



# **City of Cheney**

## **Comprehensive Solid Waste Management Study 2012 - 2031**

Contents

- 1.0 Municipal Solid Waste .....3**
  - 1.1 Generation ..... 3
  - 1.2 Existing Facilities ..... 4
    - Spokane Waste to Energy Facility
    - City of Cheney Recycling Facility
    - City of Cheney Yard Waste Facility
  - 1.3 Long Range MSW Alternatives..... 6
    - Alt. A: Remaining with the Spokane Waste to Energy System
    - Alt(s) B: Long Hauling via Truck to Other Dump Sites
    - Alt(s) C: Long Hauling via Rail to Klickitat County
    - Alts Ranked by Cost
  - 1.4 Facility Needs to Meet MSW Alternatives ..... 8
    - Sunshine Disposal Waste Transfer Facility
    - Potential Cheney Waste Transfer Facility
  - 1.5 Inventory of Potential Landfill Sites ..... 10
    - Roosevelt Regional Landfill (Klickitat County)
    - Ephrata Landfill (Grant County)
    - Cheyne Landfill (Yakima County)
- 2.0 Hazardous Waste.....12**
  - 2.1 Existing Regulations ..... 12
  - 2.2 Future Compliance..... 13
    - HHW Alt. A: Status Quo
    - HHW Alt. B: Interlocal Agreement for HHW & MRW
    - HHW Alt. C: Contract Network for HHW & MRW
- 3.0 Waste Reduction & Recycling.....19**
  - 3.1 Incentives & Opportunities ..... 19
    - City of Cheney Recycling Facility
    - Eastern Washington University
    - Levels of Public Participation
  - 3.2 Source Separation Strategies ..... 20
    - Statewide Practices
    - Considerations for Cheney
  - 3.3 Source Separation Alternatives ..... 21
    - SS Alt. 1: Single Stream Curbside Service with Disposal through Waste Management
    - SS Alt. 2: Single Stream Curbside Service with Disposal through Sunshine Disposal
    - SS Alt. 3: Single Stream Curbside Service Carried out by Cheney Solid Waste Division
    - SS Alt. 4: No Curbside Service; Continuation of Existing Program
- Appendices.....25**
  - Appendix 1: 20 Year MSW Generation Projection
  - Appendix 2: Yearly Unit (per-ton) Cost Summary (MSW)
  - Appendix 2.1: 20 Year Unit Cost Comparison (Graph)
  - Appendix 3: 20 Year Total Cost Summary

# 1.0 Municipal Solid Waste

## Overview

All Municipal Solid Waste (MSW) generated in Spokane County is required to ultimately end up at the Spokane Waste to Energy Facility (WTE) as part of a 25 year agreement set to expire in 2014. This plan examines several alternatives for the City of Cheney's MSW in the years after the expiration of the agreement.

### 1.1 Generation

The total MSW tonnage generated within the city of Cheney is expected to increase by 23.2% by the year 2031 (Exhibit 1). This solid waste generation forecast is based upon population figures in the 2008 City of Cheney Comprehensive Plan. The forecast assumes a 1.4% annual average population growth over the next 20 years. This figure was then used to forecast the growth in residential tonnage using a 0% per-capita yearly increase in waste generation due to on-going recycling education.

The forecast applies a 1% annual growth rate in all other waste generation, which should grow at close to the same rate as the population. See Appendix 3-2-2 for more.

Exhibit-1	2010	2011	2016	2021	2026	2031
Population	10,600	10,748	11,522	12,352	13,241	14,194
Total Generation (tons)	5,367	5,409	5,766	6,147	6,554	6,988
Residential Generation (tons)	3,843	3,869	4,148	4,447	4,767	5,110
Commercial, On Call, Landfill (tons)	1,524	1,539	1,618	1,701	1,787	1,878
Per-Capita residential (tons)	0.36	0.36	0.36	0.36	0.36	0.36
<p>*Note, this assumes 0% per year increase in per capita generation.  **Note, 2010 generation and population figures are actual.</p> <p>Projected annual increase in per capita generation: 0%  Base Population Year: 2010  Average Annual Population Growth Rate (forecast): 1.4%  Average annual growth in other waste 1.0%</p>						

## 1.2 Existing Facilities

### Spokane Waste to Energy Facility

Current conditions: All of the City of Cheney’s MSW and Hazardous Waste is currently handled by the Spokane Waste to Energy Facility. The waste to energy facility is located approximately 12 miles from Cheney at 2900 S. Geiger Blvd., Spokane, WA.

The Spokane Waste to Energy Facility will continue to be the primary dumping site for municipal solid waste unless new facilities are identified to handle certain portions of Cheney’s waste stream.

Facility Description: The WTE is designed to process waste from mixed residential, commercial, and industrial sources. The WTE Facility incinerates municipal solid waste using two 400-ton-per-day “mass-burn” combustion units to generate steam and electricity by means of a 26-megawatt turbine generator. Each furnace is designed to burn 400 tons each day, but conservative design parameters allow them to operate in excess of that amount. Both fly ash and bottom ash are collected and transported to the Roosevelt Regional Landfill (RRLF) for disposal. Ferrous metals are recovered from the bottom ash stream and recycled.

Emissions Controls: Facility emissions, including those from the boiler units and fugitive emissions, are regulated through the facility’s Title V Air Operating permit, Notice of Construction (NOC) permit issued by the Spokane County Air Pollution Control Authority (SCAPCA), and the Prevention of Significant Deterioration (PSD) permit issued by Ecology. The permits require continuous emission monitors, monthly reporting and annual stack tests.

Facility Site: The WTE Facility is located on a 52-acre site in Spokane County approximately 1.5 miles west of the City of Spokane limits. The site is zoned “restricted industrial.” Land adjacent to the site is also zoned “restricted industrial” or manufacturing, including a commercial zone on the southeast border of the site.

General Operations: The WTE Facility is designed to process waste 24 hours per day every day of the year except for three scheduled maintenance periods. The facility receives waste from commercial haulers and the public 7 days per week from 7:00 a.m. to 4:30 p.m., closing on six designated holidays (New Year’s Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving, and Christmas.)

The guaranteed available capacity for acceptable municipal solid waste is 248,200 tons per year (TPY). Since opening in 1991, the facility has exceeded all operations performance standards. In 2004, the WTE Facility processed 282,479 tons.

Wheelabrator Spokane Inc. (WSI) operates the facility, under contract to the System. WSI is a wholly owned subsidiary of Wheelabrator Technologies, Inc. (WTI), which is a subsidiary of Waste Management, Inc.

The facility includes three scalehouses, two independent refuse receiving areas, and a storage pit area with approximately 6 days of disposal capacity. Two overhead cranes mix and sort the waste and deliver it into the hopper for incineration. Each of the two furnaces has a design capacity of 400 tons per day of solid waste. The ash generated by the combustion process is approximately 30 percent of the incoming

material by weight, but only about 10 percent by volume. The Facility's ash is treated at the WTE facility using Wesphix process. The ash consistently passes TCLP, pH, and bioassay tests, and therefore is neither dangerous waste nor special incinerator ash.

Ash and Non-processible Wastes: The WTE facility entered into a 10-year contract (from September 11, 1991) with Regional Disposal Company (RDC) to provide for the transportation and disposal of facility ash and the disposal of certain non-processible waste at the Roosevelt Regional Landfill (RRLF). RDC owns and operates the RRLF, which is located approximately 200 miles southwest of Spokane County in Klickitat County, Washington. That contract was extended to 2011 with an additional 5-year term.

The RRLF, in compliance with RCW 70.138, is permitted to construct an ash monofill, and accept up to 280 tons of ash daily, and up to 102,200 tons yearly.

In addition, the Northside Landfill, located on the north side of the City of Spokane, is also available to dispose of the system's non-processible waste.

The City of Spokane acquired a site in an area called Malloy Prairie in west Spokane County for a future ash monofill landfill as a long-term alternative to the RRLF, if that becomes necessary. An environmental impact statement was completed before site acquisition.

Surveillance & Control: Solid waste facilities in Washington State are permitted by the local health district. The Spokane WTE is permitted by the Spokane Regional Health District. The permit was reviewed by the Washington Department of Ecology (DOE). Additionally, DOE has certified the WTE to serve as a Solid Waste Incinerator Landfill Operator. There is substantial incentive for the WTE System to self-regulate and maintain compliance with these permits which are reviewed by the respective agencies.

### **City of Cheney Recycling Facility**

Facility Description: The facility, located at 110 Anderson Road in Cheney, can accommodate all current recycling volumes in the City of Cheney and has substantial excess capacity. This capacity will be continually monitored as recycling habits change and market forces open new opportunities for accepted recyclables.

General Operations: The Cheney Recycling Facility is open for drop-off of recyclable materials Wednesdays and Fridays from noon to 5 p.m., and Saturdays from 10 a.m. to 4 p.m. The City of Cheney contracts with various recycling companies to collect the recyclable materials from the Cheney location.

The City of Cheney Solid Waste Division will continually analyze the feasibility of instituting co-mingled, curbside recycling service in addition to the existing drop-off option. This service is becoming more promising with the completion of a Waste Management Single Stream Recycling Facility located adjacent to the Spokane Waste to Energy Facility. Waste Management company officials estimate that completion of this facility will increase recycling in the entire region by as much as 40%. This increase is achieved because many materials which hadn't been accepted, will be accepted at this facility.

Accepted Materials: The following materials are accepted at the City of Cheney Recycling Facility:

- Aluminum
- Batteries (household and automobile)

- Cardboard (corrugated)
- Glass
- Motor Oil
- Paper Products (colored ledger paper, computer paper, magazines, newspapers, phone books, white ledger paper)
- Plastic Products (HDPE and PETE)
- Tin

### **City of Cheney Yard Waste Facility**

Facility Description: The facility, located at 110 Anderson Road in Cheney next to the Recycling Facility, consists of roll-off disposal bins placed for easy access by residents. This set-up can easily be up-scaled to meet future volume increases if necessary.

General Operations: The City of Cheney Yard Waste Facility is available for free use by the residents of Cheney from March to November, weather permitting. Commercial landscape businesses are required to pay an annual permit fee for the disposal of yard waste collected within the city limits only. The commercial landscape business must also have a current City of Cheney Business License.

#### Accepted Materials

The following yard waste materials are acceptable for disposal:

- leaves
- grass clippings
- pinecones
- pine needles
- weeds (except herbicide tainted material)

Brush, pruning and branches are also acceptable yard waste material but must be no larger than two inches in diameter and four feet in length.

## **1.3 Long-Range MSW Alternatives**

There are three general long-range alternatives for handling the City of Cheney's MSW, with several particular alternatives available through each. Generally, the City of Cheney may choose to remain with the Spokane Waste to Energy Facility for all solid waste needs, long-haul truck the city's solid waste elsewhere, or take the city's solid waste elsewhere via rail.

### **MSW Alternative A: Remaining with the Spokane Waste to Energy Facility**

Tipping fees at the Spokane WTE facility are currently considerably higher than elsewhere in the state, however it is close by. The current tipping fees at the Spokane WTEF as of 2012 are \$104 per ton. Cheney residents and businesses generated 5,440 tons of solid waste in 2011, for a current yearly cost of \$565,760 for tipping fees.

A simple projection of future tipping fees at the Spokane WTE, which assumes an annual increase of 1 percent carried over 20 years, shows that the anticipated tipping fee by the year 2031 to be \$126.90. This results in a 22% increase in disposal costs for the Cheney Solid Waste System, which would likely

have to be funded by rate payers. If rates were adjusted to meet this straight-line increase, Exhibit 2 shows generally what the average residential customer would pay for 64 gallon cart service each year.

Exhibit 2- Projected annual 64 gallon residential cart cost*									
2011		2016		2021		2026		2031	
Month	Annual	Month	Annual	Month	Annual	Month	Annual	Month	Annual
\$11.88	\$142.56	\$12.49	\$149.83	\$13.12	\$157.47	\$13.79	\$165.51	\$14.50	\$173.95

\*See Appendices 1-3 for detail regarding financing and cost estimates.

### **MSW Alternative(s) B: Long Hauling via Truck to Other Dumping Sites**

Any option which involves long-haul trucking Cheney’s waste via highway would require constructing a waste transfer facility for an estimated \$1.3 million. The construction, staffing, and financing of a waste transfer facility, along with transportation costs associated with long-hauling the refuse ultimately raises the cost-per ton to dispose of the solid waste, in addition to the tipping fees.

There are several locations in Washington where it is projected that the Cheney solid waste system could realize per-ton savings. Exhibit 3 shows the estimated cost-per ton, anticipated effect on a current 64 gallon residential user, and a projection of total possible savings when compared to projections of the Spokane WTE Facility carried over 20 years.

Exhibit 3- Long Hauling Options vs. Spokane County (Current)*			
MSW Alt / Location	Cost / ton (2012)	Annual 64 Gal. Service (2012)	Total Savings through 2031
B-1 Grant County	\$81.07	\$111.50 (22% reduction)	\$3.95 million (26%)
B-2 Yakima County	\$91.70	\$125.70 (12% reduction)	\$2.36 million (16%)
B-3 Klickitat County	\$93.70	\$128.44 (10% reduction)	\$2.08 million (14%)
Current	\$104.00	\$142.56 (current)	\$--

\* See Appendices 1-3 for detail regarding financing and cost estimates

### **MSW Alternative(s) C: Long Hauling via Rail to Klickitat County**

There are two options available for loading Cheney’s solid waste onto rail cars and disposing of it in Klickitat County. The other low-tipping-fee sites lack sufficient infrastructure to make rail feasible.

MSW Alternative C-1: This option would be similar to MSW alternatives B-1 through B-4 in that the City of Cheney would have to construct a waste transfer facility. This alternative would see the City of Cheney loading solid waste onto rail cars in Cheney and send the waste to Roosevelt Regional Landfill (RRLF) in Klickitat County.

MSW Alternative C-2: This option would utilize a local area waste transfer facility in Spokane Valley to load Cheney’s solid waste onto rail cars and send it to the RRLF.

MSW Alternative C-2 appears to be the lower-cost alternative in the near-term because Cheney would not have to construct a waste transfer facility. Depending on the useful life of Cheney’s potential waste transfer facility, however, the Cheney Solid Waste System could see higher savings after the projected 20 year bond payment to finance construction. Exhibit 4 shows the estimated cost-per ton, potential

effect on a current 64 gallon residential user, and a projection of total possible savings when compared to projections of the Spokane WTEF carried over 20 years.

Exhibit 4- Railing to Klickitat County vs. Spokane County (Current)*			
MSW Alternative	Cost / ton (2012)	Annual 64 Gal. Service (2012)	Total Savings through 2031
C-1	\$100.70	\$138.04 (3% reduction)	\$1.13 million (8%)
C-2	\$94.00	\$128.85 (10% reduction)	\$1.44 million (10%)
Current	\$104.00	\$142.56 (current)	\$--

\*See Appendices 1-3 for detail regarding financing and cost estimates

### Alternatives Ranked by Cost

A 20-year cost projection shows in Exhibit 5 that long-haul trucking offers the greatest potential for system-wide cost savings. While Grant and Yakima counties show potential for cost savings, Cheney may need to enter into a negotiated agreement in order for these jurisdictions to accept Cheney’s waste due to capacity concerns. Current capacities and other issues surrounding these alternatives are addressed in section 1.5 of this plan.

Exhibit 5- MSW Alternatives Ranked by Cost*		
MSW Alternatives	Build Transfer Station Y/N	Projected Savings vs. Current
B-1 Trucking to Grant County	Yes	\$3.95 million
B-2 Trucking to Yakima County	Yes	\$2.36 million
B-3 Trucking to Klickitat County	Yes	\$2.07 million
C-2 Rail with Sunshine	No	\$1.44 million
C-1 Rail from Cheney	Yes	\$1.13 million
A Remain with Spokane WTEF	No	\$0.00

\*See Appendices 1-3 for detail regarding financing and cost estimates

## 1.4 Facility Needs to Meet MSW Alternatives

The City of Cheney is currently examining several options other than the Spokane Waste to Energy Facility to handle its MSW from 2014 and on. Neither of these facilities would handle Cheney’s hazardous waste, which would be handled pursuant to the alternatives found in the hazardous waste section of this plan. Yard waste would continue to be handled at the city’s recycling facility.

Potential Facility Type	Location	Deficiencies
Waste Transfer Station	Cheney, WA*	Will handle Cheney’s MSW only. Hazardous waste will continue to be taken to the Spokane Waste to Energy Facility. Yard waste will continue to be handled at the city’s recycling facility.
Local Area Waste Transfer Station	Spokane Valley, WA	Will handle Cheney’s MSW only. Hazardous waste would continue to be taken to the Spokane Waste to Energy Facility. Yard waste will continue to be handled at the city’s recycling facility.

\*Locations for a Cheney Waste Transfer Station are currently being identified.



### **Sunshine Disposal Waste Transfer Facility**

Facility Description: The facility is located at 2405 N. University in Spokane Valley, WA, which is approximately 25 miles northwest of Cheney. Utilizing this facility would roughly double the travel distance for City of Cheney Solid Waste collection vehicles travelling to off-load. This facility currently handles approximately 100,000 tons of solid waste annually.

General Operations: The facility operates Monday through Friday throughout the year, and accepts MSW, yard waste, and is in the process of examining the potential to handle co-mingled recycling. Solid waste from this transfer facility is loaded on rail cars and taken to Roosevelt Regional Landfill (RRLF) in Klickitat County, WA.

Surveillance & Control: Solid waste facilities in Washington State are permitted by the local health district. The Spokane Regional Health District is the permitting agency for this transfer station. The Washington Department of Ecology (DOE) also has review authority of the permitting process. There is substantial incentive for the transfer station operators to self-regulate and maintain compliance with all requisite regulations, which are reviewed by the respective agencies.

### **City of Spokane – Valley Waste Transfer Facility**

Facility Description: The facility is located at 3941 N. Sullivan Road in Spokane Valley, WA, which is approximately 29 miles northwest of Cheney. Utilizing this facility would roughly double the travel distance for City of Cheney Solid Waste collection vehicles travelling to off-load.

General Operations: The facility operates Monday through Sunday throughout the year, and accepts MSW, yard waste, and recycling. Currently Solid waste from this transfer facility is transferred to the Waste to Energy Plant. (WTE)

Surveillance & Control: Solid waste facilities in Washington State are permitted by the local health district. The Spokane Regional Health District is the permitting agency for this transfer station. The Washington Department of Ecology (DOE) also has review authority of the permitting process. There is substantial incentive for the transfer station operators to self-regulate and maintain compliance with all requisite regulations, which are reviewed by the respective agencies.

### **Potential Cheney Waste Transfer Facility**

Facility Description & Operations: This facility has yet to be constructed. This facility will only be constructed pending the results of contract negotiations with current and other potential facility operators.

Surveillance & Control: Solid waste facilities in Washington State are permitted by the local health district. The Spokane Regional Health District is the permitting agency for this transfer station. The Washington Department of Ecology (DOE) also has review authority of the permitting process. There is substantial incentive for the transfer station operators to self-regulate and maintain compliance with all requisite regulations, which are reviewed by the respective agencies.

**Facility Siting:** Potential sites for a waste transfer facility in Cheney will be checked for compliance with Washington State Department of Ecology conformance standards for:

- Geology
- Soil
- Surface Water
- Cover Material
- Climatic Factors
- Toxic Air Emissions
- Groundwater
- Flooding
- Slope
- Capacity
- Land Use
- Other factors determined by Ecology

Plans for a potential waste transfer facility in Cheney will also be checked against:

- Local hazardous waste plans
- Land use/growth management plans
- Capital facilities plans
- Watershed plans
- Flood plain management plans
- Emergency management plans

Regulations and permits not specifically aimed at solid waste, but protect environmental and public health should also be reviewed for solid waste management application. These regulations and permits may address water and air pollution, fire protection and general public health. While it is recognized that regulations and plans change, this discussion may provide an important educational and reference tool for elected officials, SWAC, the solid waste industry, general public, and new local and state government staff.

## **1.5 Inventory of Potential Landfill Sites to Meet MSW Alternatives**

The City of Cheney is examining potential for cost savings by long-haul trucking the city's MSW from one of the potential transfer facilities to several landfills in the state of Washington (Exhibit 5). Contract negotiations for these sites have not yet begun, so final cost-savings are yet to be determined. Therefore, several landfills are being examined.

### **Roosevelt Regional Landfill- Klickitat County**

The Roosevelt Regional Landfill (RRLF) is located approximately 200 miles to the southwest of Cheney in Klickitat County, WA. The landfill is designed to meet all current solid waste landfill regulations, including WAC 173-351. In 2003, this facility received some type of waste from 34 Washington counties, including Spokane County's HHW, MRW, and ash from the WTE Facility. As of 2010, RRLF had 186,644,000 tons of remaining capacity, with a Washington Department of Ecology estimated closure date of 2111 (111 years).

### **Ephrata Landfill- Grant County**

The Ephrata Landfill is located approximately 100 miles to the west of Cheney in Grant County, WA. As of 2010, the Washington Department of Ecology estimated the Ephrata Landfill's remaining capacity at 2,591,497 tons, with an estimated closure date of 2034 (24 years). The 2008 Grant County

Comprehensive Solid Waste Management Plan warns against accepting additional solid waste from outside of Grant County. However, the total amount of generation from the City of Cheney for the years 2014 – 2031 amounts to approximately 110,000 tons. It is forecast that this relatively small amount of waste would only reduce the facility's life-expectancy by approximately one year. It is possible that a mutually beneficial arrangement may be negotiated with Grant County wherein the landfill accepts Cheney's waste at a higher tipping fee to allow for a build-up of reserve funds to help finance a slightly earlier expansion of the facility.

#### **Cheyne Landfill- Yakima County**

The Cheyne Road Landfill is located approximately 150 miles to the west of Cheney in Yakima County, WA. As of 2010, the Washington Department of Ecology estimated the remaining capacity of the landfill's currently used Cell 2 at 7,403,000 tons, with an estimated closure date of 2040 (30 years). The 2010 Yakima County Comprehensive Solid Waste Management Plan outlines a plan for opening a third cell when Cell 2 nears capacity. It is forecast that Cheney's total generation for the years 2014 – 2031 would only reduce Cell 2's useful life by 0.45 years.

## 2.0 Hazardous Waste

### 2.1 Existing Regulations

Local governments are required by the Washington State Hazardous Waste Management Act (HWMA, Chapter 70.105 RCW) to address moderate risk waste (MRW) management in their jurisdictions. Moderate risk wastes are hazardous wastes produced by households, and generated by businesses and institutions in small quantities that do not exceed state regulatory limits:

- 220 pounds (100 kg) of dangerous waste per month or per batch.
- 2.2 pounds (1 kg) of acute or extremely hazardous waste per month or per batch.

In addition, to maintain its status as a small-quantity generator (SQG), a business or institution may not accumulate more than 2,200 pounds of dangerous waste or more than 2.2 pounds of acute or extremely hazardous waste at one time. SQGs must meet certain requirements for identifying and managing their hazardous wastes, but are exempt from some of the waste tracking and reporting requirements.

Business or institutions producing or accumulating hazardous waste above the SQG exclusion limits are required to meet a more stringent set of regulations when storing, handling, and disposing of their hazardous wastes. In addition, these fully regulated hazardous waste generators must comply with extensive waste tracking and reporting requirements.

Hazardous waste, as defined in RCW 70.105.010, is not considered solid waste, and therefore is not typically included in a Comprehensive Solid Waste Management Plan. For the purposes of this Plan, MRWs are solid wastes, and are addressed in this Plan following planning guidelines (Publication #93-99) established by Ecology and requirements of RCW 70.105.220.

In response to the HWMA and local needs, an initial MRW Plan was completed in 1991, and was adopted by Spokane County, as well as all other municipalities within the county. The MRW Plan was designed to improve the management of moderate risk wastes, thereby promoting better regional protection of public health and the environment. The MRW Plan contributes to the Legislature's goal "...to establish a comprehensive statewide framework for the planning, regulation, and management of hazardous waste..." as outlined in the HWMA (RCW 70.105.007).

In 1991, the Used Oil Recycling Act (Chapter 70.95I RCW) was enacted by the Washington State Legislature. Among other requirements, this statute required that MRW management plans more specifically address needs for collection and recycling used motor oil produced by residential "do-it-yourselfers"; that is, individuals who change the oil in their own vehicles. The Act requires that plans establish appropriate goals for improving collection, recycling, and re-refining of used oil, for educating citizens, and for meeting reporting requirements. In response to the statute, a used oil recycling element to supplement the County's MRW Plan was completed in August 1993. This update to the Spokane County Comprehensive Solid Waste Management Plan included an update to the 1991 Spokane County Moderate Risk Waste Management Plan, and the used oil recycling element.

The MRW Plan section of the Spokane County Comprehensive Solid Waste Management Plan, adopted in 2009, proposes a comprehensive program for household and business education and technical

assistance, MRW collection, and disposal compliance. The System prepared the updated MRW Plan with the guidance and assistance of technical and management staff from county and municipal departments, the Spokane County Solid Waste Advisory Committee (SWAC), local elected officials, and interested citizens.

## 2.2 Future Compliance

The City of Cheney still operates under all relevant hazardous waste plans adopted by Spokane County. It is the intent of the City of Cheney to continue operating within those plans for disposal of HHW and MRW by:

- a) Continuing existing agreements with the Spokane WTE system.
- b) Forming an interlocal agreement with the Spokane WTE system to handle HHW and MRW if Cheney's MSW is taken elsewhere.
- c) Creating a network of contracts with private and public entities if the Spokane WTE system is no longer viable.

### HHW Alternative A: Status Quo

System Education Program: The Spokane County System currently provides HHW education for residences and businesses located in Spokane County and the City of Cheney through a variety of approaches. HHW education components are integrated within the System education programs. That is, whenever general educational information is presented by the System, a variety of topics regarding waste and disposal, including HHW, is conveyed at the same time.

Residents often have questions concerning the management of hazardous wastes, particularly used motor oil, batteries, and other hazardous wastes. Approximately 5 percent of the calls to Spokane's Recycling Hotline in 2004 were related to hazardous wastes (about 740 calls). Callers are given assistance over the phone, and in some cases are mailed supplemental information packets or brochures.

As part of the broader education program established by the System, other methods used to inform the public on HHW issues include distributing written materials through governmental offices or businesses, at meetings, and at shows and fairs. The System sponsors booths at local fairs such as the Family A-Fair, Home and Garden Show, Home Fest and Earth Day. The System has combined its waste management display with displays covering air quality and water quality issues.

Presentations, workshops, school assemblies, newsletters, and classroom presentations are used to increase awareness of environmental issues in Spokane County, including HHW management. During the 2004-2005 school year, 29 presentations were made through school assemblies and other community events by the System's solid waste education coordinator, and presentation topics typically included HHW.

Environmental education also includes production of "Recycling RAP" and "kids enviro page." Both documents are published during the school year. The RAP is distributed three times a year to 3,000 elementary school teachers countywide to assist educators with environmental education integration. The System's full-page "kids enviro page" has been a companion piece to the RAP since 1995. It is

published in “Kids News” ten times during the school year and goes home with approximately 38,000 elementary school children. In addition to promoting solid waste recycling and reuse, the publication describes the importance of segregating and diverting MRW from MSW disposal, and promoting the use of MRW collection facilities in the county.

Although it is difficult to measure the impacts of HHW education efforts, it is clear that an increasing number of residents are willing to take action to reduce and properly manage their wastes. This is demonstrated, in part, through participation at the System’s HHW collection sites, which now receive over 37,000 visits annually.

System Household Hazardous Waste Collection Events: Every year, in conjunction with the Spokane Regional Health District, the Spokane Joint Aquifer Board, and RSVP (Retired Senior Volunteer Program), the System sponsors an HHW collection program called “Spring Greening.”

Funded by a grant from Ecology, this program consists of volunteers distributing door hangers with educational materials, and collecting HHW for proper disposal. The events are designed to serve seniors and physically challenged citizens, providing them an opportunity to properly discard a range of HHW, including pesticides, paints, paint thinner, solvents, used motor oil, antifreeze, car batteries, furniture strippers, chemical drain cleaners, disinfectants, and similar hazardous products. In 2004, approximately 60 volunteers and 320 households took part in the Spring Greening program, resulting in more than eight (8) tons of HHW being properly disposed (System, 2004).

System Permanent Collection Sites: In 1991, permanent System HHW collection sites were established with the construction of the North County and Valley Transfer Stations, and the WTE Facility. This made HHW disposal significantly more convenient for citizens. Residents can now deliver HHW at the recycling/transfer stations and WTE Facility every day of the year except major holidays.

The System’s three fixed facilities receive all types of HHW. Latex paint is also accepted at these facilities, although latex paint is considered a solid waste and is processed with the MSW at the WTE facility. The cost of shipping of latex paint to a recycling facility would be prohibitive. However, useable latex paint is aggressively re-used by the public at our sites. Most latex paint disposed of is unsuitable for recycling due to freezing. The System has been involved with, and will continue to support, product stewardship initiatives such as paint recycling.

Radioactive wastes (except smoke detectors) are excluded, along with explosives and critically unstable materials. Trained staff operates the collection program. The program is paid for with solid waste tipping fees.

Staff accept, sort, and package HHW delivered by the public. Certain hazardous materials are placed inside a chemical storage building at each collection site. The storage building is prefabricated and separated into three compartments for corrosives, flammables, and poisons. Within each compartment, chemicals are stored on shelves, and up to three 55-gallon drums are placed for lab packing, loose packing, or bulking. Outside the chemical storage building (but within the covered facility), waste oil is stored in an 846-gallon tank, four 55-gallon drums are set up for antifreeze collection, and auto batteries are stored on a spill pallet.

Many of the HHWs collected are ultimately recycled or used as fuels. Currently, oil-based paints and other flammable liquids are shipped for fuel blending in cement kilns. Auto batteries are delivered

directly to battery retailers in exchange for the core deposit. Buttoncell batteries are shipped to a refining company for silver and mercury recovery. Rechargeable batteries are recycled by the Rechargeable Battery Recycling Corporation (RBRC). The costs for both shipping the batteries and recycling them are paid by the RBRC.

Used motor oil is refined in Portland, Oregon for use as a fuel supplement on ships, or sent to a refinery for production of recycled lubricating and hydraulic oils. In 2004, approximately 85,000 gallons of motor oil were sent to the refinery. The System is paid \$0.15 for each gallon shipped to Portland. Antifreeze is processed for reuse as a coolant. Other wastes, such as poisons, corrosives, oxidizers, and aerosols, are lab-packed and shipped to a hazardous waste incinerator in El Dorado, Arkansas. Waste management methods are evaluated periodically and are subject to change.

A building for storing HHW prior to shipment was constructed in 1997. This facility is located at the WTE Facility.

Materials designated for disposal from all of the collection sites are consolidated at this location and held until shipped out to a treatment storage disposal (TSD) facility. Operating costs have been remarkably low when examined on a per-vehicle basis. Average total costs per vehicle served from 1997 through 2004 were \$12. Costs are influenced by many factors, but are primarily driven by the types and quantities of waste delivered to the facilities and the management methods chosen for those wastes. In 2004, approximately 52 pounds of materials were delivered per vehicle.

System HHW Collection Participation: Since the last Hazardous Risk Waste Management Plan was published in 1991, citizen participation in the HHW program has increased ten-fold. Records have been kept of the types and quantities of waste handled through the fixed HHW collection facilities, including quantities of dry cell batteries received through the curbside and retail collection programs.

Used motor oil and auto batteries account for more than half of the HHW stream. In addition to the 90 tons collected through the System HHW collection program in 2004, the majority of used auto batteries produced during the year are delivered to battery retailers in exchange for the core deposit. These waste streams are being managed well through existing private and public sector efforts.

Also, the System sponsors a hazardous materials reuse program. A table is set up at the facilities for people to take reusable products, such as paints, pesticides, waxes, cleaners, and stains. Products are carefully screened by operations staff and do not include old or unidentifiable products or any restricted or banned pesticides. The program is extremely popular. Through 2004, nearly 150,000 pounds of products had been distributed through the reuse program.

System Dry Cell Battery Collection: Dry cell batteries are collected at the HHW facility at the transfer stations and the WTE Facility. Furthermore, the System also encourages retailers county-wide to accept dry cell batteries from the public. Currently, over 40 retailers and recycling centers are participating in the dry cell battery collection program. In 2004, over 80 tons of dry cell batteries were collected. This includes alkalines, rechargeables, and button cells. City of Spokane Solid Waste Management personnel sort the batteries. Mercury-containing batteries, including button cell batteries, are sent for recycling to reclaim the mercury. Rechargeables and batteries containing lead are recycled. The remaining batteries are sent for hazardous waste disposal.

System Health and Safety Program: The System has developed an employee training program that has become both a state and national model.

An in-house training program has been prepared for solid waste facility personnel as well as HHW facility operators. This training is available to non-municipal employees who might need hazardous materials training, such as staff from local counties.

Transfer station personnel complete a 24-hour hazardous materials training course. The course includes instruction on a variety of topics, including hazard determination, hazard communication, physical and health hazards of chemicals, use of personal protective equipment, hygiene, work procedures, basic chemistry and toxicology, information on bloodborne pathogens, waste characterization, medical monitoring, emergency response, decontamination, and storage and handling of incompatible or reactive wastes.

Hazardous waste technicians responsible for supervision and specialized waste handling receive 40-hour training. These staff members are involved in lab-packing certain wastes (such as poisons, corrosives, and oxidizers) and testing unknown wastes for proper classification and disposal.

All solid waste and HHW facility employees, as well as staff members from other counties, receive an annual 8-hour refresher course in hazardous materials training. Periodically, employees participate in drills to test the effectiveness of their training.

System Compliance and Enforcement: During implementation of the MRW Plan, emphasis has been given to expanding collection opportunities, as well as providing education and technical assistance to businesses in the county to improve MRW management. If serious or imminent threats to public health or the environment are identified through complaints or onsite visits to businesses, the System will refer such problems to the appropriate regulatory agencies.

A primary focus of the System's compliance effort has been to assure the quality of the waste stream arriving at the NSLF, the WTE Facility, and the transfer stations. A load inspection program has been established to identify non-acceptable wastes, including asbestos, regulated quantities of hazardous waste, infectious waste, large containers, nonprocessable material, recyclables, large quantities of liquids, contaminated soils, and sludge. If unacceptable wastes such as hazardous waste are discovered through load inspection, an effort is made to identify the sources of the waste. Responsible parties are notified, if possible, and arrangements made for proper waste disposal.

The quality control program also includes an emergency response plan. The plan identifies procedures for response to injuries, fires and explosions, hazardous material spills, and release of toxic gases. Training on emergency response procedures is provided to all facility employees.

System Program Evaluation: The System tracks and reports expenditures, activities, and accomplishments associated with the MRW management program. Reports are routinely provided to Ecology and the Spokane Regional Health District (SRHD). The System also compiles detailed information on its HHW and SQG waste collection programs on an annual or more frequent basis.



### **HHW Alternative B: Interlocal Agreement for HHW & MRW**

If the City of Cheney begins taking its MSW out of the county to realize cost savings for that portion of the waste stream, the first alternative will be to enter a contract with the Spokane Waste to Energy System to continue handling HHW & MRW programs.

Based on current rate schedules furnished by the Spokane Regional Solid Waste System, the City of Cheney is charged \$1 per ton in tipping fees to provide the existing hazardous waste program outlined above in HHW Alternative A.

### **HHW Alternative C: Contract Network for HHW & MRW**

If the City of Cheney begins taking its MSW out of the county to realize cost savings for that portion of the waste stream, and the Spokane Regional Solid Waste System is no longer a viable option to form an interlocal agreement with for handling HHW & MRW, then the city of Cheney will look to satisfy this service need by contracting with private entities.

HHW & MRW Disposal Markets: Approximately half of the HHW waste stream in the Spokane County WTE System is comprised of used motor oil and automotive batteries. Both of these segments of the waste stream are already handled separately by the City of Cheney at its Recycling Center at 100 Anderson Road. The private contracts for handling these segments of the waste stream will continue to be reviewed and updated regardless of the alternative selected.

There are currently (June, 2012) six active G-certificated solid waste hauler permits with the Washington Utilities & Transportation Commission for service within Spokane County. This number does not include specialty haulers who focus on specific segments of the waste stream, such as medical waste.

<b>G-Certificated Haulers in Spokane County</b>	
<b>UTC Permit</b>	<b>Company</b>
G-75	Empire Disposal, Inc.
G-142	Waste Paper Services, Inc.
G-104	Ada-Lin Waste Systems, Inc.
G-199	Sunshine Disposal, Inc.
G-237	Waste Management of Washington, Inc.
G-260	Torre Refuse and Recycling, LLC

HHW & MRW Disposal Operations: For HHW and MRW which does not generate sufficient volumes to make continuous acceptance at the Cheney Recycling Facility feasible, the City of Cheney will conduct several disposal events annually. This program will require substantial education and encouragement on the part of the City of Cheney. Residents will regularly be encouraged throughout the year to utilize the services available at the Cheney Recycling Center, and to save up HHW and MRW which cannot be accepted, and hold it for the disposal events. The Cheney Solid Waste Division will advertise the dates of HHW and MRW collection events well in advance, and accommodate for a combination of curbside and drop-off acceptance of these materials. This HHW and MRW will then be disposed of in bulk through the network of private or public contractors.

Surveillance & Control: Prior to execution of a contract to provide HHW & MRW services, potential contractors will be required to supply proper documentation of compliance with all Washington laws relating to HHW & MRW, as well as the proper permits for handling HHW & MRW from the Washington Utilities & Transportation Commission (UTC) if necessary.

As maintenance of proper state hazardous waste permits is contingent on compliance with state and local hazardous waste laws, a large portion of surveillance and control will fall directly on the contracted providers. In an effort to retain their permits required to remain in business, there will be substantial incentive for these providers to comply with the requisite regulations. Depending on the type of HHW and MRW, various permitting agencies will provide over-arching surveillance of the contractors. The City of Cheney will check on the currency of contractor permits from time to time during the life of any contract, as well as at contract renewal.

## 3.0 Waste Reduction & Recycling

### 3.1 Incentives & Opportunities

#### City of Cheney Recycling Facility

The City of Cheney currently operates a recycling facility at 100 Anderson Road which accepts Aluminum, batteries (household and automobile), cardboard (corrugated), glass, motor oil, paper products (colored ledger paper, computer paper, magazines, newspapers, phone books, white ledger paper), plastic products (HDPE and PETE), and tin.

The City of Cheney's recycling center is open 21 hours per week and is completely free to Cheney residents. This option serves as a financial incentive to source-separate, because it offers a mechanism for residents to reduce the amount of waste that they put into their garbage cans. Reducing the amount of garbage creates the potential for residents to down-size their service and reap the financial rewards.

Material	Amount in Waste Stream (tons per month)	Percent of Waste Stream*	Recovery Rates (2011 average per ton)
Newsprint	10.26	20.76%	\$60.83
Cardboard	18.30	46.26%	\$83.56
Plastic Mix	0.45	1.13%	-\$64.91
Colored Ledger	1.91	4.83%	\$18.49
Aluminum	0.42	0.95%	\$1,306
Tin	0.78	1.97%	\$137
PETE Plastic	0.95	2.41%	\$346
HDPE Natural	0.26	0.65%	\$239
HDPE Color	Na	0%	Na
Glass	8.33	21.04%	-\$35.00
Batteries			
Motor oil			

\*Percentage of waste entering Cheney Recycling Facility

#### Eastern Washington University Recycling

Eastern Washington University partners with the City of Cheney in marketing some recyclable materials (cardboard, others), but handles other materials internally. Exhibit 7 shows a breakdown of the materials present in EWU's recycling waste stream.

Material	Amount in Waste Stream (Tons per month)
OP2	1.39
Newsprint	1.50
Colored Ledger	2.15
White Ledger	1.21
Aluminum	0.14
PETE Plastic	0.91
HDPE Natural	0.09

HDPE Color	0.03
Magazines	0.68
Plastic Mix	0.20

### Levels of Public Participation

For the year 2010, the last full-year of available data, all recycling in the City of Cheney between the city-owned facility, and EWU totaled 628 tons of various materials. Based on 2010 Census figures, this yields a per-capita recycling rate of approximately 119 pounds per year.

The City of Cheney conducted a survey of solid waste customers in October, 2008. The city received 611 responses. At that time, approximately 80% of respondents indicated that they use the Cheney Recycling Facility to drop-off recyclables.

## 3.2 Source Separation Strategies

### Statewide Practices

Many curbside programs in the State are implementing multistream collection systems in an effort to reduce collection costs and increase collection of recyclables. Under this approach, commingled recyclables are placed into one or two containers. Recyclables are then sorted after delivery to a material recovery facility (“clean” MRF).

Some evidence suggests that the convenience of not having to sort recyclables leads to increased participation by residents. Some studies note, however, that container capacity, not less sorting, is the significant factor in determining the amount of materials set out at the curb.

Because collecting recyclables is the curbside recycling hauler’s biggest expense, gathering materials in one container, instead of several, leads to lower collection costs. Some communities have had capital costs for buying new carts. Lowered collection costs, however, can be negated by increased processing costs and, if necessary, the cost for building a MRF to sort the recyclables. Capital and operations costs for a clean MRF vary depending on the level of technology used at the facility but typically fall in the range of \$10,000 to \$22,000 per ton of daily capacity. Operations and maintenance costs can range from \$20 to \$60 per ton, exclusive of revenues gained from marketing recycled materials.

Problems that arise with this form of collection include:

- Contamination resulting from more non-recyclable materials being put into the recycling carts. A study of 70 multistream facilities found an average “residue percent” of 16.6 for multistream, compared to 4.3 for source-separated collection systems.
- Cross contamination between grades and types of recyclable materials.
- Recycling processors experience an increase in maintenance and repair costs to their equipment due to damage from contaminants.

### Considerations for Cheney

The Cheney Solid Waste System runs very efficiently because of the technology used in collection. Cheney’s collection vehicles utilize automated systems for pickup of residential solid waste containers.

This automation allows for a collection unit to be operated by only one handler. The institution of a curbside recycling collection program would likely force several changes to the system:

- **Collection fleet upgrades:** The system’s collection vehicles are currently designed to combine all MSW into the collection vehicle. The addition of curbside collection of source-separated materials would likely require the purchase of additional vehicles.
- **Solid Waste Rate Increases:** Adding curbside collection of recyclable materials would most likely have an impact on solid waste rate payers.

### 3.3 Source Separation Alternatives

#### Alternative 1: Single Stream Curbside Service with Disposal at Waste Management

Waste Management operates a recycling facility near the existing Spokane WTE Facility. This facility allows Cheney Solid Waste vehicles to dispose of single-stream recycling, with sorting occurring at the facility.

Operations: Under this alternative, the City of Cheney Solid Waste Division would require all solid waste customers (2,447 monthly average, 2011) to participate in the recycling service as well. Collection would utilize City of Cheney Solid Waste Division vehicles, take place separately from solid waste collection, and occur once every other week. Recyclables would be taken to the Waste Management Facility.

Cost Considerations: The existing Cheney Recycling Facility has the potential to generate some revenue for the system depending on market conditions for recyclable commodities. The implementation of a curbside recycling program would make operation of the recycling facility needlessly redundant and likely force its closure.

Costs associated with taking recyclables to the Waste Management Facility include tipping fees estimated at \$70 per ton, purchase of a new collection vehicle at \$250,000, operation of a new collection vehicle (0.5 FTE) at \$20,000 annually, and purchase of recycling containers at \$220,000. When amortizing the capital assets over 10 years and holding tipping fees & wages constant, the increase per solid waste customer comes to \$4.23 per month, or approximately \$50 per year.

It is estimated that this alternative to providing curbside collection would raise the average residential customer’s bill by 36%. This will impact those customers whether they utilize recycling services or not. Below is a straight-across application of recycling costs to solid waste users based on projected costs.

Exhibit 8: Cost Impact of Curbside Recycling				
	Current Monthly Bill	Monthly Recycling Cost*	New Total	Change versus Current
Residential 64 Gal.	\$11.88	\$4.23	\$16.11	36% Increase

*\*Tipping fee, annual operations, new collection vehicle (10-year repayment), new recycling carts (10-year repayment)*

Revenue Considerations: It is estimated that a contract with the Waste Management recycling facility could yield some revenue to off-set costs. To account for Waste Management’s costs and profits, Cheney may expect to see 30% of the total revenue generated from the sale of its recycled materials.

Resident Cost Opinions: The latest data available sampling Cheney residents’ opinion regarding payment for curbside recycling service is from October, 2008. A survey of customers received 611 responses (there were 2,447 solid waste customer accounts in 2011). The survey asked customers if they would be willing to pay an additional charge to receive weekly curbside recycling service, and if so, how much they would be willing to pay.

The results of the 2008 survey show a general aversion toward weekly curbside recycling at the price-point of \$4.23 per month identified in Exhibit 8. At this price point, only 15% of respondents are willing to pay. The price point must be cut nearly in half to \$1.99 per month before a majority of respondents say they would be willing to pay for curbside service.

Exhibit 9: 2008 Cheney Weekly Curbside Recycling Price-Point	
Cost of Service	Percent of all respondents Willing to Pay
\$0.99 per month	59.4%
\$1.99 per month	53.4%
\$2.99 per month	34.2%
\$3.99 per month	19.8%
\$4.99 per month	15.2%

It would be advised that the City of Cheney conduct another survey to gain updated customer opinions regarding curbside recycling. This updated survey should again focus on identifying a resistance point for pricing, and alter the question to a semi-weekly service.

Generation Considerations: The existing Cheney Recycling Facility processes approximately 550 to 600 tons of recyclable material annually. The implementation of a curbside, single-stream recycling option would likely have a positive impact on the rate of recycling among Cheney residents. It is estimated that the amount of recycling generated through a curbside collection program could raise that number to approximately 700 tons per year, or roughly 15%. To make the system feasible, the cost of providing the service would be applied to all accounts utilizing solid waste services in Cheney. Therefore, there will be little reason not to utilize the recycling program.

The expected increase in recycling within Cheney of 15% may seem small based on the ease of use and limited number of disincentives, but this projection takes into account the positive externality which the Cheney Recycling Facility creates for non-Cheney residents who live nearby. The existing facility is not monitored to ensure residency of those who utilize this free service. Therefore, there are nearby residents of un-incorporated Spokane County who dispose of their recyclable materials at the Cheney Recycling Facility. Doing so provides them a financial incentive by reducing the amount of waste which they place into their solid waste containers, or which they must take to the WTE Facility themselves.

Elimination of the Cheney Recycling Facility would reduce the amount of recyclable materials coming into Cheney from un-incorporated Spokane County. This would have an effect on the perceived rate or recycling among Cheney residents, and have an effect on recycling system operations for Spokane County.

## **Alternative 2: Single Stream Curbside Service with Disposal at Sunshine Disposal**

Sunshine Disposal, Inc. is currently examining the feasibility of offering single stream recycling at its Spokane Valley Transfer Station.

Operations: Under this alternative, operations would be similar to those outlined under alternative 1, with the exception that recyclables would be taken to the Sunshine Disposal Spokane Valley Transfer Station.

Cost Considerations: Costs associated with taking recyclables to the Sunshine Disposal Facility include:

- Tipping fees (\$ Unknown)
- Purchase of a new collection vehicle at \$250,000
- Operation of a new collection vehicle (0.5 FTE) at \$20,000 annually
- Purchase of recycling containers at \$220,000.

When amortizing the capital assets over 10 years and holding tipping fees & wages constant, the increase per solid waste customer can be expected to be between \$3.50 and \$5.00 per month. This translates to between a 29% and 42% increase for the average residential customer.

Depending on the tipping fees charged, and the expected revenue generated from the sale of recyclables, the cost impact will vary. These costs will impact rate payers whether they utilize recycling services or not.

Resident Cost Opinions: See Exhibit 9 for price resistance points for weekly service identified in 2008.

Generation Considerations: The impact of this alternative on recycling generation will likely have the same impact as those outlined under alternative 1.

Revenue Considerations: The recycling system can expect to see some revenue from a contract with Sunshine Disposal depending on the market price of the various commodities. These figures are as yet unknown.

## **Alternative 3: Single Stream Curbside Service Carried out by the Cheney Solid Waste Division**

The City of Cheney currently operates a recycling facility at 100 Anderson Road. This facility is a drop-off location which operates approximately 20 hours per week. With a substantial capital investment, this facility may be upgraded to accommodate the equipment necessary to perform the function of a recycling sorting facility.

Operations: Under this alternative, collection operations would be similar to those outlined under alternative 1. This alternative would also necessitate an additional aspect of operations through the sorting of materials, and administrative functions of managing wholesale recycling contracts. These additional operational aspects would add currently unknown personnel costs to the system.

Cost Considerations: Costs associated with collecting single-stream recycling, sorting it, and marketing it independently include:

- Upgrade of existing recycling facility to accommodate sorting (\$unknown)
- Purchase of a new collection vehicle at \$250,000
- Operation of a new collection vehicle (0.5 FTE) at \$20,000 annually
- Purchase of recycling containers at \$220,000.
- Operation of a sorting facility (\$unknown)

Resident Cost Opinions: See Exhibit 9 for price resistance points for weekly service identified in 2008.

Generation Considerations: The increase in generation mentioned in alternatives 1 & 2 can also be expected for this alternative; however this alternative will not result in the expected reduction which is also mentioned. Maintaining the Cheney Recycling Facility will maintain the positive externality for nearby residents of un-incorporated Spokane County who find it easier, or more feasible, to utilize Cheney's resource, rather than the Spokane WTE.

#### **Alternative 4: No Curbside Service; Continuation of Existing Program**

The City of Cheney currently operates a recycling facility at 100 Anderson Road.

Operations: This facility is open to the public approximately 20 hours per week as a drop-off facility. The facility currently accepts:

- Aluminum
- Batteries (household and automobile)
- Cardboard (corrugated)
- Glass
- Motor Oil
- Paper Products (colored ledger paper, computer paper, magazines, newspapers, phone books, white ledger paper)
- Plastic Products (HDPE and PETE)
- Tin

The City of Cheney contracts with various vendors to dispose of these recycling materials.

Cost Considerations: Depending on the market forces for the various recyclables, the Cheney Recycling Facility has the potential to generate a small amount of revenue some years, and must be subsidized by the solid waste system other years. The costs of operating the Cheney Recycling Facility are currently factored into the City of Cheney's Solid Waste System, and are continually monitored.

Continued operation of the Cheney Recycling Facility would have little, to no effect, on Cheney Solid Waste Users aside from routine maintenance and inflationary costs.

Generation Considerations: The existing Cheney Recycling Facility processes approximately 550 to 600 tons of recyclable material annually. This translates to nearly 100 pounds of recyclables per Cheney Resident. It is again important to point out, however, that not all of the recycling stream at the Cheney Recycling Facility comes from Cheney Solid Waste customers. The location of the facility, relative to the nearest other facility (Spokane WTE), makes it a beneficial option for many residents living in Southwest Spokane County.



Appendix 1				
20 Year Solid Waste Generation Projection				
	2011	2016	2021	2031
Population	10,748	11,522	12,352	14,194
Total (Tons)	5,409	5,766	6,147	6,988
Residential (Tons)	3,869	4,148	4,447	5,110
Commercial (Tons)	1,539	1,618	1,701	1,878

\*This assumes 0% per year increase in per capita generation

\*2010 generation and population figures used for projection

Average Annual Population Growth Rate: 1.4%  
 Average annual Growth in other waste: 1.0%

Appendix 2				
Yearly Unit (per-ton) Cost Summary				
Alternative	2011	2016	2021	2031
A- Spokane	\$104.00	\$109.31	\$114.88	\$126.90
B1- Grant via Truck	\$81.34	\$82.63	\$84.78	\$89.73
B2- Yakima via Truck	\$91.70	\$94.19	\$96.93	\$103.16
B3- Klickitat via Truck	\$93.70	\$96.30	\$99.14	\$105.60
C1- Rail from Cheney	\$75.70	\$77.11	\$78.74	\$82.69
C2- Rail from Spokane Valley	\$69.00	\$72.52	\$76.22	\$84.19

### Assumptions

#### **Generation**

See Appendix 1

#### **B-1,2,3 Trucking**

Average cost per ton per mile:	\$0.10
Average increase in hauling cost:	1.0%
Design/Build Transfer Station:	\$1,300,000
Construction Financing Rate:	3.0%
Yearly Transfer Station Operations:	\$30,000
Yearly increase in operations:	1.0%

#### **C-1 Rail from Cheney**

Cost per ton to rail to Klickitat:	\$55
Yearly increase in haul cost:	1.0%
Design/Build Transfer Station:	\$1,300,000
Construction Financing Rate:	3.0%
Yearly Transfer Station Operations:	\$30,000
Yearly increase in operations:	1.0%

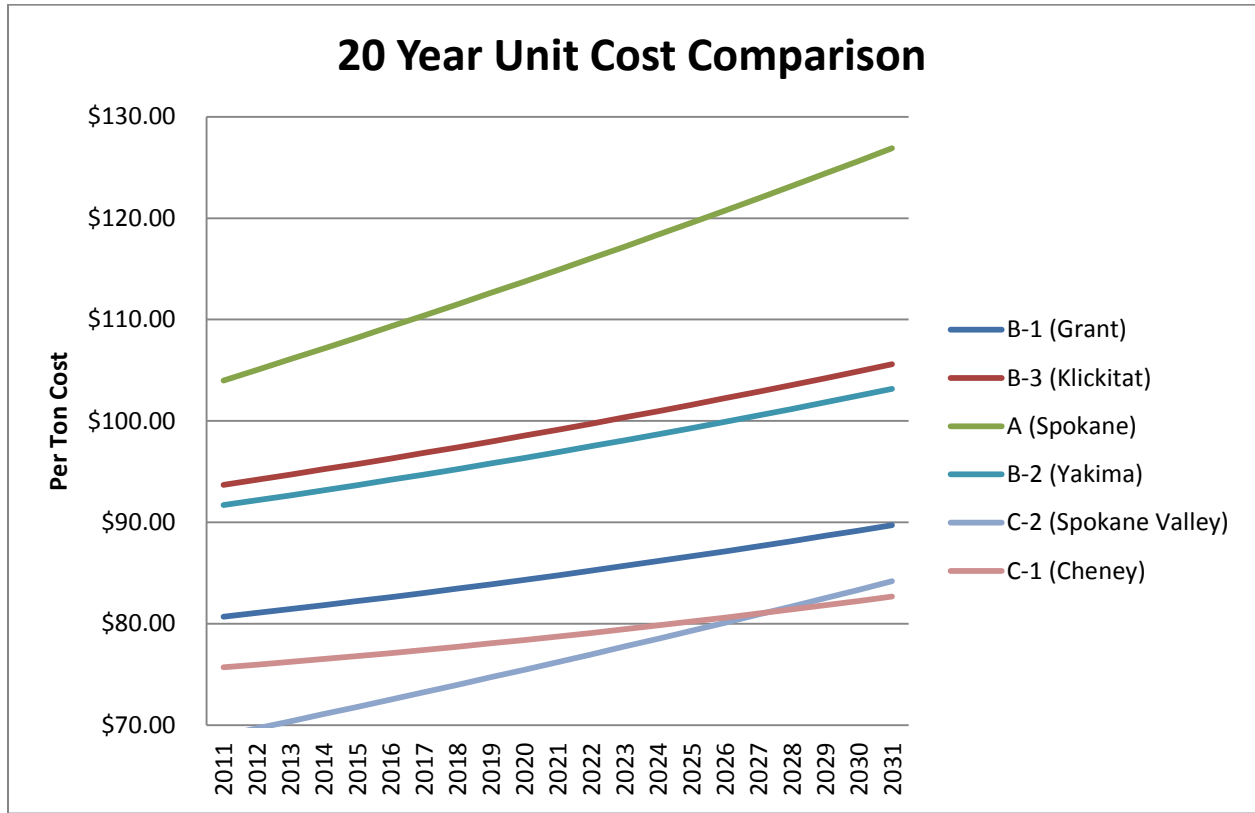
#### **C-2 Rail from Spokane Valley**

Cost per ton to rail to Klickitat:	\$55
Yearly increase in haul cost:	1.0%
Cost per ton to use Sunshine access:	\$15
Yearly increase in access cost:	1.0%

#### **Tipping**

Yearly increase to all tipping fees:	1.0%
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Appendix 2.1



Appendix 3 20 Year Total Cost Summary					
Alternative	2011	2016	2021	2031	Savings*
A- Spokane	\$563,000	\$630,000	\$706,000	\$887,000	\$ -
B1- Grant via Truck	\$437,000	\$476,000	\$521,000	\$627,000	\$3.95 M
B2- Yakima via Truck	\$496,000	\$543,000	\$596,000	\$721,000	\$2.36 M
B3- Klickitat via Truck	\$507,000	\$555,000	\$609,000	\$738,000	\$2.07 M
C1- Rail from Cheney	\$409,000	\$445,000	\$484,000	\$577,000	\$4.73 M
C2- Rail from Spokane Valley	\$373,000	\$418,000	\$469,000	\$588,000	\$5.03 M

\*Savings measured vs. Alternative A (Status Quo)

### Assumptions

#### **Generation**

See Appendix 1

#### **B-1,2,3 Trucking**

Average cost per ton per mile:	\$0.10
Average increase in hauling cost:	1.0%
Design/Build Transfer Station:	\$1,300,000
Construction Financing Rate:	3.0%
Yearly Transfer Station Operations:	\$30,000
Yearly increase in operations:	1.0%

#### **C-1 Rail from Cheney**

Cost per ton to rail to Klickitat:	\$55
Yearly increase in haul cost:	1.0%
Design/Build Transfer Station:	\$1,300,000
Construction Financing Rate:	3.0%
Yearly Transfer Station Operations:	\$30,000
Yearly increase in operations:	1.0%

#### **C-2 Rail from Spokane Valley**

Cost per ton to rail to Klickitat:	\$55
Yearly increase in haul cost:	1.0%
Cost per ton to use Sunshine access:	\$15
Yearly increase in access cost:	1.0%

#### **Tipping**

Yearly increase to all tipping fees:	1.0%
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