The City may also improve the quality and quantity of compost products for marketing.

The options for the City include the following:

- Segregate Wood Waste: Implement a system to segregate clean (untreated) wood waste from mixed MSW and C&D loads. Separate wood for grinding and composting. Pursue options such as space for storing surplus wood (and other reusable building materials) for donation/discount sale.
- Stumps and large tree trunks and limbs: Pursue options such as purchase of a wood splitter and provide chopped firewood for a fee at the transfer station.
- Food Scraps: Separately collect from restaurants and produce markets for composting.
- Dead Animals: Implement a composting program for animal carcasses.
- Gypsum: Segregate and compost or process for land application.
- Compost Products: Suggestions for marketing compost products include:
  - a. Establish a program to sell finished compost and wood chips;
  - b. Research and evaluate composting technology improvements to increase quality of products for give-away and purchase;
  - c. Purchase equipment to produce increased volumes of cleaner, competitive products and;
  - d. Research expanded collection and distribution opportunities.

Cities and towns that choose to enter into an agreement to dispose of waste at the Casper Regional Solid Waste Facility will be eligible to take advantage of new regional solid waste services. These services include Casper's "pound for pound" program where one pound of tree branches, grass, or leaves dropped off at the Casper Regional Solid Waste Facility will result in a coupon, good for one year, for one pound of compost or wood chips free. There would also be the opportunity for participating cities and towns to take advantage of the City of Casper's once a year grinding of tree trimmings and clean wood provided for a flat fee.

## 5.7. Construction and Demolition Debris

The existing landfill would be converted to an unlined construction and demolition (C&D) landfill. Some separation of C&D waste could occur to remove metal and some types of wood for recycling. The landfill operations will need to meet Wyoming Department of Environmental Quality (WDEQ) screening criteria for unlined C&D landfills, so inspection and segregation of C&D loads will need to occur. This may occur at the scale house or at the unlined C&D cell.

For example, unacceptable material such as treated wood will need to be separated and properly disposed. Most non-acceptable items are allowed to be hauled together and received at the Casper Regional Landfill. However, some items, such as creosote treated wood like railroad ties, would need to be hauled as a separate load to the Casper facility.

The City and its partners will improve existing services for construction and demolition debris recycling/disposal at the C&D landfill and transfer station as described above and in Section 2.7.

New activities to be implemented may include the following:

- Separate metal and wood from mixed C&D loads at the C&D landfill. Consider issuing bids for metal collection service and recycling.
- Implement a new diversion policy for C&D waste recycling.
- Develop a C&D reuse area to collect reusable building materials. Consider working with Habitat for Humanity to establish a Re-Store for reusable building materials.
- Enhance education using expanded promotion and education programs to promote proper separation for recycling and reuse. Target industry associations and organizations such as the Associated Builders and Contractors and Associated General Contractors.

### C&D Recycling Policy

Expanded waste management is needed for generators of construction and demolition waste in order to increase significant recovery of items in the waste stream with diversion potential including clean wood, cardboard, scrap metal, concrete, asphalt and aggregate. US EPA sources indicate that these materials comprise an estimated 58% of the C&D waste stream by weight<sup>3</sup>.

Increased recovery may be accomplished through the implementation of a C&D recycling ordinance. Specific policy components in a C&D recycling ordinance would include:

- Mandate recycling by builders of substantial projects - for example, the C&D recycling ordinance would apply to;
  - Residential construction projects with an estimated project cost of \$50,000 or more
  - Residential demolition/renovation projects with an estimated cost of \$25,000 or more
  - Any commercial or industrial projects (new construction, remodel or renovation) with an estimated value of \$50,000 or more

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<sup>3</sup> "Construction & Demolition Waste Diversion Baseline Information & Gap Analysis" prepared for the Boulder County Zero Waste effort, Gracestone, Inc. (with LBA Associates), November 2008 (Table 1 aggregate of cardboard, metal, aggregate, concrete, asphalt and clean wood waste composition in multiple C&D waste streams throughout U.S.).

- Require builders to divert a minimum of 30%, for example, of each project's total waste stream by weight with the following steps;
- Builder pays a deposit to the City (at the time of obtaining a C&D permit) – for example, a deposit of 1% to 3% of project value with a cap of \$15,000
- Builder brings all source-separated clean wood, metals, cardboard, concrete and asphalt to the landfill/transfer station - and obtains a weight ticket for each material
- Builder tips non-recycled waste at the C&D landfill - and obtains a weight ticket
- The City refunds deposit to builder once proof of minimum diversion has been submitted and substantiated with respective weight tickets
- Revenues from non-refunded deposits are expected to off-set labor costs

The policy can be expanded in the future when additional materials can reasonably be diverted in the area served by the City (i.e., shingles and drywall) and/or expanded to require greater diversion levels.

The City will need to consider the following when developing this policy:

- Coordination with building officials
- Need for scales at the transfer station/C&D landfill
- Staffing to review and verify submitted records, accept and refund deposits - it is expected that 0.05 FTE staff and 0.025 FTE management will be required for this task
- Enforcement to track unpermitted projects - estimated at 0.2 FTE during first two years of implementation (this labor could potentially be provided in part through the building departments)

Many communities in the U.S. have now successfully implemented similar C&D policies (and all of the known communities in the U.S. with similar C&D diversion policies utilize scales). Links to selected examples are provided in Appendix C.

#### 5.8. Household Hazardous Waste (HHW)

Cities and towns that are contracted with Casper's regional solid waste management program may participate in services provided by Casper including coordination of a once a year residential hazardous waste collection event, which will also include electronics. In addition, residents may drop off hazardous waste at the Casper Regional Solid Waste Facility.

The City of Rawlins may consider the following activities:

- Accept lower hazard wastes at the transfer station and/or C&D landfill such as paint. Identify markets and/or disposal options for materials or haul to the Casper Regional Facility for recycling or disposal.
- Partner with the Conservation District for HHW collection events.
- Participate in annual collection event in the City for household and small business hazardous waste offered by the City of Casper if choose to contract with Casper's regional solid waste management program.
- Enhance education through a promotion program that includes information about the following:
  - Use the least hazardous product to do the job

- Safe use and storage procedures
- Purchase only what is needed to help eliminate or minimize waste
- Give unused products to someone who might use it up
- Proper method of recycling and disposal

#### 5.9. Electronic Waste (E-Waste)

The City of Casper has recently banned electronic waste from the Casper Regional Landfill. As a result, the cities and towns that contract with the City for the regional solid waste management program must ban electronics including computers, monitors, keyboards, televisions, cellular telephones, and personal devices that contain hazardous material from the solid waste disposal stream. To help provide an option for disposal/recycling, the City of Casper will coordinate a once a year collection event in member cities and towns for residential electronics. Household and small business hazardous waste will also be accepted at the annual collection event. In addition, residents may drop off electronics at the Casper Regional Solid Waste Facility.

To increase the diversion rate of electronics and facilitate the landfill ban of the material, Rawlins may implement the following:

- Start an e-waste collection program at the recycling center, the site of the existing landfill or other convenient location.
- Bid or negotiate cooperative agreement with other jurisdictions for collection and recycling services.
- Participate in annual collection event in Rawlins for electronic waste offered by the City of Casper if choose to contract for the regional solid waste management program.
- Educate residents and businesses about collection opportunities.

#### 5.10. Special Wastes

The Casper Regional Solid Waste Facility will accept certain special wastes including small quantities of tires and dead animals in the waste stream. If not transported to a regional facility, animal carcasses must be disposed of at the landfill in a special cell or through composting.

Passively aerated static pile composting using wood chips has proved to be a viable method of managing animal carcasses. The practice requires space to construct the compost piles and takes from four to six months for decomposition and a year to make a useable end product. The process is effective if the animal carcasses are enveloped in chunky carbonaceous materials such as wood chips. The Cornell Waste Management Institute (CWMI) has done extensive research on the subject. CWMI is a program in the Department of Crop and Soil Sciences in the College of Agriculture and Life Sciences at Cornell University. Links to selected research projects conducted by CWMI are provided in Appendix D.

Regional solid waste management programs and services will be available to provide contracted cities and towns with alternative disposal options for special wastes such as tires and animal carcasses. The City of Casper will coordinate a once a year residential collection event in each city and town that will include electronics and hazardous waste. Casper would also provide wood chips when available to back haul to Rawlins for an animal carcass composting operation.

New activities for the City of Rawlins may include the following:

- Educate residents and businesses about proper locations and methods for disposal of tires and animal carcasses.
- Investigate options for the disposal of animal carcasses including composting, baling, and bagging for transport to the Casper Regional Solid Waste Facility.
- Monitor recycled tires markets. Consider purchase or lease a shredder/grinder if markets become available.

#### 5.11. Public Policy Alternatives

The City may consider implementing certain public policies to increase diversion as well as generator responsibility for waste. Some policies, such as the C&D diversion policies discussed in Section 5.7, and the franchise agreements and “Pay-as-you-throw” variable rate policies described below, may generate small revenue streams.

##### **Franchise Garbage and Recycling Collection Service**

A franchise waste collection system allows a jurisdiction to regulate rates and services by authorizing agreements with waste haulers to provide waste collection and recycling services to residents and/or businesses in a specific area. Services may be exclusive to one hauler in one service area, or non-exclusive citywide. Under these agreements, waste haulers would abide by specific service standards, rate control measures, and reporting requirements. The franchise waste collection system also provides the jurisdiction with tools for enforcement.

Franchised waste haulers are often selected through a competitive process. Waste haulers are requested to submit proposals for consideration. Criteria for selecting the best qualified waste hauler(s) include price, work plan, financial resources, references, experience, environmental record, and prior procurement and/or contract/agreement disputes.

Franchised waste haulers pay franchise fees to the regulating jurisdiction. The franchise fees can be a flat fee or a percentage of annual gross revenues. The fees can be used for administrative costs and costs associated with implementing needed programs within the franchise communities, such as residential and commercial recycling programs, additional household hazardous waste and electronic waste collection events, illegal dumping prevention and cleanup programs, and school recycling programs.

Benefits of a franchise system include:

- Uniform service standards
- Flexibility to implement programs to benefit the area such as curbside recycling
- Improved customer service
- Increased accountability
- Regulated rates charged by haulers

##### **Pay-As-You-Throw Policy**

“Pay-as-you-throw” (PAYT) (also known as unit pricing or variable-rate pricing) reflects a payment method imposed on trash collection and/or disposal by which generators are charged for the collection or disposal of waste based on the amount they throw away. Payment may include the cost of service for trash as well as recyclables and other materials for which a similar service is provided. The advantages of PAYT are many:

- Creates an incentive for waste generators to divert more waste from disposal - communities with PAYT have demonstrated a 15% to 16% reduction in disposed waste by weight<sup>4</sup>
- Creates an equitable pay scale for all generators
- PAYT can also generate the revenue needed to cover costs of solid waste management

Disadvantages can include illegal dumping during the first months of implementation. However, many rural communities that have implemented PAYT (such as those in Wisconsin and Iowa), found that education and enforcement largely mitigated this issue.

Types of PAYT systems vary, but generally feature:

- Bags purchased from the hauler (usually 30 gallons) - with pricing inclusive of all collection and disposal costs
- Tags or stickers purchased to put on generator-provided containers
- Punch cards, per-bag fees, per-container fees or similar mechanisms
- Hybrid systems - hauler may charge a flat fee to cover fixed costs and a variable rate to address varying quantities of waste generated
- Weight-based billing systems - requiring truck scales to weigh refuse at the generator source and at all collection points

The following may be considered when establishing a payment collection system:

- Staffing during restricted hours of operation (i.e., no access unless staff are present)
- Traffic flow and tipping areas located such that staff can determine and collect payments, and authorize tipping of all waste delivered
- Ability to tip both recyclables/organic materials and trash at transfer station or landfill
- Security to minimize unauthorized tipping of mixed wastes

Specific policy components in a new PAYT ordinance in the City could include:

- Working to establish or revise current licensing requirements to require all haulers (excluding self-haulers) of refuse to implement a variable, volume-based pay structure for residential and commercial customers (most commercial services are inherently volume-based);
- Requiring haulers to offer curbside collection of specified recyclables. Many communities throughout the country require refuse haulers to offer curbside recycling.
- Maintain a weight-based fee structure. The fee structure for self-haulers at the landfill should be consistent with commercial and public hauler requirements and create an incentive to divert recyclables and organics (i.e., accepted for no fee).

<sup>4</sup> "The Rural Dilemma: When to Charge Variable Rates," Lisa A. Skumatz, *World Wastes*, February 1998 and "Variable-rate or "Pay-as-you-Throw" Waste Management: Answers to Frequently Asked Questions, by Lisa A. Skumatz, Ph.D., The Reason Foundation, Policy Study 295, July 2002).

The City will need to consider the following when developing a new PAYT policy:

- Staffing to track receipts - it is expected that 0.1 FTE staff and 0.05 FTE management will be required for this task
- Enforcement to minimize/penalize illegal dumping activity (by generators) and proper charging of curbside collection requirements (by haulers)

Numerous communities in the U.S. have thriving PAYT programs. Selected PAYT case studies are provided in Appendix E.

### **Material Disposal Ban Policy**

The value of banning materials such as cardboard or yard debris from landfill disposal in the City relates to the relatively high quantity of these materials in the waste stream (US EPA estimates that cardboard is approximately 15% of the MSW stream<sup>5</sup>) and the relatively large amount of landfill space the material consumes. Additionally, during normal market conditions, materials such as cardboard are a high-value recyclable (earning over \$100/ton in the up market conditions experienced during much of 2007 and 2008).

Specific policy and program components in a new material disposal ban in the City would include:

1. Coordination with policy to charge for waste disposal.
2. Establishment of various options for collection of the materials, such as curbside collection and free if hauled to the recycling center or transfer station.
3. Requirement that all haulers (including self-haulers) remove and recycle visible banned material from both residential and commercial loads prior to disposal - all haulers can pass this requirement on to their customers.
4. Provision of education and outreach to both citizens and the private and public haulers regarding the disposal ban.
5. Establishment of a fee for non-compliant haulers (possibly twice a per-yard fee for self-haulers and \$25 to \$100/load for commercial haulers) and/or add the ability for the City to reject the load (however, load rejection is not preferred due to the consequence of illegal dumping).

The City will need to consider the following when developing a material disposal ban:

- Consistent market and adequate collection and recycling capability for the banned material.
- Staffing to enforce the ban.
- Enforcement of material disposal to be managed through fees charged or by rejecting loads.
- Education as key to implementation success.

Many communities in the U.S. have successfully banned various recyclables from disposal (Massachusetts bans C&D waste disposal, Wisconsin bans cardboard and Colorado bans whole tires) and many communities/counties ban individual materials (e.g., the City of Fort Collins, Colorado bans electronics collected curbside and imposes penalties on haulers). Known cardboard disposal bans, however, are implemented only at a state level to date.

<sup>5</sup> "Municipal Solid Waste in the United States: 2007 Facts & Figures", Table 19, EPA 530-R-08-010, November 2008.

Other public policy alternatives include:

- Contract Incentives: Award extra "points" or cost adjustments to give preference to bidders for City construction/demolition projects that propose to recycle more materials or use green building practices.
- Disposal Surcharges: Assess surcharges on disposal fees to be used to help fund recycling and composting efforts. Materials recycled/composted at the recycling center and transfer station should continue to be exempted from fees or accepted at reduced fees. In addition to providing funding, surcharges can provide incentives by increasing the cost of disposal and decreasing the relative cost of recycling.
- Grant Program for Recycling: Promote WDEQ offering grants to disposal facilities or transfer facilities to encourage recycling programs or infrastructure. The State can offer grants that are eligible only to communities reaching goals.
- Grant Program for Procurement: Promote WDEQ providing grants to cities, counties, communities, schools, non-profits for any additional cost for purchasing recycled content products. An option is if the cost for these products is a specified percentage more than the cost of comparable quality non-recycled content products.
- Discounted Tip Fee for Recycling Businesses / Jurisdictions: Provide discounted disposal fee at transfer station to set of businesses that recycle or process materials for recycling.
- Waste Reduction / Prevention: Ban sale of water bottled in single serving plastic containers. Ban use of plastic bags in grocery stores and large drug stores.
- Procurement Requirements: Provide incentives and tools beyond procurement memos and guidelines. Extra steps needed are policies and implementation tools, sample specifications, purchaser trainings, and local purchasing resources, for example. Target roads and transportation departments.

#### 5.12. Promotion and Education Alternatives

The following options can be considered by the City to continue and improve public education about solid waste management facilities and services and promotion of proper participation in waste management, recycling and composting programs.

- Create a new position at the City for a Recycling Coordinator to plan and manage the implementation of recycling, composting, and waste reduction programs including outreach and education.
- Continue promotion and education program as described in Section 2.11. Expand and enhance education and promotion programs to reflect changes in the program during implementation of the Plan.
- Develop campaigns and public outreach programs targeting specific issues such as litter reduction and waste prevention or other local priorities to increase the likelihood of desired community behavior change, such as not littering from your car.
- Coordinate education with financial incentives and equal convenience for recycling and garbage service as key to encouraging landfill diversion.
- Enhance media promotion through periodic news articles and TV/radio spots on targeted subjects such as what can be recycled and how; how to dispose / recycle special wastes; and environmental and economic impacts of alternatives.

### 5.13. Funding Alternatives

Solid waste management services as described in this Plan for waste transfer and landfill capital and operations costs are projected to require approximately \$1,535,142 in Year One (2010). The average annual costs of capital and transfer and landfill operations during the first five years are estimated at \$1,632,629 per year. Actual costs are highly dependent on program participation and volumes of wastes collected, and thus may be higher or lower than estimated.

Projected costs do not include estimates for expanded education and programs for recycling, composting, and construction and demolition debris recycling and reuse. These costs and program details will be developed for the City Council's consideration at the time implementation is considered.

The program is funded through tipping fees at the landfill and a monthly landfill utility fee charged to all residents and businesses. To offset any potential deficit that may result from implementing new services; provide stable, long-term funding for the solid waste system; and support the City's goal to promote and provide incentives to separate, reduce, reuse, recycle and compost, the following options may be considered for implementation:

- Continue to charge monthly landfill utility fees while working on operational and cost efficiencies. Increase fees as appropriate to cover the cost of new services.
- Continue to assess tipping fees for accepting waste at the landfill while working on operational and cost efficiencies. Increase fees as appropriate to cover the cost of new services.
- Identify loan opportunities, eligibility requirements, and funding cycles and prepare applications for special projects as time and resources allow.
- Identify grant opportunities, eligibility requirements, and funding cycles and prepare applications for special projects as time and resources allow. Consider hiring grants writer for solid waste and recycling grant applications and proposals.

### 5.14. Evaluation of Alternatives

This section provides an evaluation of potential alternatives described in this Chapter for solid waste management facilities and services over the 20-year planning period for the City of Rawlins. An evaluation of cost impacts to the City and to Users is provided to show the estimated magnitude of costs of the alternatives and to compare relative costs between each alternative. An assessment of the diversion potential of each preliminary alternative is also presented.

The alternatives are grouped by the following categories:

- Waste Collection, Processing, Transfer and Disposal Alternatives
- Recycling Collection, Processing and Marketing Alternatives
- Compost Alternatives
- Construction & Demolition Debris Recycling Alternatives
- Special Waste Alternatives
- Promotion and Education Alternatives
- Public Policy Alternatives
- Funding Alternatives

For the purpose of providing a general range of costs, the following evaluation criteria have been used:

**TABLE 9. General Cost Ranges for Evaluation of Solid Waste Management Alternatives.**

	<b>COST TO CITY (\$/t)</b>	<b>COST TO USERS (\$/t)</b>
Very Low (VL)	\$0.50	\$0.50
Low (L)	\$7.00	\$12.00
Medium (M)	\$20.00	\$30.00
High (H)	\$55.00	\$70.00
Very High (VH)	\$100.00	\$120.00

For the purpose of providing a general time frame for implementation, the following criteria have been used:

**TABLE 10. General Time Frames for Evaluation of Solid Waste Management Alternatives.**

<b>SHORT TERM</b>	<b>MEDIUM TERM</b>	<b>LONG TERM</b>
1 – 5 Years	6 – 10 Years	11 – 20 Years

The table below presents the description and evaluation of solid waste management alternatives under consideration. After review and selection of preferred alternatives by the City, an implementation plan will be prepared including time frame for implementation.

TABLE 11. Solid Waste Management Facilities and Services Alternatives

Alternative	Description	Cost to City	Cost to Users	Landfill Diversion Potential	Time Frame
<b>Waste Collection, Processing, Transfer and Disposal Alternatives</b>					
Collection	<ol style="list-style-type: none"> <li>1. Continue current self-haul system and private collection service.</li> <li>2. Negotiate a long-term (10+-year) agreement with City of Casper for disposal at the regional facility.</li> <li>3. Re-permit the existing landfill to dispose of C&amp;D waste in unlined cells. Implement a system to segregate and inspect C&amp;D to meet WDEQ screening criteria for unlined C&amp;D landfills.</li> <li>4. Expand and upgrade existing baler building to operate as a transfer station to transport MSW to the landfill in Casper. Staff facilities when open to manage the site, monitor waste disposal and recycling, and collect fees.</li> <li>5. Upgrade existing and/or purchase new baler equipped to compact and wrap waste in plastic prior to transport to Casper for disposal.</li> </ol>	M	M	L	Short & Ongoing
Transfer and Disposal	<ol style="list-style-type: none"> <li>1. Provide public education on environmental protection and liability risks of improper disposal.</li> </ol>	H	H	L	Short & Ongoing
Improper Disposal	<ol style="list-style-type: none"> <li>1. Provide public education on environmental protection and liability risks of improper disposal.</li> </ol>	L	L	L	Short

### Recycling Collection, Processing and Marketing Alternatives

<p>Recycling Centers</p>	<ol style="list-style-type: none"> <li>1. Site a Recycling Center at the transfer station for residents and businesses.</li> <li>2. Enhance education using expanded promotion and education programs to promote proper separation for recycling and reuse.</li> </ol>	<p>L – M</p>	<p>M</p>	<p>H</p>	<p>Short &amp; Ongoing</p>
<p>Residential Recycling</p>	<ol style="list-style-type: none"> <li>1. Investigate curbside collection options such as private collection, contracting with a hauler or offering municipal collection.</li> </ol>	<p>L – M investigation is low, implementation is medium.</p>	<p>M</p>	<p>H</p>	<p>Short</p>
<p>Commercial Recycling</p>	<ol style="list-style-type: none"> <li>1. Investigate collection options such as private collection, contracting with a hauler or offering municipal collection.</li> </ol>	<p>L – M investigation is low, implementation is medium.</p>	<p>L</p>	<p>H</p>	<p>Short</p>
<p>Small Business Recycling Services</p>	<ol style="list-style-type: none"> <li>1. Offer similar curbside collection to small businesses as that offered to residents for those businesses that produce the same type and amount of materials as residents, those receiving garbage service in cans/containers (or non-dumpsters), and/or those convenient to residential recycling routes.</li> </ol>	<p>L</p>	<p>L</p>	<p>M</p>	<p>Short</p>
<p>Rate Incentives for Residential and Commercial Recycling</p>	<ol style="list-style-type: none"> <li>1. Require that garbage plus recycling cannot be more expensive than garbage service alone – perhaps by including recycling costs in the garbage fee for areas where services are offered by the same firms.</li> <li>2. Alternatively, require that specified recycling services be offered for free or at discounted rates (so that garbage and recycling is cheaper than garbage only).</li> </ol>	<p>L</p>	<p>L</p>	<p>H</p>	<p>Short</p>

Require Recycling in City Owned and Operated Buildings	1. Require that all City-owned and operated buildings set-up and maintain recycling programs for designated recyclable materials.	M	L	H	Short
Business Recognition Program	1. Recognize businesses that set-up and maintain successful recycling programs. Establish criteria for recognition and partner with local business group to promote and present awards.	M	L	M	Medium
Public Areas and Events Recycling	1. Provide outreach, centralized drop-off recycling, and/or recycling containers near garbage containers for parallel access. Education, financial incentives, and equal convenience for recycling and garbage service are key to encouraging recycling.	L - M depending on whether or not the City is providing the service or requiring others to provide the service	L	M - H	Short
Regional Recycling	1. Participate in regional solid waste management programs and services provided through the Casper Regional Solid Waste Facility.	L	L	H	Short
Local End Uses	1. Research possible local uses successfully used by others for recyclables like crushed glass for use as road base and art projects.	L	L	H	Medium
Multi-Resource Audits for Businesses	1. Offer waste audits to businesses to identify waste streams and make recycling program recommendations. Waste audits can help develop tailored recommendations to increase recycling and reduce costs. Instead of waste audits only, work with energy utilities, water utilities and others to provide audits that help save multiple resources, save costs	M	L - M depending if customers take advantage of the "free" services or not	H	Medium

	for the audits, and provide a more useful combined audit for buildings and businesses.						
Leases with Recycling Clauses	1. Encourage or require buildings to incorporate recycling requirements for tenant businesses or units into leases. This is a particularly good tool for public projects.	L	L			M	Medium
Municipal Processing	1. Construct Materials Recovery Facility (MRF) for on-site sorting, processing, and storage prior to marketing.	H	M			H	Short
Mandatory Business Recycling Service	1. Require buildings or businesses to keep designated recyclable materials separate from wastes.	L – M depending on level of administration and enforcement	L			H if collection also required and markets available. Otherwise, do not do it.	Long
Mandatory Recycling / Diversion Goals for Businesses	1. Require buildings / businesses to meet recycling or diversion goals.	L	L			H	Long
Reuse	1. Set up periodic “swap days” or maintain space at the transfer station for reusable items.	L	L			M	Medium
<b>Compost Alternatives</b>							
Yard Debris (grass, leaves, brush and tree trimmings)	1. Maintain and improve existing composting program. Research options including hauling material to the Casper composting facility or purchasing necessary equipment and identifying a water source to compost at the existing landfill.	M – H	M – H			H	Short
	2. Research options for grinding/processing such as contracting for service or cooperatively purchasing equipment with other jurisdictions.						

Wood Waste	1. Segregate clean wood waste at the transfer station/landfill for grinding and composting.	L - M	L - M	H	Short
Stumps and large tree trunks and limbs	1. Pursue option to purchase a wood splitter to provide chopped firewood for sale.	L - M	L - M	H	Medium
Food Scraps	1. Separately collect from restaurants and produce markets for composting.	M - H	L - M	H	Long
Gypsum	1. Research composting or processing for land application programs.	L - M	L - M	M	Long
Compost Products	1. Establish a program to sell finished compost and wood chips. 2. Research and evaluate composting technology improvements to increase quality of products for give-away and purchase. 3. Purchase equipment to produce increased volumes of cleaner, competitive products. 4. Research expanded collection and distribution opportunities.	M	L	H	Short & Ongoing
Regional Composting	1. Participate in regional composting programs and services provided through the Casper Regional Solid Waste Facility's tipping fee such as the "Pound for Pound" program and once a year grinding service.	L	L	H	Short
<b>Construction &amp; Demolition Debris Recycling Alternatives</b>					
Wood Waste (construction and demolition debris, dimensional lumber, treated and untreated)	1. Separate wood from mixed C&D loads at the landfill. 2. Enhance outreach and education program to building community.	L - M depending on separation methods used	L - M	H	Short
Scrap Metal	1. Segregate at the landfill. Identify and arrange periodic collection for recycling. Track volumes.	L	L	M	Short

Reuse Area	<ol style="list-style-type: none"> <li>Pursue options such as space for storing surplus wood and metal (and other reusable building materials) for donation/discounted sale.</li> <li>Consider working with Habitat for Humanity to establish a Re-Store for reusable building materials.</li> </ol>	L – M	L – M	L – M	H	Medium
C&D Deposit Incentive	<ol style="list-style-type: none"> <li>When obtaining building permits, builders / developers pay a deposit incentive, assessed based on the type of building (commercial, multiple family, etc.), type of work (new construction vs. remodel), and square footage affected. The deposit is refunded if the builder demonstrates they brought materials generated to a "certified" C&amp;D Recycling Facility, or demonstrate they recycled at least 50% of materials.</li> </ol>	<p style="text-align: center;">M</p> <p>cost of staff to develop, implement and maintain program</p>	<p style="text-align: center;">L</p> <p>when spreading costs of program admin across all ratepayers; M – for developers who have dollars tied up</p>	H	H	Long
Targeted Education	<ol style="list-style-type: none"> <li>Enhance education using expanded promotion and education programs to promote proper separation for recycling and reuse.</li> <li>Target industry associations and organizations such as the Associated Builders and Contractors and Associated General Contractors.</li> </ol>	L	L	L	H	Short
<b>Special Waste Alternatives</b>						
Household Hazardous Waste (HHW)	<ol style="list-style-type: none"> <li>Collect lower hazard waste at the transfer station such as paint, batteries, oil, and antifreeze.</li> <li>Participate in annual collection event for HHW offered by the City of Casper as part of</li> </ol>	L – M	L – M	L – M	M	Short & Ongoing

	regional services. 3. Enhance education through a promotion program.					
Appliances	1. Continue to segregate at the transfer station and haul to Casper Regional Facility. Track volumes.	L	L	L	L	Short
Autos	1. Designate area for discarded autos or other vehicles. Arrange for periodic collection service and approved disposal/recycling with scrap metal if possible. Track volumes.	L	L	L	L	Short
Electronics (computers, monitors, TV's, and components)	1. Install a containment area for electronic waste at the transfer station. 2. Bid or negotiate cooperative agreement with other jurisdictions for collection and recycling services. 3. Participate in annual collection event for e-waste offered by the City of Casper as part of regional services.	L – M depending on agreement for recycling services.	L – M	L – M	M	Short & Ongoing
Tires	1. Educate residents and businesses about proper locations and methods for disposal of tires. 2. Monitor recycled tires markets. 3. Consider purchase or lease a shredder/grinder if markets become available.	L	L	L	M	Short & Ongoing
Dead Animals	1. Educate residents and businesses about proper locations and methods for disposal of animal carcasses. 2. Investigate special cell at C&D landfill. 3. Implement a composting program for animal carcasses or baling and bagging for transport to the Casper	L – M depending on disposal method.	L – M	L – M	M	Short

	Regional Solid Waste Facility. 4. Participate in regional solid waste management program for wood chips provided by Casper for composting dead animals.					
<b>Promotion and Education Alternatives</b>						
Recycling Coordinator	1. Create a new position at the City for a Recycling Coordinator to plan and manage the implementation of recycling, composting, and waste reduction programs including outreach and education.	M	L	H		Short
Community Outreach	1. Continue promotion through the local newspaper. 2. Produce fliers with recycling instructions, and how to dispose / recycle special wastes (include updated recycling instructions).	L – M	L	M		Short & Ongoing
Media Promotion	1. Periodic news articles on targeted subjects (what can be recycled and how; what can be burned and when; environmental and economic impacts of alternatives, for example).	L – M	L	M		Short & Ongoing
Web Promotion	1. Update website to promote programs and educate residents and businesses.	L	L	M		Short & Ongoing
<b>Public Policy Alternatives</b>						
Franchise Garbage and Recycling Collection Services	1. Establish a franchise waste collection system and authorize agreements with haulers to provide waste collection and recycling services.	M Staff time to administer and oversee the program	L – M depending on the rates and fees determined	H		Medium
PAYT / Variable Rates	1. Establish a variable, volume-based fee structure for collection rates and disposal fees.	M	M	H		Medium
Waste Reduction / Prevention	1. Ban sale of water bottled in single-serving plastic containers.	L – M depending upon programs selected	M	M		Long

	2. Ban use of plastic bags in grocery stores and large drug stores.					
Grant Program for Recycling	1. Promote WDEQ providing grants to disposal facilities or transfer facilities to encourage recycling programs or infrastructure. The State can offer grants that are eligible only to communities reaching goals. 1. Promote WDEQ offering grants to cities, counties, communities, schools, non-profits for any additional cost for purchasing recycled content products. An option is if the cost for these products is 5-10% more than the cost of comparable quality non-recycled content products.	VL	VL	M - H depending on level and type of investment	Short	
Grant Program for Procurement	1. Provide incentives and tools beyond procurement memos and guidelines. Extra steps needed are policies and implementation tools, sample specifications, purchaser trainings, and local purchasing resources, for example. Target roads and transportation departments.	VL	VL	L - M	Short	
Procurement Requirements	1. Award extra "points" or cost adjustments to give preference to bidders for City construction/demolition projects that propose to recycle more materials or use green building practices.	L	L	M	Medium	
Contract Incentives	1. Provide discounted disposal fee at landfill to jurisdictions or set of businesses that recycle or process materials for recycling.	L	L	H	Long	
Discounted Tip Fee for Recycling Businesses / Jurisdictions		L - M depending on set of businesses and jurisdictions	L	M	Medium	

Disposal Rate Increases	<p>1. Increase disposal fees to be used to help fund recycling and composting efforts. Materials recycled/composted at facility should continue to be exempted from fees or accepted at reduced fees. In addition to providing funding, increased disposal rates can provide incentives by increasing the cost of disposal and decreasing the relative cost of recycling.</p>	L assuming increased disposal rates are in excess of actual costs	L - M depending on how increased disposal rates apply	L - M	Long
Material Disposal Bans	<p>1. Banning recyclables like cardboard or yard waste from disposal can provide a significant boost to separation and diversion. Can ban broad lists or certain targeted materials.</p>	L	M	H - VH highly dependent on affordable and convenient alternatives to disposal in place, and possible costs for supporting those alternatives	Long
<b>Funding Alternatives</b>					
Landfill Utility Fees	<p>1. Continue to assess monthly landfill utility fees while working on operational and cost efficiencies.</p>	L	L	NA	Short & Ongoing
Tipping Fees	<p>1. Continue to assess tipping fees for accepting waste at landfill while working on operational and cost efficiencies.</p>	L	L	NA	Short & Ongoing
Loans	<p>1. Identify opportunities, eligibility requirements, and funding cycles and prepare applications for special projects as time and resources allow.</p>	L	L	NA	Short & Ongoing

Grants	<ol style="list-style-type: none"> <li>1. Identify opportunities, eligibility requirements, and funding cycles and prepare applications for special projects as time and resources allow.</li> <li>2. Consider hiring or contracting for grants writer for solid waste and recycling grant applications and proposals.</li> </ol>	L	L	NA	Short & Ongoing
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## Section 6. Implementation Plan

### 6.1. Overview

This Chapter describes the City of Rawlins Implementation Plan for the selected alternatives for solid waste management facilities and services over the 20-year planning period. It provides a timeline for implementing services over three time periods including one to five years, six to ten years, and eleven to twenty years.

This Integrated Solid Waste Management Plan is the overall framework for guiding solid waste management for the City of Rawlins for the next 20 years. Implementation of any specific alternative or project outlined in this Plan is subject to available funding and modification by the City. The City Council reserves the right to modify this Plan to meet the needs of the citizens of Rawlins and to be in compliance with all applicable laws and regulations.

The table below describes the alternatives selected for implementation. The alternatives are grouped in an implementation plan by the following categories:

- Baseline Service Levels
- Promotion and Education Alternatives
- Funding Alternatives
- New Program Alternatives: Years 1 to 5
- New Program Alternatives: Years 6 to 10
- New Program Alternatives: Years 11 to 20

**Table 12. City of Rawlins 20-Year Implementation Plan for Solid Waste Management.**

<b>SELECTED SOLID WASTE MANAGEMENT PROGRAMS AND SERVICES TIME FRAME FOR 20-YEAR IMPLEMENTATION City of Rawlins</b>	
<b>Baseline Service Levels</b>	
<b>ALTERNATIVE</b>	<b>DESCRIPTION</b>
Waste Disposal and Transfer	<ol style="list-style-type: none"> <li>1. Close the Rawlins Landfill for MSW. Transport MSW to the Casper Regional Landfill.</li> <li>2. Negotiate a long-term (10+-year) agreement with City of Casper for disposal at the regional facility.</li> <li>3. Re-permit the existing landfill to dispose of construction and demolition (C&amp;D) waste in unlined cells. Implement a system to segregate and inspect C&amp;D to meet WDEQ screening criteria for unlined C&amp;D landfills.</li> <li>4. Expand and upgrade the existing baler building to operate as a transfer station to transport bagged and baled MSW to the landfill in Casper.</li> <li>5. Upgrade existing and/or purchase new baler equipped to compact and wrap waste in plastic prior to transport to Casper for disposal.</li> <li>6. Staff facilities when open to manage the site, monitor waste disposal and recycling, and collect fees.</li> </ol>
Recycling Operations	<ol style="list-style-type: none"> <li>1. Continue operation of recycling drop-off at the Rawlins Recycling Center.</li> <li>2. Continue to support private commercial collection of cardboard.</li> <li>3. Continue to accept metal for recycling at the transfer station/C&amp;D landfill.</li> <li>4. Continue to research and evaluate expansion of types of recyclables accepted.</li> </ol>
Recycling Marketing	<ol style="list-style-type: none"> <li>1. Continue current marketing of recyclables through contracted services.</li> </ol>
Yard Debris (grass, leaves, brush and tree trimmings)	<ol style="list-style-type: none"> <li>1. Continue to accept yard debris at the Rawlins Recycling Center.</li> <li>2. Maintain and improve chipping and composting services.</li> </ol>
Hazardous Waste (HHW)	<ol style="list-style-type: none"> <li>1. Continue to accept lead-acid batteries, motor oil, and household and rechargeable batteries at the transfer station/C&amp;D landfill.</li> <li>2. Continue current marketing of materials through contracted service.</li> </ol>
Waste Collection	<ol style="list-style-type: none"> <li>1. Continue current self-haul system and private collection service.</li> </ol>
<b>Promotion and Education Alternatives</b>	
<b>ALTERNATIVE</b>	<b>DESCRIPTION</b>
Community Outreach	<ol style="list-style-type: none"> <li>1. Continue promotion through the local newsletter.</li> <li>2. Produce flyers with recycling instructions, and how to dispose / recycle special wastes (include updated recycling instructions).</li> <li>3. Enhance public education using expanded promotion and education programs to promote proper separation for recycling and reuse, reducing community litter and improper disposal, and participation in household and small business hazardous waste and electronic waste programs.</li> <li>4. Target industry associations and organizations such as the Association of Builders and Contractors and Associated General Contractors.</li> </ol>

Media Promotions	1. Periodic new articles on targeted subjects (what can be recycled and how; what can be burned and when; environmental and economic impacts of alternatives, for example).
Web Promotion	1. Update the City's website to promote programs and educate residents and businesses
Transfer Station/C&D Landfill	1. Update entry signs with current programs and fees.
<b>Funding Alternatives</b>	
<b>ALTERNATIVE</b>	<b>DESCRIPTION</b>
Landfill Utility Fees	1. Continue to assess monthly landfill utility fees while working on operational and cost efficiencies.
Tipping Fees	1. Continue to assess tipping fees for accepting waste at landfill while working on operational and cost efficiencies.
Loans/Grants	1. Identify opportunities, eligibility requirements, and funding cycles and prepare applications for special projects as time and resources allow. 2. Consider hiring grant writer for solid waste and recycling grant applications and proposals.
<b>New Program Alternatives: Years 1 to 5</b>	
<b>ALTERNATIVE</b>	<b>DESCRIPTION</b>
Recycling Centers	1. Site a Recycling Center at the transfer station for processing, storing, and marketing recyclables from residents and businesses.
Residential Recycling	1. Investigate curbside collection options such as private collection, contracting with a hauler or offering municipal collection.
Commercial Recycling	1. Investigate collection options such as private collection, contracting with a hauler or offering municipal collection.
Small Business Recycling Services	1. Offer similar curbside collection to small businesses as that offered to residents for those businesses that produce the same type and amount of materials as residents, those receiving garbage service in cans/containers (or non-dumpsters), and/or those convenient to residential recycling routes.
Rate Incentives for Residential and Commercial Recycling	1. Require that garbage plus recycling cannot be more expensive than garbage service alone – perhaps by including recycling costs in the garbage fee for areas where services are offered by the same firms. 2. Alternatively, require that specified recycling services be offered for free or at discounted rates (so that garbage and recycling is cheaper than garbage only).
Require Recycling in City Owned and Operated Buildings	1. Require that all City-owned and operated buildings set-up and maintain recycling programs for designated recyclable materials.
Public Areas and Events Recycling	1. Provide outreach, centralized drop-off recycling, and/or recycling containers near garbage containers for parallel access. Education, financial incentives, and equal convenience for recycling and garbage service are key to encouraging recycling.
Regional Recycling	1. Participate in regional solid waste management programs and services provided through the Casper Regional Solid Waste Facility.
Municipal Processing	1. Construct Materials Recovery Facility (MRF) for on-site sorting, processing, and storage prior to marketing.
Yard Debris (grass, leaves, brush and tree trimmings)	1. Maintain and improve existing composting program. Research options including hauling material to the Casper composting facility or purchasing necessary equipment and identifying a water source to compost at the existing landfill. 2. Research options for grinding/processing such as contracting for service or cooperatively purchasing equipment with other jurisdictions.

Wood Waste	1. Separate clean and untreated wood waste at the transfer station/C&D landfill for grinding and composting.
Compost Products	<ol style="list-style-type: none"> <li>1. Establish a program to sell finished compost and wood chips.</li> <li>2. Research and evaluate composting technology improvements to increase quality of products for give-away and purchase.</li> <li>3. Purchase equipment to produce increased volumes of cleaner, competitive products.</li> <li>4. Research expanded collection and distribution opportunities.</li> </ol>
Regional Composting	1. Participate in regional composting programs and services provided through the Casper Regional Solid Waste Facility such as the "Pound for Pound" program and once a year grinding service.
Wood Waste (construction and demolition debris, dimensional lumber, treated and untreated)	<ol style="list-style-type: none"> <li>1. Separate wood from mixed C&amp;D loads at the C&amp;D landfill.</li> <li>2. Enhance outreach and education program to building community.</li> </ol>
Scrap Metal	1. Segregate at the transfer station/C&D landfill. Identify and arrange periodic collection for recycling. Track volumes.
Household Hazardous Waste (HHW)	<ol style="list-style-type: none"> <li>1. Collect lower hazard waste at the transfer station/C&amp;D landfill such as paint, batteries, oil, and antifreeze.</li> <li>2. Participate in annual collection event for HHW offered by the City of Casper as part of regional services.</li> </ol>
Appliances	1. Continue to segregate at the transfer station/C&D landfill. Track volumes.
Autos	1. Designate area for discarded autos or other vehicles. Arrange for periodic collection service and approved disposal/recycling with scrap metal if possible. Track volumes.
Electronics (computers, monitors, TV's, and components)	<ol style="list-style-type: none"> <li>1. Install a containment area for electronic waste at the transfer station.</li> <li>2. Bid or negotiate cooperative agreement with other jurisdictions for collection and recycling services.</li> <li>3. Participate in annual collection event for e-waste offered by the City of Casper as part of regional services.</li> </ol>
Tires	<ol style="list-style-type: none"> <li>1. Monitor recycled tires markets.</li> <li>2. Consider purchase or lease a shredder/grinder if markets become available.</li> </ol>
Dead Animals	<ol style="list-style-type: none"> <li>1. Investigate special cell at C&amp;D landfill.</li> <li>2. Implement a composting program for animal carcasses or baling and bagging for transport to the Casper Regional Solid Waste Facility.</li> <li>3. Participate in regional solid waste management program for wood chips provided by Casper for composting dead animals.</li> </ol>
Recycling Coordinator	1. Create a new position at the City for a Recycling Coordinator to plan and manage the implementation of recycling, composting, and waste reduction programs including outreach and education.
Grant Program for Recycling	1. Promote WDEQ providing grants to disposal facilities or transfer facilities to encourage recycling programs or infrastructure. The State can offer grants that are eligible only to communities reaching goals.
Grant Program for Procurement	1. Promote WDEQ offering grants to cities, counties, communities, schools, non-profits for any additional cost for purchasing recycled content products. An option is if the cost for these products is 5-10% more than the cost of comparable quality non-recycled content products.

<b>New Program Alternatives: Years 6 to 10</b>	
<b>ALTERNATIVE</b>	<b>DESCRIPTION</b>
Business Recognition Program	1. Recognize businesses that set-up and maintain successful recycling programs. Establish criteria for recognition and partner with local business group to promote and present awards.
Local End Uses	1. Research possible local uses successfully used by others for recyclables like crushed glass for use as road base and art projects.
Multi-Resource Audits for Businesses	1. Offer waste audits to businesses to identify waste streams and make recycling program recommendations. Waste audits can help develop tailored recommendations to increase recycling and reduce costs. Instead of waste audits only, work with energy utilities, water utilities and others to provide audits that help save multiple resources, save costs for the audits, and provide a more useful combined audit for buildings and businesses.
Leases with Recycling Clauses	1. Encourage or require buildings to incorporate recycling requirements for tenant businesses or units into leases. This is a particularly good tool for public projects.
Reuse	1. Set up periodic "swap days" or maintain space at the landfill or new transfer station/C&D landfill for reusable items. 2. Pursue options such as space for storing surplus wood and metal (and other reusable building materials) for donation/discounted sale. 3. Consider working with Habitat for Humanity to establish a Re-Store for reusable building materials.
Stumps and large tree trunks and limbs	1. Pursue option to purchase a wood splitter to provide chopped firewood for sale.
Franchise Garbage and Recycling Collection Services	1. Establish a franchise waste collection system and authorize agreements with haulers to provide waste collection and recycling services.
PAYT / Variable Rates	1. Establish a variable, volume-based fee structure for collection rates and disposal fees.
Procurement Requirements	1. Provide incentives and tools beyond procurement memos and guidelines. Extra steps needed are policies and implementation tools, sample specifications, purchaser trainings, and local purchasing resources, for example. Target roads and transportation departments.
Discounted Tip Fee for Recycling Businesses / Jurisdictions	1. Provide discounted disposal fee at landfill to jurisdictions or set of businesses that recycle or process materials for recycling.
Year 10 ISWMP Update	1. Evaluate effectiveness of existing programs and measurement of results to date. 2. Evaluate planned programs and identify additional opportunities given current and projected conditions. 3. Prepare Updated Implementation Plan.
<b>New Program Alternatives: Years 11-20</b>	
<b>ALTERNATIVE</b>	<b>DESCRIPTION</b>
Waste Management Programs and Services	1. Implement selected programs and services as determined in Year 10 Updated Implementation Plan.
Mandatory Business Recycling Service	1. Require buildings or businesses to keep designated recyclable materials separate from wastes.
Mandatory Recycling / Diversion Goals for Businesses	1. Require buildings / businesses to meet recycling or diversion goals.
Food Scraps	1. Separately collect from restaurants and produce markets for composting.

Gypsum	1. Research composting or processing for land application programs.
C&D Deposit Incentive	1. When obtaining building permits, builders / developers pay a deposit incentive, assessed based on the type of building (commercial, multiple family, etc.), type of work (new construction vs. remodel), and square footage affected. The deposit is refunded if the builder demonstrates they brought materials generated to a "certified" C&D Recycling Facility, or demonstrate they recycled at least 50% of materials.
Waste Reduction / Prevention	1. Ban sale of water bottled in single-serving plastic containers. 2. Ban use of plastic bags in grocery stores and large drug stores.
Contract Incentives	1. Award extra "points" or cost adjustments to give preference to bidders for City construction/demolition projects that propose to recycle more materials or use green building practices.
Disposal Rate Increases	1. Increase disposal fees to be used to help fund recycling and composting efforts. Materials recycled/composted at facility should continue to be exempted from fees or accepted at reduced fees. In addition to providing funding, increased disposal rates can provide incentives by increasing the cost of disposal and decreasing the relative cost of recycling.
Material Disposal Bans	1. Banning recyclables like cardboard or yard waste from disposal can provide a significant boost to separation and diversion. Can ban broad lists or certain targeted materials.

# **Economic Analysis Integrated Solid Waste Management Plan City of Rawlins September 29, 2008**

## **Alternative Solid Waste Management Facilities and Services**

This Economic Analysis provides a description of potential goals and priorities, alternative solid waste systems, and planning level cost estimates for the alternatives. The analysis is consistent with the goals and requirements of the State of Wyoming Integrated Solid Waste Management Planning legislation. It forms the basis for development of an Integrated Solid Waste Management Plan (ISWMP) for the City of Rawlins.

## **Goals and Priorities**

The goals of an Integrated Solid Waste Management Plan (ISWMP) give direction for implementing programs to provide cost effective and environmentally acceptable management and disposal options. Potential goals that may be determined by the City of Rawlins include the following:

- Establish a cost effective and efficient system for managing the integrated solid waste management system.
- Provide cost effective and environmentally sound collection, transfer, and disposal of solid waste.
- Provide additional solid waste management services and facilities as needs arise over time.
- Obtain funding for these solid waste management services and facilities.
- Assure the financial solvency of all collection, transfer and disposal operations.
- Manage services and facilities to control risk and reduce regulatory liability and exposure.
- Comply with all local, state and federal solid waste laws and regulations.
- Minimize illegal dumping and inappropriate disposal of solid waste.
- Provide easily available and convenient recycling opportunities for residents and businesses.
- Promote and provide incentives including rate structures to separate, reduce, reuse, recycle and compost.
- Reduce landfill disposal of the solid waste stream through waste reduction, recycling, and composting to save costs and conserve resources.
- Educate and involve citizens in waste reduction and recycling efforts and in responsible waste management.
- Ensure that household hazardous waste and special wastes are handled, recycled or disposed of in a safe manner.
- Continue to build cooperative relationships among the cities, waste collection and disposal companies, the agricultural and natural resource communities, school districts, fire districts, retailers, business groups, community organizations, the Conservation District, Wyoming Department of Environmental Quality, and other State and Federal agencies.
- Increase public awareness of solid waste issues through educational and information opportunities.
- Coordinate solid waste management planning and development efforts in cooperation with the cities, unincorporated communities, citizens, commercial businesses, public institutions, collection services, and the state.

## Description of Preliminary Alternatives

This section provides a description of specific alternatives that the City may consider for improving the solid waste management system. The alternatives were developed based on the expressed goals and policies of the City, review of existing conditions, and analysis of the key challenges facing the City.

For the City of Rawlins, the following three (3) alternatives have been identified:

1. Construct and operate a transfer station. Haul baled municipal solid waste to the Casper Regional Landfill in transfer trailers. Dispose of construction and demolition debris in the Rawlins Landfill.
2. Construct and operate a transfer station. Haul loose municipal solid waste to the Casper Regional Landfill in transfer trailers. Dispose of construction and demolition debris in the Rawlins Landfill.
3. Construct a new landfill with lined cells in a different location than the Rawlins Landfill for municipal solid waste and construction and demolition debris.

These alternatives are more fully described below. Key advantages and disadvantages of each alternative are described.

### ***Alternative 1: Transfer Baled MSW to Casper Landfill; C&D in Unlined Cells at Rawlins Landfill***

The City would expand and upgrade the existing baler building to operate a transfer station. A baler would be utilized to compact municipal solid waste (MSW) prior to transportation to the Casper Regional Landfill. The baler would be equipped to wrap the compacted waste in plastic. A flatbed trailer would be used to transport baled waste. The facility might also provide room for recycling drop-off, baling and storage. Baled recyclables could also be loaded onto the trailers for transport to market.

The existing landfill would be converted to an unlined construction and demolition (C&D) landfill. Some separation of C&D waste could occur to remove metal and wood for recycling.

#### Major Advantages

- Extends life of existing landfill
- Avoids cost of lining new cells
- Baler discount would be applied to tipping fee at the Casper Regional Landfill
- Potential to sort out recyclables on tipping floor may result in higher diversion rate
- Potential space and labor to improve composting program

#### Major Disadvantages

- Added cost to transport waste to landfill for disposal
- Higher capital cost to expand and upgrade baler building for transfer operations

- Potential increase in labor costs to load bales onto flatbed trailer as compared to loading loose waste
- Potential increase in repair and maintenance costs associated with the baler

***Alternative 2: Transfer Loose MSW to Casper Landfill; C&D in Unlined Cells at Rawlins Landfill***

The City would utilize the existing baler building as a transfer station. Equipment would include a front loader, stationary crane, and walking floor trailers. Municipal solid waste (MSW) would be loaded into the open top of a walking floor trailer for transportation to the regional landfill in Casper for disposal. The facility might also provide room for recycling drop-off and storage. Recyclables could also be loaded onto the trailers for transport to market.

The existing landfill would be converted to an unlined construction and demolition (C&D) landfill. Some separation of C&D waste could occur to remove metal and wood for recycling.

Major Advantages

- Extends life of existing landfill
- Avoids cost of lining new cells
- Lower equipment costs compared to baling waste prior to transport
- Potential to sort out recyclables on tipping floor may result in higher diversion rate
- Potential space and labor to improve composting program

Major Disadvantages

- Added cost to transport waste to landfill for disposal
- Baler discount would not be applied to tipping fee at the Casper Regional Landfill
- May need to upgrade facility to be equipped with a push wall and load out tunnel

***Alternative 3: Construct New Landfill with Lined Cells for MSW and C&D***

The City would construct a new landfill for municipal solid waste (MSW) and construction and demolition (C&D) waste at a different location than the existing Rawlins Landfill. New lined cells would be constructed with a leachate treatment system to treat the water collected from the lined cells.

The viability of this option depends on the ability to procure land suitable for landfill construction and operations.

Major Advantages

- Avoids continued operations at existing landfill with groundwater contamination risks and lack of clay soils

- Few operational changes
- No transportation costs

#### Major Disadvantages

- Will require the negotiation and purchase or lease of additional land
- May require clay to be imported for liner base
- Cost to design and install liners and leachate treatment facilities
- Minimizes but does not reduce regulatory liability and exposure
- Increased closure costs

#### ***Additional Program Options for All Alternatives***

In order to reduce landfill disposal of the solid waste stream, several waste reduction and recycling options have also been identified. The following additional options may be applied to any selected disposal alternative:

- Composting Yard Waste and Wood Waste
  - Compost on site (purchase necessary equipment and identify a water source)
- Wood Waste and Tires
  - Purchase a grinder/shredder
  - Lease a grinder/shredder
  - Cooperatively purchase a grinder/shredder with other jurisdictions
- Construction and Demolition (C&D) Waste
  - See above for wood waste
  - Continue current program for metal, look at going out for bid on collection service
  - Separate metal and wood from mixed C&D loads at the landfill
  - Cooperatively purchase crusher for concrete and rubble (statewide)
- Commercial Recycling
  - Promote the Rawlins Recycling Center
  - Encourage/support/promote private collection of recyclables from businesses, schools, government offices, and institutions
  - Contract with a hauler to run a commercial recycling collection route
- Residential Recycling
  - Maintain and expand services at the Rawlins Recycling Center
  - Set up additional recycling depots in convenient locations
- Increase recycling education
  - Target schools
- Electronic Waste (e-waste)
  - Start an e-waste collection program at the Rawlins Recycling Center or the landfill/transfer station
  - Bid or negotiate cooperative agreement with other jurisdictions for collection and recycling services

- Household Hazardous Waste (HHW)
  - Collect lower hazard wastes including latex paint, batteries, oil and antifreeze
  - Partner with the Conservation District for annual collection events

**Planning Level Economic Analysis of Preliminary Alternatives**

To further evaluate the financial impact of the alternatives, an order-of-magnitude pro forma cost estimate has been prepared.

Please note that these are preliminary estimates only and are only intended to show the estimated magnitude of costs of the alternative and to compare relative costs between the alternatives. In order to prepare these cost estimates, certain assumptions have been made regarding the alternatives.

Current operations and landfill expenditures for FY 2006-2007 are shown in Table 1. A comparison of estimated costs for each alternative is presented in Table 2. A list of key assumptions for the cost estimates follows Table 2.

**TABLE 1. Current Operations and Expenditures, FY 2006 - 2007, City of Rawlins**

	<b>Current Operations FY 06-07</b>
<b>Tons MSW/Year</b>	7,753
<b>Tons C&amp;D/Year</b>	12,598
<b>Tons Other Separated Materials (tires, recyclables, HHW and Bio Hazard)</b>	411
<b>Total Tons/Year</b>	20,762
	<b>Expenditures FY 06-07</b>
<b>Solid Waste Fund</b>	Labor \$329,065  Operations \$283,050  \$612,115
<b>Recycling Center</b>	Labor \$38,920  Operations \$19,335  \$ 58,255
<b>Total Annual Costs</b>	\$670,370
<b>Operational Cost per Ton</b>	\$32.29
<b>Unfunded Closure Cost*</b>	\$1,000,000

\*Current closure liability of 25 acres @ \$40,000/acre = \$1,000,000.

TABLE 2. Comparison of Costs for Alternatives, City of Rawlins

	<b>Alternative 1: Transfer Baled MSW to Casper Landfill; Unlined Cells for C&amp;D at Rawlins Landfill</b>	<b>Alternative 2: Transfer Loose MSW to Casper Landfill; Unlined Cells for C&amp;D at Rawlins Landfill</b>	<b>Alternative 3: Construct New Landfill with Lined Cells for MSW and C&amp;D</b>
<b>Total Tons/Year</b>	MSW 7,800 C&D 13,000  20,800	MSW 7,800 C&D 13,000  20,800	   21,279 (2011)
<b>Total Capital Cost</b>	Baler Building Expansion: \$350,000  Baler Building Upgrade: \$443,750  MSW Transportation Capital: \$590,714  Unfunded Closure Costs: \$1,060,900  \$2,445,364	Transfer Equipment: \$300,000  MSW Transportation Capital: \$590,714  Unfunded Closure Costs: \$1,060,900  \$1,951,614	Permitting/Construction: \$3,027,009  Baler Building Upgrade: \$842,089  Unfunded Closure Costs: \$1,060,900  \$4,929,998
<b>Annual Capital Cost</b>	Baler Building Expansion & Upgrade: \$105,747  MSW Transportation Capital: \$60,844  Unfunded Closure Costs: \$44,842  \$211,433	Transfer Equipment: \$30,000  MSW Transportation Capital: \$60,844  Unfunded Closure Costs: \$44,842  \$135,686	Permitting/Construction: \$312,940  Baler Building Upgrade: \$81,805  Unfunded Closure Costs: \$45,876  \$440,620
<b>Annual Operations Cost</b>	MSW Transportation Operations: \$179,999  MSW Disposal: \$296,400  Transfer/C&D Landfill Operations: \$670,370  \$1,146,769	MSW Transportation Operations: \$179,999  MSW Disposal: \$327,600  Transfer/C&D Landfill Operations: \$670,370  \$1,177,969	   \$856,029
<b>Total Cost/Ton</b>	   \$89.05	   \$89.41	   \$60.93

*Key Assumptions for Cost Estimates*

1. Waste quantities and composition are based on tonnages by materials types reported by the City.
2. A 10% annual growth rate is assumed for MSW and C&D debris up to 2013; then a 3.5% annual growth rate is assumed.
3. A 15% recycling and recovery rate is assumed by 2015.
4. A 3% Consumer Price Index (CPI), or cost adjustment factor, is assumed.
5. Capital costs have a 10-year amortization and a cost of capital at 6%.
6. Closure and post-closure costs are calculated at \$40,000 per acre.
7. Baler compaction is assumed at 1,200 pounds per cubic yard.
8. Transport costs assume City purchase and operation of 2 tractors and 2 trailers.
9. Use of existing baler facility is assumed for transfer operations in Alternatives 1 and 2.
10. Alternative 3 assumes acquisition of adjacent Bureau of Land Management property at no cost.
11. Cost of disposal at Casper Landfill assumed at \$42.00 per ton loose, \$38.00 per ton baled.

**City of Rawlins**  
**Summary of Alternatives Cost Estimates**

**Alternative 1**

Transfer Baled MSW to Casper, C&D landfilled in Rawlins

System Changes	Capital Cost	Annual Capital Cost	Annual Ops Costs	\$ per ton	2015 Costs	2015 per ton
Baler Building Expansion	350,000					
Baler Upgrade	443,750	98,716		\$ 4.65	\$ 98,716	\$ 4.65
Unfunded Closure Costs	1,060,900	53,045		\$ 2.50	\$ 53,045	\$ 2.41
<b>Alternative Costs</b>						
Transportation of MSW	392,286	39,229	115,184	\$ 19.09	\$ 179,385	\$ 8.15
Disposal Cost at Casper LF (\$38 per ton)			380,239	\$ 47.00	\$ 443,719	\$ 52.90
<b>Operational Costs</b>						
Baler Facility and C&D Landfill			728,854	\$ 34.32	\$ 820,331	\$ 37.26
Envirobate Ops & supplies			64,721	\$ 8.00	\$ 72,845	\$ 8.68
C&D closure costs			55,154	\$ 4.20	\$ 62,076	\$ 4.72
<b>Total Costs</b>	2,246,936	190,989	1,344,152		\$ 1,730,117	
<b>MSW Tons (2010 tons)</b>	8,090				8,368	
<b>C&amp;D Tons (2010 tons)</b>	13,146				13,630	
<b>Total Waste Tons (MSW &amp; C&amp;D)</b>	21,236				22,018	
<b>Cost per waste ton (total cost / total tons)</b>			\$ 63.30		\$ 78.58	

	Total Cost	Total Tons	Per Ton
System Cost in 2010	\$ 1,535,142	21,236	\$ 63.30
System Cost in 2015	\$ 1,730,117	22,018	\$ 78.58
5 year average cost	\$ 1,632,629		\$ 70.94

**Alternative 2**

Transfer Loose MSW to Casper, C&D landfilled in Rawlins

System Changes	Capital Cost	Annual Capital Cost	Annual Ops Costs	\$ per ton
Transfer Station Equipment	300,000	30,000		\$ 3.71
Unfunded Closure Costs	1,060,900	53,045		\$ 2.50
<b>Alternative Costs</b>				
Transportation of MSW	486,247	48,625	164,694	\$ 26.37
Disposal Cost at Casper LF (\$38 per ton)			436,870	\$ 54.00
<b>Operational Costs</b>				
Transfer Station and C&D Landfill			728,854	\$ 34.32
C&D closure costs			55,154	
<b>Total Costs</b>	1,847,147	131,670	1,385,571	
<b>MSW Tons (2010 tons)</b>	8,090			
<b>C&amp;D Tons (2010 tons)</b>	13,146			
<b>Total Waste Tons (MSW &amp; C&amp;D)</b>	21,236			
<b>Cost per waste ton (total cost / total tons)</b>			\$ 65.25	

## City of Rawlins - Summary of Alternatives Cost Estimates, continued

### Alternative 3

Construct a 20 acre lined cell at the existing landfill site

System Changes	Capital Cost	Annual Capital Cost	Annual Ops Cost	\$ per ton
Permitting and Construction	6,307,571	855,074		\$ 39.69
Baler Building Upgrade	470,774	52,429		\$ 2.43
Unfunded Closure Costs	1,060,900	53,045	232,710	\$ 2.46
Closure Costs				\$ 10.80
<b>Operational Costs</b>				
Landfill Operations			754,507	\$ 35.02
<b>Total Costs</b>	7,839,245	960,549	987,218	
<b>Total Waste Tons in 2011</b>	21,545			
<b>Cost per waste ton</b>				<b>\$ 90.40</b>
<b>Future Cell Expansion (2018)</b>		6,826,115		<b>\$ 38.72</b>
<b>Cumulated SW tons (2010 to 2018)</b>		176,290		
<i>(This assumes the City will implement a reserve (sinking) fund to finance future cells)</i>				
<b>Total with Reserve</b>				<b>\$ 129.13</b>

### Alternative 4

Construct a new landfill on BLM Land

System Changes	Capital Cost	Annual Capital Cost	Annual Ops Cost	\$ per ton
Permitting and Construction	2,860,856	318,935		\$ 14.80
Baler and Equipment Building	5,272,673	587,210		\$ 27.26
Unfunded Closure Costs	1,060,900	53,045	68,531	\$ 2.47
Closure Costs				\$ 3.18
<b>Operational Costs</b>				
Landfill Operations			754,507	\$ 36.96
<b>Total Costs</b>	9,194,429	959,189	823,039	
<b>Total Waste Tons in 2011</b>	21,545			
<b>Cost per waste ton</b>				<b>\$ 84.67</b>
<b>Future Cell Expansion (2020)</b>		2,181,907		<b>\$ 11.16</b>
<b>Cumulated SW tons (2010 to 2020)</b>		195,446		
<i>(This assumes the City will implement a reserve (sinking) fund to finance future cells)</i>				
<b>Total with Reserve</b>				<b>\$ 95.84</b>

## Appendix C

### C&D Debris Diversion Ordinances

Boulder, Colorado - The City of Boulder enacted its "Green Points" program in 2007, which requires C&D diversion (along with other green requirements such as energy efficiency features in building) for Residential new construction, demolition, remodeling, and additions. Additional information is available at [www.bouldercolorado.gov/index.php?option=com\\_content&task=view&id=208&Itemid=489](http://www.bouldercolorado.gov/index.php?option=com_content&task=view&id=208&Itemid=489), including the Guideline Booklet, the Construction Waste Recycling Tracking Spreadsheet, and the Deconstruction Plan and Construction Waste Recycling Form. (Boulder County has also had a green building program ("Build Smart") since 2008, which targets recycling of residential construction, demolition, and remodeling debris - see [www.bouldercounty.org/lu/buildsmart](http://www.bouldercounty.org/lu/buildsmart)).

Long Beach, California - Implemented in 2007, Long Beach's policy requires a commitment for 60% diversion of C&D (with a maximum of 20% from inert material) as a condition of building or demolition permit approval. The requirement applies to all construction projects over \$75,000 and demolition projects over \$50,000. There is a minimum deposit of \$1,500 and maximum of \$50,000. More information is available at [www.ci.long-beach.ca.us/civica/filebank/blobdload.asp?BlobID=18963](http://www.ci.long-beach.ca.us/civica/filebank/blobdload.asp?BlobID=18963).

Portland, Oregon - Portland requires recycling on all construction projects with a value greater than \$50,000. A Pre-Construction Recycling Plan must be submitted as a condition for a building permit. Wood, cardboard, metal, land clearing debris and rubble are targeted. The program without a deposit, but can incur a penalty up to \$500 per violation - see [www.portlandonline.com/osd/index.cfm?c=41683](http://www.portlandonline.com/osd/index.cfm?c=41683).

## Appendix D:

### Composting Animal Carcasses

Pathogen Analysis of New York State Department of Transportation Road-Killed Deer Carcass Compost Facilities, <http://cwmi.css.cornell.edu/tirc.htm>

Composting Road Kill, <http://cwmi.css.cornell.edu/roadkillfs.pdf> (Separately Attached)

Mortality Composting, <http://cwmi.css.cornell.edu/composting.htm#mortalitycomposting>



# Cornell Waste Management Institute

Department of Crop & Soil Sciences  
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**Ellen Z. Harrison**  
**Mary Schwarz**

## Composting Road Kill

### Road Kill — Current Situation

Over 25,000 dead deer and numerous carcasses of other animals, such as raccoon, coyote and fox are managed annually by the New York State Department of Transportation (NYSDOT). NYSDOT maintains and operates a 15,656 mile highway system of interstates, expressways and collectors which comprises about 15 percent of New York State's (NYS) 111,000 miles of highway. The 25,000 dead deer managed annually by NYSDOT do not account for deer killed on county and local roads that must be managed by local highway departments.

Current disposal practices include contracting with service providers to pick up and dispose of the animals, dragging animals further off the road or placing them in pits and depressions off roadsides. These methods are becoming less acceptable as rural areas become more populated and there is increased concern for environmental quality. Water quality can be compromised when animals decompose on or below ground and it could become a public health issue as pets and people may come in contact with the carcasses. Collection services are costly. Contractors are paid between \$30 and \$125 per deer for pick-up and disposal. Landfills often either do not accept or restrict carcasses. Disposal options are thus limited.

### The Need: Consider Static Pile Composting

Composting provides an inexpensive alternative for disposal of dead animals in many cases. Composting animal carcasses is not new; chickens, pigs, calves, cows and even whales have been composted.

Passively aerated static pile composting in which piles are not turned and natural processes result in high temperatures is proving to be a viable method of managing carcasses. It is quick and simple, uses



equipment and materials used in daily road maintenance operations and is cost effective. This method helps protect ground and surface water by keeping the carcasses out of contact with water. Composting also reduces pathogens, nuisance to neighbors and odors in properly managed piles.

In many states, including NYS, mortality composting is a legal and accepted way of disposal. Composting and compost use can be accomplished in compliance with environmental regulations in many states, but check regulations before you start. The temperatures and microbial processes achieved during composting will kill or greatly reduce most pathogens, reducing the chance to spread wildlife disease. Properly composted material is an acceptable soil amendment for use where public contact is low, such as roadside projects.

### Regulations

In NYS, composting of any material, except sludges, generated by a private or public entity on their own property is exempt from regulation. This includes road killed animals that are collected and composted on the agency's land. However, the agency is responsible for



New York State  
Department of Transportation  
[www.nysdot.gov](http://www.nysdot.gov)

Cornell Cooperative Extension



### Why Compost Road Kill?

- ◆ Pathogen kill occurs in thermophilic composts
- ◆ Can be done any time of the year, even when the ground is frozen
- ◆ Can be done using common highway equipment and readily available materials
- ◆ Relatively odor free
- ◆ All sizes of animals can be composted
- ◆ Relatively low labor and management needed
- ◆ Low cost

siting and implementing composting practices that do not cause air or water pollution or create a general nuisance. Use of the end product is not subject to regulation in NYS, however it is recommended that the product be used in applications with low public contact such as roadside revegetation projects so that an unknowing person would be unlikely to come into contact with the compost.

### Carcass Handling

For proper handling of carcasses, and to ensure worker health and safety, please refer to NYSDOT Safety Bulletin on Handling Animal Carcasses (see Common Questions on page 8).

### Composting

Static pile composting of dead deer, bear, moose, raccoon, fox and more is a practice that can fit into the daily operations of those responsible for road maintenance. Road managers have all the components for successful composting: trained personnel,

equipment, wood chips and the animals killed by vehicles. The practice requires space to construct the compost piles and takes from four to six months for the animals to decompose and a year to make a useable end product. Many people are skeptical that road kill composting will manage road kill but become convinced when they see it working.

Static pile mortality composting is an easily managed technique. Air flow through the pile is key (Figure 1). By properly constructing the compost pile to allow for adequate natural aeration, mortality composting can be completed on intact animals with little or no turning. An adequate bed of chips beneath the pile and surrounding the carcasses is important. The process is effective if the animals are enveloped in chunky carbonaceous material such as wood chips (see CWMI fact sheet #5, Compost Bulking Materials: <http://cwmi.css.cornell.edu/compostfs5.pdf>). Make sure there are enough chips!

### Timing

Mortality composting can be done at any time during the year. However, when you are learning how to compost it is best to start piles in forgiving weather. In southern climates it will not matter, but in climates that experience freezing temperatures, planning is important. Get piles started before the cold temperatures set in so you experience the learning curve when temperatures are warm and the pile is more likely to get hot. This will also set the process up to keep composting through the winter months since there will be heat in the pile to warm the carcasses and keep the composting process going. Piles can be started in the winter, but it may take months for the composting process to begin during warm weather.

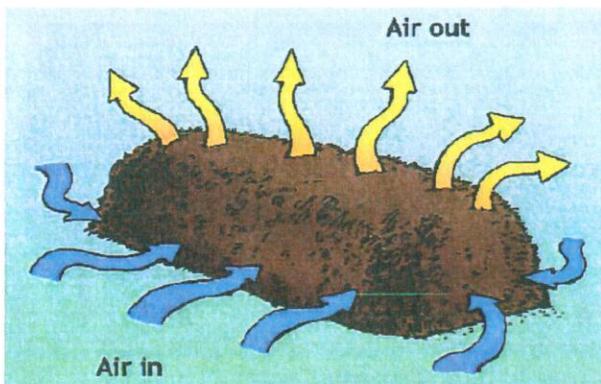


Figure 1. Natural air flow through compost windrow.



Road kill compost windrows in NYSDOT yard.

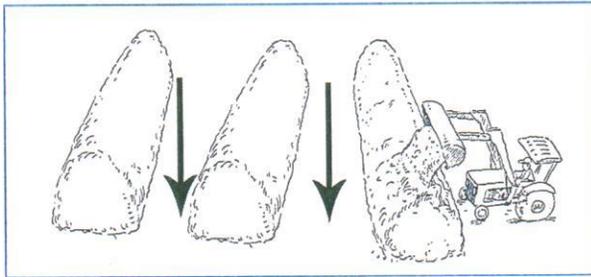


Figure 2. Pad slope.

### Choosing a Compost Site

Highway yards are often good sites for composting if space allows. They have compacted or improved surfaces and public and animal access is often limited by fencing. NYSDOT personnel can contact their Maintenance Environmental Coordinator for advice.

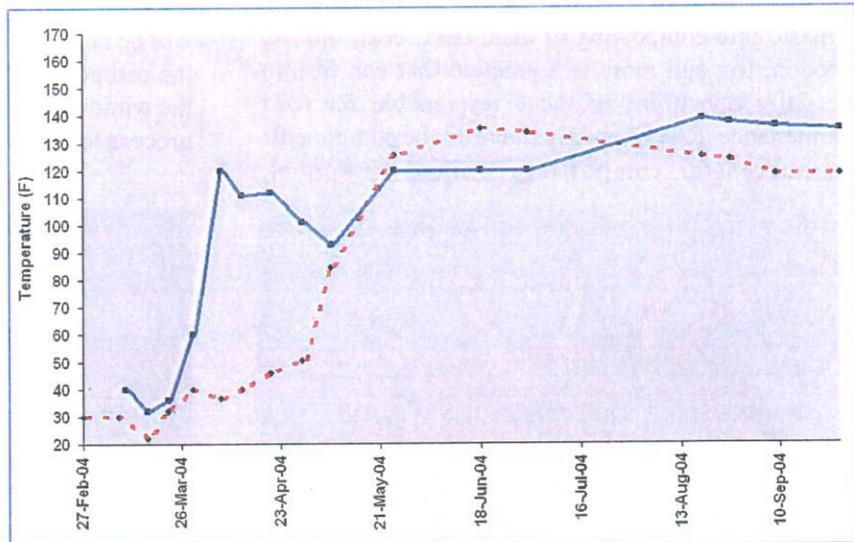
Consideration of water flow is important. Sites should be selected that are unlikely to receive water running onto the site. They should be well away from surface water bodies and swales to reduce the chance that runoff from the site will enter surface water. Moderate to well-drained, hard-packed soils with gentle slopes are well suited. A slope of about two percent is desirable to prevent ponding of water. Steep slopes are not satisfactory because of potential problems with erosion, vehicular access, and equipment operation. Compost windrows should run up and down a minimal slope, rather than across, to allow runoff water to move between the piles rather than through them (Figure 2).

Siting is very important to help avoid neighbor complaints. Compost processing can generate odors, though these should be minimal in well-run operations. Odor is likely the main reason neighbors may complain about the operation. Determine the dominant wind direction, and if most air flow is directed toward populated areas, look for another site. In NYS, permitted compost facilities need to be at least 500 feet away from the closest dwelling. They cannot be sited in a floodplain or wetland, where the seasonal high groundwater is less than 24 inches

from the ground surface, or where bedrock lies less than 24 inches below the ground surface, unless provisions have been made to protect water quality. Although road kill composting piles operated by highway personnel are not required to have New York State Department of Environmental Conservation (NYSDEC) permits, it is advisable to use existing regulations as guidelines and to keep piles as far as possible from neighbors.

### Managing Frozen Deer--Don't Wait Until They Thaw!

In late February 2004, NYSDOT in Washington County had a pile of frozen deer that they had collected. They had heard about composting through the NYSDOT Maintenance Environmental Coordinator and Washington County Cornell Cooperative Extension and were interested in trying it. On a very cold day compost piles were built with the frozen deer. The pile temperature read 30° F and then dropped (see graph below). The insulation from the wood chips kept the deer frozen until May. When the outside temperatures warmed in April and May, the deer thawed in the piles and the compost process started. It is easier to place frozen deer in compost piles before they thaw and let nature work out the rest. When managing frozen piles, the process clock starts when the pile gets hot (110°).



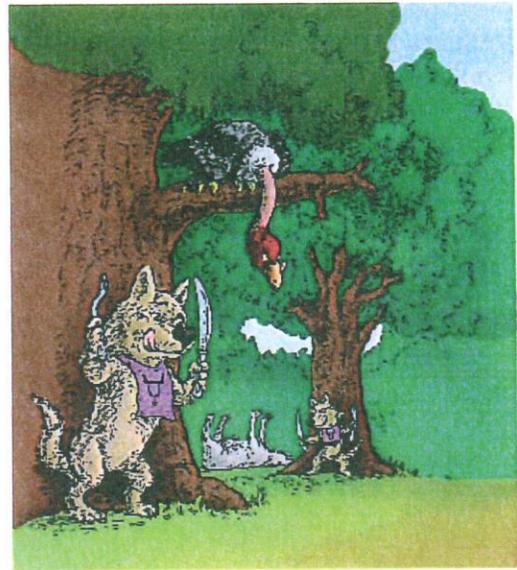
Carcass Pile Temperature Curves, NYSDOT, Washington County.

Dotted line: pile built with frozen deer. Solid line: pile built with recently killed deer.

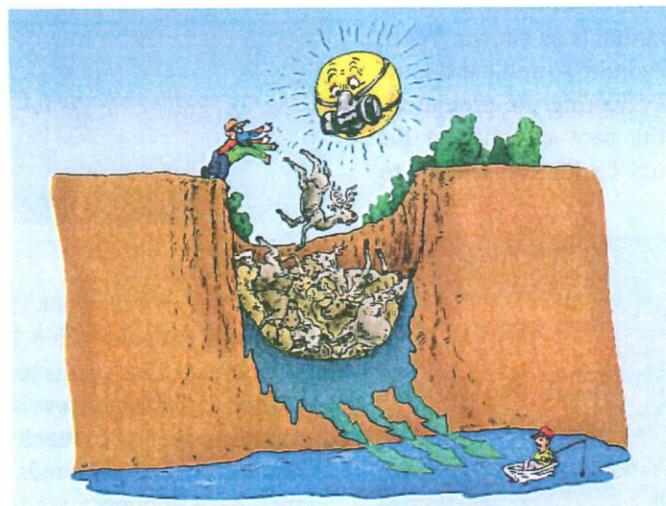
## Potential Environmental and Biosecurity Risk of Dead Animal Disposal

### Lowest Risk

- ◆ Composting - minimizes risk and produces a soil amendment.
- ◆ Landfill - acceptable if landfill will accept carcasses.
- ◆ Buried in a pit - carcasses “mummify” and do not break down (NYSDOT is allowed to bury 10 animals in a 3 foot deep pit above groundwater and at least 50 feet from a water body or water course).
- ◆ Carcass is left outside for scavengers or to decay. Because of the cost of disposal, it will be tempting to dispose of carcasses by leaving them to be scavenged. This is very risky from an environmental standpoint and encourages wild animals and house pets to come close to roads to become road-kill themselves.
- ◆ Placed in ravines and low areas to degrade - pollute ground and surface water.



Highest Risk



Adapted from NYS Agriculture Environmental Management (AEM) Tier II Worksheet on Farm Waste Disposal, Revised Sept 2000.

## Key Points of Static Pile Carcass Composting

♦ Select a site that is well drained and not subject to flooding. Depending on site topography, keep piles away from water courses, sinkholes, seasonal seeps or other landscape features that indicate the area is hydrologically sensitive (see CWMI fact sheet #6 Compost Pads: <http://cwmi.css.cornell.edu/compostfs6.pdf>).

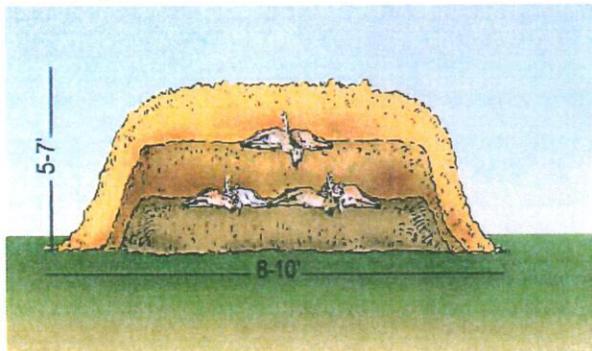
♦ Start with a hard surface made of asphalt, concrete or millings. Obtain a sufficient supply of fresh wood chips. Buy a compost thermometer. Have loader nearby. NYSDOT personnel should contact their Maintenance Environmental Coordinator.



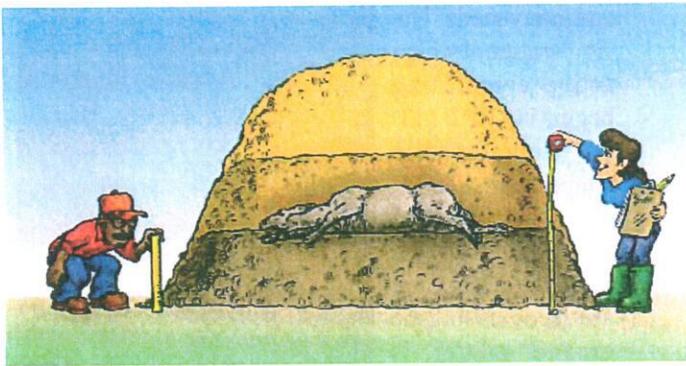
♦ Lay a 24-inch bed of bulky, absorbent organic material; chips from tree chipping operators 2-inches or larger work well. Ensure the base is large enough to allow for a 2-foot clearance around the carcasses on all sides. To promote air flow, do not drive on the compost bed or pile.



♦ Lay animal(s) in the center of the bed. Lance the stomach if the carcass is bloated. Lancing to avoid bloating and possible explosion of the body cavity is optional. Explosive release of gases can result in odor problems and it would blow the cover material off the composting carcass. Place animals as shown. When adding a new animal to the windrow, pull back some of the wood chips that are covering the previously placed animal and place the new animal near the others. Small animals should be layered similar to stair steps.



♦ With animals under 150 pounds, there can be two layers of animals with a 12-inch layer of wood chips in between. This seems to create conditions where the carbon and nitrogen levels are in balance and provides the mass needed to reach thermophilic temperatures. Animals over 150 pounds will be difficult to layer and they have enough mass to compost when enveloped in one layer of wood chips.



◆ When layering, position one layer of animals then cover with a 12-inch layer of wood chips, add another layer of animals and cover with 2 feet of wood chips. The finished height should be 5-7 feet high. A pile too wide or too high prevents good air flow.

◆ With large animals (over 150 pounds or too heavy to lift to a second layer), cover a single layer of carcasses with 24 inches of wood chips.

◆ Check temperatures to be sure the composting process is active. If carcasses are not frozen and the pile built properly, the temperatures should reach 120°-150°F (49°-65° C) in the first few days (Figure 3).

◆ Let sit for 4-6 months after the last carcass is added and the pile has gotten hot (110°F), then check to see if the animal is degraded. If the compost process worked well you should find clean bones and some hair.

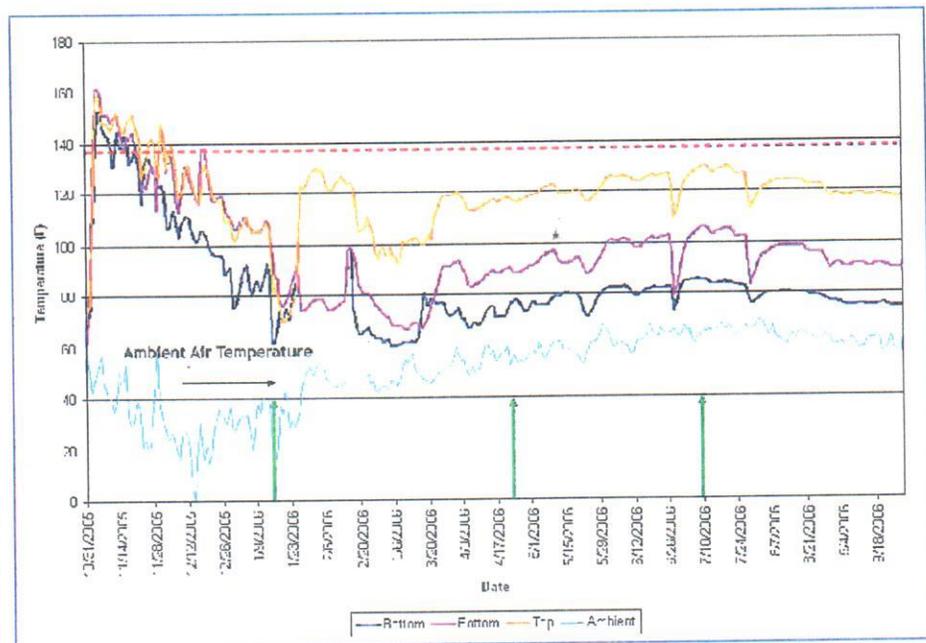
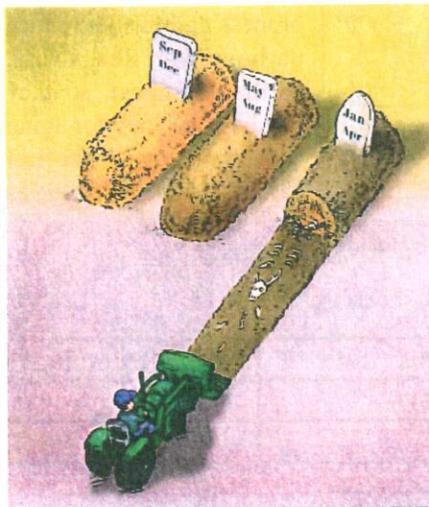


Figure 3. Pile temperatures over time.



◆ Reuse the material as a bed for additional carcass compost piles or allow it to age for a year after the last carcass was added and the pile got hot. Then remove large bones and use the compost in roadside maintenance or establishment projects. The bones can be used in the base of the next pile. Keep track of the pile start date and when the last carcass is added and the pile has gotten hot (110°F).

◆ Site cleanliness is an important aspect of composting; it deters scavengers, helps control odors and keeps good neighbor relations.



### Signage on Compost Sites

Be sure to place signs on the piles so that those managing road kill know the difference between active piles, unused wood chips, and storage piles and to prevent people from taking the material for personal use. Also, use flags or signs to indicate when the last carcass was added and when the pile got hot (110° F).

### Monitoring Compost Piles or Windrows

A log of temperature, odor, unwanted animal visitors, leachate (liquid that comes out of the pile), carcass fluid spills and other unexpected events should be kept as a record of the process (Table 1). Temperatures should be taken in several spots towards the center of the most recently constructed portion of the pile. Thermometers with a 3-4 foot probe are available and should be inserted close to the middle of the pile (Thermometer sources on page 11). The temperature log will allow the composteer to see if sufficiently high temperatures have been reached and adjust the process if there is any problem.

Internal compost pile temperatures affect the rate of decomposition as well as the destruction of pathogenic bacteria, fungi

and many seeds. The temperature at which active composting begins is 110° F (43° C). Compost pile temperatures depend on how much of the heat, produced by the microorganisms that are decomposing the organic matter, is lost through aeration or surface cooling. During periods of extremely cold weather, piles may need to be larger to minimize surface cooling. As decomposition slows, temperatures will gradually drop and remain within a few degrees of ambient air temperature (Troubleshooting Chart on page 10).



Thermometer showing elevated temperatures.

Odor can be an issue and compost piles are an easy target for complaints. If an odor event occurs, add an additional 12 inches of wood chips or finished compost on top of the pile to act as a biofilter (Figure 4).

### Moving the Compost

Carcass piles should not be turned early in the process. Odor is a big issue and if liberated would be problematic.

After a minimum of 4-6 months after the last carcass is added and the pile has gotten hot (110° F), turning is an option that may speed the curing process and further reduce pathogens. Piles shrink as they compost, so they can be combined for aging 4-6 months after the last carcass is added. This saves space and will help aerate the pile.

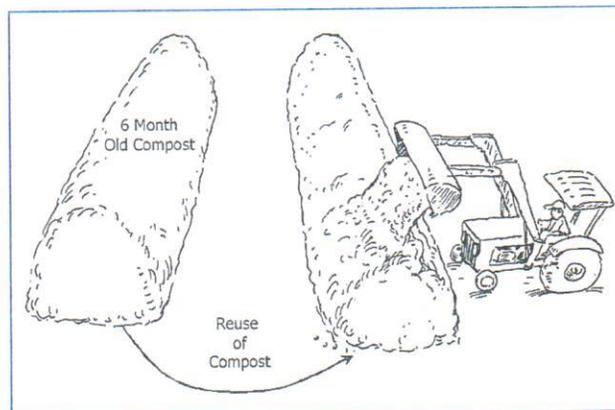


Figure 4. Aged compost or wood chips can be used as a biofilter to help contain odors.

Date	Pile Location	Pile Temperature	# of Carcasses	Comments	Person Recording

Table 1. Sample chart.

## Pathogen Control

Pathogens are organisms that have the potential to cause disease. There is a wide array of pathogens found in our environment and pathogens may be elevated in animal carcasses. There are currently no temperature or pathogen regulations for mortality composting in NYS.

Very little work has been done on documenting pathogen kill in composting of road kill. The Cornell Waste Management Institute conducted a research project with NYSDOT to assess pathogen levels in passively aerated static piles of composting deer. In this study, which included three research piles and three field piles throughout NYS, significant pathogen reduction was observed after a year.

For information on the CWMI/NYSDOT project, see: <http://cwmi.css.cornell.edu/tirc/tirc.htm>.

## Chronic Wasting Disease

Chronic Wasting Disease (CWD) is a prion disease that is of concern in deer populations. There are no data to show whether CWD would be disabled in the composting process. Compost temperatures are not high enough to inactivate prions, but it is possible that microbial and enzymatic activity could have an effect on disabling prions. Disposal of prion-diseased animals and animals from the containment area identified by the NYS Department of Environmental Conservation (NYS DEC) in Oneida and Madison counties is restricted and composting is not an acceptable option at this time.



Roadside spreading of compost by NYSDOT.

## Use of the End Product and Bones

Use of the material as the base for the next pile is recommended and can be done 4-6 months after the last carcass is added and pile has gotten hot (110° F). The remaining bones add structure to the base material for improved aeration. After a year of composting, the end product can also be used on roadside construction and maintenance projects. Testing to prove the safety of carcass compost materials would be a very expensive undertaking, and would require the testing of essentially every pile. It is, therefore, appropriate to limit the use of these products to the highway right-of-way where there is low human or pet traffic. Applying this compost to “table-top” crops directly consumed by people or distributing the compost material for public use is not recommended. In addition, all compost materials may contain environmental microbes and decomposition products, such as mold spores, which may pose an inhalation, ingestion or contact risk to some individuals.

## Common Questions

**Q** Are there worker health and safety issues?

**A** Proper precautions including personal protective gear, hygienic practices like hand washing and tick inspections will minimize risks.

More information on worker safety and health is available at: NYSDOT Safety Bulletin on Handling Animal Carcasses (<https://www.nysdot.gov/portal/page/portal/divisions/operating/employee-health-safety/repository/sb-05-1.pdf>). A NYSDOT Safety Bulletin on Carcass Composting is under development.



Workers wearing personal protective gear.

**Q** Are animals attracted to the windrows?

**A** If built properly, it is unlikely that animals and flies will be attracted to the piles. If the site is messy with blood and animal parts spilled on the ground, animals will be attracted and investigate further. Make sure that all parts of the carcasses in the piles are well covered.

**Q** Can road kill be composted in turned windrows?

**A** Turning is not recommended. Composting mortalities in turned piles requires more labor, machinery and management than static pile composting, thus increasing costs. It also provides the potential for release of odors if turned too early in the process.

**Montana Experience:** Montana started composting road kill in the spring of 2005. The facility handles mostly white-tailed deer from about 60 miles of highway in the Bitterroot Valley. One site near Victor has processed 1,800 deer in 21 months of operation. Another site in Clearwater Junction has handled 90 deer and 10 elk in two months of operation.

Source: Patrick Crowley

### A Note on Fire Danger

As with any collection of woody waste, be aware of potential fire danger. In the compost piles, temperatures can reach 170° F and with that there can be spontaneous combustion. Carcasses supply a lot of moisture to mortality piles therefore the occurrence is unlikely. Take basic precautions by keeping piles not too wide or tall, separated from each other for fire department access and not driving machinery on piles or smoking around piles.

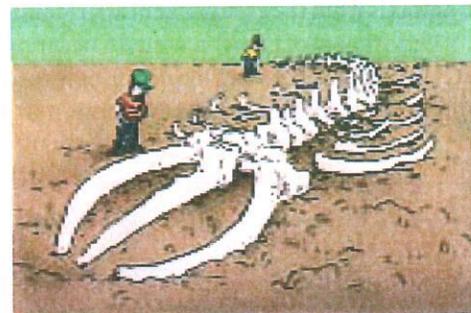


Elk and deer composting in Montana.

### A Whale of a Tale!

In 1999, a Northern Right Whale in the North Atlantic became severely entangled in fishing equipment. About six months later the whale was found dead off the coast of New Jersey. The US Coast Guard hauled the 30,000 pound whale to shore. Since there are only approximately 300 individuals left, a call went out to museums to see if there was interest to preserve the whale in some way. The Paleontological Research Institute (PRI) in Ithaca, NY said they would take it. They cut some of the flesh and blubber off the carcass and hauled it on a flat bed truck to Ithaca. Behind PRI, next to the Cayuga Medical Center, the whale was laid in a large bed of horse manure and completely covered and left to compost in a large pile. The pile was left for six months (October-April) and gently uncovered so the bones could be tagged and turned by hand. The bones, bits of flesh and skin were again covered and left until October. With many volunteers, the bones were cleaned and weighed and ready to be assembled. If you are ever in Ithaca, come to PRI and visit the whale skeleton that was composted on their site. (Note: in one year the bones actually showed signs of pitting and degradation, for preservation purposes it could have come out of the pile a bit sooner.)

Source: Jean Bonhotal, Cornell Waste Management Institute



**Troubleshooting Table**

Symptoms	Problems	Recommendations
Pile fails to reach temperature.	<p>Material is dense. Not enough air circulation.</p> <p>Pile too small.</p> <p>Frozen carcasses placed in pile.</p>	<p>Rebuild pile with more chunky carbon. *If it is in an odor sensitive area and the pile can not be moved, let process run its course and turn in 4-6 months.</p> <p>To heat, pile needs to be greater than 4'x4'x4'.</p> <p>May need to wait until warmer weather to reach temperature.</p>
Insects and other animals attracted to pile.	<p>Carcasses not covered well.</p> <p>Leachate puddling on pad surface.</p>	<p>Cover carcass or residual well with carbon.</p> <p>Pad should have 1-2% slope and holes should be filled to avoid standing water.</p>
Carcass uncovered.	<p>May not have lanced rumen (stomach area) resulting in carbon cover material being thrown off the pile.</p> <p>May have insufficient cover.</p>	<p>Lance rumen of bloated carcasses before animal is put into pile.</p> <p>Use plenty of wood chip cover material.</p>
Standing water/surface ponding.	<p>Inadequate slope.</p> <p>Improper windrow/pile alignment.</p> <p>Depressions in high traffic areas.</p>	<p>Establish 1-2% slope with proper grading.</p> <p>Cover standing water with wood chips.</p> <p>Improve drainage, add an absorbent such as wood chips. Run windrows/piles down slope, not across.</p> <p>Fill and grade.</p>
Odors	<p>Ponded water.</p> <p>Insufficient cover.</p> <p>Anaerobic conditions.</p>	<p>Regrade the site to make sure there is no standing water.</p> <p>Make sure piles are covered with at least 2 feet of wood chips.</p> <p>Add a cover blanket of fresh chips or finished compost.</p> <p>Build piles that are not too wide or too dense so that air flow can keep the piles aerobic. DO NOT turn or disturb piles for 4 months (depending on the size of the animals). Turning can release odors, especially early in the process.</p>

## **Other Mortality Composting Resources**

(Fact Sheets, DVD/VHS and Posters are available at:  
<http://cwmi.css.cornell.edu/naturalrendering.htm>)

### **Fact Sheets:**

- Composting Road Kill (2007) – Jean Bonhotal, Ellen Z. Harrison, and Mary Schwarz
- Avian Influenza (coming in 2007)
- Composting Livestock Mortality and Butcher Waste (2002) – Jean Bonhotal, Lee Telega, and Joan Petzen

### **DVD/VHS:**

- Composting Road Kill (2007) – 10-minute DVD produced by Insights International (<http://hdl.handle.net/1813/7870>)
- Composting Livestock Mortality and Butcher Waste (2002) – 20-minute VHS video (A Spanish DVD will be available soon). Produced by Insights International.

### **Posters:**

- Composting Road Kill (2007)
- Key Points of Static Pile Butcher Residual Composting (2002) (English or Spanish)
- Key Points of Static Pile Carcass Composting (2002) (English or Spanish)
- Potential Environmental and Biosecurity Risk of Dead Animal Disposal (2002) (English or Spanish)

### **NYSDOT:**

- NYSDOT Road Kill Composting Operation and Maintenance Manual ([https://www.nysdot.gov/portal/page/portal/divisions/engineering/environmental-analysis/repository/deer\\_c\\_manual.pdf](https://www.nysdot.gov/portal/page/portal/divisions/engineering/environmental-analysis/repository/deer_c_manual.pdf))
- NYSDOT Safety Bulletin on Handling Animal Carcasses (<https://www.nysdot.gov/portal/page/portal/divisions/operating/employee-health-safety/repository/sb-05-1.pdf>).
- NYSDOT Safety Bulletin on Carcass Composting (in press)

## **Suppliers — Temperature Probes**

- |                              |                       |              |
|------------------------------|-----------------------|--------------|
| • Meriden Cooper Corporation | Meriden, CT 06450     | 203-237-8448 |
| • Morgan Scientific          | Haverill, MA 01832    | 508-521-4440 |
| • Omega Engineering, Inc.    | Stanford, CT 06907    | 203-359-1660 |
| • Reotemp Instruments        | Strong, ME 04983      | 800-648-7737 |
| • Spectrum Technologies      | Plainfield, IL 60544  | 800-248-8873 |
| • Trend Instruments          | Westchester, PA 19380 | 800-431-0002 |

## CWMI Compost Fact Sheet Series

#1 Marketing Composts and Meeting Consumer Needs	( <a href="http://cwmi.css.cornell.edu/compostfs1.pdf">http://cwmi.css.cornell.edu/compostfs1.pdf</a> )
#2 Regulation and Certification of Composts	( <a href="http://cwmi.css.cornell.edu/compostfs2.pdf">http://cwmi.css.cornell.edu/compostfs2.pdf</a> )
#3 Improving and Maintaining Compost Quality	( <a href="http://cwmi.css.cornell.edu/compostfs3.pdf">http://cwmi.css.cornell.edu/compostfs3.pdf</a> )
#4 Testing Composts	( <a href="http://cwmi.css.cornell.edu/compostfs4.pdf">http://cwmi.css.cornell.edu/compostfs4.pdf</a> )
#5 Compost Bulking Materials	( <a href="http://cwmi.css.cornell.edu/compostfs5.pdf">http://cwmi.css.cornell.edu/compostfs5.pdf</a> )
#6 Compost Pads	( <a href="http://cwmi.css.cornell.edu/compostfs6.pdf">http://cwmi.css.cornell.edu/compostfs6.pdf</a> )
#7 Compost Equipment	( <a href="http://cwmi.css.cornell.edu/compostfs7.pdf">http://cwmi.css.cornell.edu/compostfs7.pdf</a> )
#8 Composting Liquids	( <a href="http://cwmi.css.cornell.edu/compostfs8.pdf">http://cwmi.css.cornell.edu/compostfs8.pdf</a> )

Maps and database of NYS Compost Facilities can be accessed at: <http://compost.css.cornell.edu/maps/simple-search.asp>.

### NYS Compost Facilities Search



#### Select a Map to View Facilities:

- All Compost Facilities
- Yardwaste Compost Facilities
- Manure Compost Facilities
- Foodscrap Compost Facilities
- Biosolids Compost Facilities
- Compost Research Farms
- Small Scale Compost Demo Sites

### Special Thanks to Contributors and Supporters

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## Appendix E

### PAYT Case Studies

Alachua County, Florida - This County has had a number of staffed, free drop sites for waste/recycle:

- Citizens paid property tax assessment to cover costs of staffing & running a number of free trash/recycle drop-off sites around the county. Waste hauling/recycle was offered (by subscription) countywide, but mostly subscribed to in towns (like in Fremont Co.).
- To reduce the number of drop sites (and lower its costs), County created an Urban Services Area ("USA") which includes the most populated areas of the Unincorporated County (plus the City of Gainesville).
- Residents in the non-urban, Unincorporated Alachua County outside of the USA can now use the drop-offs free (though they can subscribe and pay for household collection).
- Residents of the USA now must subscribe to PAYT-structured trash/recyclables collection (county-managed mandatory collection by private haulers under franchise). USA residents may use any of five drop-off centers (staffed) throughout the County but must pay.
- Shifting to the USA structure enabled the County to close drop sites in the USA and to charge residents in the USA a lower rate for the solid waste part of the property tax, which pays for the drop sites; those outside the USA pay a higher-rate. This variation in the waste portion of the property tax is commensurate with actual usage of the drop sites.
- Transition from private subscription throughout the county to the USA/non-USA structure went more smoothly than anticipated. The PAYT structure enabled citizens to control their own costs; complaints to County Commission stopped.
- County provided much education to citizens so they understood changes & impacts

Fort Collins, Colorado - Like the municipalities in Fremont County, has always had subscription-based private hauling for its residents. As well, residents have made it clear to City Council they do not want the City to manage franchised or other forms of collection; households prefer the ability to select haulers. In order to increase recycling (and lengthen the life of the landfill it partially owns), Fort Collins took incremental steps to institute PAYT pricing over the years:

- Ordinance requires trash haulers to provide residential recycling service. (1991)
- Trash haulers required to charge residential customers for amount of trash disposed; flat fees are no longer allowed. Each 33-gallon unit of trash must cost the same amount as the rate set (individually by haulers) for the first 33-gallon unit. (1993)
- Ordinance requiring trash haulers to provide weekly recycling collection as part of basic residential trash collection service. (1995)
- Ordinance requiring volume-based rates for residential accounts; haulers may charge a flat monthly base fee to recover fixed costs. Flat fee may not exceed 50% of the total trash bill; both the flat fee and the volume-based rate must be shown on customers' bills. Failure to charge for excess waste, or for violating any other element of the PAYT ordinance, could cause a hauling company to lose its municipal hauling license. (1996)
- Amendment to ordinance requiring volume-based rates for accounts serving multi-family housing up to eight units and for homeowner-association accounts. (2004)
- Haulers required to pick-up expanded list of recyclables; City Manager may amend this list annually. (2006)
- City is diverting about 27% of its residential waste to recycling as a result. (2008)
- See ordinance online at <http://fcgov.com/recycling/ordinances.php>

New England - The New England region is historically dotted with small towns with no curbside service and a tradition of self-haul to the "dump" (usually a transfer station with recycle bins):

- Residents of many rural Maine communities pay a portion of annual property taxes to support "the dump". In order to better manage these costs, the state of Maine has provided education, sample ordinances, and resources to help towns move to PAYT systems.
- Many of the towns that own "the dump" now charge per-bag fees for receiving trash but no fees for recyclables.
- For example, the town of Aquinnah, ME (pop. 1,100) charges \$2 for a 17-gallon bag and \$4.75 for a 33-gallon bag of trash.
- Some jurisdictions simply sell stickers that can be affixed to bags, with the sticker revenue covering program costs. Stickers sold at town hall and local stores.

**SPECIAL MEETING OF THE RAWLINS CITY COUNCIL  
JUNE 23, 2009 CITY HALL COUNCIL CHAMBERS  
RAWLINS, WYOMING**

**OPENING:** Mayor Kenneth C. Klouda called the meeting to order at 5:31 P.M., the Pledge of Allegiance was recited and roll taken. Members present were:

Mayor Kenneth C. Klouda

Council Members: Louis Espinoza

Steve Kovachevich DeBari Martinez

Patricia Schuler

Council Members Judy Dixon and Jim Wells were absent.

**CITY OFFICIALS PRESENT:**

Steven Golnar City Manager

Marla Brown City Clerk

LeRoy Lucero Interim Director of Public Works

Don Cuin Landfill Superintendent

**APPROVAL OF AGENDA:** Council Member Martinez made the motion to approve the agenda as presented, seconded by Council Member Schuler. The motion carried with all present members voting yes.

**NEW BUSINESS:**

**RESOLUTION - APPROVING INTEGRATED SOLID WASTE MANAGEMENT PLAN:**

**A RESOLUTION AUTHORIZING APPROVAL OF THE CITY OF RAWLINS,  
WYOMING INTEGRATED SOLID WASTE MANAGEMENT PLAN.**

Council Member Martinez made the motion to approve the resolution authorizing approval of the City of Rawlins, Wyoming Integrated Solid Waste Management Plan as revised, seconded by Council Member Kovachevich. The motion carried with all present members voting yes.

**ADJOURNMENT:** There being no further business on the Agenda, Mayor Klouda adjourned the meeting at 6:29 P.M.

Submitted by:

Marla K. Brown

Marla K. Brown, City Clerk

Approved: July 7, 2009

Kenneth C. Klouda

Kenneth C. Klouda, Mayor