

# WASATCH

**I N T E G R A T E D**

waste management district

Integrated Waste Management Plan  
2023-2032

November 1, 2022

# WASATCH

## INTEGRATED

waste management district

Integrated Waste Management Plan - 2023-2032

November 1, 2022

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## Executive Summary

Wasatch Integrated Waste Management District (“Wasatch”) has contracted with Gershman, Brickner & Bratton, Inc. (“GBB”) to develop a comprehensive, integrated long-term plan for responsible solid waste management for its service area in Davis and Morgan Counties, Utah. Wasatch members include 14 of the 15 municipalities in Davis County, as well as Morgan City in Morgan County. Wasatch also includes the unincorporated area of Davis County and all the remaining unincorporated area of Morgan County in Utah, which is located east of Davis County. Bountiful City is not a Wasatch member. Wasatch’s present boundaries encompass an area of over 800 square miles with an estimated population of 325,000, which is expected to continue to grow rapidly in both Davis and Morgan Counties in the next decade. An average annual growth rate population of 1.8 percent (%) is used in the population projections.

This plan, which is titled the Integrated Waste Management Plan (“Plan”), presents the existing system, provides guidance, and sets forth goals of increasing the diversion of Wasatch’s material streams (formerly waste streams) from its landfill, improving its solid waste infrastructure, expanding disposal alternatives, and evaluating current services and opportunities to ensure that all residents have safe, efficient, and effective access to waste collection and/or drop-off opportunities during the Plan time period of 2023-2032, and beyond. While this is written and presented as a ten-year plan, the projections covered in the analysis herein project twenty years into the future, to account for when the Davis Landfill will reach its full capacity.

This Plan was developed under the direction of the Administrative Control Board pursuant to the Utah Solid Waste Management Act (UCA 17-15-23), which requires each county to adopt a solid waste management plan and is an updated version that is intended to replace and advance the previous plan that was first published in 2013, and last updated in 2017.

The Plan is informed by Wasatch’s Mission Statement to provide sustainable, cost-effective, and environmentally sound solid waste management. The Plan requires addressing the need for disposal capacity while considering waste diversion, recycling and composting opportunities, and the continued safe handling and management of toxic items such as household hazardous waste. Effective solid waste management is not only a public health imperative of the expanding population of people that live within Wasatch’s members and boundaries but is also a tool to protect the environment through resource management. The five guiding principles of Wasatch’s Mission Statement are:

- Maintain fiscal integrity with minimal financial risk. Consider long-term effects and life cycle costs. Maximize the value of assets.
- Recognize waste as a resource through reuse, reduction, recycling, and the production of fuels and energy, when financially viable. Manage waste destined for disposal with state-of-the-art landfill resources, operations, and long-term care.
- Make well-informed decisions based upon sound scientific and business judgment and ethical business practices.
- Aggressively pursue the best available demonstrated technologies that minimize the volume and toxicity of wastes and protect the environment for future generations.
- Promote public education and awareness of effective and efficient municipal solid waste management practices.

The Plan is developed under the direction of the Administrative Control Board with feedback and input collected from Wasatch’s members and administration. Input from the public is considered through an inclusive community-wide phone and online citizen survey effort conducted in March through May 2022.

The planning horizon, from fiscal year 2023 to 2032 represents Wasatch’s planning period efforts to set goals and serve as Wasatch’s working guidance document as it moves to implement solid waste management system changes to achieve those goals. The Plan envisions an Advisory Committee, appointed by Wasatch’s Administrative Control Board, will provide input and guidance into the development of this Plan, including recommendations. The Plan will be approved by the Administrative Control Board before it is fully implemented. The Board’s input into this draft Plan began at the Board’s April 2022 Retreat, continued with input from the Advisory Committee, and the Board’s review and acceptance at its November 2022 Board meeting.

In 2021, Wasatch handled over 344,000 tons of various materials including:

- Residential Waste and Recycling – 130,040 tons,
- Commercial Waste – 88,409 tons,
- Self-Haul Waste – 40,460 tons,
- Construction & Demolition Debris Waste – 27,449 tons,
- Out of District Waste – 21,623 tons,
- Clean Fill – 9,500 tons,
- Green Waste - 18,606 tons, and
- Special Waste - 557 tons.

These materials were received, handled, and processed through the following facilities:

- The Davis Landfill Complex, which includes the Davis Landfill and its Landfill Gas Systems, Citizen Drop-Off, Green Waste Recycling Facility, Landfill Thrift Store, Household Hazardous Waste Facility (HHW), and Administrative Offices.
  - The inbound material at the HHW Facility and Thrift Store is not tracked by Wasatch, as they are located in front of the scales, and their collection services are provided at no charge to residents of the District.
  - A good portion of the HHW material is placed in the reuse shed and goes without being tracked. In 2021, the outbound materials from the HHW totaled 450 tons including:
    - 5.05 tons Antifreeze
    - 31.83 tons batteries
    - 139.82 tons electronic waste
    - 231.9 tons hazardous waste
    - 46 tons oil
- The Davis Material Recovery Complex, which includes a Material Recovery Facility (MRF), a transfer station, and an education center.
- Other facilities potentially used by Wasatch to manage and move waste as needed:
  - Wasatch Resource Recovery – Anaerobic Food Waste Digester, North Salt Lake
  - Devil’s Slide Cement Plant, Croydon
  - Waste Management’s Tekoi Landfill, Tooele County
  - NUERA/Bayview Landfill, Utah County
  - Other commercial landfills
  - Hauling Contractors
- Operation of the existing system in 2021 resulted in the following disposition of materials:
  - Davis Landfill Disposal as waste – 205,549 tons,
  - Transfer to Regional Landfill as waste and residue, Tekoi – 116,193 tons,



- Green Waste Recycling Facility as process feedstock – 12,498 tons,
- Devil’s Slide cement plant as engineered fuel – 4,725 tons, and
- Markets as Recyclable Materials – 3,994 tons.

Understanding the current capacity and future needs of these facilities, in combination with Wasatch’s guiding principles and prioritized goals to maximize the diversion of material from landfills, potential scenarios (operational changes) have been developed and considered for new options, or alternatives, for the processing and transfer of material tonnages through Wasatch’s facilities moving forward.

The scenarios that were suggested for consideration in this Plan include:

- Scenario 1 – The Base Case, status quo of Davis Landfill, Transfer Station(s);
- Scenario 2 – Robust Single Stream Recycling; and
- Scenario 3 – Engineered Fuel and Organics Use from MRF.

To assist in planning and decision-making moving forward, a financial model was developed, which was used in the evaluation of the three scenarios mentioned above. The financial model uses 2023 as its base year with the budget figures for revenues, rates charged, and costs consistent with the accounts of Wasatch’s current financial system. In each scenario, the model allowed for changes in tonnage flows through the system, rates and charges, facilities, and equipment fluctuations, in operations. To summarize the impact of any scenario, the model calculated projections of the average annual net cash income over 20 years, and the net in cash position over 20 years, to account and plan for the filling up of the Davis Landfill. The results for each scenario are further described and presented in the scenarios section of this Plan. Additionally, extensive public outreach efforts were conducted as part of this Plan analysis through a phone and online survey. A full explanation of the survey process, including questions asked, as well as the responses is included within this report. The key takeaways to note are that the vast majority of the public that is currently served by Wasatch and living within its service area boundaries is happy with the levels of service that Wasatch provides at present, and is willing to pay more, (\$5 per month), for expanded recycling services.

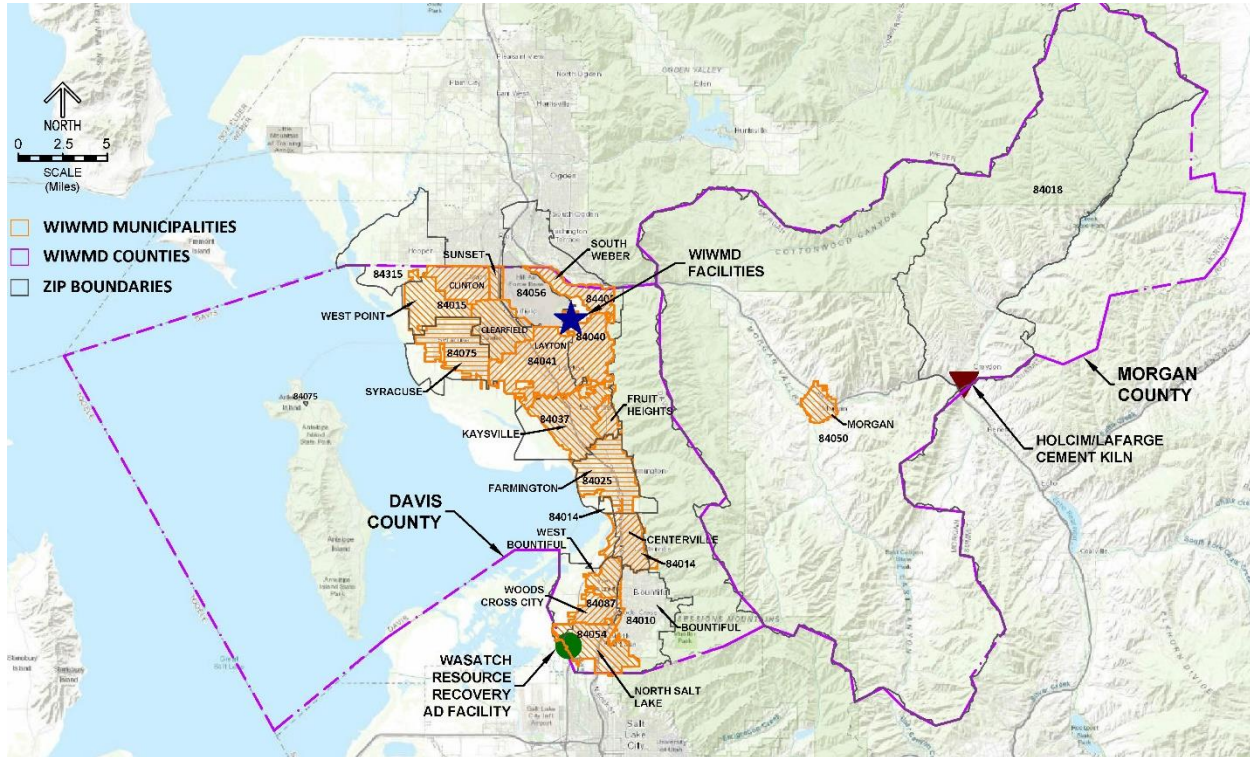
## Introduction & Background

In 2021, Wasatch contracted with GBB to review Wasatch’s current solid waste management services and efforts, and to develop this updated Plan to guide effective and efficient solid waste management needs, and the waste diversion goals, of Wasatch and its members. This Plan outlines the current solid waste system of Wasatch, as well as its future needs. To provide guidance for the future of Wasatch’s solid waste system, the Plan has developed and compared potential scenarios for consideration and conducted a large-scale citizen survey effort to include community feedback in the development of the Plan’s recommendations.

## Wasatch and its System

Wasatch is a Special Service District that provides solid waste services to its members. This District is comprised of two Utah counties, Davis and Morgan, and several separately incorporated municipalities. Wasatch’s service area, as shown in Figure 1, is located approximately 20 miles north of downtown Salt Lake City, and its boundaries include all the municipalities in Davis County, other than the City of Bountiful, the unincorporated areas of Davis County, Morgan City, and the unincorporated areas of Morgan County.

Figure 1 - District Service Region



## Wasatch’s Mission and Purpose of this Plan

This Plan represents Wasatch’s planning efforts to provide appropriate solid waste management services into the future and will serve as Wasatch’s working guidance document as it moves to implement solid waste management system changes over the planning period of 2023 through 2032. Members of the Advisory Committee, appointed by Wasatch’s Administrative Control Board, have provided input into the development of this Plan, and approved the suggested recommendations before presented to the full Administrative Control Board. Implementation of all or part of the recommendations contained in the final Plan will be achieved through the normal budgeting and project approval processes of Wasatch.

Wasatch’s mission is to provide sustainable, cost-effective, and environmentally sound solid waste management. Implementation of the mission is informed by the five (5) guiding principles in its vision<sup>1</sup>:

- Maintain fiscal integrity with minimal financial risk. Consider long term effects and life cycle costs. Maximize the value of assets.
- Recognize waste as a resource through reuse, reduction, recycling, and the production of fuels and energy, when financially viable. Manage waste destined for disposal with state-of-the-art landfill resources, operations, and long-term care.
- Make well informed decisions based upon sound scientific and business judgment and ethical business practices.
- Aggressively pursue the best available demonstrated technologies that minimize the volume and toxicity of wastes and protect the environment for future generations.

<sup>1</sup> Wasatch Integrated Waste Management District Mission Statement, adopted 2011.

- Promote public education and awareness of effective and efficient municipal solid waste management practices.

The scenarios to be evaluated and the recommendations provided in this Plan were developed with those guiding principles in mind, as well as in coordination with feedback and input that was collected directly from Wasatch's members and the public through an inclusive and wide-ranging phone and online citizen survey effort conducted in March through May of 2022.

## Background: Wasatch Integrated Waste Management District

### General

Wasatch was established on September 24, 1984, by Resolution No. 84-200 adopted by the Board of County Commissioners of Davis County, Utah, pursuant to the provisions of the Utah Special Service District Act, Title 17A, Chapter 2, Part 13, Utah Code Annotated 1953, as amended (the "Special Service District Act"). Under the Special Service District Act, Wasatch constitutes a separate body politic and corporate and a quasi-municipal public corporation distance from each county or municipality in which Wasatch is located. Following the establishment of Wasatch, the governing body of each city, now included within the boundaries of Wasatch, adopted a resolution electing to be included within Wasatch in accordance with the provisions of the Special Service District Act.

When formed in 1984, Wasatch was named the Davis County Solid Waste Management and Energy Recovery Special Service District. In the mid-1990s, Wasatch created a doing-business-as (DBA) name of Wasatch Energy Systems. On July 1, 2004, Wasatch legally changed its name to Wasatch Integrated Waste Management District.

In 1990, the Utah State Legislature enacted Senate Bill 255 (SB255) to address county planning for solid waste over the next twenty years. SB255 required comprehensive solid waste management plans be conducted at both the local and state level according to draft guidelines released by the Division of Solid and Hazardous Waste in July 1991. In 1992, the Davis County Planning Commission, in conjunction with Morgan County, submitted a solid waste management plan to the Solid and Hazardous Waste Control Board. Per SB255, this plan was to be reviewed and modified no less frequently than every five years; however, the State did not provide funding for or follow through on the requirement for the periodic updates.

Since the development of the Davis/Morgan County Solid Waste Management Plan in 1992, many changes have occurred, requiring a continuous update to the counties' solid waste management planning. Until the development of this new Plan that covers the time period of 2023-2032, Wasatch was utilizing its previous Solid Waste Management Plan, which was published in 2013 and updated in 2017.

### Form of Government

The Utah Special Service District Act, as applied to Wasatch, provides that the Board of County Commissioners of Davis County shall control and have supervisory authority over all activities of Wasatch, but that the Board of Davis County Commissioners may delegate to an administrative control board the governance of Wasatch and the exercise of certain powers of Wasatch under the Special Service District Act. Pursuant to Resolution No. 84-200 and Resolution No. 87-130, adopted by the Board of Davis County Commissioners (collectively, the "County Resolution"), the governance and the exercise of the powers of Wasatch were delegated to the Administrative Control Board.

## Administrative Control Board

Wasatch’s Administrative Control Board is composed of 19 voting members, including three Davis County Commissioners and one member from each of the 15 incorporated cities within the boundaries of Wasatch. Morgan County also appoints a representative to serve on the Board. Each member of the Administrative Control Board is appointed by the governing body of the member's respective political subdivision for a four-year term. The Administrative Control Board annually elects an executive committee including a Chairman, Vice Chairman and Secretary (see Table 1 below). In addition to all regular board meetings, which are open to the public, there are three (3) separate Board Committees that meet once monthly to delve deeper into specific topics, and then report a summary of those findings back to the greater Board. These committees include the Budget and Finance Committee, the Government Relations Committee, and the Operations Committee. The Executive Director, Nathan Rich, serves as an ex-officio member of the Administrative Control Board.

Table 1 - District Board Members as of January 2022

Board Member:	Representing:
Mayor Clark Wilkinson	Centerville
Mayor Brandon Stanger	Clinton
Council Member Tim Roper	Clearfield
Commissioner Randy Elliot	Davis County
Commissioner Bob Stevenson	Davis County
Commissioner Lorene Kamalu	Davis County
Mayor Brett Anderson	Farmington
Mayor John Pohlman	Fruit Heights
Mayor Tami Tran	Kaysville
Mayor Joy Petro	Layton
Council Member Tony London	Morgan City
Council Member Mike Newton	Morgan County
Mayor Brian Horrocks	North Salt Lake
Mayor Rod Westbroek	South Weber
Council Member Chad Bangerter	Sunset
Council Jordan Savage	Syracuse
Council Member James Bruhn	West Bountiful
Mayor Brian Vincent	West Point
Council Member Wally Larrabee	Woods Cross
District Executive Director Nathan Rich	District



## Employee Workforce and Organization

The daily operations of Wasatch are supervised by the Executive Director, who is appointed by the Administrative Control Board as described above. The Executive Director also serves as ex officio member of the Board, Wasatch Treasurer, and Budget Officer. Duties of Wasatch’s Clerk are currently divided between the Wasatch Accounting Manager, Adam Hacker, and Wasatch Executive Assistant, Juli McIntosh, who also serves as Assistant Treasurer.

Wasatch organizes its activities and accounts into three (3) business units:

- District/Administration,
- Material Recovery and Transfer Facility (MRF), and
- Landfill.

Presented in Figure 2 are selected District management and staff. Wasatch’s Administration business unit is responsible for all management and support services, including safety monitoring, purchasing, and accounting. This unit has ten (10) full-time administrative employees and three (3) part-time tour guides.

The Material Recovery and Transfer Facility (MRF) business unit is responsible for the operation of the MRF. MRF personnel consists of 46 full-time positions, some of which are currently staffed through a temporary labor agency.

The Landfill business unit is responsible for operating the Davis Landfill, including the ancillary facilities, (the landfill gas systems, the citizen drop-off, the green material recycling facility, the landfill thrift store, the HHW facility, and the scales). The Landfill business unit is also responsible for the waste transfer operations at the MRF. The Landfill personnel consist of 31 full-time positions.



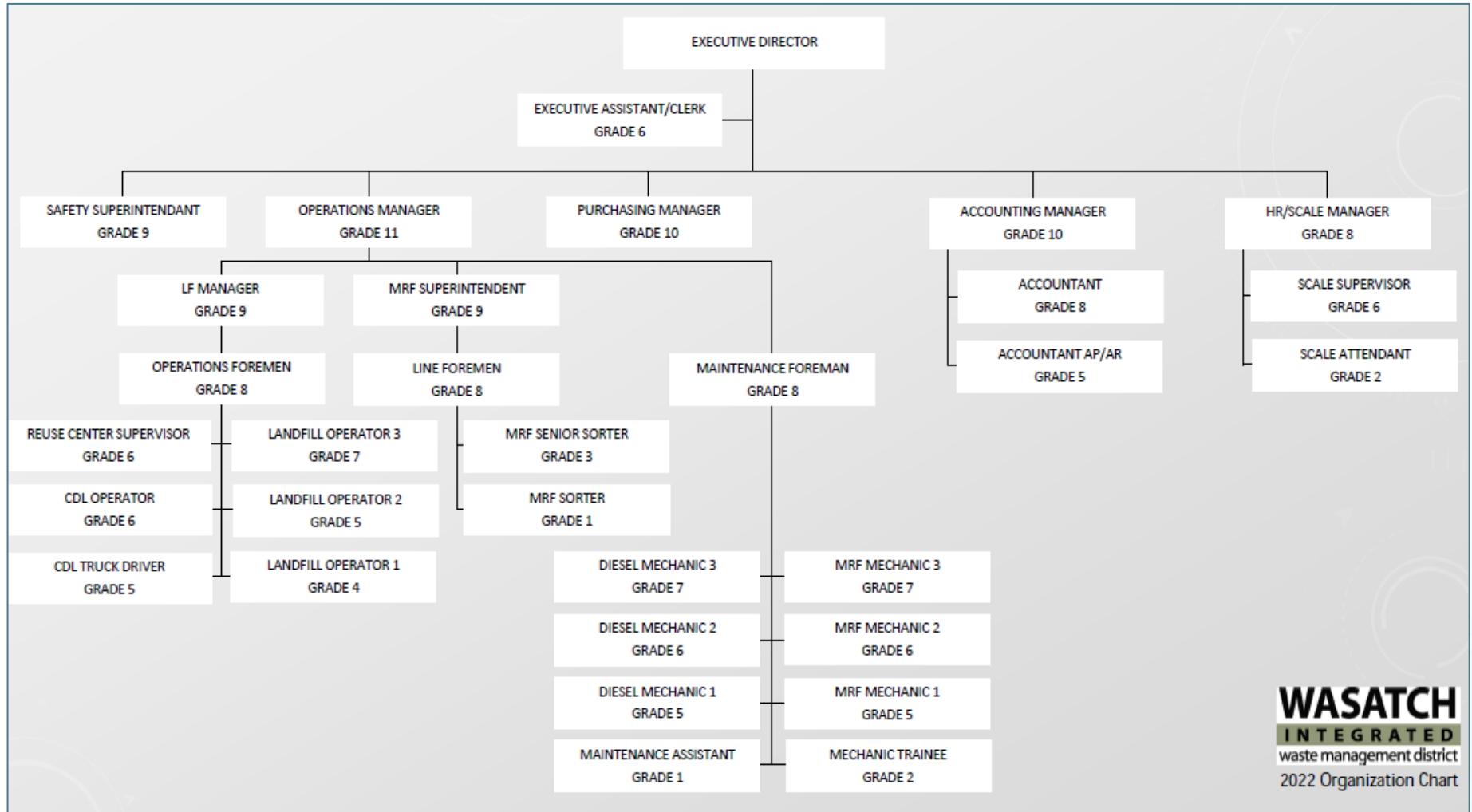


Figure 3 - District Organizational Chart



## Historical Collections

### Residential Waste and Recycling

Since the completion of the previous Integrated Waste Management Plan in 2013, a majority of District members have changed their residential collection services through their private contractors to include separate green waste and separate single-stream recyclables (SSR) collection services, both by setting out appropriate materials in either a city or contractor-provided can that is approximately 90 to 100 gallons in size. An example of the set out of residential cans is shown below.



Figure 4 – Residential curbside bin set out example

District member cities each contract for their own waste hauling services independently of other member cities and of Wasatch. Services include pick up and hauling and may also include SSR and/or curbside green waste pick up, bulky material pick up, and/or large-scale green waste pick up. The following contractors currently provide residential collection services for Wasatch Members:

- Ace Disposal
- Econo Waste
- Robinson Waste
- Waste Management

Residential waste collected by city contracted haulers is delivered to District facilities under the Household Use Fee. Wasatch charges a Household Use Fee of \$7.20 per can per month for solid waste and recycling services. The Household Use Fee is billed through member cities or commercial haulers setting out collection carts within Wasatch. In addition to Wasatch's Household Use fee, the individual cities charge their households for collection service as well. Each city contracts independently for waste hauling, and the costs charged by the haulers to each city for solid waste services varies throughout Wasatch's service area. Curbside collection of comingled recycling is currently provided at the discretion of the cities and materials are delivered to the MRF at no additional charge under the Household Use Fee. Any member city may add curbside collection of comingled recyclables at any time without further approval of the Administrative Control Board with delivery of the materials for processing at no additional cost.

Recyclables are also accepted from non-city sponsored programs at a charge of \$50 per ton. This material is primarily delivered by Mountain West Recycling which provides a subscription service outside of city sponsored programs. A small number of recyclables is also delivered from programs in Weber County. Curbside collected green waste is currently available in seven (7) cities and residents choosing to participate in the program pay an additional fee as determined by each city. Wasatch currently charges a fee on each green waste can of \$2 per month per can help defray processing costs. Implementation of new or additional curbside green collection services requires approval of the Administrative Control Board.



From the Blog: Nathan Rich advises customers on what goes into the blue recyclables cart.

### Description of Wasatch’s Service Area

The boundaries of Wasatch’s service area include the municipalities in Davis County, other than the City of Bountiful, as well as the unincorporated areas of Davis County, Morgan City, and the unincorporated areas of Morgan County. Wasatch’s present boundaries encompass an area of approximately 268 square miles with an estimated population that is greater than 300,000 and expected to continue to grow over the next decade. The Wasatch Integrated Waste Management District serves 14 of the 15 municipalities in Davis County, as well as Morgan City.

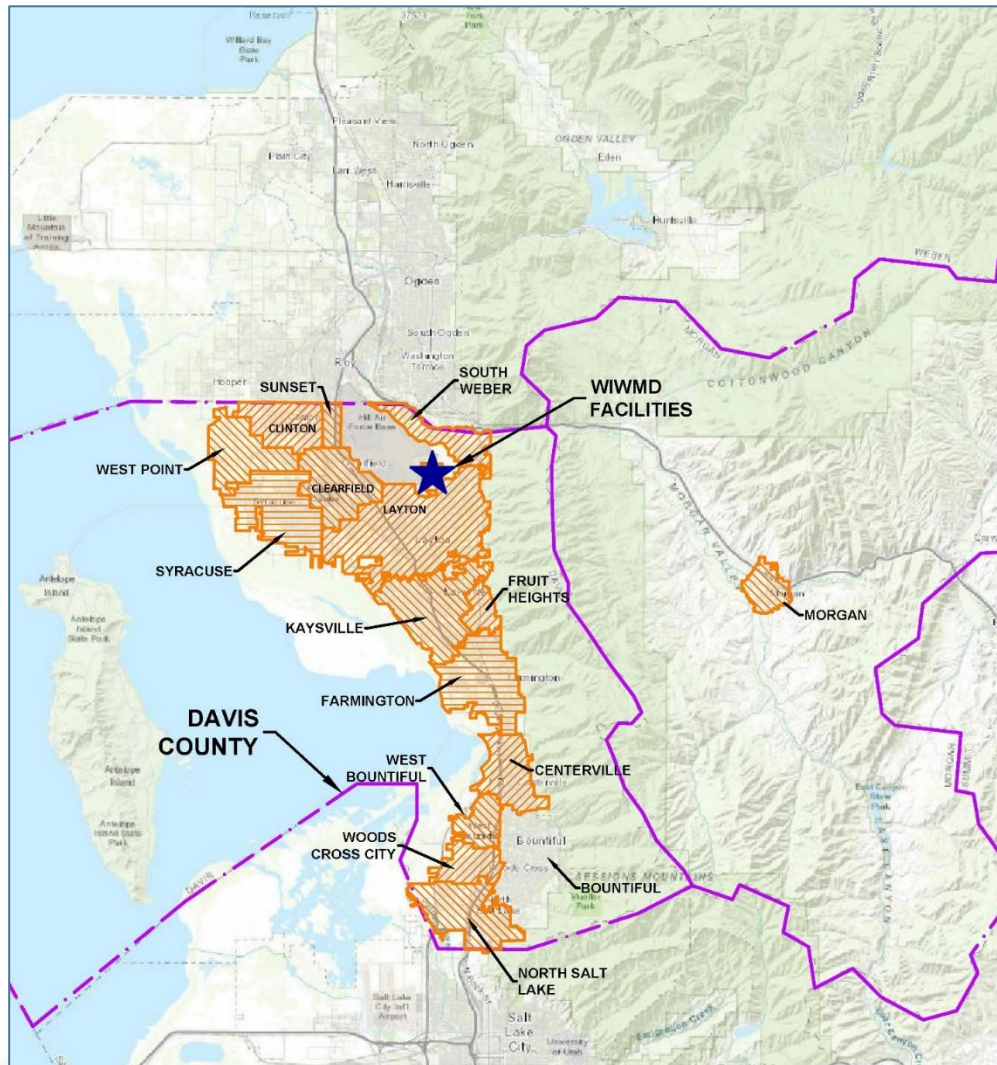


Figure 5 - Map of Wasatch with select sites and Davis & Morgan Counties highlighted

## Davis County, UT

Davis County is Utah's smallest county in land area, but it is the third largest county in population. The County has an area of 634 square miles, of which 299 sq. mi are covering land and 335 sq. mi water. The County is bounded by the Wasatch Mountains on the east, the Weber River on the north, and the mouth of the Jordan River on the south. To the west, the County includes a portion of the Great Salt Lake and its largest island, on which Antelope Island State Park is located. In 2020, 362,679 residents lived in the County's fifteen communities, which reflects an increase of approximately 18% since 2010.<sup>2</sup> The population of member cities in Davis County in 2020 is shown in Table 2.

Table 2 - Population of Davis County Member Cities (2020)<sup>3</sup>

City	Population (2020)
Centerville	16,884
Clearfield	31,909
Clinton	23,386
Farmington	24,531
Fruit Heights	6,101
Kaysville	32,945
Layton	81,773
North Salt Lake	21,907
South Weber	7,867
Sunset	5,475
Syracuse	32,141
West Bountiful	5,917
West Point	10,963
Woods Cross	11,340
<b>Total</b>	<b>313,139</b>

## Non-member: Bountiful City, UT

Bountiful City is located within Davis County, Utah. In 2020, 45,762 residents<sup>4</sup> lived in Bountiful City, which reflects an increase of over 8% since 2010. Bountiful City is not currently serviced by Wasatch. Bountiful City has its own landfill within its boundaries. The Bountiful Sanitary Landfill is a public municipal facility, owned by the Bountiful City Corporation, and under management of the Bountiful Solid Waste Management Authority. It accepts non-hazardous solid waste including municipal solid waste, commercial waste, industrial waste, construction/demolition waste, and special waste, (including conditionally exempt small quantity generator hazardous waste), as allowed by Utah Administrative Code R315-315. The facility

<sup>2</sup> U.S. Census Bureau 2020

<sup>3</sup> U.S. Census Bureau 2020

<sup>4</sup> U.S. Census Bureau 2020



is open only to the residents and businesses of Bountiful City. The facility handled approximately 110,000 tons of MSW and C&D material in 2020.

## Morgan County, UT

Morgan County is comprised of 611 square miles, of which 609 square miles are land and two square miles are water. The Weber River flows from the east to the northwest through the valley formed by Weber Canyon, which is bounded by the Wasatch Mountains on the south, west, and north, and by the Uinta Mountains on the east. Morgan County has the largest percentage of privately owned land of any County in Utah (93%), much of which is used for growing hay and other crops, as well as for grazing sheep for meat and other marketable products and cattle both for beef and for dairy. Much of the land in Morgan County that is not devoted to livestock and agricultural use is either mountainous or affected by wetlands surrounding the Weber River, so areas of current industry and future development are limited.

### Morgan County

In 2020, 12,295 residents lived in the County's eight communities and unincorporated County area. Morgan County has experienced significant growth in the last ten years as the US Census shows an increase of over 30% since 2010.

### Morgan City

Morgan City is a city within Morgan County. In 2020, 4,071 residents lived in the City, which reflects an increase of estimated 10% since 2010.

## Growth Update – Population and Economic

At 18%, Utah has experienced one of the highest growth rates in the nation over the past ten years, according to the 2020 figures by the U.S. Census Bureau<sup>5</sup>. As of April 1, 2020, the State of Utah’s population increased to 3,271,616, from the 2010 census count of 2,763,885.<sup>6</sup> The counties that constitute the northern metropolitan region surrounding Salt Lake County have shown some of the most significant growth within the state during the years 2010-2020, including Wasatch County (48% increase), Tooele County (25% increase), Utah County (28% increase), Morgan County (30% increase), Davis County (18% increase), and Juab County (15% increase).<sup>7</sup>

## Davis County

In 2020, Davis County’s population reached 362,679,<sup>11</sup> according to the US Census. As seen in the population data above, Davis County had an increase in population growth 2010 to 2020. The population growth trend is similar to that which is displayed in the projection included in Table 3. It is important to note that the population growth projection used

Year	Population <sup>8</sup>
<b>AAGR</b>	<i>1.8 Percent</i>
<b>2030</b>	391,933
<b>2040</b>	426,392
<b>2050</b>	465,664
<b>2060</b>	503,985

Table 3 - Average Annual Growth Rate (AAGR)<sup>9</sup> and population projection estimates for Davis County<sup>10</sup>

<sup>5</sup> Ibid

<sup>6</sup> Ibid

<sup>7</sup> Ibid

<sup>8</sup> The population projections used in this Plan are from 2016 and conservative. When future planning, it is advised to continuously account for an expanding population as more people will correlate with more waste.

<sup>9</sup> State and County Population Estimates for Utah: 2016

<sup>10</sup> Utah Governor’s Office of Planning and Budget, 2012

<sup>11</sup> U.S. Census Bureau 2020

below is the same as what was used in the Update to the Integrated Solid Waste Management Plan that GBB prepared for Wasatch in 2017<sup>12</sup>. Upon review of the source data from these projections in the 2017 Update, GBB did not identify an updated version of this source data, therefore, Davis County’s population is still projected to increase to approximately 400,000 during the time of this Plan, between 2030 and 2040.

As the population of Davis County continues to rise, the Utah Governor’s Office of Planning and Budget also predicts that employment within the county will increase by approximately 84,000 jobs by 2060<sup>13</sup> as shown in Table 4.

Table 4 - Davis County Employment Projections<sup>14</sup>

Employment	2030	2040	2050	2060
<b>Total Employment</b>	190,362	204,850	221,618	239,976

### Morgan County

Between 2010 and 2020, the population of Morgan County increased by over 30%. The population growth trend is like that which is displayed in the projection in Table 5. It is important to note that the population growth projection used below is the same as that which was inserted in Wasatch Integrated Management District Solid Waste Update 2017. Upon review of the source data from these projections in the 2017 Solid Waste Update, GBB did not identify an updated version of this source data. After 2010 and until 2016, the population slowed down to an average of 3.2% growth rate per year.

Year	Population
<b>AAGR</b>	3.2%
<b>2030</b>	15,013
<b>2040</b>	17,926
<b>2050</b>	20,654
<b>2060</b>	24,234

Table 5 - AAGR Population Projections for Morgan County<sup>15</sup>

As the population of Morgan County is projected to continue to grow substantially through 2060, the Utah Governor’s Office of Planning and Budget also predicts that employment within the county will rise to nearly 10,000 by 2060 as shown in Table 6.

Table 6 - Morgan County Employment Projections

	2030	2040	2050	2060
<b>Total Employment</b>	6,085	7,241	8,571	10,028

<sup>12</sup> Update to the Integrated Solid Waste Management Plan 2017

<sup>13</sup> Utah Governor’s Office of Planning and Budget, 2012

<sup>16</sup> Ibid

<sup>17</sup> Ibid



## Inventory of Solid Waste Quantities & Services

Below is the analysis of waste that is currently delivered to the disposal facilities managed by Wasatch. Waste tonnage is from 2021 and is presented by the following types:

- Residential Waste and Recycling – 130,040 tons,
- Commercial Waste – 88,409 tons,
- Self-Haul Waste – 40,460 tons,
- Construction & Demolition Debris Waste – 27,449 tons,
- Out of District Waste – 21,623 tons,
- Clean Fill – 9,500 tons,
- Green Waste -- 18,606 tons, and
- Special Waste - 557 tons.

## Estimated Flows of Waste Streams processed by District

In 2021, Wasatch received 344,699 tons<sup>16</sup> of incoming materials to be processed through its facilities at the Landfill and the MRF. Tonnages associated to another outgoing category, particularly Engineered Fuels, were not included in this total.

Figure 6 on the next page displays the flow of materials managed (materials received, handled, and processed) by using District product reports for 2021. The diagram is provided to visualize the inflow and outflow of six (6) major material streams received at District facilities including: MSW, Recyclables, Organics, Special Waste, Construction & Demolition, and other (Engineered Fuel). The imported volumes include materials collected from Davis and Morgan Counties through contractors collecting residential curbside materials from District cities, self-hauled to the facility by residents and businesses within Wasatch, haulers from outside Wasatch, and commercial waste delivered by haulers operating in Wasatch region.

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<sup>16</sup> 2021 Product Breakdown Report 01/01/21 – 12/31/21. (2021). Retrieved from Wasatch Integrated Waste Management District

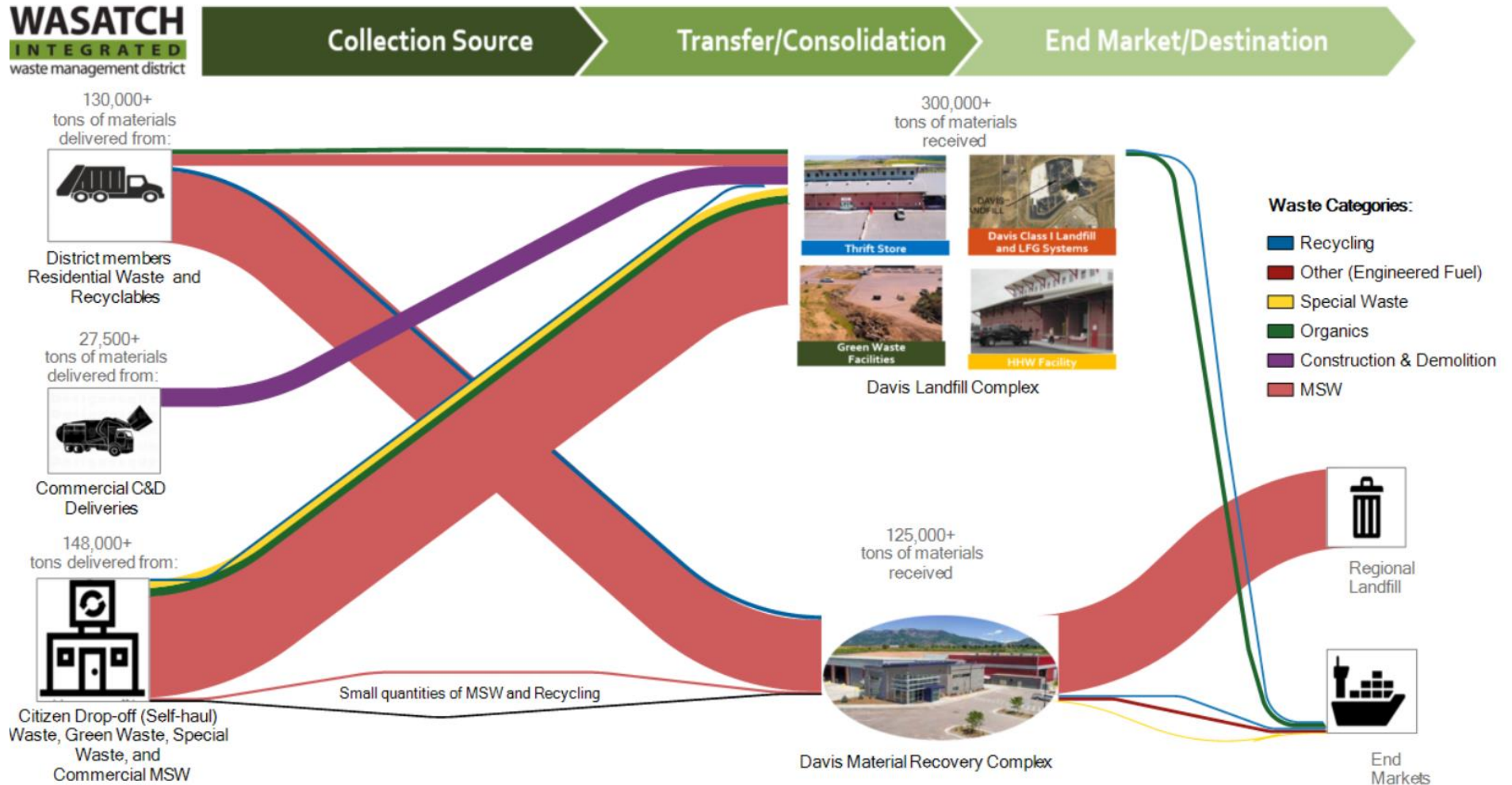


Figure 6 - Waste Flow Diagram<sup>17</sup>

<sup>17</sup> Data Source: 2021 Product Breakdown Report 01/01/21 - 12/31/21 – Provided by Wasatch Integrated Waste Management District

## Residential Waste and Recycling

Residential waste includes all the materials that are generated by single-family (and some multi-family) households within Wasatch's service area that are collected by contracted haulers. Except for Bountiful City, all Davis and Morgan County municipalities currently send their solid waste to either the Landfill or the MRF. When delivered to the MRF, the material is generally processed through the MRF to divert recyclables and produce some engineered fuel. Residue produced from the MRF is transferred to a regional landfill to extend the life of the Davis Landfill. The MRF is not currently accepting commercial recycling material that is generated at businesses. During 2021, approximately 125,043 tons<sup>18</sup> of -collected residential material was delivered to Wasatch facilities in total.

Recyclable materials within Wasatch are collected through a combination of city provided programs and optional curbside services that residents may arrange directly with their city, local hauler, and/or through public recycling collection bins that are located at the Davis Landfill. Once these materials are retrieved by haulers that serve residences within Wasatch, they are taken to the MRF for processing and diversion. The MRF sorts and reclaims materials that have a recyclable value. The non-recyclable plastics and some papers received at the MRF are combined with the MSW processing to create an engineered fuel which can be used by industrial sources to offset the use of coal. Organic waste items, such as food waste and grass clippings, are concentrated during processing and can potentially be used as feedstock for anaerobic digestion to generate renewable natural gas and a residue that is sent to a regional landfill.

The materials accepted in recyclables collections delivered to Wasatch include clean, dry cardboard and paperboard, aluminum cans, steel cans, Plastic #1 bottles, and Plastic #2 bottles and jugs. In addition to the SSR collection, Wasatch is currently accepting Plastics #4-#7 and paper for use in its engineered fuel product. Glass, wrappers, and food-contaminated materials are not accepted for recycling and end up in the residue streams.

Wasatch hosts many school and scout facility site tours each year to inform and educate its future citizens on sound recycling and solid waste practices. Additionally, Wasatch's website has informative and engaging videos and graphics that illustrate what happens to materials received at the MRF and transfer facility. Wasatch also publishes a Recycling Info Sheet which outlines a full list of specific items accepted for recycling. The current Recycling Info Sheet (as of September 2022) is included below; the Info Sheet is available to the public via Wasatch's website using the following URL, [www.wasatchintegrated.org/wp-content/uploads/2020/10/RECYCLING-INFO-SHEET.pdf](http://www.wasatchintegrated.org/wp-content/uploads/2020/10/RECYCLING-INFO-SHEET.pdf).








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<sup>18</sup> 2021 Product Breakdown Report 01/01/21 – 12/31/21. (2021). Retrieved from Wasatch Integrated Waste Management District

Figure 7 - Wasatch's Recycling Info Sheet (as of September 2022)

**RECYCLING INFO SHEET**



COMMONLY RECYCLED ITEMS	PLACE IN RECYCLING BIN?	COMMON PRODUCTS	ADDITIONAL NOTES
<b>Aluminum Cans</b>	YES	Soda, beer, and other beverage cans (NOT aluminum foil)	Acceptable for recycling. Empty containers.
<b>Steel Cans</b> (commonly referred to as "tin" cans)	YES	Canned food	Acceptable for recycling. Empty containers.
<b>Cardboard</b>	YES	Boxes	Acceptable for recycling. Must be clean and dry. Not acceptable if contaminated with food or oily residue.
<b>Clean Paper</b>	YES	Newspaper, copy paper, junk mail, magazines	Acceptable for use as engineered fuel.
 Polyethylene Terephthalate PET	YES	Soda bottles, water bottles, food packaging	Acceptable for recycling. Empty containers and remove lids.
 High-Density Polyethylene HDPE	YES	Detergent bottles, bleach bottles, milk jugs, motor oil bottles	Acceptable for recycling. Empty containers and remove lids.
 Polyvinyl Chloride PVC	<b>NO</b>	Plastic piping, toys, furnishings	NOT acceptable for recycling or for use as engineered fuel.
 Low-Density Polyethylene LDPE	YES	Plastic wrap, grocery bags, sandwich bags	Acceptable for use as engineered fuel.
 Polypropylene PP	YES	Some bottles, margarine tubs, some yogurt containers	Acceptable for use as engineered fuel.
 Polystyrene (Styrofoam) PS	YES	Cups, foam food trays, packing peanuts	Acceptable for use as engineered fuel.
 Other OTHER	YES	baby bottles, sippy cups, water cooler bottles, car parts	Acceptable for use as engineered fuel.

[www.wasatchintegrated.org](http://www.wasatchintegrated.org)

In 2021, Wasatch's Product Breakdown Report showed a total residential generation by its members to be 113,275 tons of MSW. GBB estimates that approximately 15% of that amount is recyclable, which means that the total estimated single-stream recyclable materials that are generated from households in Wasatch, based on the 2021 municipal solid waste data, is 16,991 tons per year.

As noted above, curbside collection services for residential material varies throughout Wasatch. The cost of collection service to residents differs based on the service levels that residents choose to opt-in, as household recycling is not mandated by law in Utah, and member cities can make different choices for whether and how their services are provided. Currently, 60% of District residents from 10 of the 16 District member entities have a SSR collection service option, and 40% of residents from 7 of the 16 member entities have a curbside green waste collection service option. Table 7 presents a snapshot of residential curbside collection services that are currently in place within Wasatch, as well as the rates that the cities charge residents for solid waste, recycling, and green waste collection.

Table 7 - Residential Services for District Members

Member City	Population Percentage of District	City Contracted Hauler	Residential Curbside Fees (1st Can Waste + 1 <sup>st</sup> Can Recycling)	Waste Service Cost (Monthly Charge)	Recycling Service Cost (Monthly Charge)	Green Waste Cost (Monthly Charge)	Refuse Collection	Recycling Collection	Green Waste Collection
Centerville	5%	Ace Disposal	\$18.04	1st Can: \$13.69; 2nd Can: \$11.94	1st Can: \$4.35; 2nd Can: \$2.25	1st Can: \$ 10.61; 2nd Can: \$10.61	Once weekly	Bi-weekly	Once weekly
Clearfield	10%	Waste Management	\$21.55	1st Can: \$16.75; 2nd Can: \$10.00	1st Can: \$4.80	-	Once weekly	Bi-weekly	No services
Clinton	7%	Robinson Waste		1st Can: \$16.10; 2nd Can: \$12.50	-	-	Once weekly	No services	No services
Farmington	8%	Robinson Waste	\$17.50	1st Can: \$14.50; 2nd Can: \$11.75	1st Can: \$3.00	-	Once weekly	Bi-weekly	No services
Fruit Heights	2%	Robinson Waste		1st Can: \$13.40; 2nd Can: \$10.65	-	1st Can: \$6.15	Once weekly	No services	Once weekly
Kaysville	10%	Robinson Waste	\$18.65	1st Can: \$13.75; 2nd Can: \$10.25	1st Can: \$4.90	1st Can: \$6.90	Once weekly	Bi-weekly	Once weekly
Layton	25%	Waste Management	\$21.15	1st Can: \$13.65; 2nd Can: \$10.95	1st Can: \$7.50	-	Once weekly	Bi-weekly	No services
Morgan City	<i>Included with Morgan County</i>	Robinson Waste		1st Can: \$19.00; 2nd Can: \$19.00	-	-	Once weekly	No services	No services
Morgan County	4%	Robinson Waste		1st Can: \$17.00; 2nd Can: \$17.00	-	-	Once weekly	No services	No services
North Salt Lake	7%	Ace Disposal	\$20.15	1st Can: \$14.45; 2nd Can: \$14.45	1st Can: \$5.70	-	Once weekly	Bi-weekly	No services
South Weber	2%	Robinson Waste		1st Can: \$14.55; 2nd Can: \$8.70	-	-	Once weekly	No services	No services
Sunset	2%	Econo Waste	\$19.90	1st Can: \$15.00; 2nd Can: \$13.95	1st Can: \$4.90	1st Can: \$6.95	Once weekly	Bi-weekly	Once weekly
Syracuse	10%	Robinson Waste		1st Can: \$12.02; 2nd Can: \$9.32	-	1st Can: \$7.63	Once weekly	No services	Once weekly
West Bountiful	2%	Ace Disposal	\$15.50	1st Can: \$ 11.00; 2nd Can: \$11.00	1st Can: \$4.50	-	Once weekly	Bi-weekly	No services
West Point	3%	Ace Disposal	\$16.55	1st Can: \$11.80; 2nd Can: \$10.00	1st Can: \$4.75	1st Can: \$6.00	Once weekly	Bi-weekly	Once weekly
Woods Cross	3%	Waste Management	\$18.40	1st Can: \$ 18.40; 2nd Can: \$10.50	1st Can: Free 2nd Can: \$3.50	1st Can: \$6.50; 2nd Can: \$6.50	Once weekly	Bi-weekly	Once weekly



In addition to the range of monthly fees that the different cities charge for waste services, Wasatch itself charges its members a universal household use fee of \$7.20 per can per month, which covers solid waste disposal and customer services at the landfill. The household use fee is billed through all member cities or commercial haulers that are setting out collection carts within Wasatch's service area. Along with the household use fee, the member cities charge their households for collection service as well. Each member city contracts independently for its waste hauling, and the costs of the hauling and additional solid waste services that are provided by the haulers is charged differently throughout Wasatch, based on the particular contract arrangement made between each hauling company and city. Additionally, Wasatch receives \$2 per month, per green waste can, to defray the cost of processing green waste at the Davis Landfill Complex.

When Wasatch charges are added, the total monthly effective cost to residents in member cities varies, as shown in Table 7 above. This cost reflects the residential curbside fees for the first can for waste and recycling each, per residence. Across all District members, the average cost per residence for waste service is \$14.29 per month (weighted by population). Morgan City has the highest service cost at \$19.00 per residence. In comparison, West Bountiful has the lowest service cost at \$11.00 per residence.

At present there are 10 member cities that have the option to receive SSR collection service, while five (5) do not have that service provided. The cities with recycling collection service include Centerville, Clearfield, Farmington, Kaysville, Layton, North Salt Lake, Sunset, West Bountiful, West Point, and Woods Cross. For residents living within these cities that elect to receive SSR service, automated single-stream recycling collection is performed on a biweekly basis, on the same day as their refuse collection.

The average monthly residential recycling service fees for the first recycling can is \$4.44 per residence, including Woods Cross that does not directly charge for recycling services. Of Wasatch members that are charged separately for recycling services, Layton has the highest recycling services cost of \$7.50 per resident, while Farmington has the lowest recycling services cost of \$3.00 per residence. Subscription recycling services are generally available in cities without city sponsored programs through Mountain West Recycling at a cost of \$7 to \$15 per month.

Similar to recycling, the curbside collection of residential green waste is not available to all District residents. Seven (7) municipalities provide a green waste collection option: Centerville, Fruit Heights, Kaysville, Layton, Sunset, Syracuse, West Point, and Woods Cross. Across all participating municipalities, the average monthly cost per resident for the first green waste can is \$7.25 per month. Centerville has the highest green waste services cost at \$10.71 per residence while West Point has the lowest green waste services cost at \$6.00 per residence.

There are five (5) District members, or approximately 23% of Wasatch's population, that do have access to all three-curbside waste, recycling, and green waste collection options. These include Centerville, Kaysville, Sunset, West Point and Woods Cross. The average total monthly fee for District residences that receive waste, recycling, and green waste services is \$25.55 (utilizing one cart for each service). Centerville has the highest total monthly service fee of \$28.65 per residence, while West Point residents are charged \$22.55 for similar services.

## Imported, Exported and Transferred Waste

In addition to recyclables and engineered fuel recovered at the MRF and exported to markets, the Davis Landfill accepts electronic waste, HHW, and separates source metals which are recycled or sent to a hazardous waste landfill for appropriate disposal, as shown in the table below.

Certain valuable materials can be recovered from processed MSW, sold to markets, and transferred to markets. Recyclables sold include items such as metals, electronics, and other recyclables.

Table 8 - Outbound Materials (tons) Transferred Out of Wasatch in 2021<sup>19</sup>

Material	Davis Landfill	MRF	Total, District
Antifreeze	5	0	5
Batteries	27	5	32
Electronic Waste	140	0	139
Household Hazardous	231	0	231
Metals	939	0	939
Metals from Mattresses	0	0	0
Oil	46	0	46
Tires	92	0	92
Recyclables	0	2,741	2,741
MSW-Regional Landfill	0	116,193	116,193
Organics-WRR	0	12	12
Engineered Fuel	0	4,724	4,724
<b>Total Tons</b>	<b>1,382</b>	<b>123,676</b>	<b>125,156</b>

<sup>19</sup> 2021 Product Breakdown Report 01/01/21 – 12/31/21. (2021). Retrieved from Wasatch Integrated Waste Management District

## Commercial Waste

As shown in Table 9, in 2021, a total of 81,745 tons<sup>20</sup> of commercial waste generated from businesses and commercial properties was delivered to District facilities by private haulers. Of that total, 96% was ultimately disposed of at the Davis Landfill and 4% was processed at the MRF.

Table 9 - 2021 Commercial Waste (tons)<sup>21</sup>

Type	Davis Landfill	MRF	District (Total)
Commercial Weighed <sup>22</sup>	83,913	0	83,913
Commercial Automated <sup>23</sup>	866	3,631	4,497
<b>Total</b>	<b>84,779</b>	<b>3,631</b>	<b>88,410</b>

## Construction and Demolition Waste (C&D) and Clean Fill

Construction and Demolition (C&D) debris includes materials generated from construction and/or demolition activities and includes land clearing activities and road resurfacing. These materials are generally delivered to Wasatch facilities either by self-haul small contractors or by haulers providing roll-off box services to construction/demolition sites. Wasatch also accepts material which can be used as daily cover at the Davis Landfill at a reduced rate as Clean Fill.

Table 10 - C&D waste(tons)<sup>24</sup> delivered to District Facilities in 2021

Type	Davis Landfill	MRF	District (Total)
C&D	27,449	0	27,449
Clean Fill	9,500	0	9,500

## Green Waste

Wasatch accepts green waste material, such as leaves, grass clippings and other yard waste items, for processing at its Green Waste Recycling Facility (GWRF), located at the Davis Landfill Complex. Some of the member municipalities provide curbside collection of green waste services to their residents, but not all. The green material that is collected by haulers from member municipalities that do provide green waste collection service, as well as the green materials that are hauled to the Landfill by residents and commercial customers, is taken to the GWRF where it is processed, screened, or composted, and then sold as wood chips and compost products. Generally, these products are reused in garden and landscape projects throughout the District. Shown in Table 11 is a breakdown of the 18,101 tons <sup>25</sup>of green waste that was accepted at the GWCF in 2021.

<sup>20</sup> 2021 Product Breakdown Report 01/01/21 – 12/31/21. (2021). Retrieved from Wasatch Integrated Waste Management District

<sup>21</sup> 2021 Product Breakdown Report 01/01/21 – 12/31/21. (2021). Retrieved from Wasatch Integrated Waste Management District

<sup>22</sup> Commercial “weighted” describes waste that comes in over the scales and is charged by the ton and includes all waste charged to an account.

<sup>23</sup> Commercial “automated” describes waste received under the household use fee, so collected using side loaders at no additional charge coming in.

<sup>24</sup> 2021 Product Breakdown Report 01/01/21 – 12/31/21. (2021). Retrieved from Wasatch Integrated Waste Management District

<sup>25</sup> 2021 Product Breakdown Report 01/01/21 – 12/31/21. (2021). Retrieved from Wasatch Integrated Waste Management District

Table 11 - Green waste delivered to the GWCF in 2021

Type	Tons
Curbside Green Waste	6,219
Green Waste Commercial/Self-Haul	12,387
<b>Total</b>	<b>18,606</b>

If Wasatch were to expand the curbside green waste program through the purchase of containers for additional cities that want to implement the program, it is estimated that an additional 6,000 tons of material per year could be diverted, resulting in a total of approximately 24,000 tons per year.

### Special Waste

Materials from several special waste categories are either self-hauled by District residents to the citizen drop-off area at the Davis Landfill Complex, or they are deposited at the facilities directly by the commercial haulers. Some of the special waste types are measured by unit, not by weight in tons. Shown in Table 12 is a breakdown of the nearly 12,000 items of special waste<sup>26</sup> that were accepted at the Davis Landfill Complex in 2021.

Table 12 - Special Waste material delivered in Wasatch in 2021<sup>27</sup>

Material	Davis Landfill
Refrigerators (each)	2,639
Tires (each)	9,461
Mattresses (each)	0
Mobile Homes (each)	0
Weighed Vehicles (each)	658
Special Handling Waste	497
<b>Total</b>	<b>11,949</b>

Some examples of special waste items that are received at Wasatch facilities include, but are not limited to, materials from storm drain clean-outs, confidential documents, unsealed and non-hazardous barrels, hydrocarbon-contaminated soils, and non-friable asbestos. Fees are applied for the disposal of many of these materials, which vary with the type of waste and the complexity of their disposal. Some materials may be subject to additional fees, particularly those that require special processing before their ultimate recycling or disposal. This includes appliances containing refrigerants, items that have recyclable components that must be transferred to a recycler, and/or wastes that pose potential environmental and health hazards. Additionally, Wasatch added a mattress recycling service in 2022 which is expected to divert and process over 20,000 mattresses per year.

<sup>26</sup> 2021 Product Breakdown Report 01/01/21 – 12/31/21. (2021). Retrieved from Wasatch Integrated Waste Management District

<sup>27</sup> 2021 Product Breakdown Report 01/01/21 – 12/31/21. (2021). Retrieved from Wasatch Integrated Waste Management District

## Inventory of Solid Waste Facilities and Services

### Davis Landfill Complex

Wasatch operates the Davis Landfill Complex (“Landfill”), which includes the Davis Landfill, the Landfill Gas to Energy Systems, a Citizen Drop-Off area, a Green Material Recycling Facility, the Landfill Thrift Store, a Household Hazardous Waste Facility, and administrative offices.

### Davis Landfill

Wasatch owns and operates the Davis Landfill for the disposal of municipal solid waste. The lined landfill cell was constructed in 1998 to meet Federal Standards under the Resource Conservation and Recovery Act (RCRA) Subtitle D and includes an engineered bottom liner and leachate collection system. It accepts non-hazardous solid waste material including MSW, commercial waste, industrial waste, construction/demolition waste, and special waste as allowed by Utah Administrative Code R315-315. As of December 31, 2021, the facility has approximately 13,813,000 cubic yards of permitted disposal capacity, of which 5,914,000 cubic yards remain unused. This will be the final capacity of the landfill when the phase IV liner, which is currently under construction, is completed. The Davis Landfill Remaining Capacity at the end of June 2022 was 5,914,158 cubic yards. At a rate of 293,642 cy per year there is 19 years of remaining capacity left, indicating a landfill closure date of 2041.

With the closure of the Davis Energy Recovery facility, the Davis Landfill had an estimated lifespan of 15 years if all waste were to continue to be directly landfilled as of June 30, 2019. The energy recovery facility had been accepting nearly half of Wasatch’s waste. Currently about 130,000 tons of waste, all residential curbside waste, is being transferred through the new material recovery and transfer facility. Transferring waste, recovering recyclables, and not delivering all District received waste to the Davis Landfill will significantly extend its remaining life.

During 2021, the District handled over 342,000 tons<sup>28</sup> of various materials, which ultimately went to the following:

- 205,549 tons of waste landfilled at Davis Landfill,
- 116,193 tons of waste transferred to the Tekoi Regional Landfill,
- 12,498 tons of process feedstock from the Green Waste Recycling Facility,
- 4,725 tons of engineered fuel to the Devil’s Slide cement plant, and
- 3,994 tons of recyclable materials that went to various recycling markets.

### Landfill Gas to Energy System

In 2004, Wasatch installed equipment at the Davis Landfill to compress and ship landfill gas, via pipeline, to Hill Air Force Base (HAFB) for their use in generating electricity. The project began operation in 2005, putting landfill gas, produced from decaying garbage, for a beneficial use in lieu of emitting directly into the atmosphere or flaring the output. This utilization approach results in environmental benefits reducing greenhouse gas emissions. The project was completed in partnership with HAFB, the U.S. Department of Energy, and the Utah Energy Office. This was the first operational landfill gas to energy project completed in the State of Utah. In 2008, an additional generator was installed, which increased capacity to 2.2 megawatts of renewable electricity, which is enough to power approximately 1,500 homes. There is a temporary cover made from flexible membrane material installed over all the inactive areas of the lined landfill to improve landfill gas capture efficiency and to control odor. The current 20-year contract with HAFB ends on January 13, 2026. Wasatch intends to pursue a Renewable Natural Gas project when this contract ends.

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<sup>28</sup> 2021 Product Breakdown Report 01/01/21 – 12/31/21. (2021). Retrieved from Wasatch Integrated Waste Management District



## Citizens Drop Off

Constructed in 2006, the Citizen Drop-Off facility at the Davis Landfill is a clean, safe location where residents can self-haul and deposit waste on a large concrete pad, without having to enter the landfill working face. Landfill personnel then haul the waste into the landfill for its ultimate disposal. The residents can drop-off items such as trash, bulky metals, mattresses, and carpet padding for recycling at their convenience. Reuse and recycling opportunities are also provided as part of the citizen drop off facility. Items citizens feel can be reused are left in a covered area for the Landfill Thrift Store to gather for sale.

## Green Material Recycling Facility

The Green Material Recycling Facility is owned and operated by Wasatch and is co-located at the Landfill. It began its operations in 2002. It processes yard waste into compost and wood chips, creating saleable products while saving valuable landfill space. Wasatch has also implemented a program for residential curbside collection of green waste in large carts. Seven (7) members have their contract haulers collect and deliver these materials to the Green Waste Recycling Facility. Currently the cities of Centerville, Fruit Heights, Kaysville, Sunset, Syracuse, West Point, and Woods Cross participate in the green waste collection program.

Active composting at the facility is achieved using an Aerated Static Pile (ASP) composting system. This composting system incorporates appropriate levels of moisture and air to create a superior product. This ASP system was implemented in 2013 and expanded through the purchase of a larger windrow turner in 2017. Green Waste accepted items include tree and shrub trimmings, wood pallets, clean lumber, leaves, lawn clippings, manure, and chipped limbs. High quality compost and wood chip products that are created at this facility are sold and reused in garden and landscape projects throughout District communities year-round.

## Landfill Thrift Store

Wasatch opened a thrift store located within the Landfill HHW Facility in 2015. The Thrift store benefits the community by increasing reuse/recycling through the reuse of items which might otherwise be landfilled and is an excellent educational opportunity. In 2021, more than 62 tons<sup>29</sup> of reusable items were diverted from disposal via the Landfill Thrift Store, which is co-located with the HHW and electronic waste drop-off facility.

## Household Hazardous Waste Facility

The Household Hazardous Waste Facility is located at the Landfill and was originally opened in 2003 at another location. The facility accepts household quantities of hazardous materials generated by residents such as: E-WASTE, paint, varnish, pesticides, lawn care products, aerosols, paint thinner, antifreeze, motor oil, diesel, gasoline, cleaning items, automotive products, rechargeable and lead acid batteries, etc. There is no charge for District residents to bring hazardous wastes to the facility. In 2021, a total of 347 tons<sup>30</sup> were handled at this facility that included: 217 tons<sup>31</sup> of household exempt hazardous waste and 130 tons<sup>32</sup> of electronic waste.

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<sup>29</sup> 2021 Product Breakdown Report 01/01/21 – 12/31/21. (2021). Retrieved from Wasatch Integrated Waste Management District

<sup>30</sup> *Ibid.*

<sup>31</sup> *Ibid.*

<sup>32</sup> *Ibid.*



## Davis Material Recovery Complex

The Davis Material Recovery Complex includes a material recovery facility (MRF) and transfer station. This location also includes an educational facility where tours take place for local scouts, students, and other interested community members.

## Material Recovery and Transfer Facility

Located at the former site of the Davis Energy Recovery Facility in Layton, UT, the Davis Material Recovery and Transfer Facility (MRF) began operations in June 2020. Materials are first received and weighed at the Transfer Station, and then brought to the MRF for sorting, processing, and preparation for their ultimate shipment to an engineered fuel user, markets, recycling manufacturers, and disposal locations for residues. The materials processed at the MRF are collected from residential SSR and refuse cans, as well as some participating commercial generators, in both Davis and Morgan Counties. In addition to the curbside collection, residents may haul trash, recyclables, and other materials to the Davis Landfill Drop-off Center.

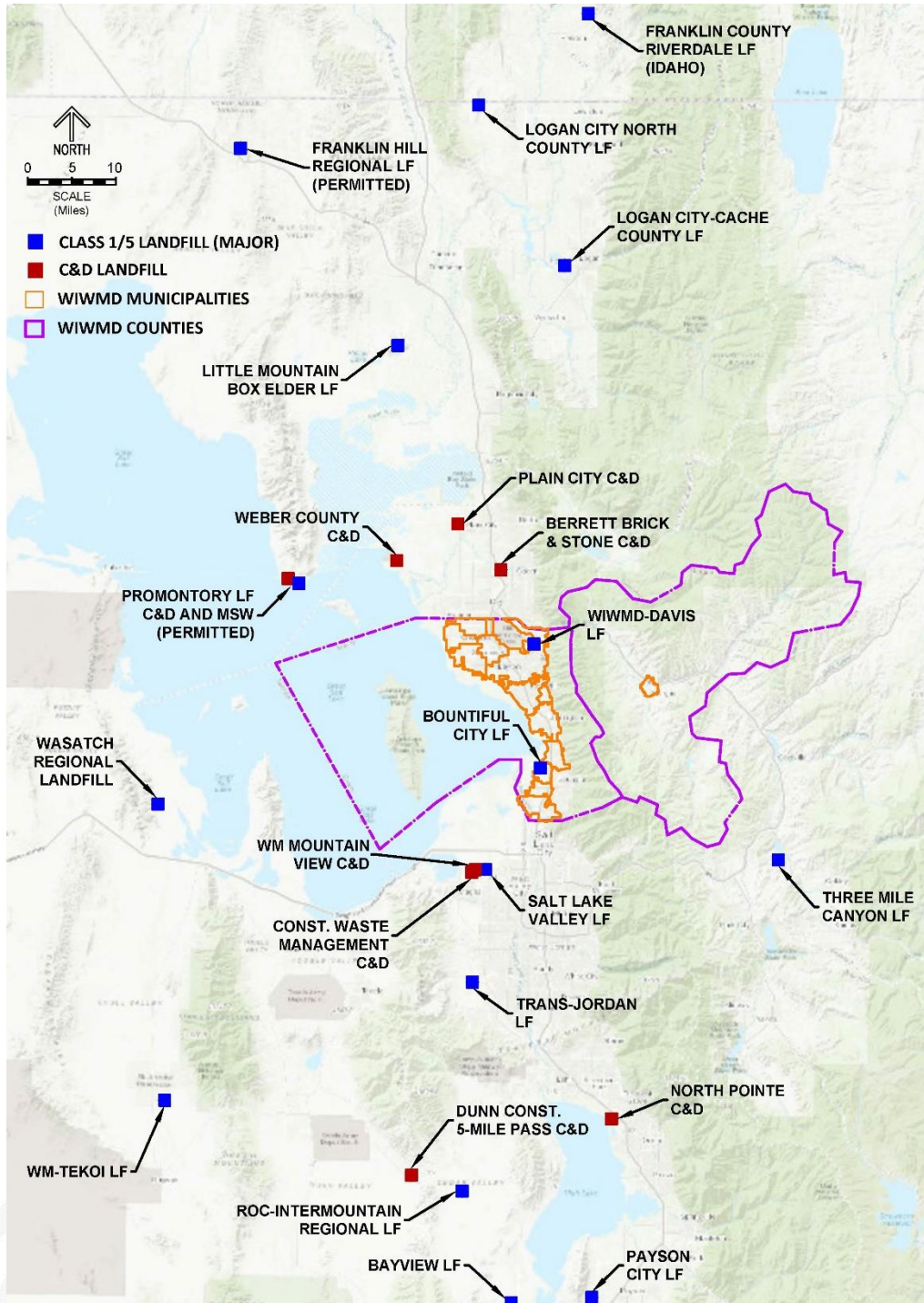
The MRF sorts and reclaims materials that have a recyclable value. These materials are processed in a highly mechanized system that recovers recyclable materials for use and/or sale to market. Additionally, the non-recyclable plastics and some papers are combined to create an engineered fuel which can be used by industrial sources to offset the use of coal. Currently, the engineered fuel output is used by a nearby cement kiln. Organics, such as food waste and grass, are concentrated and can potentially be used as feedstock for anaerobic digestion to generate renewable natural gas and a compost feedstock. Residue from the facility, along with other non-recyclable items, is then transferred to a regional landfill rather than to the Davis Landfill so as to conserve its remaining capacity.

## Regional Solid Waste Facilities

Due to the geography of the Wasatch Front, most of the region's facilities are aligned north and south. However, there are some facilities away from the population centers that have less expensive land costs and are of significant size. The following map (Figure 8) shows the larger permitted Class I and V MSW landfills as well as the (mostly) Class IVb C&D landfills in the region.

*\*\*See the next page for Figure 8\*\**

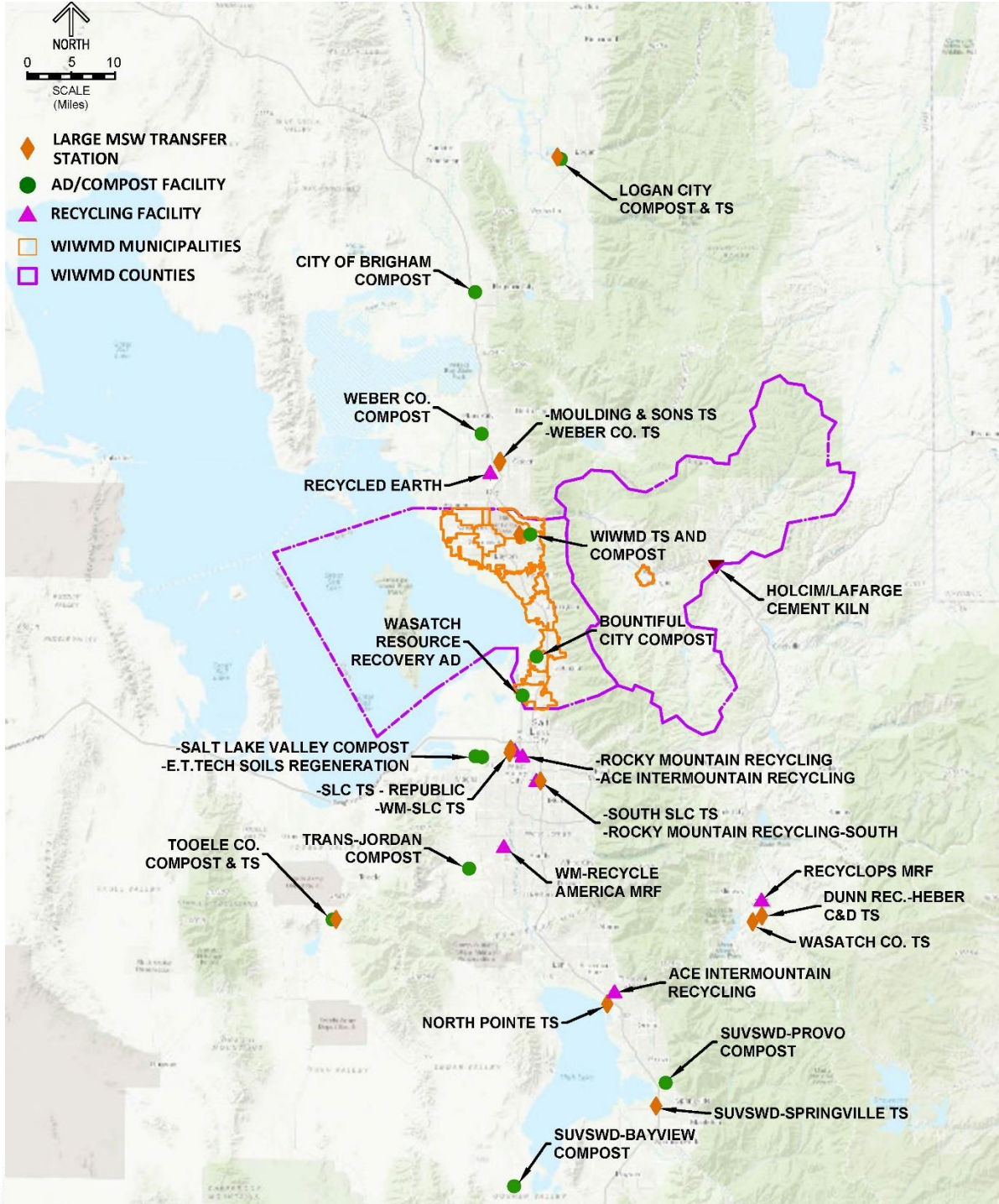
Figure 8 - Regional MSW and C&D Landfills in the Wasatch Front Region





The map below (Figure 9) shows the other types of solid waste facilities in the Wasatch Front region including major transfer stations, recycling centers and compost facilities.

Figure 9 - Regional Solid Waste Facilities Other than Landfill



## Commercial Landfills

There are additional nearby facilities that Wasatch uses to manage and move waste as needed.

### NUERA/Bayview Landfill

Several northern Utah public entities involved with the management, transportation, and disposal of MSW have formed an interlocal entity to address various solid waste issues. The group, organized as the Northern Utah Environmental Resource Agency (NUERA), was created by an agreement dated October 28, 2014. NUERA is governed by 8-member board and has an Operations and Management Committee of four (4) members who are the solid waste managers of each of the member entities. NUERA has completed the purchase of the Bayview Landfill, located in Utah County, and assumed operation of the facility on January 1, 2017.

Wasatch became a member of this group in 2014 and currently does not use the Bayview Landfill. Bayview Landfill has an estimated capacity of 25,800,000 tons. Current use of NUERA is approximately 500,000 tons of waste per year, or at current use rate has approximately 80+ years of capacity remaining. This added capacity at Bayview is a hedge for Wasatch future capacity when the Davis Landfill becomes full.

### Commercial Landfills

Landfills that are located within a 100-mile driving distance from the Davis Landfill are presented below in Table 15. These landfills are listed by proximity to the Davis Landfill, ownership, tonnages received, and tip fees (when posted). This information was obtained from a combination of two distinct sources, the Waste Business Journal Directory,<sup>33</sup> and the Utah State Division of Waste Management and Radiation Control website. Tonnage and tip fees were calculated based on monthly data for all waste types (MSW, C&D, etc.) received by the respective facility. The two (2) landfills with the largest capacity are the WM Tekoi facility, which Wasatch currently uses, and the NUERA facility.

Table 13 - Utah MSW Permitted Landfills

Miles from Davis Landfill	Travel Time (Minutes) from Davis Landfill	Facility Name	County	Ownership	Total tons received July 2020 - June 2021 (All Waste Types)	Average Tip Fee of All Waste Types July 2020 - June 2021	Remaining Capacity (tons)
20	28	Bountiful City Landfill	Davis	Public	62,400 (MSW)	\$30.00	2,450,000
32	39	Salt Lake Valley Landfill	Salt Lake	Public	495,619 (MSW)	\$42.60	Unknown
98	94	WM – Tekoi Landfill	Tooele	Private	131,000*	Not Available	40,740,000
33	41	Summit County Henefer C&D Landfill	Summit	Public	13,964 (C&D)	\$16.00	1,300,000
52	55	Summit County Three Mile Canyon Landfill	Summit	Public	38,616 (MSW)	\$9.00	527,000
45	59	Trans-Jordan Landfill	Salt Lake	Public	407,852 (MSW)	Unknown	4,200,000
60	62	North Pointe C&D Landfill	Utah	Public	213,337 (C&D)	\$40.75	Unknown
62	66	Tooele County Landfill	Tooele	Public	27,383*	\$45.00	1,860,000

<sup>33</sup> The Waste Business Journal Directory is an industry resource for operational data about solid waste facilities located in the United States.

Miles from Davis Landfill	Travel Time (Minutes) from Davis Landfill	Facility Name	County	Ownership	Total tons received July 2020 - June 2021 (All Waste Types)	Average Tip Fee of All Waste Types July 2020 - June 2021	Remaining Capacity (tons)
79	90	Logan City Landfill – North Valley	Cache	Public	73,233 (MSW)	\$25.00	Unknown
60	65	Logan City Landfill - South	Cache	Public	20,213*	\$25.40	139,000
51	77	Little Mountain Landfill	Box Elder	Public	38,978 (MSW)	\$15.56	926,000
77	104	Intermountain Regional Landfill	Salt Lake	Private	386,137 (MSW)	\$45.43	11,300,000
87	87	Payson City Landfill	Utah	Public	36,961 (MSW)	\$31.76	2,170,000
108	93	Bayview Landfill (NUERA)	Utah	Public	414,341 (MSW)	\$23.16	25,800,000
81	88	Wasatch Regional Landfill, Inc.	Box Elder	Private	432,546 (MSW)	\$31.21	595,000
27.5	35	Weber County C&D (Mouldings)	Weber	Public	165,165 (C&D)	\$20.00	Unknown
90	110	Rich County Landfill	Rich	Public	11,223 (MSW)	\$31.00	128,000

\*Total tons received were retrieved from the Waste Business Journal.

## Hauling

Wasatch is not involved in providing any residential and/or commercial collection services. Currently, Wasatch performs hauling services for materials delivered to the citizen drop off area at the Davis Complex and the engineered fuel material being delivered to the Holcim Cement Plant with in-house staff and equipment. Residential waste includes waste generated by single family (and some multi-family) residential units within Davis and Morgan Counties and collected curbside by city contracted haulers. Recyclables and green waste is also collected by haulers under contract with municipalities that provide these programs, directly by commercial haulers, and by self-haul from Member residents and taken to Wasatch’s Green Waste Recycling Facility located at the Davis Landfill Complex, where it is processed, composted, and sold as bulk and bagged compost and mulch products, or recyclables directly to the MRF for processing and marketing.

## Major Contracts and Wasatch Revenue Sources

Wasatch currently contracts for MSW and residue from the Davis Material Recovery and Transfer Facility to the Waste Management Tekoi Landfill located in Tooele County with Rawson Development, Inc. The term of the current contract expires on May 18, 2025. During 2021 Rawson Development Inc. transported approximately 112,000 tons of waste to the Tekoi Landfill. The current contract price is \$19.60 per ton plus a fuel surcharge when fuel is over \$3.03 per gallon. Current total pricing is approximately \$21.90 per ton. The contract is also adjusted annually by the All-Urban Consumer Midwest Region (all items less energy).

Table 14 illustrates the current rates that the member cities pay to Wasatch, per container size, and per number of containers that are placed within their boundaries.



Table 14 - Monthly Rates that Member Cities pay Wasatch for container sizes

Container Size (Gallons)	Rate per Container Per Month	Number of Containers (2021)
90-105	\$7.20	117,603
350	\$20.00	8
440	\$25.00	10
90-105 Green Waste	\$2.00	12,806

SSR container contents collected from member cities are delivered to the MRF at no charge, which helps to incentivize landfill diversion through recycling and should hold down cost to the subscriber as haulers can bid the service independent of the market for recyclables. Large loads of city member green waste collected from city-wide pickups or wind events are also delivered to the Green Waste Recycling Facility at no charge. These are the only fees that are directly collected from cities by Wasatch unless they bring bulky or other waste for disposal; then, they are charged a reduced rate of \$30 per ton, as compared to the normal tipping fee of \$38 per ton for non-member cities and private haulers bringing commercial waste or self-haul waste.

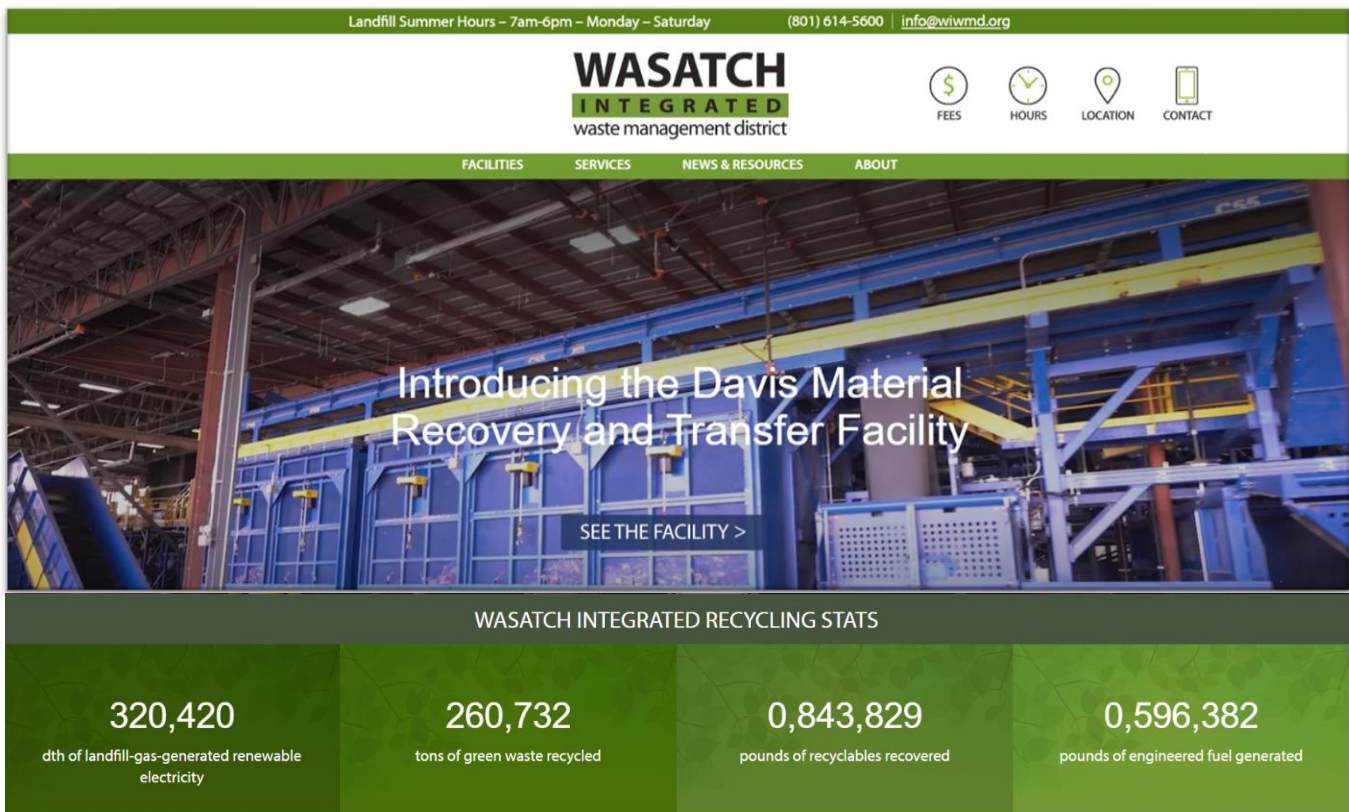


### District Website and Social Media

Employing frequent and consistent communication about Wasatch is vital to remind member residents of where and how to properly dispose of their waste, what is recyclable, to alert those who may have recently moved to the area of the various solid waste policies and programs, and/or to inform the public of reuse opportunities and special collection events as applicable. To keep the public abreast of relevant solid waste information, Wasatch maintains a comprehensive website and a public communication program that includes several social media outlets.

### District Website

Wasatch’s website, [www.wasatchintegrated.org](http://www.wasatchintegrated.org), provides an easy-to-navigate experience to website visitors, robust and current information about the waste management program available to customers, and allows website visitors to quickly find options for their unwanted items, along with waste reduction and reuse tips for those items, when appropriate. It also allows users to view details about the different facilities that manage their discarded materials. Website visitors can learn about Wasatch’s operations through a series of videos that highlight the Material Recovery and Transfer Facility, as well as informative educational videos about what can be recycled.



The website's homepage offers visitors the opportunity to read the latest updates and outreach efforts from Wasatch using a rotating news reel on its homepage. The updates are enticing to the reader, use colorful and contextually appropriate images, and address issues affecting the community, such as those highlighted below.

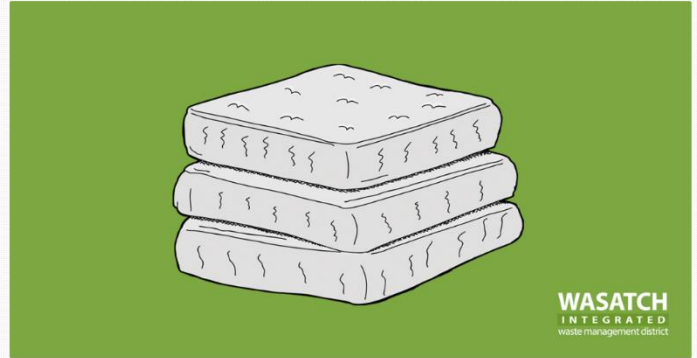
NEWS



How to Safely Recycle Auto Batteries

HOW TO SAFELY RECYCLE AUTO BATTERIES

NEWS



WASATCH'S NEW MATTRESS AND BOX SPRING  
RECYCLING PROGRAM

NEWS



Don't Bag Your Recyclables

DON'T BAG YOUR RECYCLABLES

NEWS



What Can I Put In My Blue Bin?

WHAT CAN I PUT INTO MY BIN

NEWS



Empty Water Bottles Before Recycling

EMPTY WATER BOTTLES BEFORE RECYCLING



The homepage also includes quotes from community leaders that are members of the Wasatch Integrated Waste Management District’s Administrative Control Board. This shows support from member cities and may offer website visitors a chance to recognize their local representatives.



“Wasatch Integrated Waste Management District is an efficient and well-run Special Service District serving Davis and Morgan Counties. They are continually looking for innovative ways to recycle, convert, and reuse solid waste. As a citizen of the community since 1996, I have really appreciated their forward-thinking approach to solid waste disposal.”

- Commissioner Lorene Miner Kamalu, Davis County

“Wasatch Integrated operates a super clean facility offering full-service landfill, green waste, and household hazardous waste drop off as well as upcycled green waste product for sale. They really care about residents living around the landfill. They have worked tirelessly to mitigate odors inherent to landfills, have constructed a costly cover over some of the garbage, and operate a system to collect gas from the landfill which has helped control odors. They are willing to listen and do everything they can to be a good neighbor.”

- Mayor Jo Sjoblom, South Weber City



“I just turned seventy! I can honestly say that the Wasatch Integrated Waste Management District landfill and I have grown up, side-by-side. During my youth a Saturday was not complete without a trip to the “dump” and being hefted up onto Mr. Jacques’ Caterpillar® dozer. Wasatch Integrated has brought the “dump” of my childhood into the 21st century, with state-of-the-art solid waste disposal, recycling, and re-use facilities. The newly constructed Material Recovery and Transfer Facility recycles many different types of waste materials and will be instrumental in preserving the landfill for future kids.”

- Mayor Mike Gailey, Syracuse City

Towards the bottom of Wasatch’s website home page, visitors can use an interactive FAQ section and robust footer to provide answers to questions quickly and help them navigate the site easily.

### FREQUENTLY ASKED QUESTIONS

**Q: What is the landfill address?**

**A:** The landfill is located at:  
 1997 East 3500 North  
 Layton, Utah 84040  
 This address does not work with navigation apps or devices. Please visit our contact page for a map and directions.

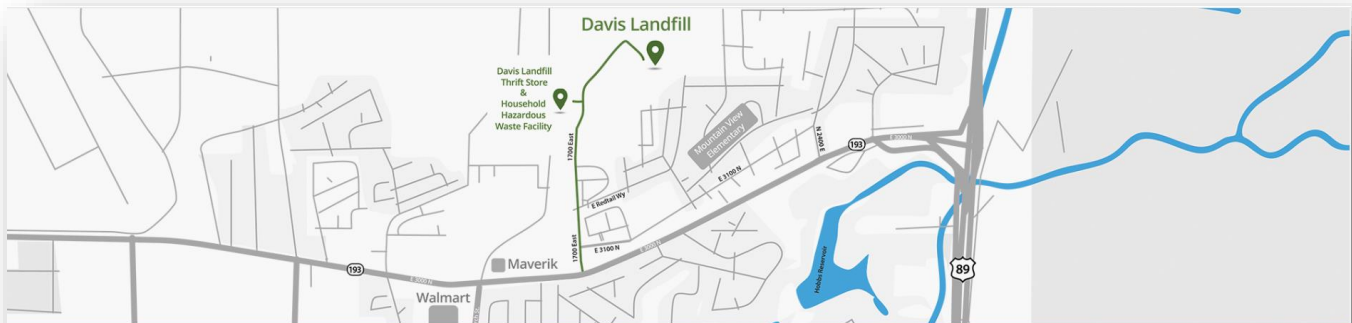
**Q: What is the material recovery and transfer facility address?**

**Q: What is the Administrative Office Address?**

**Q: What are your hours of operation?**

**Q: Why are summer and winter hours different?**

**Q: I have a problem regarding my curbside garbage, recycling, or green waste can. Who can I call?**



**FOLLOW US ON...**

**WASATCH**  
**INTEGRATED**  
 waste management district

1997 East 3500 North  
 Layton, Utah 84040  
 Phone: (801) 614-5600  
 Fax: (801) 771-6438

**FACILITIES**

- LANDFILL
- MATERIAL RECOVERY AND TRANSFER FACILITY
- GREEN WASTE
- HOUSEHOLD HAZARDOUS WASTE
- THRIFT STORE

**QUICK INFO**

- FEES

**SERVICES**

- THRIFT STORE
- COMPOST/WOOD CHIPS
- SPECIAL HANDLING WASTE
- FEES

**NEWS & RESOURCES**

- NEWS
- VIDEOS

**ABOUT**

- MISSION & VISION
- STAFF
- BOARD INFORMATION
- FINANCIAL
- PURCHASING
- EMPLOYMENT
- FAQS
- LOCATION



## Wasatch’s Social Media Presence

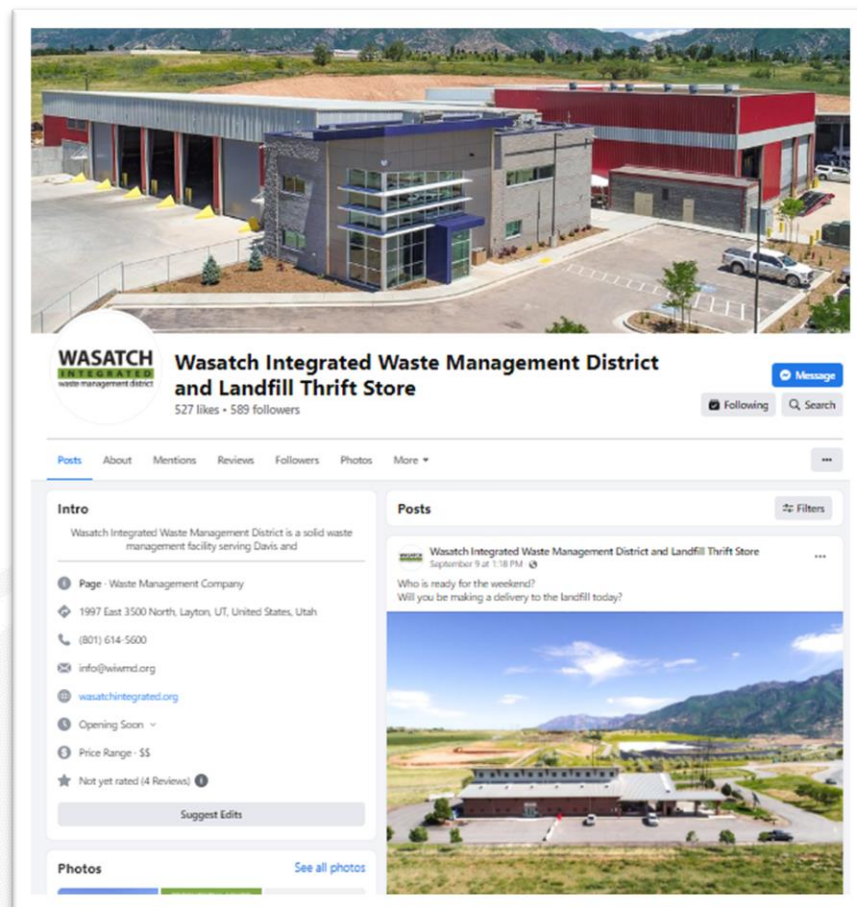
Wasatch maintains a robust social media presence with several social media accounts:

Table 15 - Wasatch's Social Media Outlets

Outlet Name	Handle / Profile Name	Link
Facebook	@WasatchIntegrated	<a href="https://www.facebook.com/wasatchintegrated/">https://www.facebook.com/wasatchintegrated/</a>
Twitter	@WasatchWaste	<a href="https://twitter.com/WasatchWaste">https://twitter.com/WasatchWaste</a>
Instagram	@WasatchIntegrated	<a href="https://www.instagram.com/wasatchintegrated/">https://www.instagram.com/wasatchintegrated/</a>
YouTube	Wasatch Integrated Waste Management District	<a href="https://www.youtube.com/channel/UCOTsq0FycY_DJZFpVL5hfdA">https://www.youtube.com/channel/UCOTsq0FycY_DJZFpVL5hfdA</a>
LinkedIn	Wasatch Integrated Waste Management District	<a href="https://www.linkedin.com/company/wasatch-integrated-waste-management-district/">https://www.linkedin.com/company/wasatch-integrated-waste-management-district/</a>

For instance, Wasatch’s Facebook page, “Wasatch Integrated Waste Management District”, allows community members to actively keep track of current services, new announcements, and engage in discussions about solid waste, recycling, reuse, and Wasatch’s services. District Facebook posts are designed to be fun to view and contain engaging prompts that remind the community how to recycle correctly, inform them about services, as well as share the rules on proper solid waste management.

Figure 10 - Screenshot of Wasatch's Facebook Page (September 2022)



## Plan Scenarios and Strategies

### Overview of Scenarios Development & Evaluation

The primary goal of the solid waste management plan is to describe and evaluate projects and/or operational changes which will be required to meet the challenges of the future which include:

- 1) Anticipated increase in waste flow over time driven by population growth,
- 2) Limited capacity of the Davis Landfill,
- 3) Status of technology and availability of alternate markets or off-take partners for refuse derived materials generated by the system, and
- 4) Changing expectations of customers/residents.

Drivers behind an evaluation and modeling of future operational scenarios and strategies as guided by Wasatch's overall mission are summarized as follows:

- Lower costs,
- Improved revenue position,
- Projected cash flows,
- Increased diversion from landfill, and
- Provide more levels of services to a greater portion of the residents, businesses, and municipalities that are presently served.

In addition, fostering different opportunities allows for greater flexibility within Wasatch's operations moving forward, which helps to adjust to changing needs of the community over time, including varying material stream composition, economic factors, potential emergencies, etc. This evaluation also helps to identify probable capital projects to plan for upcoming budget years.

Initial Priorities:

1. Optimize operation of the MRF,
2. Develop additional transfer capacity to transfer essentially all commercial waste from the Davis Complex to a regional landfill and extend the remaining capacity and life of the Davis Landfill,
3. Develop C&D recycling and transfer at the Davis LF Complex, and
4. Evaluate the provision of residential services and transfer capacity in south Davis County.

### Waste Projections/Fixed Capacity at the Davis Landfill - Baseline

Wasatch’s primary responsibility (mission statement) is to provide sustainable, cost effective, and environmentally sound solid waste management. To accomplish that, Wasatch must ensure robust system capacity is available to divert or transfer solid waste and processing residue to a regional landfill to best use the Davis Landfill remaining capacity. Part of the planning process includes deciding the appropriate time to increase waste diversion from the Davis Landfill and ensure Wasatch has the facilities and/or contracts in place to accomplish the desired level of transfer out of District. The baseline conditions are the current and projected waste generation anticipated presented in Table 16.

Table 16 - Davis Landfill Remaining Capacity and District Population Projections – No Outbound Diversion

Year	Projected District Member Population	Estimated Tons of Material Handled by District	Estimated Remaining Davis Class I Landfill Capacity (Remaining Tons)
AAGR	1.8%	332,965	4,476,000
<b>2030</b>	<b>391,933</b>	<b>350,000</b>	<b>919,000</b>
<b>2040</b>	<b>426,392</b>	<b>381,000</b>	<b>-3,206,000</b>
<b>2050</b>	<b>465,664</b>	<b>416,000</b>	<b>-7,704,000</b>
<b>2060</b>	<b>503,985</b>	<b>451,000</b>	<b>-12,576,000</b>

Wasatch population projections represent the combined total of Davis and Morgan Counties population projected by their average annual growth rates, respectively 1.8% and 3.2% (as presented earlier in the Plan). The 2020 estimated tons of MSW disposed at Davis Landfill is based on Wasatch’s fiscal year 2021 total tonnages with no diversion of materials to non-District landfills. In this worst-case scenario, the landfill would have the shortest expected lifespan.

As of December 31, 2021, Wasatch reported that the Davis Class I Landfill had 4,139,910 tons of MSW capacity remaining. The subsequent years’ projected tonnages are based on the EPA’s national per capita MSW generation rate of 4.9 pounds per capita per day.

At this rate, the Davis Landfill’s capacity for MSW waste will be consumed by the beginning of 2034. By the year 2060, it is projected that in the event of a 2034 landfill closure, over 9.3 million tons will need alternative diversion.

#### Commercial Waste

Shown also in Table 16 are projections for commercial MSW tonnages that Wasatch received recently and projected into the future. These projections assume the same level (percentage relative to Residential MSW) of commercial MSW is delivered to District locations based on the population growth in Wasatch.

Since 2013, Wasatch has been without legislative based statutory ability to direct commercial MSW to its facilities. Instead, Wasatch has relied upon economic flow control, i.e., setting prices at levels attractive to the customer, to cause commercial haulers to use District facilities. Wasatch believes that there are significant commercial MSW tonnages generated within the service area that are leaving Wasatch, especially from the southern areas of the district. Since commercial MSW is not subject to flow control anywhere in Utah, commercial MSW serviced in Morgan County, for example, does find its way into Wasatch facilities based on the location and attractiveness of the tipping fees that are set by Wasatch. In addition, Wasatch also accepts a substantial amount of waste from communities north of the service area as tipping fees at the Weber County Transfer Station are currently \$44 per ton, compared to Wasatch’s fee of \$38 per ton.

Wasatch can influence the level of commercial MSW tonnages by increasing the tipping fees causing reduced flows or decreasing the tipping fees causing increased flows. Actual tonnages in any future year will therefore be subject to tipping fee policies Wasatch establishes and the resulting commercial MSW that ends up being delivered by the various commercial haulers operating both in Davis and Morgan Counties.

Figure 11 graphically represents the change in landfill capacity over time if all waste is disposed at Davis Landfill, relative to the projected change in both population and waste generation in Wasatch over the same period. The landfill would have approximately a 13-year life in that case.

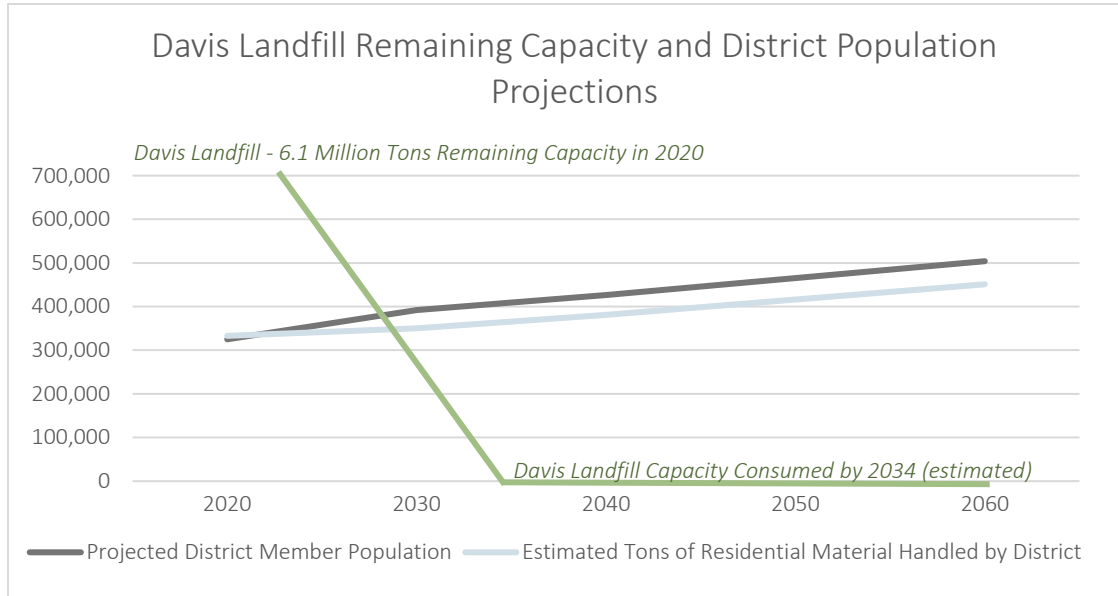


Figure 11 - Davis Landfill MSW Capacity Without Diversion vs. District Population Projections

Davis LF life can be extended through diversion of tonnage from disposal by transferring it to other regional disposal facilities. Table 17 presents scenarios of several diversion tonnage quantities, and their corresponding percent diversion, and the resulting drop in tonnage disposed at Davis along with the corresponding estimated remaining life of the landfill. As the tonnage diverted increases, so does the estimated life of the landfill.

Table 17 - Davis Landfill Remaining Capacity with Different Transfer Levels to Non-District Landfills

Annual Tonnage (FY 2021) Transferred to Non-District Landfills	% Diversion (Transferred) <sup>1</sup>	Total Annual MSW Disposed	Tons per day disposed	Estimated Remaining Life of Davis Landfill <sup>2</sup>
0	0	322,000	1030	13
72,000	22	250,000	800	17
90,000	28	232,000	743	18
120,000 (current)	37	202,000	647	20
166,000	52	156,000	500	27

Annual Tonnage (FY 2021) Transferred to Non-District Landfills	% Diversion (Transferred) <sup>1</sup>	Total Annual MSW Disposed	Tons per day disposed	Estimated Remaining Life of Davis Landfill <sup>2</sup>
190,000	59	132,000	423	31
247,000	77	75,000	240	55

1) Diverted from Davis Landfill does include diverting to Tekoi or NUERA landfills.

2) Based on remaining capacity as of FY2021

### Residential Recyclables Diversion Potential

For additional consideration in the planning process, Wasatch may consider implementing curbside recycling services to all its member cities. Presently, not all members have curbside recycling services. Under the current level of services, Wasatch diverted approximately 5,000 tons of recyclables to markets in 2021. If all the members had recycling services for all residential properties, it is reasonable to expect that a significant increase in recyclables tonnages would result. GBB estimates between 19,000 to 21,000 tons per year of recyclables could be diverted if all households within Wasatch were provided a bi-weekly collection service from a 96-gallon cart. Further details of what implementing this service district-wide would entail, including expected costs, efforts, and outcomes, are discussed below in Scenario 2 Robust Single Stream Recycling.

### Scenarios

As presented above, Wasatch is currently transferring approximately 120,000 tons per year, the majority of which is residential waste. This material is currently going to the WM-Tekoi regional landfill through the newly constructed Davis Material Recovery and Transfer Facility. Continuing to operate under this scenario, the Davis Landfill capacity will be depleted in 20 years, extending its life by 7 years.

Understanding the current capacity and future needs of these facilities, in combination with Wasatch’s guiding principles and prioritized goals to maximize the diversion of material from landfills, potential scenarios, (operational changes), were developed and considered for new options, or alternatives, for the processing and transfer of material tonnages through Wasatch’s facilities moving forward.

The scenarios were developed with underlying assumptions consistent across the evaluations including, planning horizon, projected waste generation rates, fixed airspace capacity at Davis LF, and the current processing capabilities at the Davis Material Recovery Facility. These scenarios are presented below and were each evaluated by Wasatch’s Administrative Control Board.

The three (3) scenarios analyzed in this Plan include:

- Scenario 1 – The Base Case, status quo of Davis Landfill, Transfer Station(s);
- Scenario 2 – Robust Single Stream Recycling; and
- Scenario 3 – Engineered Fuel and Organics Use from MRF.

A financial model was developed to evaluate each of the three (3) scenarios. The financial model uses 2023 as its base year with the budget figures for revenues, rates charged, and costs consistent with the accounts of Wasatch’s current financial system.

The model projected 20 years of:



- Revenues
- Operating Costs
- Non-operating items, including
  - Interest earnings
  - Bond debt service
  - Sale of assets proceeds
  - Capital purchases
- Net cash income
- Changes in net cash position

In each scenario, the model allowed for changes in tonnage flows through the system, rates and charges, facilities, and equipment fluctuations, in operations. To summarize the impact of any scenario in the Plan, the model calculated:

- The average annual net cash income over 20 years, and
- The net change in cash position over 20 years.

### Scenario 1 – The Base Case, status quo of Davis Landfill, Transfer Station(s)

Scenario 1 forecast starts with operations at Wasatch as of June 2022 and projects operations using the Davis Landfill up to a point, and then implementing additional transfer capacity as the Davis Landfill becomes full. In Scenario 1, the June 2022 operations and programs stay the same: there is the current moderate level single stream recycling occurring in some of Wasatch members' cities; all residential MSW is processed or transferred at the MRF; very little engineered fuel that is produced and used by Holcim, and no organics separated in the MRF, are used at all. The residues and organics are transferred to a regional landfill, and the Davis Landfill takes all the commercial waste that Wasatch receives at present.

Several years prior to reaching Davis Landfill's capacity in the future, Wasatch will develop additional transfer station capacity at a Davis Landfill site. Ultimately, all MSW would be transported to a regional landfill from both the MRF transfer station and later from the additional transfer station added at the Davis Landfill which would be left with a standby capacity of 250,000 tons in reserve for future emergency use as needed.

### Operations

The following operational changes will be modeled in Scenario 1:

- No change to June 2022 operations, as this scenario describes what would happen if Wasatch were to maintain its status quo.

### Model Results

The base case of the model assumes that the current operations continue as is for twenty years with the following assumptions:

- Average annual increase in system rates of 2% per year
- Average annual increase in system operating costs of 4% per year
- Average annual Wasatch population growth of 1.8% per year compounded
- Davis Landfill remaining capacity held in reserve: 250,000 tons

The key results include:

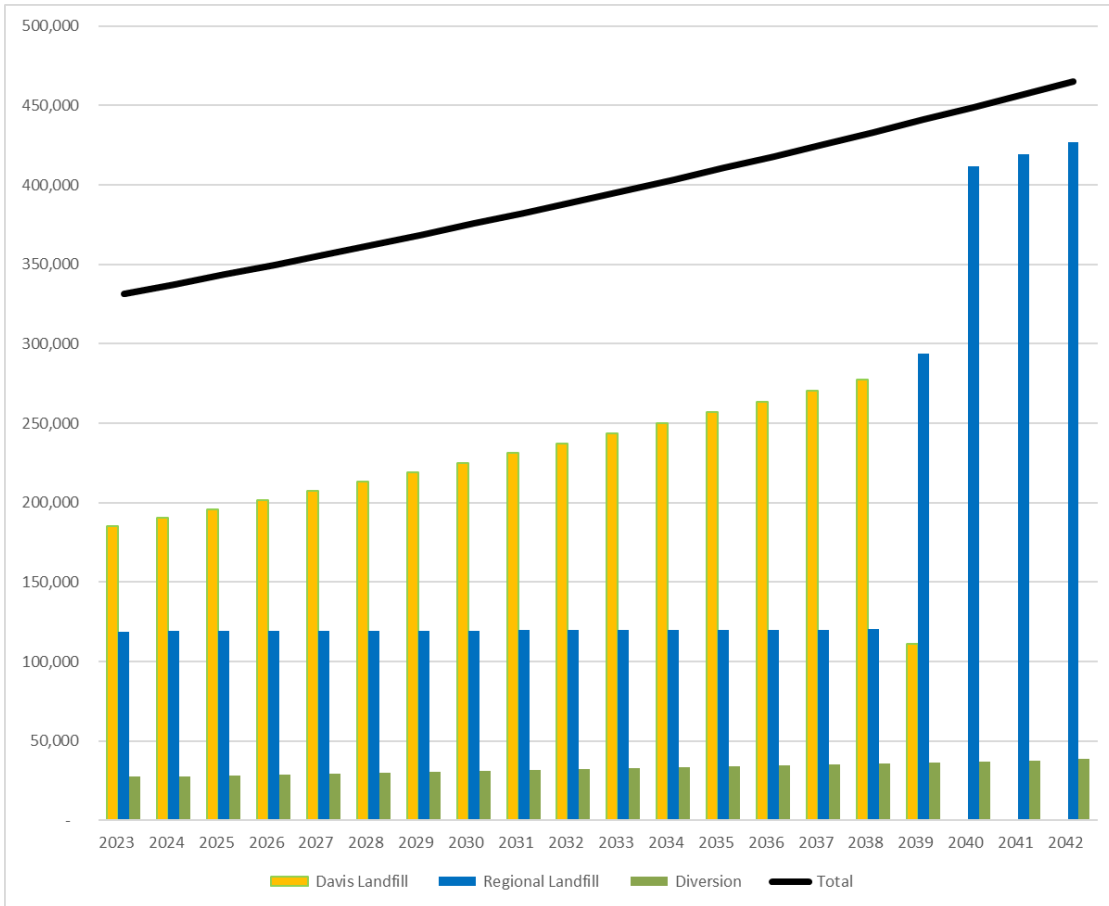
- Average annual net cash income of Negative \$2.11mm

- 20-Year change in net cash position of Negative \$41.5mm = \$20.3mm to Negative \$21.2mm
- A material diversion rate of 8.3%
- A Davis Landfill closure date (net of Reserve Capacity) of: Year 2039
- Implementation of new Transfer Station operation: Year 2039
- Increase in Expenses of 23% when second Transfer Station begins Operations

Scenario 1 Financial Results



Scenario 1 Diversion Results



### Scenario 1 Status

As of August 24, 2022, the Advisory Committee, based on information contained herein and other Wasatch Board considerations and present conditions, has confirmed that this scenario is not a viable approach for the Wasatch to pursue further planning beyond this Plan.

### Scenario 2 – Robust Single Stream Recycling

Scenario 2 acknowledges that current diversion efforts are not as vigorous as they could be and redirects Wasatch and its members’ efforts towards a more robust single stream recycling program at both residential and commercial properties. In Scenario 2, Wasatch members launch robust single stream recycling with Wasatch’s assistance through promotional education efforts and the processing resources at the Material Recovery Facility (MRF).

The focus of this scenario is to improve the operational strategies in place at the MRF to aid in Wasatch’s overall goal of efficiently increasing material diversion from the landfill and transfer. To achieve this, the existing MRF will undergo equipment changes to separate out cardboard more efficiently, redirecting it to higher value commodity markets, rather than including it in the engineered fuel product, as in Scenario 1. To achieve “robust” recycling, every household in Wasatch will be provided a large recycling cart and will receive a higher level of public education and recycling communications through added support from Wasatch.

There are four options to assist cities in providing recycling services to all households:

1. Wasatch member cities purchase their own carts and add recycling to existing hauling contracts with education support from Wasatch.
2. Wasatch incentivizes cities by purchasing the initial cart needs for the entire system, at a cost of approximately \$5 million over three years.
3. Wasatch requires by resolution member cities to implement recycling program by a given date.
4. Wasatch provides contracting services, franchise procurement, and full-time program education and implementation support.

Table 18 presents a listing of the member cities and the number of households that need carts for robust recycling to be reached. The last column presents the capital cost each city would need to fund to reach full cart distribution to all households. This table does not take into consideration existing carts. It is estimated that by 2027, 85,000 carts are needed to be in place requiring a total cost of \$5,100,000 for the cities combined.

Table 18 Member Cities and number of households that need recycling carts

Wasatch Member City	Households in Member Cities (1 <sup>st</sup> Can Data, July 2022)	Recycling Tons July 2022	Households that Need Carts	Cost of Additional Carts @\$60 per cart
Centerville	4,340	45.63	4,403	\$264,182
Clearfield	6,151	34.66	6,240	\$374,421
Clinton	6,794		6,893	\$413,561
Farmington	6,589	77.85	6,685	\$401,083
Fruit Heights	1,724		1,749	\$104,943
Kaysville	8,835	89.18	8,963	\$537,800
Layton	19,362	79.31	19,643	\$1,178,595
Morgan City	1,336		1,355	\$81,324
Morgan County	2,362		2,396	\$143,779
North Salt Lake	4,950	44.82	5,022	\$301,314
South Weber	2,138		2,169	\$130,143
Sunset	1,587	4.79	1,610	\$96,603
Syracuse	9,391		9,527	\$571,645
West Bountiful	1,793	19.71	1,819	\$109,143
West Point	3,448	31.05	3,498	\$209,885
Woods Cross	2,983	39.66	3,026	\$181,580
<b>Total</b>	<b>83,783</b>	<b>466.66</b>	<b>85,000</b>	<b>\$5,100,000</b>

Some pros and cons of member purchase vs Wasatch purchase, for consideration, include:

1. Member Purchase;
  - Survey results displayed community support for SSR – more recycling needed
  - Individual member cities purchase the number of carts needed to fully provide for their residents, see Table 19
  - Member cities retain control for the roll-out of carts within a defined timeframe set by Wasatch
  - Sizable capital investment by member cities who haven't implemented recycling totally
  - Member cities maintain/repair carts

2. Wasatch Purchase;

- Wasatch pays member cities for existing carts and new carts over a 3-year roll-out period
- Member cities pay for more carts as needed after roll-out as well as maintenance/repair
- Wasatch applies for Wasatch-wide grant available to the district on cart purchases to reduce costs

“Robust” also means that Wasatch will work with its members to require all residential curbside customers be offered single stream services. Wasatch will make its MRF available to receive the additional privately collected commercial single stream recyclables as well as work with haulers to create “dry” routes (for improved quality and processing efficiency) and process those materials for recycling as well.

Instead of producing engineered fuel from processing MSW, the residue from the single stream recycling processing will be used by Holcim as its engineered fuel instead. Holcim will be able to accommodate this change as it has experience using residues from other MRFs in the Salt Lake region already.

To maximize the quantity of waste diverted from the Davis Landfill, this scenario aims to increase recycling in both the public and commercial sector. This will be accomplished through changes to current regulations, stronger public education, and technical assistance to customers. Suggested changes to current regulations include:

- Hauler collection contractors must offer recyclables collection to all residential and commercial establishments in their contract areas;
- Recyclables collected can be delivered to the Wasatch’s facilities at competitive rates.

A determination will be made as to whether any or all processing costs for recyclables will be charged by the hauler contractors to their customers directly or whether Wasatch will cover the cost of processing from the commercial sector and waive tipping fees for the contractors.

Successful implementation of Scenario 2 will involve a significantly ramped up public education effort each step along the way and will yield a significantly higher diversion of waste from landfill disposal.

## Operations

The following operational changes are modeled in Scenario 2:

- Take on as much commercial sector single stream recyclables to operate a full time-first shift at the MRF within 6 months to 1 year of changing operations.
- The retrofit of the MRF will add/update equipment to operate more efficiently for single stream materials and to better recover OCC material for market.
- As member cities roll out recycling carts to residents and quantities increase, implement additional processing time as material quantities warrant.
- The MRF will no longer process residential MSW.
  - All residential MSW received will be transferred out of the MRF complex and hauled to a regional landfill.
- Wasatch will ask its members to have recycling for all households, and carts will be provided to residents accordingly.
  - All recycling carts will be the responsibility of the cities/haulers, including cart purchases, installation, maintenance, and replacement.
- Holcim will receive MRF residue as its engineered fuel feedstock.



To support the efforts of increased recycling collection and enhanced MRF operations, this option also includes the hiring of two (2) full-time equivalent Recycling Coordinator positions added to Wasatch staff dedicated to technical assistance, signage development, public education efforts, and program implementation in the commercial and industrial sector, spending approximately 80 to 90 percent of their time outside of the office (32 to 35 hours per week). This staffing level would provide 15 to 20 minutes of program activity per establishment to contact or visit each establishment once every three years. In addition to providing recycling education and support to commercial entities, the recycling coordinators will also support the public’s efforts through their attendance and presentations at community events, the development of informational brochures, magnets, and mailers that they will distribute to residents, direct response to questions through email blasts, social media posts and website updates, phone call inquiries, etc.

In addition, it is proposed that Wasatch train staff who have access to MSW tipping floors to identify loads that contain large quantities of recyclables. Pictures could be taken of loads and the origin of the material identified by the hauler and through discussions with the drivers. This information would then be passed on to the Recycling Coordinator described above who could work with the identified establishments to implement single stream services.

A further opportunity for increased diversion includes further implementation of residential green waste collection services by expanding green waste cans for more residences. Some of the Wasatch member cities are already doing this and in those cities are achieving higher diversion rates as a result. For example, the City of Centerville has implemented curbside green waste collection and reached an MSW diversion rate of 19% in 2021. In comparison, the City of Layton which does not have a curbside green waste option, has a diversion rate of 3% in 2021. Table 19 below shows the current cans and tons of Wasatch member cities and illustrates that those that offer green waste cart options are already achieving higher diversion rates. For additional consideration, the cities that currently have second cans in place would likely be able to eliminate those cans if they were to increase their recycling tons.

Table 19 2021 Member City Collection and Diversion Statistics

City	1 <sup>st</sup> Can	2 <sup>nd</sup> Can	Green Waste Can Tons	Commingled Recycling Tons	Total Refuse and Recycling Tons	Tons Per Household	Recycling Diversion	Green Waste Diversion	Combined Diversion Rate
Centerville	4,341	1,412	709	645	7,107	1.6	9%	10%	19%
Clearfield	6,155	2,513	-	481	9,149	1.5	5%	Not Collected	5%
Clinton	6,787	4,175	-	-	10,962	1.6	0	Not Collected	-
Farmington	6,582	2,309	-	984	9,875	1.5	10%	Not Collected	10%
Fruit Heights	1,732	685	419	-	2,836	1.6	0	15%	15%
Kaysville	8,835	5,007	2,301	1,183	17,326	2.0	7%	13%	20%
Layton	19,344	11,891	-	915	32,150	1.7	3%	Not Collected	3%
Morgan City	1,332	-	-	-	-	-	-	-	-
Morgan County	2,355	2,422	-	-	4,777	2	0	Not Collected	-
North Salt Lake	4,939	1,295	-	679	6,913	1.4	10%	Not Collected	10%
South Weber	2,125	1,281	-	-	3,406	1.6	0	Not Collected	-

Sunset	1,587	504	93	70	2,254	1.4	3%	4%	7%
Syracuse	9,373	4,589	1,248	16	15,226	1.6	0	8%	8%
West Bountiful	1,795	1,105	-	233	3,133	1.7	7%	Not Collected	7%
West Point	3,432	826	753	316	5,327	1.6	6%	14%	20%
Woods Cross	2,961	656	697	474	4,788	1.6	10%	15%	24%
<b>Total:</b>	<b>83,675</b>	<b>40,670</b>	<b>6,219</b>	<b>5,996</b>	<b>135,230</b>	<b>1.6</b>	<b>4%</b>	<b>5%</b>	<b>9%</b>

To achieve Wasatch’s overall planning, diversion, and sustainability goals, encouraging all its member cities to implement both curbside recycling and green waste collection is recommended.

### Model Results

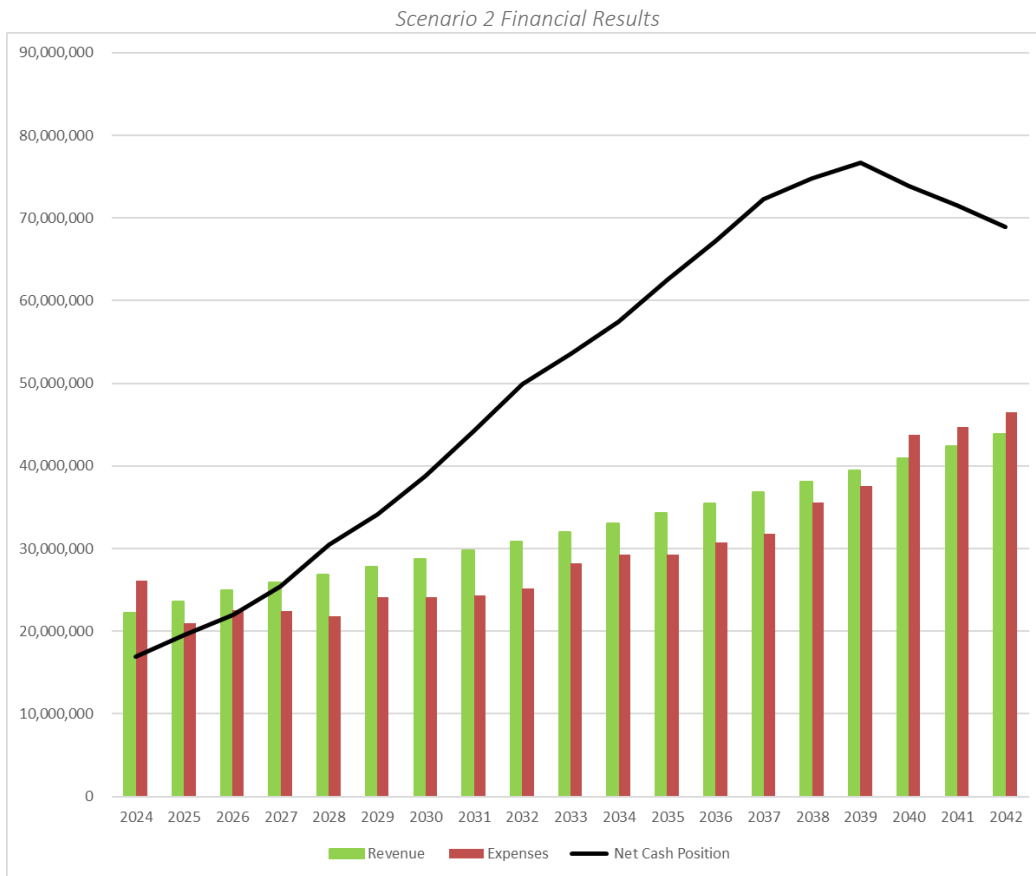
1. It is assumed that approximately 83,675 recycling carts in total are provided to all households by 2026. We have estimated a need for 85,000 carts for model planning purposes.
  - a. Direct expense to the Wasatch of approximately \$6 million over a three-year period.
  - b. The Recycling Partnership’s Residential Curbside Recycling Cart Grant Program<sup>34</sup> provides some relief to Wasatch as it presents funding opportunity to implement new cart-based curbside recycling programs.
2. Increase in tonnage of single-stream recyclables received.
  - a. The commingled recycling tonnages projected to be delivered to the MRF are based on a generation rate of 400 pounds of recyclables per household per year.
  - b. The total tonnages are calculated by multiplying the generation rate times the number of carts in place at the time.
  - c. MSW projected to be generated by households in any year is decreased by the recycling tonnage created by this program.
3. A capital cost impact of \$3.5 million is included to cover the purchase of new MRF equipment, including an OCC screen and baler.
4. Upon installation of the new equipment mentioned above, an increased OCC commodity yield, from 30% to 90%, is expected. This will ultimately lead to additional revenue.
5. The recycling program adds new costs for Wasatch.
  - a. Two program coordinators are added to the staff at a burdened salary of \$88,077 each.
  - b. Additional direct expenses for program implementation amount to \$150,000 in the first year, and \$50,000 each year thereafter.
6. Going to a single shift at the MRF lowers operating costs for Wasatch.
  - a. Reduction in employees as staffing is reduced from 90 to 70 individuals.
  - b. Direct expenses, such as utilities, maintenance and supplies are also reduced, decreasing by approximately \$183,000 per year.
  - c. Transfer Station capacity is increased from 125,000 tons to 208,000 tons, or 800 TPD.
7. Cost savings and efficiency occur from no longer double handling MSW.

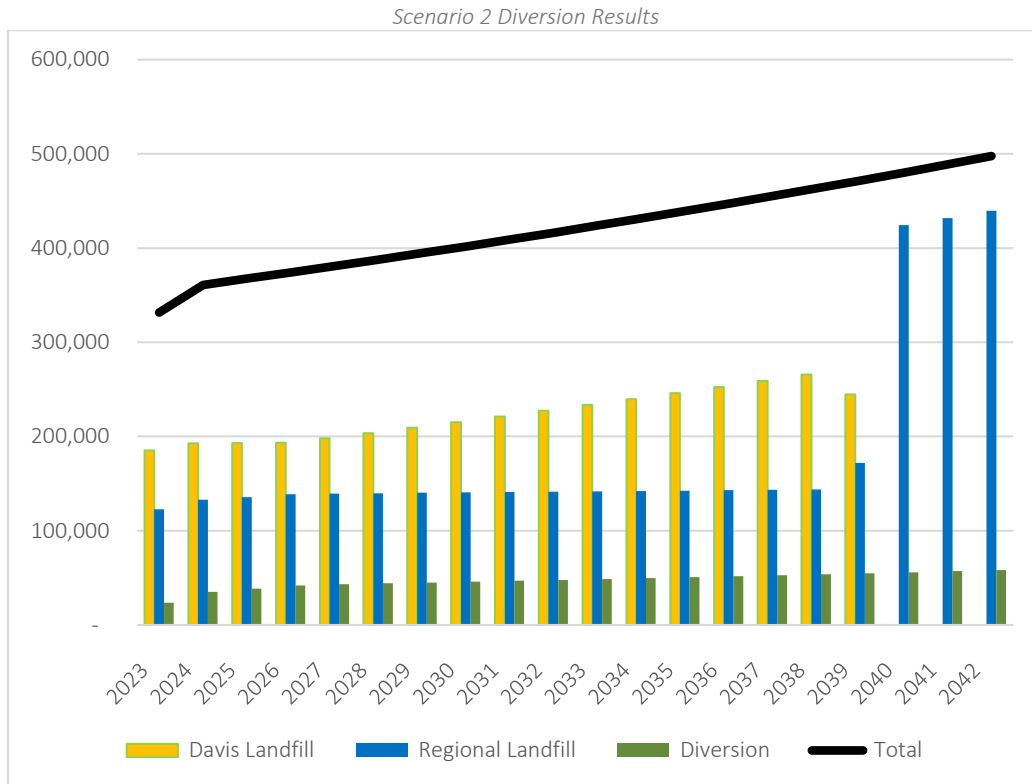
<sup>34</sup> The Recycling Partnership. August 31, 2022. <https://recyclingpartnership.org/recycling-cart-grant/#:~:text=The%20Recycling%20Partnership's%20Residential%20Curbside,card%2Dbased%20curbside%20recycling%20programs.>

8. Holcim receives additional MRF residue.
  - a. Begins with 4,875 in 2023, bumps up to 15,000 when the cement plant will have implemented a changeover that will allow it to take more engineered fuel material.
9. Scenario 2 adds two additional years of capacity and life to the Davis Landfill.

The key results include:

- Average annual net cash income of \$2,402,197
- 20-Year change in net cash position of \$48,097,007
- A system-wide material diversion rate of 7%-12%





### “What If” - Additions to Scenario 2

“What If’s” are options that could be added to a scenario. They represent additional mechanisms to either divert additional recyclable material streams from the Davis Landfill or to limit waste input to the Davis Landfill for extending its life. The following “What If’s” are presented:

- A Construction and Demolition Recycling and Transfer is presented along with a Davis Landfill annual waste limit; or
- The Davis Landfill is limited to receiving and disposing of 150,000 tons per year starting in 2024.

### Construction and Demolition Waste (C&D) Recycling and Transfer

There is considerable C&D that comes in that could be diverted from the landfill and not take up valuable airspace with inert materials that do not decompose nor generate useable gas nor reduce in volume over time. Adding a C&D recycling and transfer area at the Davis Landfill in the year 2024 would yield more recovered recyclables from the C&D, with the remaining C&D waste going to local landfill(s). The following assumptions are used for this “what if” addition:

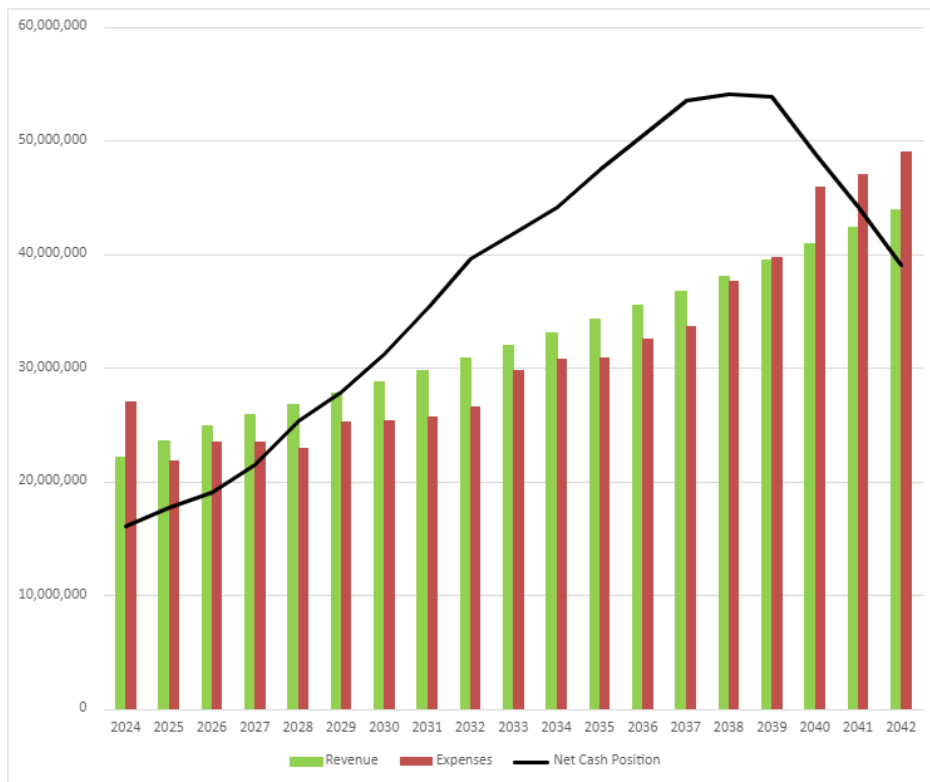
- C&D recycling and transfer needs are planned, designed, permitted, and constructed at Davis Landfill in 2023
- 20% of 34,000 tons per year recovered for recycling and beneficial reuse; there may be additional diversion if some materials can be used as alternative daily cover at the Davis Landfill.
- Remaining C&D residues transferred to Weber County C&D Landfill
- Estimated tons of capacity saved at Davis Landfill through 2042, i.e. 100% x 34,000 tons escalating from 2024 through 2042 (remember, remaining C&D waste is transferred to Weber)

The key results include:

- Average annual net cash income drops from \$2,400,000 to \$900,000.
- 20-Year change in net cash position from \$48,000,000 to \$18,200,000.
- The life of the Davis Landfill is extended approximately three (3) years beyond the 20-year planning horizon of this Plan.
- A transfer station is not needed in the latter years of the planning period.
- System-wide material diversion increases from 7.5-9.0% to 7-11.8%.
- Residential diversion increases from 17.8-22.6% to 17.8-26.7%.

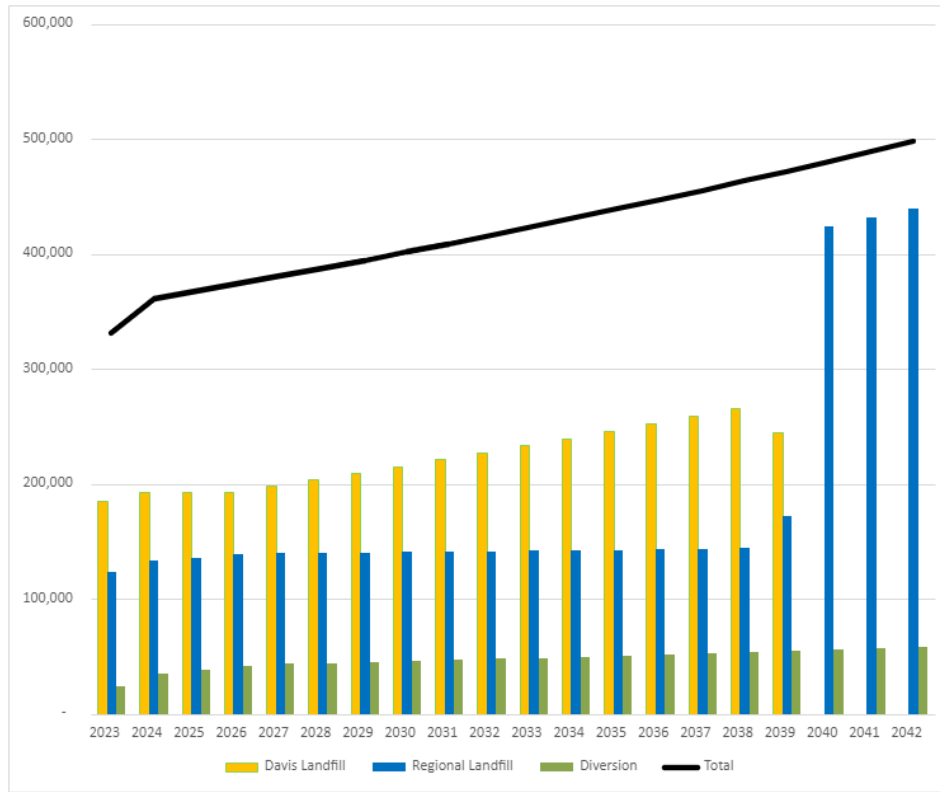
Included in the Appendices is a study from Virginia’s Fauquier County that contains applicable C&D Technology information for Wasatch reference.

*Scenario 2 Financial Results with C&D “What If”*





Scenario 2 Diversion Results with C&D "What If"



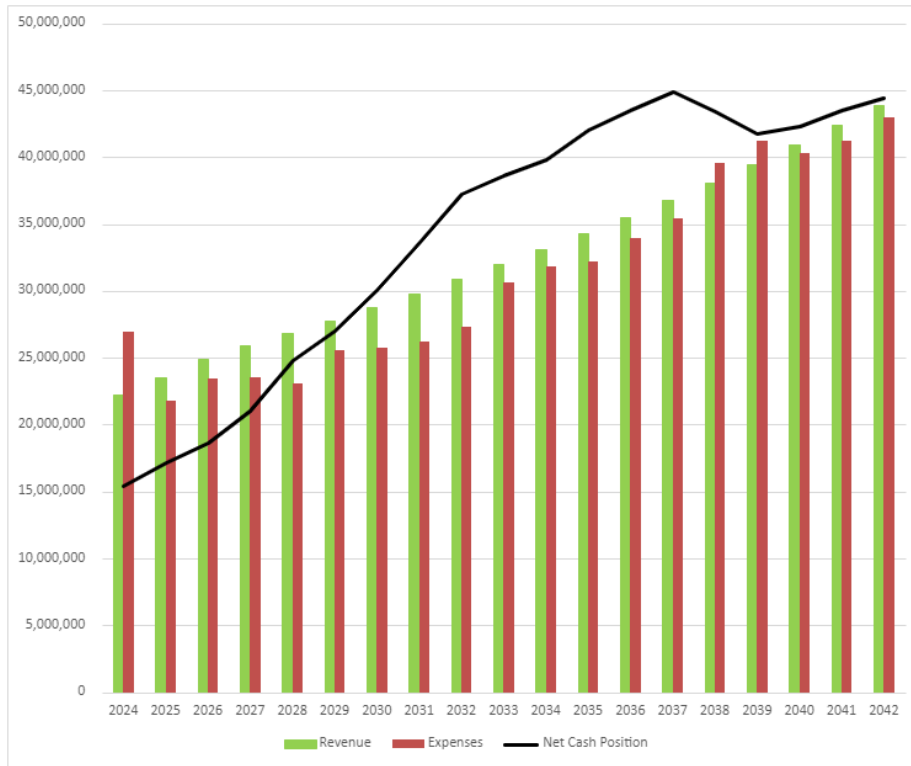
**Limit Davis Landfill to 150,000 TPY**

To extend the life of the Davis Landfill, Wasatch could limit how much waste goes into the David Landfill to a certain level; here the limit is set at 150,000 tons per year starting in the year 2024. All other MSW, greater than the 150,000 tons per year, would be transferred to regional landfill for disposal.

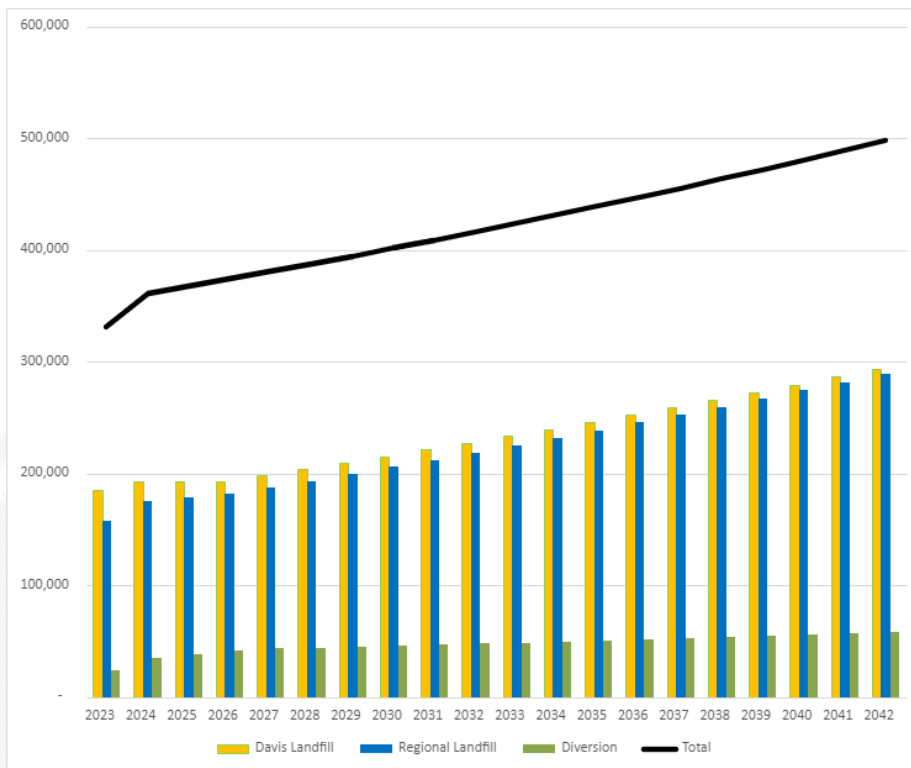
The key results include:

- Average annual net cash income drops from \$2,400,000 to \$1,200,000.
- 20-Year change in net cash position from \$48,000,000 to \$24,200,000.
- The life of the Davis Landfill is extended approximately five (5) years beyond the 20-year planning horizon of this Plan.
- A transfer station is not needed in the latter years of the planning period.

Scenario 2 Financial Results with Davis Landfill capacity limit of 150,000 TPY "What If"



Scenario 2 Diversion Results with Davis Landfill capacity limit of 150,000 TPY "What If"



Waste management options vary in convenience, affordability, environmental protection, and local availability. A review of some of the waste management strategies currently available in the United States, including landfilling, incineration, and recycling, uncovers myriad reasons why recycling is more beneficial than either landfilling or incineration. Recycling conserves natural resources, reduces air pollution, conserves energy, creates jobs, lessens materials being sent to landfill and therefore extends landfill capacity and life, achieves sustainability targets, lowers carbon emissions and footprint, and provides the public with a tangible action they can complete at home that directly benefits the environment for themselves and the future. See the value of recycling appendix of this Plan for further information about the benefits of recycling.

## Scenario 2 Status

Upon recommendation of the Advisory Committee, Wasatch will move forward with implementation of Scenario 2 Robust Recycling and adding C&D recycling.

## Scenario 3 – Engineered Fuel and Organics Use from MRF

This scenario is considered a best case/dream option that assumes full utilization by off-take users of both engineered fuel and recovered organics from processing residential MSW at the MRF. If this were to occur, Wasatch would enjoy significant material diversion as a result, approaching a 50% diversion from landfill disposal. Also included in Scenario 3 is a brief look at the conclusions from the separate study that Jacobs completed to find a significant user for the organics that are processed out of the MRF.

## Operations

Ideally, residential MSW would be fully processed at the MRF, and 100% of engineered fuel and recovered organics production maximized and shipped to a cement kiln and organics digester. The resulting residue that occurs from MSW processing would be significantly reduced and transferred out to a regional landfill. Recycling (Single Stream Recyclables) would remain as it is currently operating as discussed in Scenario 1 - Base Case. The Davis Landfill would also remain as it is currently operating, requiring transfer capacity to be built a few years ahead of when the landfill is expected to reach its capacity.

- Currently, the use of Engineered Fuel at Holcim Cement does not achieve Wasatch expected diversion of 15,000 TPY or a net positive revenue and is maintained at 5,000 tpy until anticipated changes at the Holcim facility occur to take the full diversion potential.
- Currently, no recovered organics are being delivered to a reuse facility and based on a recently completed Organics Study by Jacobs, the diversion of organics would cost a minimum of \$30 per ton to a digester, a net negative impact. Continued operation to divert a recovered organics material stream under Scenario 3 would require sustained negative impact to the cash position until such time as an organics material steam user is found.

## Model Results

- Starts with the Scenario 1 - Base Case
- Transfers out 100% of potential engineered fuel and recovered organics
- Has little effect on Davis Landfill life as most of that material was transferred to regional LF in the Base Case
- Financial Results (see graphical representation below)
  - 20-year average net cash income = (1,609,609)
  - 20-yr change in net cash position = (31,857,463)
- Diversion Results (see graphical representation below)

- As much as 50% diversion in material from Davis Landfill could be achieved

### Scenario 3 Improvements

- Seek alternatives that might exist now that could use the engineered fuel at a site provided by Wasatch at the Davis Complex (in new Layout), about 10-15 acres in size made available or at a site by a third-party developer;
- Consider alternatives that estimate order of magnitude costs of running MRF per how organics may or may not need to be separated from engineered fuel.
- Review research projects that Wasatch is actively supporting using DOE grant funding in partnership with INL, NREL, UW and UKY to develop greater efficiencies in the conversion of BTU value in MSW. While these projects are not yet expected to result in commercial process in the near term, they are helping to improve available technologies needed to make better use of MSW.

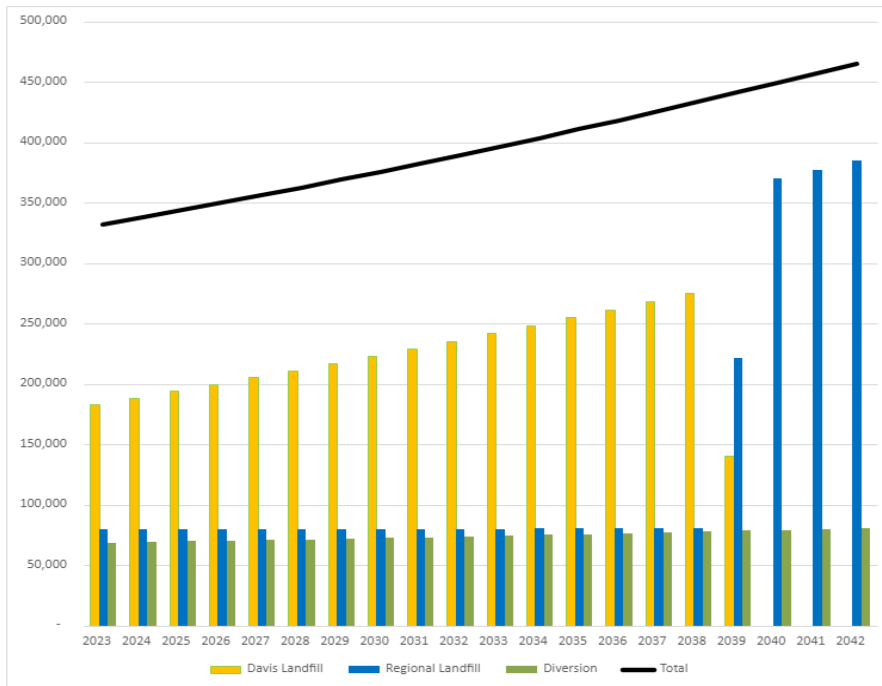
### Conclusions from the 2022 Jacobs Study

- In 2022, Wasatch selected Jacobs Engineering Group Inc. to evaluate the feasibility of anaerobically digesting the organic fraction of municipal solid waste (OFMSW) from Wasatch's Davis Material Recovery and Transfer Facility using the existing digester capacity.
- To complete this assessment, Jacobs evaluated the business case for Wasatch, as well as looked at the economic feasibility of potential partnerships.
- The best scenario was the one with sidestream chemical costs being offset. This suggests that a reasonable cost for OFMSW is possible, with the right conditions.
- Distribution costs of residuals and rejects are a major cost and back hauling of materials is a crucial element of a successful project. Additionally, a higher value for RNG is necessary, as well as revenue from ammonia recovery, to offset the sidestream chemical cost.
- Finding ways of increasing the quality of the organic feedstock also improves the economics of this project. A tipping fee is necessary for profitable WRR operation, unless WIW takes the residuals and rejects.
- For further details, a Technical Memo describing the Jacobs report is included as an Appendix in this Plan.

Scenario 3 Financial Results



Scenario 3 Diversion Results



### Scenario 3 Status

As of August 24, 2022, the Advisory Committee, based on information contained herein and other Wasatch Board considerations, has confirmed that this scenario, given present conditions, is not a viable approach for Wasatch to pursue further planning beyond this Plan.



## Public Opinion Surveys

Public opinion surveys have been made to solicit general feedback from residents from Morgan and Davis Counties because they are likely to be Wasatch Integrated Waste Management District (Wasatch) members regarding the various options that Wasatch is considering in its solid waste planning moving forward. There have been two surveys implemented, one by phone and the other online, to attract feedback from residents. The two surveys work together to accomplish garnering public opinion that can be used as the basis for planning as well as serving as an outreach opportunity regarding Wasatch’s services. GBB’s sub-consultant team member EPIC-MRA, an experienced public opinion research firm, was selected and engaged to advise and administer the phone survey and review the online survey questions.

## Phone Survey

The phone survey was conducted by EPIC-MRA over the course of two weeks in March 2022 with no prior advertising.

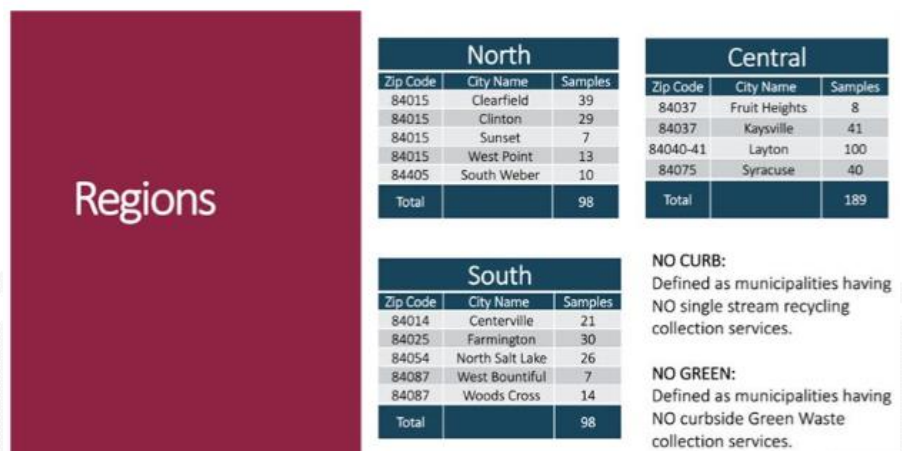
During the phone survey, EPIC-MRA administered live telephone interviews with 400 adults who are permanent, full-time residents and live within Davis and Morgan Counties. The survey calls were conducted using live operator telephone interviewers, with 70% of all interviews conducted via cell phone. Respondents were included in the sample if they confirmed permanent, full-time residency status in Davis or Morgan Counties and if they play a primary or joint role in the household’s waste management decisions, including trash, recycling, and green waste collection and disposal.

Respondents were randomly selected from records of residence in Davis and Morgan Counties. The sample was stratified such that every geographic sub-unit (city/town) served by Wasatch was represented in the sample according to its contribution to the total adult population of each geographical area of Wasatch’s service area.

## Phone Survey Results – Overview of Findings

A majority (87%) of respondents offered a positive rating (39% “excellent”) for the job their city or town does in providing basic solid waste management services to its residents, including household trash, recycling, and green waste collection, processing, and disposal services. Also, an overwhelming majority of respondents said the fees they pay are “about right” when thinking about the quality of services their city provides in return for the fees they pay, while just 19% said they are “too high.”

Figure 12 - Regions



*For reference throughout this report, the regions include the cities described above.*

## Recycling

A majority (60%) of respondents said that they separate recyclable materials from the trash in their household, while 40% said they do not. Of that 60% majority, 85% of respondents said they use a SSR bin for collection at their residence. Of the 85% of respondents who said they use a SSR bin, 83% said they use SSR at their residence “all the time,” another 13% said “most of the

time,” 3% said “seldomly,” and only 1% said they “never” use it. Among those respondents who do not use SSR at their residence, the top reasons cited for NOT doing so included:

- “Cost of it” (33%);
- “Prefer to drop off/less expensive” (19%);
- “Little to nothing to recycle” (17%);
- Unavailable/not offered in my area/have no bin” (14%); and
- “Need more detailed information/unaware of it” (5%).

The top reasons why surveyed households do NOT separate recyclable materials from trash included:

- “Service is unavailable/not offered in their area/have no bin” (37%);
- “Cost of the service” (25%);
- “No interest/desire/lazy” (11%);
- “Have/produce little to nothing that can be recycled” (6%);
- “Inconvenient/too time consuming” (5%);
- “Inefficient/just ends up in landfills anyway” (4%); and “no drop off location” (4%).

Among respondents who do not recycle:

- 46% said they would use recycling service at their residence if it were available in their area for an additional \$5 per month;
- 38% said they would not use it, and
- 16% were “undecided.”

## Green Waste

When respondents were asked what they do with Green Waste:

- 21% said they separate it from trash for curbside Green Waste collection;
- 15% said they do backyard composting;
- 16% haul it to a landfill for composting;
- 8% have a yard service or landscaping company take it away;
- 2% do more than one thing;
- 3% said they do not have yard waste; and
- 34% DO NOT do any of the things listed.

Among those respondents who do use curbside Green Waste collection:

- 63% said they use it every week,
- 22% said every other week,
- 7% said monthly,
- 6% said they seldom use it, and
- 2% unsure.

Among those respondents who DO NOT separate yard waste for collection or composting, top reasons why they DO NOT include them:

- “Unavailable/not offered in my area/have no bin” (31%);
- “Little or nothing to recycle” (15%);
- “Just toss it in with the trash” (10%);
- “No interest/desire/laziness” (9%);
- “We compost/mulch our yard waste” (8%);
- “Has another source/homeowners association/landlord/service handles it” (7%); and
- “Cost of it” (5%).

Among those respondents who DO NOT use Green Waste recycling collection service, if it was available at their residence:

- 36% said they would use the service if it cost an additional \$5 per month,
- 56% said they would not use it,
- with 8% undecided.

## Davis Landfill

Respondents were informed that Wasatch owns and operates the Davis Landfill, located in Layton, Utah, serving Davis and Morgan Counties and that residential services include residential waste disposal, green waste drop off, sale of compost and wood chips from recycled green waste, and a landfill thrift store. When asked:

- 74% of respondents said they had used the services or facilities offered at the Davis Landfill, and
- 24% reporting not having used it.

The top reasons for the most recent visit to the Davis Landfill among respondents reporting use included:

- “Drop off residential waste” (37%);
- “Yard waste/green waste disposal” (23%);
- “Drop off household hazardous waste disposal, like batteries/paint” (15%);
- “Drop off recyclables into the bin” (6%);
- “Purchase compost, wood chips or mulch” (6%); and
- “Dispose of large items” (3%).

When asked how often landfill users visit the Davis Landfill, the grouped responses were:

- Twice per year or less (53%);
- Three to five times per year (23%);
- Six to ten times per year (20%); and
- More than ten times per year (4%).

The mean response for annual use was 3.810 times, with a median response of 2.0 times.

Among the 74% of survey respondents who used the services and facilities at the Davis Landfill:

- 94% offered a positive job rating of
  - “excellent” (54%) or
  - “pretty good” (40%) for the quality of services provided.

Among the 24% of respondents who had never used the services or facilities of the Davis Landfill, the top reasons cited for NOT using it included:

- “No need or reason to use it” (30%);
- “Need more detailed information/unaware of it” (22%);
- “Location/too far away” (15%);
- “Have other source/homeowners association/landlord/service handles it” (9%); and
- “Have no vehicle to haul waste/do not drive” (6%).

Among those same respondents, if similar residential customer services and facilities to those currently offered at the Davis Landfill were made available closer to your home, say, within 10 miles:

- 46% said they would be more likely to use those services and facilities, including
- 20% “very likely”

- 26% “somewhat likely”,
- 17% “only a little likely”,
- 28% “not likely at all” and
- 9% “undecided.”

If similar residential customer services and facilities to those currently offered at the Davis Landfill were made available closer – within 10 miles – of the respondents’ homes among that same subgroup, the following services were cited as the ones that would be used the most:

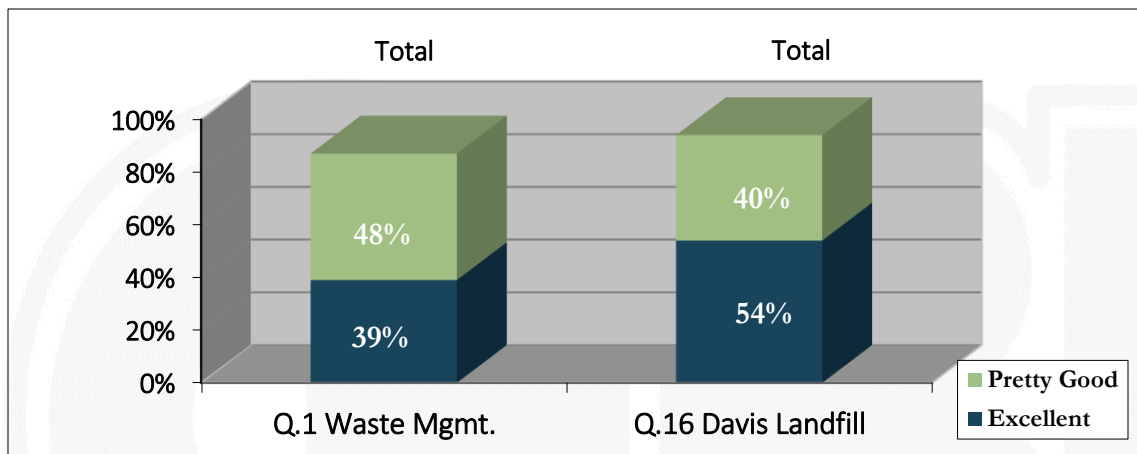
- “Drop off recyclables into the bin” (19%);
- “Drop off household hazardous waste disposal, like batteries and paint” (17%);
- “Yard waste or green waste disposal” (15%);
- “Drop off residential waste” (14%);
- “Purchase compost, wood chips or mulch” (11%);
- “Make thrift store purchase/donation” (8%); and
- “Dispose of household medical waste” (5%).

The top sources of information that influences respondent opinion the most about “local issues” included:

- “Word of mouth/family member or friend” (22%);
- “Television” (17%);
- “Social media/Facebook, Twitter, Instagram, Reddit” (16%);
- “Google/Internet searches (11%);
- Direct mail (7%);
- “City/town website” (5%);
- “Radio” (4%); and
- “Local government officials/meetings” (3%).

### Phone Survey Results – Summary

Wasatch enjoys both a high level of satisfaction among residents, and an equally high rating of the facilities and services offered at the Davis Landfill. Resident respondents offered an 87% *Total Positive* rating (39% *Excellent* – 48% *Pretty Good*) for the job their “city or town does in providing basic solid waste management services” (Q.1) to residents, and a 94% *Total Positive* rating (54% *Excellent* – 40% *Pretty Good*) for the “residential customer services



Survey Results: Residential Customer Solid Waste Management Service Satisfaction

and facilities offered at the Davis Landfill” (Q.16), among nearly three-quarters of district-wide respondents that have used the Landfill’s offerings.

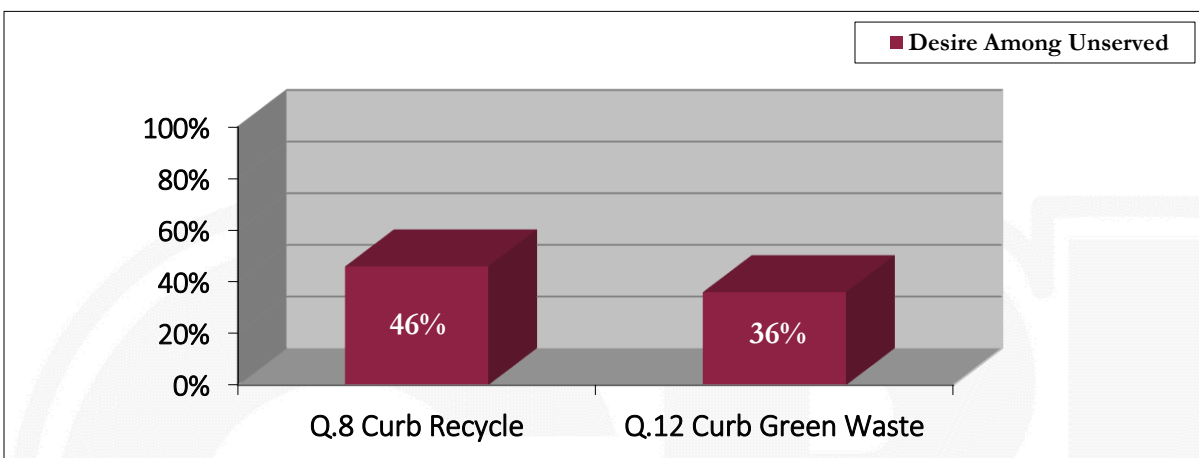
Furthermore, these high marks appear widely shared among the majority of the demographic segments that comprise the population that resides within the service area of Wasatch – a finding that bodes well when considering the expansion of waste removal and recycling services offered District-wide. Coupled with the fact that a solid majority of residents do NOT feel, at least in a general sense, that local fees paid for “municipal” types of services are too high - 70% of the entire sampling shares the sentiment that they are *About Right* (Q.2) - the potential for expanding SSR collection and/or curbside Green Waste recycling collection at a modest increased cost shows potential, with that increased cost being an unlikely barrier in-and-of-itself, *among the portion of the populace supportive of the purpose of the fee increase*.

Sixty percent of residents already report “recycling” in one form or another (Q.3), with a total of half of all residents using SSR as their primary method of doing so (Q.5), and a strong majority of those, 83%, doing so *All of the time* (Q.6). However, when presented with the possibility of increased availability for residential SSR pickup at a cost of an additional \$5 per month, 46% of residents without current access to that service - just under an additional 20% of the entire sampling - reported a desire for it (Q.8).

An equal number, 60%, of residents’ report separating yard waste (green waste) from their waste in one manner or another (Q.9), further broken out by method as:

- 21% via curbside green waste collection
- 16% self-hauling green waste to a landfill
- 15% backyard composting
- 8% removal via a yard service and/or landscaping company

Juxtaposed with the reported frequency of more “traditional” recycling, one-fifth of residents using SSR as their primary method of disposing of yard waste, with a majority of those, 63%, doing so *All of the time* (Q.10). When presented with the possibility of increased availability for residential green waste SSR pickup at the cost of an additional \$5 per month, 36% of residents without current access to that service - just under an additional 30% of the entire sampling - reported a desire for it (Q.12).



Survey Results: Residential Interest in Expanded Curbside Green Waste Services

Respondent subgroups most likely to use SSR services if made available for an additional \$5 per month, by more than 46%, were identified as:

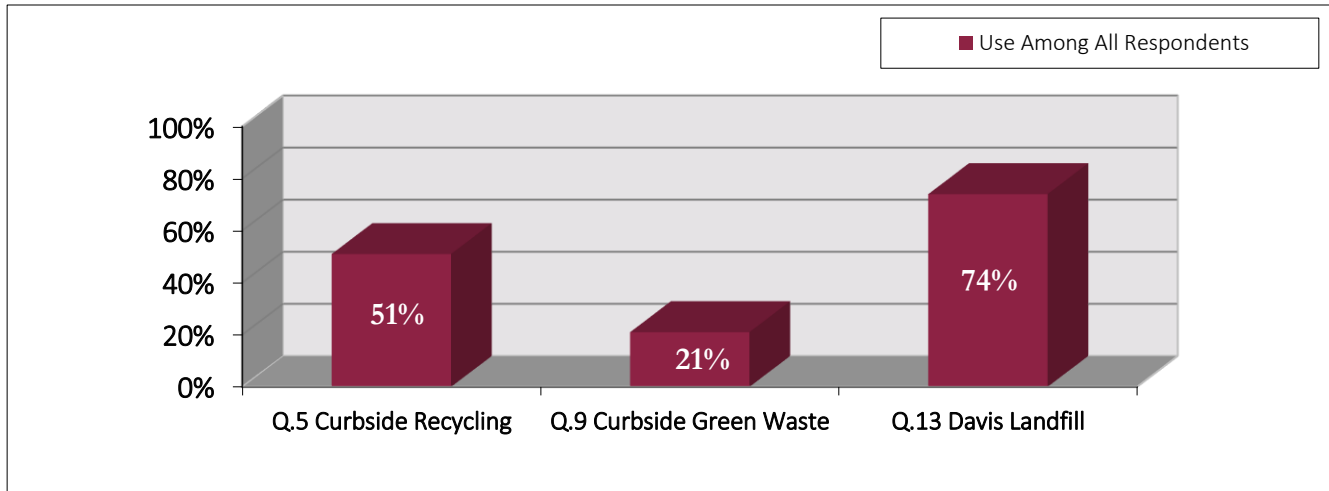


- Northern region, Morgan; DO NOT use Davis Landfill;
- Use the Davis Landfill once or twice, or five to ten times, per year;
- Very likely or somewhat likely to use closer Davis-like facility;
- Gets information from direct mail, social media, websites, or the Internet;
- Households with children;
- Households with 5 or more people;
- People with less than a college education
- Renters;
- People whose incomes under \$75K and incomes over \$100K;
- Non-single-family homes;
- All races;
- All women; and
- All under age 50, particularly those 26-49;

Respondent subgroups most likely to use curbside Green Waste recycling services if made available for an additional \$5 per month, by more than 46%, were identified as:

- Southern region;
- those who separate recycling from trash;
- those who use a curbside bin;
- uses a curbside bin all the time or most of the time;
- would pay \$5 per month for a curbside bin;
- does not use the Davis Landfill;
- uses the Davis Landfill five to ten times per year;
- very likely to use a Davis-like facility that was closer to their home;
- gets information from word-of-mouth and social media;
- has children in the home;
- has three or more living in the household;
- post HS technical education;
- incomes over \$100K;
- all women; and
- all under age 50, particularly ages 25-49;

Use of the Davis Landfill itself is widespread among residents, with 74% reporting having used its services and/or facilities (Q.13), with just over half, 53%, using it *Twice per year or less*, and nearly another quarter, 23%, using it *Three to five times per year* (Q.15).



Survey Results: Residential Utilization of Waste Management Services and Facilities

The top five most-cited reasons for visiting the landfill, accounting for just under 90% of residents' most recent visits, included:

- 37% *Dropping off residential waste*,
- 23% *Yard waste disposal*,
- 15% *Dropping of hazardous waste (batteries, paint, etc.)*,
- 6% *Dropping of recyclables*, and
- 6% *Purchasing compost, wood chips or mulch* (Q.14).

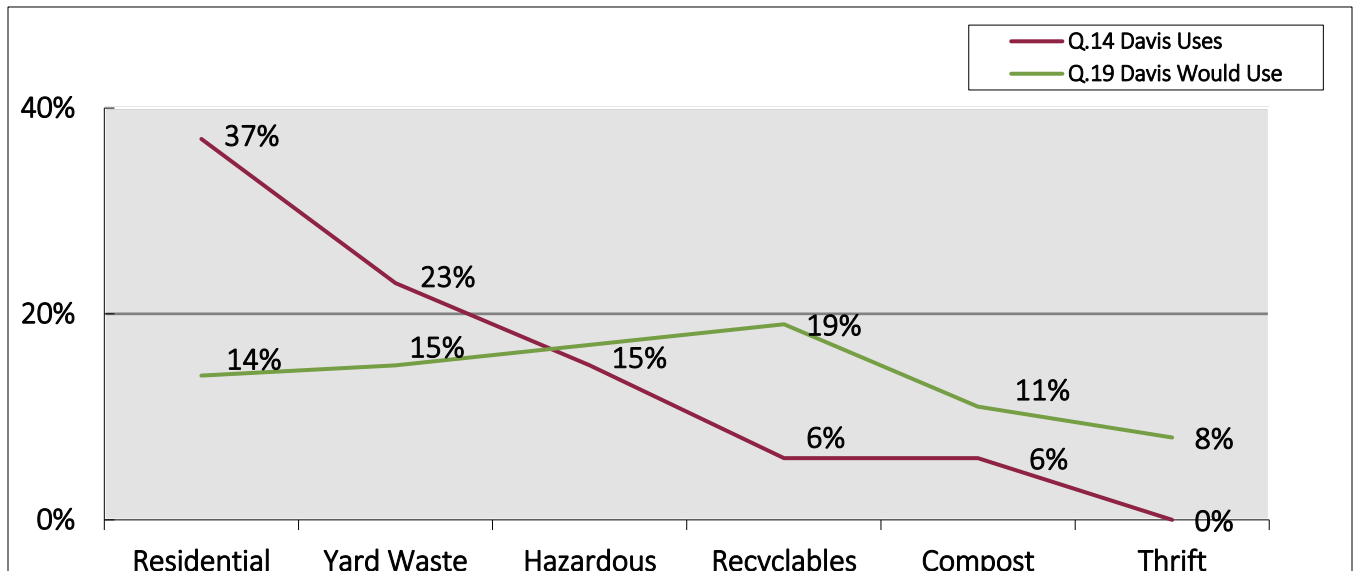
Respondent subgroups that reported not having used the Davis Landfill, by more than 24%, were identified as:

- Northern and Southern regions;
- uses a curbside bin most of the time;
- would use curbside green waste recycling if available;
- Those that get info from websites;
- Those who are not a registered voter;
- Age 34 and under and age 65 and older;
- Households of one or two people;
- Those with post-high school technical education;
- Renters;
- Those with incomes under \$75K;
- Non-single-family homes;
- Non-Caucasians; and
- All women.

Among the one-quarter of residents surveyed that had not used Davis Landfill's offerings and services, 46% - just over an additional 10% of the entire sampling – report being likely (20% *Very likely*, 26% *Somewhat likely*) to use similar services and facilities if made available within 10 miles of their primary residence (Q.18). Among those

respondents, the top six most-cited reasons for using a closer Davis-like facility, accounting for just over 80% of residents' most-desired services, included:

- 19% *Dropping of recyclables,*
- 17% *Dropping of hazardous waste (batteries, paint, etc.),*
- 15% *Yard waste disposal,*
- 14% *Dropping off residential waste,*
- 11% *Purchasing compost, wood chips or mulch, and*
- 8% *Making a thrift store purchase/donation (Q.19).*



Survey Results: Resident Preferences in Landfill Offerings and Services

Respondent subgroups that reported being more likely to use closer, Davis-like facilities and services, by more than 46%, were identified as:

- Those who are in the Southern Region;
- Those that do not separate recycling from trash;
- Those who would use
  - SSR collection if it was available for \$5 per month;
  - use Green yard waste collection for \$5 per month if it were available;
- Those that DO NOT use the Davis Landfill;
- Those that get their information from social media, websites, and the internet;
- Registered voters;
- All under age 50;
- Have children in household;
- Have five or more people living in the home;
- Have up to a High School education;
- Renters;
- Those with incomes of \$50K or more;
- Those living in non-single-family homes; and
- All women.

Further details, including a phone survey Question by Question Analysis, is included as [Appendix B – Phone Survey Frequency Report and Answers](#).

### Online Survey

After the phone survey was completed, an online survey was coordinated through GBB, Wasatch, and Wasatch’s contractor, Salt Works. GBB worked with Wasatch to develop the online survey questions and with Salt Works, who manages Wasatch’s website and social media outreach. The online survey was released to the public and announced on April 15, 2022, and stayed open for two months, through June 15, 2022. The survey was designed to take less than 10 minutes (the average response time was 8 minutes), developed and executed in English, and in the end a total of 1,439 completed responses were received (exceeding the goal of 1,000 responses) from respondents in Morgan and Davis counties. District-wide participation in the online survey was as follows:

County Name	Samples	% of Total
<b>Total Responses with Zip Code</b>	<b>1,439</b>	<b>100.00%</b>
Davis County Number of Responses <sup>35</sup>	1,377	95.69%
<b>Morgan County</b>	<b>62</b>	<b>4.31%</b>

### Outreach and Survey Advertising

Unlike the phone survey, the online survey was voluntary and had to be advertised. To garner responses from respondents (otherwise known as “participant recruitment”), GBB, Wasatch, and Salt Works worked together to advertise and encourage participation, including the following efforts:

- Development of an online survey landing page, designed by Salt Works and informed by GBB, with an easy-to-remember URL ([www.wasatchintegrated.org/2022wastesurvey](http://www.wasatchintegrated.org/2022wastesurvey)).
- The landing page was important so that Wasatch had a singular site to point interested persons to, from which to communicate and that would direct would-be participants to the online survey site. The online survey was developed by GBB using QuestionPro, which is a robust and user-friendly opinion research online survey platform. The URL used for the Wasatch survey designed by GBB and reviewed by Wasatch was <https://gbb-inc.questionpro.com/wasatch-2022-waste-survey>. The survey was opened early in the morning on April 15, 2022, and was officially closed around 2:00 AM MST on June 16, 2022, to allow for any final surveys started just before midnight to finish.
- The online survey landing page garnered 2,176 views from 2,057 visitors during the online survey’s open period. According to Google Analytics data, the users spent an average of four (4) minutes reviewing the landing page. Details on additional website engagement, including metrics such as entrances, bounce rate, and exit percentage, are as follows:
  - 1,975 Entrances, meaning the number of times individuals visited the rest of Wasatch’s website after first viewing the online survey landing page;
  - 91.75% Bounce rate, meaning the percentage of one-time, single-page visits, where the users entered and exited the survey without reviewing any other areas of the website;
  - 89.84% Exit, meaning the percentage of exits from the survey landing page.

<sup>35</sup> Included in the Davis County respondents that completed the survey are 23 respondents from the City of Bountiful which is not part currently members of the Wasatch Integrated Waste Management District.



- GBB developed a press release announcing the survey and Salt Works released it to local online, print and radio news outlets.
- Salt Works advertised the survey on Wasatch’s website on several pages, including its home page, a banner on all webpages, and the survey’s landing page.
- Salt Works developed and regularly posted about the survey on Wasatch’s social media accounts (Facebook, Instagram, Twitter, LinkedIn, and YouTube);
  - According to the Google Analytics data, the survey landing page link garnered 1,220 clicks from promotional viewers earned from social media promotion, primarily through Facebook and Instagram.
  - A significant majority of these social media viewers identified as women (71%) and were between the ages of 25 and 65+ years old. [See the survey Appendices for more information.](#)
- Development of printed handouts and posters to place at strategic locations throughout Morgan and Davis counties and at all buildings at Wasatch’s headquarters and at publicly available places at the Davis Landfill, including at the scalehouse, thrift shop, and reuse store.
  - Each printed handout or poster contained QR code developed by Wasatch that connects those that scan the code to the survey’s landing page, [www.wasatchintegrated.org/2022wastesurvey](http://www.wasatchintegrated.org/2022wastesurvey) (see QR code to the right).



Figure 13 - QR Code that directed to the landing page for Wasatch 2022 Solid Waste Survey

## Selection Bias

Before delving further into the analysis of results, it is important to describe selection bias and its potential impact on online survey results, as well as the importance of having a survey approach that utilizes a randomized survey method (in Wasatch's case it was a randomized phone survey) to complement a voluntary online survey.

*Selection bias* is a type of bias in market research where the respondents that complete a survey are demographically or behaviorally different than the intended sample. Survey bias can be the result of a lack of randomization of survey participants. With voluntary online surveys that are advertised, selection can go both ways, by a survey organizer selecting the survey's advertising methods and outlets AND a respondent choosing (or self-selecting) to participate in a survey because the survey was effectively advertised to them, and the topic interests them. In these cases, *advertising* and *interest* are the cruxes of how an *Actual Sample* can differ from an *Intended Sample*.

The intended sample for Wasatch's online survey was all adults that reside in Morgan and Davis Counties in Utah who have some decision-making power regarding waste management in their households. However, if a Morgan and Davis County resident was not in a position to be effectively advertised to, they may not have had an opportunity to learn about the survey. Further, if a resident was effectively informed about the survey but it did not interest them, they may have selected to not participate. Therefore, the actual sample differs from the intended sample. Wasatch was well advised to implement a randomized phone survey first to gather data without the impact of selection bias.

Selection bias in online surveys regarding waste management has been observed several ways. Through GBB's experience implementing solid waste management surveys for its municipal customers, selection bias is typically exhibited by demographic differences and differences in the behavior of intended samples. The demographic differences observed have been an increased level of homeownership (usually an overwhelming majority of respondents are homeowners) and an extremely high percentage of respondents that live in detached single-family homes (at a rate much higher than the municipalities housing stock according to US Census Bureau data). Additionally, the difference in behavior has been interpreted to be a perception of agency in waste management decisions. That those that own their homes and/or live in detached single-family homes may have more agency in how their household solid waste is managed and therefore may be more interested in participating in an online survey about waste management in their municipality. Unfortunately, there is no way to prevent selection bias for a voluntary online survey advertised by a municipality through its media outlets, there is only mitigating its effects by (but not limited to) purposely advertising as widely as possible, reaching as many different groups of eligible respondents as possible, keeping the survey open long enough so that as many eligible respondents have time to participate, and/or implementing a similar survey in a randomized fashion (such as by phone) to augment results and increase the understanding of the intended sample.

In the case of Wasatch's online survey, selection bias is observed and is especially noticeable when reviewing the answers to Question 32 ("Which of the following best describes where you live?"), Question 33 ("Do you currently own your home/buying a home, do you lease or rent where you live, or something else?"), and Question 38 ("Where did you learn about this survey?"). The reasons for the bias are believed to be for similar reasons observed in other municipal waste management surveys done by GBB (as described in the paragraph above). *However, these observations are not intended to discredit the feedback received from online survey entirely*, especially if the feedback received will be used anecdotally or to increase Wasatch's general understanding of how its customers are using its facilities. In fact, those that did respond to the online survey DO have an interest in solid waste management in Wasatch's service area and are likely to use their services, therefore their feedback is important. It's just important to understand that feedback through the online survey may not be enough to make more

pointed, impactful decisions that will affect all Morgan and Davis County residents. **For major decisions, such as key financial decisions that will affect all residents, the results of the randomized phone survey should be used.**

Below, we detail the responses from the online survey. When reviewing the information, please acknowledge the potential impact of selection bias and use the information alongside the results from the phone survey to increase understanding about its customer base. Results from the online survey should be treated like the result of an outreach effort to customers, whereas the phone survey should be referred to its statistical validity and used for Wasatch’s forecasting efforts.

### Overview of Online Survey Findings

For the purposes of this report, only completed surveys are analyzed but it is worth noting that the survey garnered a total of 2,127 views and 1,739 responses. Of those responses, 1,439 were completed (meaning they started and fully completed the survey through to the end or their response was terminated due to ineligibility). Ineligibility included not being age 18 or older, currently living outside of Morgan or Davis Counties, or identifying as individuals that are not involved in making waste management decisions in their household. In all, the survey enjoyed an 82.75% completion rate with only 300 respondents dropping out (over one-half of all eligible respondents that dropped out stopped responding by the 4<sup>th</sup> question and two-thirds of dropouts stopped responding when demographic questions were presented about three-quarters of the way through the survey)<sup>36</sup>.

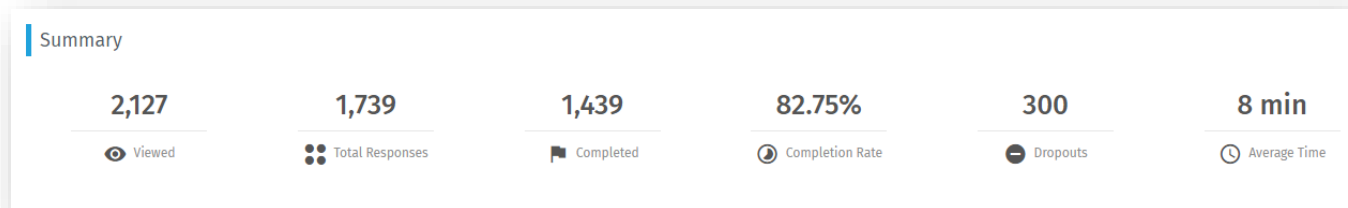


Figure 14 - Summary of Respondents for the Wasatch 2022 Solid Waste Survey

Of the total respondents, over half (nearly 53%) were between 35 and 54 years in age. Nearly all the survey respondents, 94.7%, noted that they are currently permanent, full-time residents of Davis County, and 4.4% of respondents were residents of Morgan County. Please note that 0.9% identified as neither Davis County nor Morgan County residents, but their responses were terminated due to ineligibility, so no more questions were asked of them. Of those that complete the survey, the highest percentage of survey participants, 24%, came from the City of Layton within Davis County.

Overall, the online survey results generally aligned with the results of the phone survey. The majority of the residents are happy with Wasatch’s facilities and services. Online respondents offered a 78% Total Positive rating (25% Excellent – 53% Pretty good) for the job done by Wasatch. When asked to think about the quality of services provided by Wasatch in return for the fees that residents pay, the majority of the respondents, 69%, felt that the fees they pay for the services provided by their city are “About right”, while just over a quarter were displeased with the services offered in relation to their cost, (26% Somewhat too high – 4% Much too high). Only 1% felt the fees were “too low”. Coupled with the fact that a solid majority of residents do NOT feel, at least in a general sense, that local fees paid for “municipal” types of services are too high the potential for expanding SSR collection and/or curbside Green Waste recycling collection at a modest increased cost shows potential.

Just over two-thirds of residents (69%) reported that they separate their recyclable materials from the trash, with 88% of all respondents using SSR as their primary method of doing so, and nearly 89% noting that they utilize SSR

<sup>36</sup> Of those that dropped out, there is a chance that they restarted the survey later, however, this was not tracked to ensure anonymity.

collection at their residence “all of the time.” When presented with the possibility of increased availability for residential SSR pickup at a cost of an additional \$5 per month, 62.6% of respondents said that they would use the service.

In a slight departure from the results from the Phone Survey, online survey respondents were roughly split between those that do and do not separate their yard waste (“green waste”) from the trash for composting. Nearly half (45%) of the online respondents indicated that they separate their green waste via a variety of methods, including curbside collection (18%), backyard composting (9.4%), hauling to the landfill for composting themselves (8.9%), they have it collected by a yard service or landscaping company (3.2%), or a combination of these options (5.5%). Whereas 47% of the online respondents said they do not separate green waste from the trash. Those that selected the “Other, please describe” option also seem to be split between those that do and do not separate green waste, or they fluctuate between the choices. The primary reasons for not separating out green waste from trash included that the service was “unavailable to me – not offered in my area,” or that it is easier to simply toss it in with the trash. Similar to their support of expanding SSR collection, when asked if curbside green waste recycling collection was made available at your residence for an additional \$5.00 per month, 57% of online respondents said that “yes,” they would use that service.

### Additional Analysis of the Online Survey Results

Use of the Davis Landfill itself is widespread among residents, with 77% reporting having used its services and/or facilities. The top five most-cited reasons for visiting the landfill included:

- **30% Dropping off residential waste,**
- 18% Yard waste disposal,
- 18% Disposing of large items,
- 11% Dropping of hazardous waste (batteries, paint, etc.),
- 7% Purchasing compost, wood chips or mulch.

Among the respondents that had not used Davis Landfill’s offerings and services, the top three most-cited reasons for not using the services or facilities offered at the Davis Landfill included:

- **30% need more detailed information,**
- 17% mentioned location – it’s too far away, and
- 15% said they have no need or reason to use it.

### Recycling

A majority (60%) of respondents said that, in their household, they separate recyclable materials from the trash, while 31% said they do not. Of the majority of people who do recycle at home, 87% use a recycling bin for SSR collection. The top reasons why surveyed households do NOT separate recyclable materials from trash included:

- **“service is unavailable/not offered in their area/have no bin” (34%);**
- “cost of the service” (25%);
- “inefficient/just ends up in landfills anyway (13%)”.

Among the respondents who do not recycle, 62% said they would use recycling service at their residence if it were available in their area for an additional \$5 per month, and none, (0%), reported that they did not recycle due to a lack of interest or desire.

### Green Waste

When respondents were asked what they do with Green Waste at home:



- **The majority, 47%, said that they do not separate yard waste from the trash for curbside collection.**
- 18% said they separate it from trash for curbside Green Waste collection; and
- 9% said they do backyard composting.

Among those respondents who do use curbside Green Waste collection:

- **66% said they use it every week,**
- 24% said every other week, and
- 8% said once monthly.

Among those respondents who DO NOT separate yard waste for collection or composting, the top three reasons why they DO NOT include:

- **43% mentioned it is “unavailable/not offered in my area/have no bin”;**
- 20% “just toss it in with the trash; and
- 10% do not because of the “cost of it.

Among those respondents who DO NOT use Green Waste recycling collection service, if it was available at their residence for an additional \$5.00 per month:

- **57% said they would use the service,**
- 43% said they would not use it.

## Davis Landfill

Respondents were informed that Wasatch owns and operates the Davis Landfill, located in Layton, Utah, serving Davis and Morgan Counties, and that residential services include residential waste disposal, green waste drop off, sale of compost and wood chips from recycled green waste, and a landfill thrift store. When asked:

- **77% of respondents said they have used the services or facilities offered at the Davis Landfill,** and
- 21% reporting not having used it.

The top reasons for the most recent visit to the Davis Landfill among respondents reporting use included:

- **“drop off residential waste” (30%);**
- “yard waste/green waste disposal” (18%);
- “dispose of large items” (18%)
- “drop off household hazardous waste disposal, like batteries/paint” (11%).

When asked how often landfill users visit the Davis Landfill, the grouped responses were:

- **twice per year or less (32%);**
- three to five times per year (23%);
- six to ten times per year (7%); and
- more than ten times per year (4%).
- The mean response for annual use was 1.723 times.



Among the 77% of survey respondents who used the services and facilities at the Davis Landfill:

- **Nearly all, 95%, offered a positive job rating:**
  - “excellent” (40%), “pretty good” (55%) for the quality of services provided.

Among the 23% of respondents who had never used the services or facilities of the Davis Landfill, the top reasons cited for NOT using it included:

- **30% selected they “need more detailed information/unaware of it”**
- 17% selected “location/too far away” (17%);
- 15% have “no need or reason to use it”.

Among those same respondents, if similar residential customer services and facilities to those currently offered at the Davis Landfill were made available closer to your home, say, within 10 miles:

- **77% said they would be more likely to use those services and facilities, including**
  - 48% “very likely”
  - 29% “somewhat likely”

If similar residential customer services and facilities to those currently offered at the Davis Landfill were made available closer – within 10 miles – of the respondents’ homes among that same subgroup, the following services were cited as the ones that would be used the most:

- **“Drop off household hazardous waste disposal, like batteries and paint” (19%);**
- **“Yard waste or green waste disposal” (17%);**
- “Purchase compost, wood chips or mulch” (15%);
- “Drop off recyclables into the bin” (12%);
- “Drop off residential waste” (11%);
- “Make thrift store purchase/donation” (7%); and
- “Dispose of household medical waste” (6%).

The top three sources of information that influences respondent opinion the most about “local issues” included:

- **“Social media/Facebook, Twitter, Instagram, Reddit” (21%);**
- “Word of mouth/family member or friend” (14%);
- “Google/Internet searches (13%); and “city/town website” (13%).

## Review of Open Comments

The following trends were observed within the substantive comments (588)<sup>37</sup> received in response to the question, “Are there any other comments you would like to make about the current or future waste management system in your area? Please provide your comments in the box below (Limited to 1,500 characters)”.

- **Desire for Expanded Services**
  - 30% of comments requested implementing recycling services in their area or provided comments on their SSR services
  - 23% included requests for or commentary on green waste collection
  - 21% of comments included requests for added recycling options for specific materials. Glass was the most requested material, other materials included plastic film/grocery bags and cardboard.

<sup>37</sup> For the purpose of this analysis, non-substantive comments such as “None”, “No”, “N/A” and “Not at this time” were not considered. There were a total of 237 non-substantive comments.

- 13% requested more frequent or weekly pickups of recycling
  - coupled with this, 3% of commented expressed concern over the size of their bins, that they are not large enough for bi-weekly recycling collection.
- 4% of the comments included mention of experience with or desire for HHW disposal (specifically batteries, paint, chemicals, and household appliances), and shredding.
- 3% of the comments included opinions on bulk waste collection, and 1% mentioned a desire for annual or bi-annual community cleanups for yard waste and/or bulk waste
- 2% of respondents that commented expressed a desire for food waste collection and composting
  
- **Need for More Information and Public Education**
  - 10% of comments included requests for more information and education on waste management practices
  - Related to the need for more education, 6% of the comments expressed concerns over whether or not recycling is actually happening, or general distrust in the process. Of those that expressed these concerns, there is a general sentiment that they wanted Wasatch or their city to “prove” that recycling is happening. Several respondents claimed they saw recycling collectors mix recycling with the trash or they are concerned that processing trash and recycling together meant that no recycling is happening. More education on this area is recommended.
  - Also related to education, 1% of the commented expressed the respondent’s satisfaction with the survey or how the survey helped them learn about various services offered at the landfill that they had previously been unaware of.
  
- **General Access issues:**
  - 7% of the comments included a desire to have closer disposal facilities or commented on the distance of disposal facilities. Within these comments, several mentioned that the respondent was aging or living alone and that traveling far distances to recycle at the landfill prevented them from doing so. These comments also tended to mention access issues at the disposal facilities themselves, either the drop-off areas required lifting or a large vehicle to take items into the facilities, or that certain areas of the disposal facilities were off limits to them that would make disposal easier.
  - 2% of the comments mentioned that access to the Bountiful Landfills was restricted only to Bountiful resident.
  - 2% of the comments included opinions on how area schools could be involved with waste management
  - 1% of the comments mentioned a desire for expanded public recycling or accessible containers in individual cities for disposing of materials locally.
  
- **General sentiments<sup>38</sup>**
  - 12% of comments mentioned general happiness with Wasatch’s waste management system
  - 2% of comments included mention of satisfaction with the fees they pay and a willingness to pay more for improved or expanded services.
  - 7% of comments were particularly displeased. These comments usually were coupled with expressions of distrust in whether recycling was actually happening, displeasure that the burn plant was closed, or frustration over costs.

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● <sup>38</sup> Note: interpretations of general sentiment were highly subjective and based on the text within the open commentary only.

- 4% of the comments were particularly passionate, typically including several exclamation points. Comments also typically included expressions of concern or displeasure, but several passionate responses were also very positive about recycling.
- **General programmatic or bin size concerns** (4%), there were several comments on the litter issues along the roads leading to and from the landfill and the odor issues at the landfill.
- **General satisfaction with the Thrift Store and Reuse Shed** at the landfill was expressed in 2% of the comments
- About 1% of comments included a **desire for recycling to be mandatory**

## Demographics of Respondents

Overall, the demographics of online survey respondents that completed the survey were:

- Voter status: **Registered to vote in Davis or Morgan counties (96.88%)**, Not registered in either (3.12%)
- Children under 18 living in their home: **No (50.45%)**, Yes (47.60%), Undecided or refuse to answer (1.95%)
- Number of people living in the household: One (4.94%), **Two (30.73%)**, Three (17.19%), Four (18.98%), Five to six (23.85%), Seven to nine (4.08%), 10 or more (0.21%)
- Housing type: **A single-family home (96.23%)**, Multi-family dwelling (1.68%), A single family home with multiple units (1.33%), a mobile home or RV (0.21%).
- Home ownership: **Own or buying (95.85%)**, Rent or lease (3.31%), Live with a relative (0.7%), Other (0.14%)
- Yearly household income: Under \$25,000 (0.5%), \$25,000 to \$50,000 (5.61%), \$50,000 to \$75,000 (13.07%), \$75,000 to \$100,000 (23.37%), **\$100,000 to \$150,000 (32.75%)**, \$150,000 to \$200,000 (14.82%), \$200,000 to \$250,000 (4.94%), Over \$250,000(4.94%)
- Highest grade or level of schooling completed: 1st to 11th grade (0.44%), High school graduate (4.89%), Non-college post high school (like technical training) (4.24%), Some college (20.75%), **College graduate (43.9%)**, Post-graduate school (25.79%)
- Racial or ethnic group: **White (94.36%)**, Hispanic or Latino (Puerto Rican, Mexican American, etc.) (2.51%), Asian or Pacific Islander (1.02%), African American or Black (0.16%), Mixed race (1.18%), Native American or Alaskan Native (0.16%), Other, please describe. (0.63%)
- Gender: **Female (65.37%)**, Male (34.33%), Non-binary (0.22%), Other (0.07%)

*See Appendix C – Online Survey Questions and Answers for more details.*

## Consideration of online survey results by Area

The survey results were split out by the following areas and the results reviewed for any major differences. Individual reports are provided separately. There were only 3 responses from the area considered “Unincorporated Areas of Davis County”, so this grouping was not analyzed. The following trends were observed:

### Bountiful – Zip Code: 84010

- 23 completed responses
- The average age of respondents was older. The majority of respondents were 45 or older:
  - 0% were 18 to 24 years old
  - 13% were 25 to 34 years old
  - 17 % were 35 to 44 years old
  - 22% were 45 to 54 years old
  - 8% were 55 to 64 years old
  - **30% were 65 to 74 years old**
  - 9% were 75 to 84 years old
  - 0% were 85 or older
- All provided a positive opinion of the basic solid waste services provided by their City. Opinions were exactly split 50-50 between “Pretty good” and “Excellent”.
- 82% thought the amount they pay for the solid waste services they receive is “about right”
- 100% separate recycling from the trash and 87% (all but 2) use their SSR container for disposing recyclables.
- 56% do not separate green waste from the trash. Of those, the majority said it was because the service was not available to them and most (76%) indicated that they would be willing to pay \$5.00 per month for green waste services.
- Of those that have visited the Davis Landfill (65%), they typically go up to 2 times per year and their primary purposes are to buy compost, wood chips or mulch and dispose of residential waste. Of those that have never visited the Davis Landfill, the primary reason is because they use the City of Bountiful’s Landfill instead.
- If services like those offered at the Davis Landfill were made available closer to Bountiful, the respondents overwhelmingly indicated that they would use them (45% said “very likely” and 36% said “somewhat likely”). If the facilities were closer, they would primarily use it for Dropping off HHW (20%), Green waste disposal (18%), and purchasing compost, wood chips, or mulch. All “other, please describe” responses mentioned that they would use it to recycle glass.
- The most common ways that this population accessed information about local issues were “Davis Journal”, the “Salt Lake Tribune”, and “Google / Internet Searches”. Likewise, the majority of respondents heard about this survey through local news outlets (newspapers, blogs, and online news sites).
- Of the open comments, there were many mentions of a desire for glass recycling, green waste collection, and a desire for closer disposal facilities.
- The overwhelming majority (96%) are registered to vote in Davis or Morgan Counties, 60% had no children living at home; the typical household size is 2; 91% live in a single-family home that they own; the yearly household income was commonly \$75,000 to \$100,000; the overwhelming majority are college graduates (50% of respondents said they graduated college and 32% said they have a post-graduate degree); 100% were white; and 74% were female and 26% were male.



## Centerville – Zip Code: 84014

- 76 completed responses
- The average age of respondents was younger. The majority of respondents were between 25 and 54:
  - 0% were 18 to 24 years old
  - 4% were 25 to 34 years old
  - **30% were 35 to 44 years old**
  - 26% were 45 to 54 years old
  - 18% were 55 to 64 years old
  - 16% were 65 to 74 years old
  - 5% were 75 to 84 years old
  - 0% were 85 or older
- Most provided a very positive opinion of the basic solid waste services provided by their City. 47% indicated their City is doing a “Pretty good” job, 41% said “Excellent”; and 12% indicated they are doing “Only fair”
- 70% thought the amount they pay for the solid waste services they receive is “about right”, while 24 % thought the fees were “somewhat too high”.
- 92% separate recycling from the trash and 97% of those (all but 2) use their SSR container for disposing recyclables. For those that do not separate their recyclables, the primary reasons for not including “little to none to recycle” (50%), and the other 50% are evenly split (16.7% each) between “Collector handles separation of recycling”, “Inefficient – just ends up in landfill anyways”, “Inconvenient – too time consuming”. Those that do not separate recycling, 67% indicated that they would not pay \$5.00 per month to add this service.
- The majority (62%) do separate green waste from the trash. Of those, the majority said they use a curbside green waste cart or collecting it for pickup every week. Of the minority that do not separate green waste processing, the reasons for doing so are mostly split between “the cost of it”, they “just toss it in the trash”, or the service is “unavailable to them” or there is “no drop-off location”. The majority (59%) of those that do not separate their green waste for processing indicated that they would be interested in paying \$5.00 per month for green waste collection services.
- Of those that have visited the Davis Landfill (76%), they typically go up to 2 times per year and their primary purposes are to dispose of residential waste and “large items”. Of those that have never visited the Davis Landfill, the primary reason is because it is too far away.
- If services like those offered at the Davis Landfill were made available closer to Centerville, the respondents indicated that they would use them (63% said “very likely” and 16% said “somewhat likely”). If the facilities were closer, they would primarily use it for Dropping off HHW (22%), purchasing compost, wood chips, or mulch (16%), and drop off residential waste (14%).
- The most common ways that this population accessed information about local issues were “Social media”, the City website, and “word of mouth”. Likewise, the majority of respondents heard about this survey through Facebook (63%) and Instagram (16%).
- Of the open comments, there were many mentions of a desire for weekly collection, more education, closer facilities, expanded recycling options (including glass and plastic bags), and green waste collection.
- The overwhelming majority (97%) are registered to vote in Davis or Morgan Counties, 55% have no children living at home; the typical household size skewed larger with 37% of respondents indicating 5-6 people live in the household; 96% live in a single-family home that they very likely own; the yearly household income was commonly \$100,000 to \$150,000; the overwhelming majority are college graduates (50% of respondents said they graduated college and 33% said they have a post-graduate degree); 98% were white and 2% Hispanic; and 63% were female, 35% male, and 1% indicated they were non-binary.



## Clearfield / Clinton / West Point / Sunset – Zip Code: 84015

- 394 completed responses
- The majority of respondents were between 25 and 54:
  - 2% were 18 to 24 years old
  - 19% were 25 to 34 years old
  - **30% were 35 to 44 years old**
  - 25% were 45 to 54 years old
  - 11% were 55 to 64 years old
  - 9% were 65 to 74 years old
  - 4% were 75 to 84 years old
  - <1% were 85 or older
- Most provided a generally positive opinion of the basic solid waste services provided by their City. 50% indicated their City is doing a “Pretty good” job, 22% said “Excellent”, and 22% indicated they are doing “Only fair”.
- 64% thought the amount they pay for the solid waste services they receive is “about right”, while 30 % thought the fees were “somewhat too high”.
- 62% separate recycling from the trash and 82% of those (all but 2) use their SSR container for disposing recyclables. For those that do not separate their recyclables, the primary reasons for not including “Unavailable to me – Not offered in my area – have no bin” (47%) and ‘Cost of it” (23%), and “Inefficient – just ends up in landfill anyways” (11%). All of the “Other, please describe” submissions mention that their City does not offer recycling. Those that do not separate recycling, 67% indicated that they would pay \$5.00 per month to add this service.
- The majority (56%) do NOT separate green waste from the trash. The primary reasons for not separating their green waste include the service is “unavailable to them” (50%) and they “just toss it in the trash” (16%). The majority (57%) indicated that they would be interested in paying \$5.00 per month for green waste collection services.
- Of those that have visited the Davis Landfill (77%), they typically go up to 5 times per year and their primary purposes are to dispose of residential waste and “large items”. Of those that have never visited the Davis Landfill, the primary reason is because they need more information about it or were unaware of it.
- If services like those offered at the Davis Landfill were made available closer to this area, the respondents indicated that they would use them (43% said “very likely” and 36% said “somewhat likely”). If the facilities were closer, they would primarily use it for Dropping off HHW (19%), yard waste disposal (18%), purchasing compost, wood chips, or mulch (15%), and drop off recyclables (13%).
- The most common ways that this population accessed information about local issues were “Social media”, the “City website”, and “word of mouth”. Likewise, the majority of respondents heard about this survey through Facebook (55%) and their local municipality informed them (28%).
- Of the open comments, there were many mentions of a desire for recycling services, more education, that recycling be mandatory, weekly collection, expanded recycling options (including glass and plastic bags), green waste collection, bulk pickup, and general satisfaction with the solid waste system.
- The overwhelming majority (95%) are registered to vote in Davis or Morgan County, 53% have children living at home; the typical household size was fairly evenly split with the average being between 3 and 4 but a multiplicity of respondents (27%) indicated a household size of 2; 96% live in a single-family home that they own; the typical yearly household income was \$100,000 to \$150,000; the majority are college graduates (45% of respondents said they have graduated college and 19% said they have a post-graduate degree); 93% were white, 3% Hispanic, 2% Asian, and 2% Mixed Race; and 64% of respondents were female, 35% male, and <1% indicated they were non-binary.

## Farmington – Zip Code:84025

- 67 completed responses
- The age groups are fairly evenly split between 35 and 74:
  - 0% were 18 to 24 years old
  - 1% were 25 to 34 years old
  - 24% were 35 to 44 years old
  - **27% were 45 to 54 years old**
  - 18% were 55 and 64 years old
  - 22% were 65 to 74 years old
  - 7% were between 75 and 84
  - 0% were 85 or older
- Most provided a generally positive opinion of the basic solid waste services provided by their City. 54% indicated their City is doing a “Pretty good” job, 33% said “Excellent”, and 13% indicated they are doing “Only fair”.
- 83% thought the amount they pay for the solid waste services they receive is “about right”, while 17% thought the fees were “somewhat too high”.
- 99% separate recycling from the trash and all of those use their SSR container for disposing recyclables. For those that do not separate their recyclables (only 1 respondent), the reason they do not is the “Cost of it” (23%). The lone non-recycler respondent indicated that they would not pay \$5.00 per month to add this service.
- A slight majority (52%) do NOT separate green waste from the trash. For those that do not separate green waste, the primary reasons were the service is “unavailable to them” (74%) and they “just toss it in the trash” (21%). The majority (74%) indicated that they would be interested in paying \$5.00 per month for green waste collection services.
- Of those that have visited the Davis Landfill (73%), they typically go up to 2 times per year and their primary purposes are to dispose of residential waste and “large items”. Of those that have never visited the Davis Landfill, the primary reason is because they need more information about it or were unaware of it or curbside services are sufficient.
- If services like those offered at the Davis Landfill were made available closer to this area, the respondents indicated that they would use them (52% said “very likely” and 26% said “somewhat likely”). If the facilities were closer, they would primarily use it for Dropping off HHW (21%), yard waste disposal (21%), purchasing compost, wood chips, or mulch (15%), and drop off recyclables (13%).
- The most common ways that this population accessed information about local issues were “Social media”, “word of mouth”, and the “City website”. Likewise, the majority of respondents heard about this survey through Facebook (66%) and Instagram (18%).
- Of the open comments, there were many mentions of a desire for green waste collection, weekly collection, expanded recycling services (including glass and plastic bags), more education, and closer disposal facilities.
- 100% of the respondents are registered to vote in Davis or Morgan County, 55% do not have children living at home; a multiplicity of respondents (33%) indicated their household size was 2 but the average household size was likely between 3 and 4; 96% live in a single-family home that they very likely own; the typical yearly household income was \$100,000 to \$150,000; the majority are college graduates (34% of respondents said they have graduated college and 47% said they have a post-graduate degree; 98% were white and 2% Hispanic; and 71% of respondents were female and 29% were male.

## Kaysville / Fruit Heights – Zip Code: 84037

- 120 respondents
- The average age tended to be older. The majority of respondents were between 45 and 74:
  - <1% were 18 to 24 years old
  - 10% were 25 to 34 years old
  - 20% were 35 to 44 years old
  - 26% were 45 to 54 years old
  - **29% were 55 to 64 years old**
  - 13% were 65 to 74 years old
  - <1% were 75 to 84 years old
  - 0% were 85 or older
- Most provided a very positive opinion of the basic solid waste services provided by their City. 57% indicated their City is doing a “Pretty good” job, 36% said “Excellent”, and only 7% indicated they are doing “Only fair”.
- 76% thought the amount they pay for the solid waste services they receive is “about right”, while 21% thought the fees were “somewhat too high”.
- 85% separate recycling from the trash and 93% of those (all but 7) use their SSR container for disposing recyclables. For those that do not separate their recyclables, the primary reasons for not including “Unavailable to me – Not offered in my area – have no bin” (28%), “Inefficient – just ends up in landfill anyways” (28%), and “Cost of it” (22%). Those that do not separate recycling, 59% indicated that they would pay \$5.00 per month to add this service.
- The majority of respondents (78%) do separate green waste from the trash every week. Of those that do not separate green waste, the primary reasons for not “the cost of it” (42%) and the “just toss it in the trash” (23%). The majority of non-green waste participants (64%) indicated that they would NOT be interested in paying \$5.00 per month for green waste collection services.
- Of those that have visited the Davis Landfill (89%), they typically go up to 5 times per year and their primary purposes are to dispose of residential waste and “large items”. Of those that have never visited the Davis Landfill, the primary reason is because curbside services are sufficient, or they need more information about it or were unaware of it.
- If services like those offered at the Davis Landfill were made available closer to this area, the respondents indicated that they would use them (53% said “very likely” and 31% said “somewhat likely”). If the facilities were closer, they would primarily use it for Dropping off HHW (19%), purchasing compost, wood chips, or mulch (17%), and drop off recyclables (13%).
- The most common ways that this population accessed information about local issues were “Social media”, “Google/Internet searches”, and “word of mouth”. Likewise, the majority of respondents heard about this survey through Facebook (69%) and Instagram (17%).
- Of the open comments, there were mentions of a desire for recycling services, more frequent or weekly collection, expanded recycling options (particularly glass recycling), closer disposal facilities (particularly for battery and medical waste disposal), green waste collection, bulk pickup, more education; concern over programmatic transparency, and to know if recycling is actually happening.
- The overwhelming majority (96.5%) are registered to vote in Davis or Morgan Counties, 58% do not have children living at home; the typical household size is 2; 95% live in a single-family home that they very likely own; the typical yearly household income was \$100,000 to \$150,000; the majority are college graduates (47% of respondents said they have graduated college and 26% said they have a post-graduate degree); 96% were white, 4% Hispanic, and 67% of respondents were female, 32% male, and 1% indicated they were non-binary.

## Layton – Zip Codes: 84040 and 84041

- 345 respondents
- The majority of respondents were between 34 and 64 years old, and tended to skew younger:
  - <1% were 18 to 24 years old
  - 9% were 25 to 34 years old
  - **29% were 35 to 44 years old**
  - 26% were 45 to 54 years old
  - 19% were 55 to 64 years old
  - 12% were 65 to 74 years old
  - 4% were 75 to 84 years old
  - <1% were 85 or older
- Most provided a positive opinion of the basic solid waste services provided by their City. 56% indicated their City is doing a “Pretty good” job, 19% said “Excellent”, and 20% said “Only fair”.
- 70% thought the amount they pay for the solid waste services they receive is “about right”, 25% thought the fees were “somewhat too high”, and 4% said “Much too high”.
- 63% separate recycling and 87% of those use their SSR container for disposing recyclables. Those that do recycle indicate that they use their recycling bin to recycle all (87%) or most (13%) of the time.
- For those that do not separate their recyclables (37%), the primary reasons for not including the “Cost of it” (31%), it’s “Unavailable to me – Not offered in my area – have no bin” (16%), or it’s “Inefficient – just ends up in landfill anyways” (16%). Those that do not separate recycling, 56% indicated that they would pay \$5.00 per month to add this service.
- The majority (55%) do not separate green waste from the trash and the primary reasons for not including it’s “Unavailable to me – Not offered in my area – Have no bin” (48%) and “the cost of it” (25%) and “Need more detailed information – Unaware of it” (11%). The majority of non-green waste participants (65%) indicated that they would be interested in paying \$5.00 per month for green waste collection services.
- Of those that have visited the Davis Landfill (86%), they typically go up to 5 times per year and their primary purposes are to dispose of residential waste and “large items”. Of those that have never visited the Davis Landfill, the primary reason is because they “need more information about it or were unaware of it”, “have no reason to use it”, or “have no vehicle to haul waste – I do not drive”.
- If services like those offered at the Davis Landfill were made available closer to this area, the respondents indicated that they would likely use them (47% said “very likely”, 18% said “somewhat likely”, 19% said “only a little likely”, and 16% said “not likely at all”). If the facilities were closer, they would primarily use it for Yard waste disposal (19%), Dropping off HHW (18%), purchasing compost, wood chips, or mulch (13%), and dropping off recyclables (12%). Several “other, please describe” comments indicated the lack of an appropriate vehicle for taking waste to the landfill.
- The most common ways that this population accessed information about local issues were “Social media”, “Google/Internet searches”, and “word of mouth”. Likewise, the majority of respondents heard about this survey through Facebook (76%), Instagram (9%), and Wasatch’s website (6%).
- Of the open comments, there were many mentions of a Desire for recycling services, more frequent or weekly collection, expanded recycling options (particularly glass recycling), green waste collection, more education, closer disposal facilities; concerns over the size of the waste and recycling containers, cost control, bulk pickup, programmatic transparency, and to know if recycling is actually happening. Several respondents expressed satisfaction with the solid waste services in general.
- The overwhelming majority (98.2%) are registered to vote in Davis or Morgan Counties, 53% do not have children living at home; the typical household size was 2 (30% of respondents) but the household size tended to skew larger with 46% indicating their household size is 4 or more; 96% live in a single-family home that they likely own; the typical yearly household income was \$100,000 to \$150,000; the majority are college graduates (40% of respondents said they have graduated college and 32% said they have a post-graduate degree); 93% were white, 4% Hispanic, 1% each were Mixed race, Asian, Black, Native American; and 66% of respondents were female, 34% male, and up to 1% identified as non-binary.



## Morgan County (includes Morgan City & Unincorporated areas of Morgan County) – Zip Code: 84050

- 60 respondents
- The majority of respondents were between 34 and 64 years old:
  - 0% were 18 to 24 years old
  - 3% were 25 to 34 years old
  - 23% were 35 to 44 years old
  - **32% were 45 to 54 years old**
  - 28% were 55 to 64 years old
  - 12% were 65 to 74 years old
  - 2% were 75 to 84 years old
  - 0% were 85 or older
- This population indicated they live in two general areas: Morgan City and the Unincorporated areas of Morgan County, with 52% of respondents indicating they live within the latter.
- Most provided a positive opinion of the basic solid waste services provided by their City. 49% indicated their City is doing a “Pretty good” job, 25% said “Excellent”, and 20% said “Only fair”. 5% of the respondents thought their City was doing a “Poor” job.
- 68% thought the amount they pay for the solid waste services they receive is “about right”, 31% thought the fees were “somewhat too high”, and 2% said “Much too high”.
- 48% separate recycling and 86% of those use their SSR container for disposing recyclables. Those that do recycle indicate that they use their recycling bin to recycle all (76%) or most (24%) of the time.
- For those that do not separate their recyclables (52%), the primary reasons for not including it’s “Unavailable to me – Not offered in my area – have no bin” (45%), the “Cost of it” (23%), or it’s “Inefficient – just ends up in landfill anyways” (10%). Those that do not separate recycling, 59% indicated that they would pay \$5.00 per month to add this service.
- The majority (57%) do separate their green waste from the trash and handle it through a variety of methods (self-haul to the landfill for composting, backyard composting, a landscaping company handles it for them, or a variety of these options). None selected “Curbside Green Waste collection” as an option. 31% do not separate green waste from the trash and the primary reasons for not including it’s “Unavailable to me – Not offered in my area – Have no bin” (44%) and “reside in a rural area “17%”, and “Just toss it in with the trash” (11%). The majority of non-green waste participants (62%) indicated that they would NOT be interested in paying \$5.00 per month for green waste collection services.
- Of those that have visited the Davis Landfill (80%), they typically go up to 2 times per year and their primary purposes are to dispose of “large items” and HHW. Of those that have never visited the Davis Landfill, the primary reason is because it is too far away (67%).
- If services like those offered at the Davis Landfill were made available closer to this area, the respondents indicated that they would very likely use them (67% said “very likely”, 22% said “somewhat likely”, and 9% said “only a little likely”). If the facilities were closer, they would primarily use it for dropping off HHW (19%), yard waste disposal (16%), purchasing compost, wood chips, or mulch (13%), and dropping off recyclables (13%).
- The most common ways that this population accessed information about local issues were “Word of Mouth”, “Social media”, and “Google/Internet searches”. The majority of respondents heard about this survey through Facebook (78%), Instagram (8%), and Wasatch’s website (5%).
- Of the open comments, there were mentions of Access issues at the Morgan disposal site; desires for more and standardized education, recycling services, more frequent or weekly collection, expanded recycling options (particularly glass recycling), green waste collection during the warmer months, closer disposal facilities, and concerns over the way charges for services are handled.
- The overwhelming majority (98.3%) are registered to vote in Morgan or Davis Counties, 56% do not have children living at home; the typical household size was 2 (46% of respondents); 98% live in a single-family home that they likely own; the typical yearly household income was \$75,000 to \$100,000; the majority are college graduates (42% of respondents said they have graduated college and 27% said they have a post-graduate degree); 96% were white and 4% were Mixed race; and 57% of respondents were female and 43% were male..



## North Salt Lake – Zip Code: 84054

- 66 respondents
- The majority of respondents were between 34 and 64 years old, and tended to skew younger:
  - 0% were 18 to 24 years old
  - 11% were 25 to 34 years old
  - **33% were 35 to 44 years old**
  - 17% were 45 to 54 years old
  - 17% were 55 to 64 years old
  - 10% were 65 to 74 years old
  - 4% were 75 to 84 years old
  - 1% were 85 or older
- Most provided a positive opinion of the basic solid waste services provided by their City. 57% indicated their City is doing a “Pretty good” job, 20% said “Excellent”, and 22% said “Only fair”.
- 64% thought the amount they pay for the solid waste services they receive is “about right”, 28% thought the fees were “somewhat too high”, and 5% said “Much too high”.
- 97% separate recycling from the trash and 97% of those use their SSR container for disposing recyclables. Those that do recycle indicate that they use their recycling bin to recycle all (95%) or most (5%) of the time.
- The majority (55%) do not separate green waste from the trash and the primary reasons for not including it’s “Unavailable to me – Not offered in my area – Have no bin” (64%) and “Just toss it in with the trash” (14%). The majority of non-green waste participants (75%) indicated that they would be interested in paying \$5.00 per month for green waste collection services.
- Of those that have visited the Davis Landfill (53%), they typically go up to 2 times per year and their primary purposes are to dispose of yard waste and dispose of “large items”. Of those that have never visited the Davis Landfill, the primary reason is because of location – it’s too far away, they “need more information about it or were unaware of it”, or they use the Bountiful landfill instead.
- If services like those offered at the Davis Landfill were made available closer to this area, the respondents indicated that they would likely use them (52% said “very likely”, 32% said “somewhat likely”, 8% said “only a little likely”, and 8% said “not likely at all”). If the facilities were closer, they would primarily use it for dropping off HHW (22%), Yard waste disposal (19%), and purchasing compost, wood chips, or mulch (14%). The two “other, please describe” comments indicated dropping off glass for recycling.
- The most common ways that this population accessed information about local issues were “Social media”, the “City website”, and “Google/Internet searches”. Likewise, the majority of respondents heard about this survey through Facebook (74%) and their local municipality informed them (11%).
- Of the open comments, there were mentions of desires for recycling services, more education, more frequent or weekly collection, expanded recycling options (particularly glass recycling), green waste and food waste collection, closer disposal facilities (and frustration that they cannot use the Bountiful landfill), annual bulk pickup, and several expressed satisfactions with the solid waste services in general.
- 100% of respondents are registered to vote in Davis or Morgan Counties, 55% do not have children living at home; the typical household size was 2; 91% live in a single-family home that they very likely own; the typical yearly household income was \$150,000 to \$200,000; the majority are college graduates (51% of respondents said they have graduated college and 21% said they have a post-graduate degree); 91% were white, 6% Hispanic, and 2% Asian; and 63% of respondents were female and 37% male.

## South Weber – Zip Code: 84405

- 24 respondents
- The majority of respondents were between 55 and 74 years old, and tended to skew older:
  - 0% were under 44 years old
  - 21% were 45 to 54 years old
  - **42% were 55 to 64 years old**
  - 29% were 65 to 74 years old
  - 8% were 75 to 84 years old
  - 0% were 85 or older
- A slight majority provided a generally positive opinion of the basic solid waste services provided by their City. 38% indicated their City is doing a “Pretty good” job, 17% said “Excellent”, 33% said “Only fair”, and 13% said “Poor”.
- The majority thought the amount they pay for the solid waste services they receive is too high (46% somewhat too high” and “8% said “much too high”. 46% said “about right”.
- 50% separate recycling from the trash and 75% of those use their SSR container for disposing recyclables. Those that do recycle indicate that they use their recycling bin to recycle all of the time. For those that do not separate their recyclables (37%), the primary reasons for not including its “Unavailable to me – Not offered in my area – have no bin” (42%) or the “cost of it” (33%). Those that do not separate recycling, 58% indicated that they would pay \$5.00 per month to add this service.
- The majority (about 65%) do separate green waste from the trash. For those that do not (about 35%), the primary reasons include they “just toss it in the trash” (63%) and “Unavailable to me – not offered in my area – have no bin” (37%). The majority of non-green waste participants (58%) indicated that they would be interested in paying \$5.00 per month for green waste collection services.
- Of those that have visited the Davis Landfill (96%), they typically go up to 5 times per year and their primary purposes are to dispose of residential waste and “construction waste/materials”. The one respondent that had never visited the Davis Landfill, the primary reason was that they had no vehicle to haul the waste - I do not drive”. If services like those offered at the Davis Landfill were made available closer to this area, the respondents indicated that they may use them (45% said “very likely”, 25% said “somewhat likely”, 10 said “only a little likely”, and 20% said “not likely at all”). If the facilities were closer, they would primarily use it for purchasing compost, wood chips, or mulch (20%), dropping off recyclables (18%), Yard waste disposal (15%), and dropping off HHW (18%).
- The most common ways that this population accessed information about local issues were “Social media”, “Google/Internet searches”, the “Standard Examiner”, “word of mouth”, and their City’s website. The majority of respondents heard about this survey through Facebook (70%), Instagram (9%), when they visited the landfill and saw a poster or handout (9%), and via email (9%).
- Of the open comments, there were mentions of concern of costs, programmatic transparency, and to know if recycling is actually happening; desires for recycling services, more frequent or weekly collection, expanded recycling options (particularly glass recycling), green waste collection, and several respondents expressed satisfaction with the solid waste services in general.
- The majority (92%) are registered to vote in Davis or Morgan Counties, 92% do not have children living at home; the typical household size was 2; 100% live in a single-family home that they own; the typical yearly household income was \$100,000 to \$150,000; the majority are college graduates (46% of respondents said they have graduated college and 42% said they have a post-graduate degree); 100% were white; and 58% of respondents were female, 42% male.

## Syracuse – Zip Code: 84075

- 150 respondents
- The majority of respondents were between 34 and 64 years old, and tended to skew younger:
  - 0% were 18 to 24 years old
  - 16% were 25 to 34 years old
  - **38% were 35 to 44 years old**
  - 21% were 45 to 54 years old
  - 12% were 55 to 64 years old
  - 11% were 65 to 74 years old
  - 3% were 75 to 84 years old
  - 0% were 85 or older
- Most provided a positive opinion of the basic solid waste services provided by their City. 46% indicated their City is doing a “Pretty good” job, 26% said “Excellent”, 25% said “Only fair”, and 4% said “Poor”.
- 79% thought the amount they pay for the solid waste services they receive is “about right”, 19% thought the fees were “somewhat too high”, and 2% said “Much too high”.
- 60% separate recycling from the trash and 53% of those use their SSR container for disposing recyclables. Those that do recycle indicate that they use their recycling bin to recycle all (97%) or most (3%) of the time. For those that do not separate their recyclables (40%), the primary reasons for not including “Unavailable to me – Not offered in my area – have no bin” (38%) or the “Cost of it” (22%). Those that do not separate recycling, 69% indicated that they would pay \$5.00 per month to add this service.
- The majority (55%) do separate green waste. For those that do not (39%), the primary reasons include they “Just toss it in the trash” (23%), “the cost of it” (22%), and it’s “Unavailable to me – Not offered in my area – Have no bin” (10%). The majority of non-green waste participants (62%) indicated that they would NOT be interested in paying \$5.00 per month for green waste collection services.
- Of those that have visited the Davis Landfill (79%), they typically go up to 5 times per year and their primary purposes are to dispose of residential waste and “large items”. Of those that have never visited the Davis Landfill, the primary reasons are because they “need more information about it or were unaware of it” and “have no reason to use it. If services like those offered at the Davis Landfill were made available closer to this area, the respondents indicated that they would likely use them (43% said “very likely”, 32% said “somewhat likely”, 15% said “only a little likely”, and 11% said “not likely at all”). If the facilities were closer, they would primarily use it for dropping off HHW (19%), dropping off recyclables (16%) and purchasing compost, wood chips, or mulch (14%).
- The most common ways that this population accessed information about local issues were “Social media”, the “City website”, “word of mouth”, and “Google/Internet searches”. Likewise, the majority of respondents heard about this survey through Facebook (80%), Instagram (7%), and when they visited the landfill and saw a poster or handout (5%).
- Of the open comments, there were mentions of desires for recycling services, more frequent or weekly collection, expanded recycling options (particularly for glass and plastic bags), green waste collection, more education, sharing information with the public that recycling is extracted from the waste, public recycling, closer disposal facilities; concerns over the size of the waste and recycling containers, litter on US 193, and cost.
- The overwhelming majority (96.6%) are registered to vote in Davis or Morgan Counties, 62% have children living at home; the typical household size skewed larger with 33% of respondents indicating 5 to 6 living in the household, 97% live in a single-family home that they very likely own; the typical yearly household income was \$100,000 to \$150,000; the majority attended some college or have a college degree (28% attended some college, 47% of respondents said they have graduated college and 18% said they have a post-graduate degree); 96% were white, 2% Asian, 2% Hispanic, and 1% were Mixed Race; and 65% of respondents were female, 35% male.

## Woods Cross / West Bountiful – Zip Code: 84087

- 109 respondents
- The majority of respondents were between 34 and 64 years old, and tended to skew younger:
  - 0% were 18 to 24 years old
  - 7% were 25 to 34 years old
  - **33% were 35 to 44 years old**
  - 27% were 45 to 54 years old
  - 22% were 55 to 64 years old
  - 8% were 65 to 74 years old
  - 3% were 75 to 84 years old
  - 0% were 85 or older
- Most provided a positive opinion of the basic solid waste services provided by their City. 67% indicated their City is doing a “Pretty good” job, 22% said “Excellent”, 10% said “Only fair”, and less than 1%% said “Poor”.
- 67% thought the amount they pay for the solid waste services they receive is “about right”, 26% thought the fees were “somewhat too high”, and 7% said “Much too high”.
- 97% separate recycling from the trash and 99% of those use their SSR container for disposing recyclables. Those that do recycle indicate that they use their recycling bin to recycle all (83%) or most (16%) of the time. For those that do not separate their recyclables (3%), the primary reasons for not including it’s “Inefficient – Just ends up in landfills anyway” (1 respondent), “Lack of storage space for recyclable materials at my residence” (1 respondent), and “None, no reason” (1 respondent). Those that do not separate recycling, 50% indicated that they would pay \$5.00 per month to add this service.
- The majority (64%) do separate green waste from the trash. For those that do not (33%), the primary reasons include it’s “Unavailable to me – Not offered in my area – Have no bin” (33%), the “Cost of it” (17%), they “Just toss it in the trash” (14%), and “they compost/mulch our yard waste”. A slight majority of non-green waste participants (52%) indicated that they would be interested in paying \$5.00 per month for green waste collection services.
- Of those that have visited the Davis Landfill (56%), they typically go up to 2 times per year and their primary purposes are to dispose of residential waste, HHW, and “large items”. Of those that have never visited the Davis Landfill, the primary reasons are because it is too far away and they “need more information about it or were unaware of it”. If services like those offered at the Davis Landfill were made available closer to this area, the respondents indicated that they would likely use them (56% said “very likely”, 34% said “somewhat likely”, 6% said “only a little likely”, and 5% said “not likely at all”). If the facilities were closer, they would primarily use it for dropping off HHW (23%), yard waste disposal (14%), and purchasing compost, wood chips, or mulch (13%).
- The most common ways this population accessed information about local issues were by “Social media”, “word of mouth”, and the “City website”. Likewise, the majority of respondents heard about this survey through Facebook (83%), Instagram (5%), and Wasatch’s website (4%).
- Of the open comments, there were mentions of desires for recycling services, more frequent or weekly collection, to be able to use the Bountiful landfill and to have closer disposal facilities, expanded recycling options (particularly for glass), green waste collection, more education; concerns over costs, and distrust over whether recycling is actually being recycled.
- The overwhelming majority (99%) are registered to vote in Davis or Morgan Counties, 51% have children living at home; the typical household size skewed smaller with 32% of respondents indicating 2 living in the household; 97% live in a single-family home that they very likely own; the typical yearly household income was \$75,000 to \$100,000; the majority attended some college or have a college degree (20% attended some college, 46% of respondents said they have graduated college and 19% said they have a post-graduate degree); 98% were white, 1% Hispanic, and 1% were Mixed Race; and 73% of respondents were female, 27% male.

See the following pages for a Summary Table of Responses by Area

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Table 20 - Summary Table of Responses by Area

City/Area	Bountiful	Centreville	Clearfield / Clinton / West Point / Sunset	Farmington	Kaysville / Fruit Heights	Layton	Morgan City and Unincorporated Areas of Morgan County	North Salt Lake	South Weber	Syracuse	Woods Cross / West Bountiful
Zip Code(s)	84010	84014	84015	84025	84037	84040 and 84041	84050	84054	84405	84075	84087
# of Responses	23	76	394	67	120	345	60	66	24	150	109
Typical age group of respondents in this area	65 to 74 years old (30%)	35 to 44 years old (30%)	35 to 44 years old (30%)	45 to 54 years old (27%)	55 to 64 years old (29%)	35 to 44 years old (29%)	45 to 54 years old (32%)	35 to 44 years old (33%)	55 to 64 years old (42%)	35 to 44 years old (38%)	35 to 44 years old (33%)
% with a "Pretty Good" Outlook on services provided by City	50%	41%	50%	54%	36%	56%	49%	57%	38%	46%	67%
% that believe the amount they pay for services is "About right".	82%	82%	64%	83%	76%	70%	68%	64%	46% (but the majority thought it was too high)	79%	67%
% Recycling participation (separate recyclables from the trash)	100%	92%	62%	99%	85%	63%	48%	97%	50%	60%	97%
% that Non-recyclers would pay \$5 for SSR services	N/A	33%	67%	N/A	59%	56%	59%	N/A	58%	69%	50%
% of Green waste diversion participation	56%	62%	44%	48%	78%	45%	57%	45%	65%	55%	64%
% that Non-green waste diverters would pay \$5 for curbside green waste collection services	76%	59%	57%	74%	36%	65%	38%	75%	58%	38%	50%
% that have ever visited the Davis Landfill	65%	76%	77%	73%	89%	86%	80%	53%	96%	79%	56%
Typical # of times visiting Davis Landfill per year	Up to 2	Up to 2	Up to 5	Up to 2	Up to 5	Up to 5	Up to 2	Up to 2	Up to 5	Up to 5	Up to 2
Why do they visit the landfill primarily?	To buy compost, wood chips or mulch and dispose of residential waste	To dispose of residential waste and "large items".	To dispose of residential waste and "large items"	To dispose of residential waste and "large items"	To dispose of residential waste and "large items"	To dispose of residential waste and "large items"	To dispose of "large items" and HHW	To dispose of yard waste and "large items"	To dispose of residential waste and "construction waste/materials"	To dispose of residential waste and "large items"	To dispose of residential waste, HHW, and "large items"
Those that indicate they would "Very likely" visit disposal facilities if they were closer to them	46%	63%	43%	52%	53%	47%	67%	52%	45%	43%	56%
Most common ways of accessing local news	Davis Journal	Social media, the City website, and by word of mouth	Social media, the City website, and by word of mouth	Social media, by word of mouth, and the City website	Social media, Google/internet searches, and by word of mouth	Social media, Google/internet searches, and by word of mouth	By word of mouth, Social media, and Google/Internet searches	Social media, the City website, and Google / Internet searches	Social media, Google/Internet searches, Standard Examiner, word of mouth, and City's website.	Social media, City website, by word of mouth, and Google/Internet searches	Social media, by word of mouth, and City website

City/Area	Bountiful	Centreville	Clearfield / Clinton / West Point / Sunset	Farmington	Kaysville / Fruit Heights	Layton	Morgan City and Unincorporated Areas of Morgan County	North Salt Lake	South Weber	Syracuse	Woods Cross / West Bountiful
<b>Most common open comments</b>	Desire for glass recycling, green waste collection, and for closer disposal facilities.	Desire for weekly collection, more education, closer facilities, expanded recycling options (including glass and plastic bags), and green waste collection	Desire for recycling services, more education, that recycling be mandatory, weekly collection, expanded recycling options (including glass and plastic bags), green waste collection, bulk pickup, and general pleasure with the solid waste system.	Desire for green waste collection, weekly collection, expanded recycling services (including glass and plastic bags), more education, and closer disposal facilities.	Desire for recycling services, more frequent or weekly collection, expanded recycling options (particularly glass recycling), closer disposal facilities (particularly for battery and medical waste disposal), green waste collection, bulk pickup, more education, concern over programmatic transparency, and to know if recycling is actually happening.	Desire for recycling services, more frequent or weekly collection, expanded recycling options (particularly glass recycling), green waste collection, more education, closer disposal facilities; concerns over the size of the waste and recycling containers, cost control, bulk pickup, programmatic transparency, and to know if recycling is actually happening. Several respondents expressed pleasure with the solid waste services in general.	Access issues at the Morgan disposal site; desires for more and standardized education, recycling services, more frequent or weekly collection, expanded recycling options (particularly glass recycling), green waste collection during the warmer months, closer disposal facilities, and concerns over the way charges for services are handled.	Desire for recycling services, more education, more frequent or weekly collection, expanded recycling options (particularly glass recycling), green waste and food waste collection, closer disposal facilities (and frustration that they cannot use the Bountiful landfill), annual bulk pickup, and several expressed pleasure with the solid waste services in general.	concern of costs, programmatic transparency, and to know if recycling is actually happening; a Desires for recycling services, more frequent or weekly collection, expanded recycling options (particularly glass recycling), green waste collection; and several respondents expressed their satisfaction with the solid waste services.	Desires for recycling services, more frequent or weekly collection, expanded recycling options (particularly for glass and plastic bags), green waste collection, more education, sharing information with the public that recycling is extracted from the waste, public recycling, closer disposal facilities; concerns over the size of the waste and recycling containers, litter on US 193, and cost.	Desires for recycling services, more frequent or weekly collection, to be able to use the Bountiful landfill and to have closer disposal facilities, expanded recycling options (particularly for glass), green waste collection, more education; concerns over costs, and distrust over whether recycling is actually being recycled.
<b>% registered to vote in Davis or Morgan Counties</b>	96%	97%	95%	100%	96.50%	98%	98%	100%	92%	97%	99%
<b>% with Children living at home</b>	40%	45%	53%	45%	42%	47%	44%	45%	8%	62%	51%
<b>Typical household size</b>	2	5 to 6	2	2	2	2	2	2	2	5 to 6	2
<b>% that live in a single-family home</b>	91%	96%	96%	96%	95%	96%	98%	91%	100%	97%	97%
<b>Typical yearly household income</b>	\$75k to 100k	\$100k to \$150k	\$100k to \$150k	\$100k to \$150k	\$100k to \$150k	\$100k to \$150k	\$75k to \$100k	\$150k to \$200k	\$100k to \$150k	\$100k to \$150k	\$75k to \$100k
<b>% with college degrees</b>	82%	83%	64%	77%	63%	72%	69%	72%	88%	65%	65%

## Conclusions and Recommendations

### Conclusions

- Wasatch has an excellent mission statement for sustainable, cost-effective, and environmentally sound solid waste management informed by five (5) guiding principles:
  - Maintain fiscal integrity with minimal financial risk. Consider long-term effects and life cycle costs. Maximize the value of assets.
  - Recognize waste as a resource through reuse, reduction, recycling, and the production of fuels and energy, when financially viable. Manage waste destined for disposal with state-of-the-art landfill resources, operations, and long-term care.
  - Make well informed decisions based upon sound scientific and business judgment and ethical business practices.
  - Aggressively pursue the best available demonstrated technologies that minimize the volume and toxicity of wastes and protect the environment for future generations.
  - Promote public education and awareness of effective and efficient municipal solid waste management practices.
- Wasatch has substantial integrated system resources for processing, transfer, and disposal of the waste and recyclables it receives from its members and commercial haulers in its region and the region adjacent. In 2021, Wasatch handled over 344,000 tons from its population of approximately 325,000 residents and commercial haulers.
- As demonstrated in the results of the extensive public survey and outreach efforts that were conducted in this analysis, the vast majority of the public that is currently served by Wasatch and living within its service area boundaries is happy with the levels of service that Wasatch provides at present, and is willing to pay more, (\$5 per month), for expanded recycling services.
- End users for the engineered fuel and organics that can be processed out of residential MSW at the Wasatch MRF site unfortunately have not developed as hoped, and alternative end users have yet to be identified nor available. As a result, the current processing infrastructure can be made available for alternative processing of single stream recyclables and/or primarily dry recyclables delivered by commercial haulers.
- Wasatch's Davis Landfill, which is primarily used for disposal of commercial waste and C&D materials, has a remaining life, at its current fill rate, of approximately 19 years with closure to take place in 2041. When the Davis Landfill is filled, Wasatch will be required to rely completely on regional landfills for disposal that can be reached through transfer operations at significantly greater cost.
- With no possibility to expand the Davis Landfill capacity, efforts to extend the closure date would require either, or both, increased diversion efforts and/or, additional transfer of both residential and commercial waste to regional landfills.
- The quantity of single stream recyclables from Wasatch member cities is currently low. In 2021 approximately 2,700 tons per year of recyclables were sold from 7,100 tons of single stream recyclables. GBB estimates that there is potential for almost 17,000 tons per year that could be recycled if all Wasatch members' residential households received curbside collection services. Additional source separated recyclables and/or recyclable rich loads from commercial sources can also be processed at the Wasatch MRF. A more robust level of participation by all member cities for both residential and commercial sources increases diversion from the landfill, and consequently would reduce residential waste transferred for disposal helping lower Wasatch system costs.

- Fortunately, the Wasatch MRF can be modified to better support processing more single stream recyclables that could be sourced from all member households as well as commercial haulers.
- Of the material Wasatch receives, C&D materials are significant, approximately 10% or 34,000 tons per year of what is received. These materials can be processed for improved diversion helping extend the remaining capacity of the Davis Landfill.
- The Davis Landfill currently produces methane gas from decomposing waste. This methane gas is currently sold to neighboring HAFB, who uses it as a fuel to produce electricity for on-Base use. The current 20-year contract with HAFB ends on January 13, 2026, and as such, Wasatch will need to find a new use for the methane from a new partner. Wasatch is planning a procurement to identify a future partner and make changes to the utilization of this fuel.
- Understanding the current capacity and future needs of these facilities, in combination with Wasatch's guiding principles and prioritized goals to maximize the diversion of material from landfills, potential scenarios (operational changes) were developed and considered for new options, or alternatives, for the processing and transfer of material tonnages through Wasatch's facilities moving forward.
- Three scenarios were analyzed in this Plan, and in each scenario, a financial model was developed and used to look at changes in waste tonnage flows through the system over time, as well as the average annual net cash income over the 20-year planning period, and the net change in cash position over 20 years.
- The key results of the three scenarios in this Plan are as follows:

#### Scenario 1 – The Base Case, status quo of Davis Landfill, Transfer Station(s)

This scenario starts with operations at Wasatch as of June 2022 and projects operations using the Davis Landfill up to a point, and then implementing additional transfer capacity as the Davis Landfill becomes full.

- Average annual net cash income of Negative \$2.11mm
- 20-Year change in net cash position from \$20.3mm to Negative \$21.2mm
- A material diversion rate of 8.3%, no change over 20-year period
- A Davis Landfill closure date (net of Reserve Capacity) of: Year 2039
- Implementation of new Transfer Station operation: Year 2039
- Increase in Expenses of 23% when Transfer Station begins Operations

#### Scenario 2 – Robust Single Stream Recycling

This scenario acknowledges that current diversion efforts are not as robust as they could be and redirects Wasatch and its members' efforts towards a more robust single stream recycling program at both residential and commercial properties.

- Average annual net cash income of \$2,402,197
- 20-Year change in net cash position of \$48,097,007
- A system-wide material diversion rate of 7%-12%

#### Scenario 3 – Engineered Fuel and Organics Use from MRF

This scenario is considered a best case/dream option that assumes full utilization by off-take users of both engineered fuel and recovered organics from processing residential MSW at the MRF.

- 20-year average net cash income = Negative \$1,609,609
- 20-yr change in net cash position = Negative \$31,857,463
- As much as 50% diversion in material from Davis Landfill could be achieved

## Recommendations

Recommendations are developed and based on the planning process completed with the Wasatch Board Advisory Committee, staff, and management. It should not be a surprise that when significant changes are recommended, that a review check on Wasatch guiding principles – the guidelines for Wasatch, be reexamined every five (5) years or so to adjust to changing economic, marketplace, and Wasatch development in the member communities.

- The Wasatch Board should confirm or modify its five (5) guiding principles as it navigates its member cities forward. With the loss of waste-to-energy as a diversion path and no available significant end market users of engineered fuel and organics currently, this Plan provides Wasatch with different alternatives to consider advancing for significant diversion from landfilling waste.
- Continue to advance toward robust single stream recycling, (Scenario 2), for increased diversion from disposal through:
  - Implement robust recycling from Wasatch members' residential households and commercial haulers serving non-residential properties processing at the MRF upgraded to address the changing material composition
  - Promote and work with haulers for increased commercial waste recycling estimated at 25,650 tons per year
  - Hire new Wasatch staff and efforts for program implementation to help assure robust diversion levels achieved
  - MRF modification for improved processing of single stream recyclables for OCC recovery and processing selected commercial loads
  - New C&D recycling at Davis Landfill and transfer C&D residual to a regional landfill
  - Wasatch work with member cities to increase curbside green waste collection for increased diversion
- Wasatch consider franchising the collection of members' residential recyclables and green waste in efforts to both lower collection costs and achieve robust recycling and diversion potential.
- Preserve Davis Landfill capacity by limiting Annual tonnages into the Davis Landfill at 150,000 tons annually.
- Wasatch track development opportunities for utilization of both engineered fuel and organics.
- Wasatch conduct a procurement for Davis Landfill methane gas utilization starting on January 14, 2026.
- Wasatch pursue grant opportunities such as the upcoming U.S. EPA Recycling grants and those offered by the Recycling Partnership. There are multiple applicable grants Wasatch may wish to consider, which include:
  - Solid Waste Infrastructure for Recycling Grant Program, U.S. EPA.
  - Recycling Education and Outreach Grant Program, Model Recycling Program Toolkit and School Curriculum, U.S. EPA.
  - These opportunities tie into Scenario 2 via their support of cart procurement, increased recycling education and outreach, and overall implementation of improved waste management infrastructure.
  - In addition, the Recycling Partnership offers resources, including grant funding, to municipalities looking to improve recycling that are well suited for Wasatch's planning efforts as outlined in this Plan, the annual residential curbside recycling cart grant.



Remaining focused on long-term goals and not getting dragged down by day-to-day operations is key in future planning. This is especially true when assessing how the community's needs and wants are related to available capacity.

## Appendices

### Value of Recycling

Recycling is the process of collecting and processing materials that would otherwise be thrown away as trash and turning them into new products for resale and reuse. Making a new product from recycled materials almost always requires less energy than is required to make the same product from new, virgin materials. For example, using recycled aluminum cans to make new aluminum cans uses 95% less energy<sup>39</sup> than using bauxite ore, the raw material that aluminum is made from.

As a further energy example, according to the U.S. EPA<sup>40</sup>, recycling one ton of paper could save enough energy to power the average American household for six months, as well as save 7,000 gallons of water, save 3.3 cubic yards of landfill space, and reduce greenhouse gas emissions by one metric ton, (or 2,205 pounds), of carbon equivalent.

Waste management options vary in convenience, affordability, environmental protection, and local availability. Multiple life cycle assessment studies have consistently shown over time that recycling is more beneficial than either landfilling or incineration in the United States. These benefits<sup>41</sup> include, and are not limited to, protecting natural resources, reducing air pollution, conserving energy, and creating jobs, among others:

- Recycling Conserves Natural Resources
  - Producing new products with recycled materials conserves natural resources such as timber, water and minerals. See examples above.
- Recycling Reduces Air Pollution
  - Landfilled waste produces methane gas, and incineration can release heavy metals and toxic chemicals into the air. Conversely, recycling can cut air pollution substantially. For example, manufacturing glass from recycled materials reduces air pollution by 20 percent when compared to production of glass products from virgin materials.
- Recycling Conserves Energy
  - As noted above, manufacturing an aluminum can from recycled materials takes 95 percent less energy than creating the same can from virgin materials. And while some energy can be recovered from the methane gas released from landfills or through

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<sup>39</sup> Recycling and energy. U.S. Energy Information Administration (EIA). Source: [https://www.eia.gov/energyexplained/energy-and-the-environment/recycling-and-energy.php#:~:text=Recycling%20saves%20energy%20and%20other%20resources&text=Save%20enough%20energy%20to%20power,2%2C205%20pounds\)%20of%20carbon%20equivalent](https://www.eia.gov/energyexplained/energy-and-the-environment/recycling-and-energy.php#:~:text=Recycling%20saves%20energy%20and%20other%20resources&text=Save%20enough%20energy%20to%20power,2%2C205%20pounds)%20of%20carbon%20equivalent). Retrieved 10.24.22.

<sup>40</sup> United States Environmental Protection Agency. Source: <https://archive.epa.gov/wastes/conserve/materials/paper/web/html/index-2.html> Retrieved 10.24.22.

<sup>41</sup> Sciening.com. Source: <https://sciening.com/how-does-recycling-paper-affect-the-environment-5171772.html>. Retrieved 10.24.22.

waste incineration, it is significantly less than the amount of energy saved through manufacturing with recycled materials. This still holds true even after accounting for energy usage during collection, processing, and transportation to end-use markets for recycled materials.

- Recycling Creates Jobs
  - According to the national report "More Jobs, Less Pollution," achieving a national recycling rate of 75 percent in the United States by 2030 would result in an additional 1.5 million jobs. These estimates were reached by researching the number of jobs required to complete the recycling process compared to the disposal (landfilling or incineration) of the same waste. The findings indicate that waste disposal generates the fewest jobs per ton of waste at 0.1 jobs per 1,000 tons of waste, while recycling generates 2 jobs per 1,000 tons.

While recycling may not always be cost-effective from an immediate financial standpoint, it has clear benefits that translate into worth in other ways. Recycling any type of material is beneficial in comparison to sending that same material to landfill or incineration where it will release greenhouse gases and other pollutants. Recycling materials significantly reduces demand for natural resources, reliance on fossil fuels, and the impacts associated with extracting both. In short, when considering how to manage waste, the best method is to produce less waste to begin with. Yet for the waste that does get produced, recycling is worth it in the long run, even if it costs slightly more than disposing of waste in the trash. Recycling's greatest impact on both people and the planet is in its environmental benefits.

### Construction and Demolition (C&D) Technology

Implementing a Public Sector Mixed C&D Processing/Recycling System. Virginia's Fauquier County joins a small group of governments running C&D recycling plants. 2008.

**Title:**  
Opportunities for Recycling Construction Waste and Demolition Debris  
[ PART 2 – Case Study Fauquier Co. VA ]  
Presented on Lorman Webinar June 3, 2014  
Presentation by: Bob Brickner, Executive V-P  
Gershman, Brickner & Bratton, Inc. (GBB)  
Fairfax, VA  
With GBB's Client Contact: Mike Dorsey, the Environmental Services Director of Fauquier Co., VA

**6. Fauquier Co. VA System A Project Case Study**

- Operated a MSW landfill – 70,000 tons in 2005
- Operated a C&D Landfill - 112,000 tons in 2005
- Operate the scale house
- Less than one year of C&D waste disposal capacity existed within the C&D Landfill
- The disposal of most of C&D Waste was within their MSW Landfill, which was not deemed in the County's best interests.

**Sanitary Landfill 1996-2000: Asset or Liability?**

1.3 Million CY Unused Landfill Capacity

Liability → Closure Post-Closure

Asset → VA HB1205 Vertical Expansion Accept Regional C&D

**2013 Aerial Map – Fauquier Co. Solid Waste Complex**

MSW Landfill #575, MSW Recycling Center, Landfill #149, C&D Recycling Facility

**Sanitary Landfill #149 Regional C&D Landfill FY 2002-07 Tonnage**

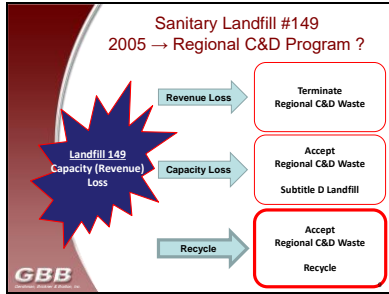
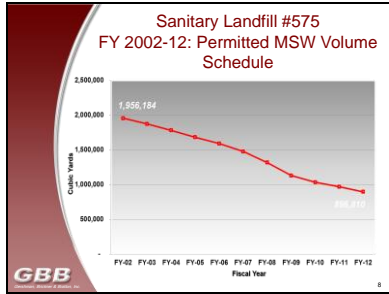
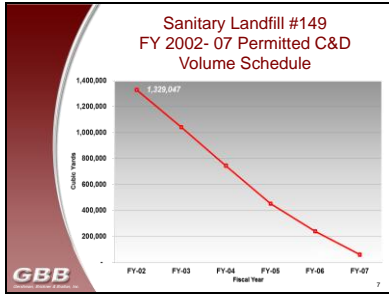
Fiscal Year	Tonnage
FY-02	129,717
FY-03	143,196
FY-04	137,006
FY-05	146,332
FY-06	93,220
FY-07	68,686

Total Tonnage: 718,168 Tons

**Sanitary Landfill #149 Regional C&D Landfill FY 2002-07 Revenue**

Fiscal Year	Revenue
FY-02	\$2,767,781
FY-03	\$3,579,889
FY-04	\$3,993,308
FY-05	\$5,091,513
FY-06	\$4,195,342
FY-07	\$3,153,007

Total Revenue: \$22,780,838



### How GBB got involved?

- GBB was hired by County (in mid-March 2006) to lead the C&D recycling system procurement & negotiations effort (including Acceptance Testing of the System)

### Scope of Basic C&D-related RFP Services

- The County sought Proposals for: **Design, Supply, Installation, Startup and Acceptance Testing** of a turnkey C&D waste processing/recycling System

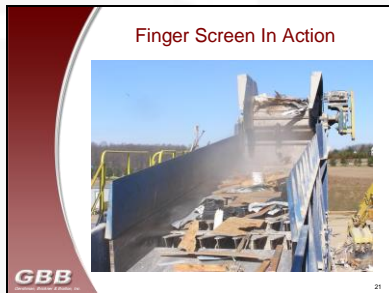
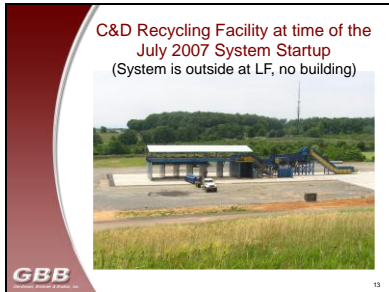
*Note:* The County took responsibility for the operation and all marketing of the recovered/processed C&D Waste constituents and ultimate disposal of any non-recovered Residuals.

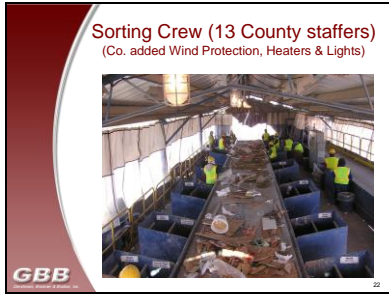
### C&D Recycling Plant

- Design, Permitting & Procurement (2006)
- Operational (July 2, 2007)

**Lead Consultant- Procurement Firms**

- Gershman, Brickner & Branton, Inc. (GBB)**  
 Plant Design, Procurement, Installation, Startup and Acceptance Testing
- Drapeer Aden Associates (DAA)**  
 Civil Engineering
- Whitlock Dalrymple Poston (WDP)**  
 Solidification Engineering/Testing
- McDonough Boyard Peck (MBP)**  
 Electrical, Mechanical Engineering
- Sherbrooke OEM**  
 C&D Recycling System
- General Kinematics**  
 Fingerscreen





**Investment made by County**

Sorting System	\$1,200,000
Mobile Equipment	\$750,000
<b>Additional Work on the Sorting Line:</b>	
Enclosed the Line for winter weather protection	\$20,000
Added Heat and Lights	\$20,000
<b>Additional Maintenance Equipment:</b>	
Purchased Used Scissors Lift	\$8,000
Purchased Dust Sweeper for the Pad	\$25,000
	\$73,000
<b>Site Work and Utilities (Approx.)</b>	<u>\$1,980,000</u>
<b>Total Capital Invested (US\$)</b>	<b>\$4,000,000</b>

GBB

**% C&D Materials Marketed**

At Startup – July 1, 2007 (to 12/31/07)

- July: 19%
- August: 21%
- September: 30%
- October: 39%
- November: 38%
- December: 46%
- Total C&D Received (7/1/07 – 12/31/07)  
34,089 Tons ( 260 TPD on 5 DPW basis)

GBB



### C&D Materials Marketed

- **Startup: July 1, 2007**
  - July: 19%
  - August: 21%
  - September: 30%
  - October: 39%
  - November: 38%
  - December: 46%
  - C&D Received 34,089 Tons (260 TPD5)
- **FY 2008**
  - Average Recycling Rate 38%
- **FY 2009 (first half of year)**
  - Average Recycling Rate 47%

### Local C&D Waste Trends

### Current Diversion Program (MSW & C&D)

- Aluminum cans, foil
- Antifreeze
- Batteries
- Bi-metal cans
- Books
- Donations (local charities)
- Drywall
- Electronic wastes
- Eyeglasses (Lions Club)
- Ferrous metal
- Fines (C&D ... ADC)
- Film plastics
- Flags (Eagle Scouts)
- Freon
- Glass
- HWW
- HDPE plastics
- Inert materials
- Latex paint
- Leather goods
- Mixed paper
- Mulch
- Non-ferrous metals
- OCC (cardboard)
- Office paper
- Oil filters
- ONP (newspaper)
- Pallets
- Pet Carriers (SPCA)
- PETE containers
- Propane tanks
- Rigid plastics
- Soil
- Textiles
- Tires
- Waste oil

### Fauquier Co, VA C&D Waste – FY12

	FY12 Total
Incoming Tonnage (MIXED C&D)	5,744
Non-County Commercial	13,316
Total In-County	19,060
Total C&D Processed at Facility	4,945
Source Separated C&D Delivered	24,005
<b>Total C&amp;D Received/Handled</b>	<b>28,950</b>
Total Reuse/Recycle Tons	10,286
Separated Asphalt/Concrete/Block/Tons	4,945
<b>TOTAL Reuse/Recycled</b>	<b>15,231</b>
Percent Diversion(Reuse/Recycled)	63%

### Fauquier Co. Materials Reused/Recycled (FY 2011 vs. FY 2012)

Reuse/Recycled Materials	FY 2011		FY 2012	
	TONS	PERCENT	TONS	PERCENT
Drywall	74	1.1%	22	0.1%
Fines (0"-2")	4188	59.7%	6041	39.7%
Concrete/Asphalt/Block & Other Inerts	5576	79.5%	5961	39.1%
Metal-Bulk	454	6.6%	496	3.2%
Metal-Fines	141	2.0%	254	1.7%
OCC	90	1.3%	151	1.0%
Plastic, incl. PVC	43	0.6%	113	0.7%
Wood	1328	19.1%	2142	14.1%
Mining Recycling	0	0.0%	61	0.4%
<b>Total Reuse/Recycle Tons</b>	<b>7,013</b>	<b>100.0%</b>	<b>15,231</b>	<b>100.0%</b>

### New Fauquier County VA Rates Construction & Demolition Waste (mixed recyclable materials)- as of 7/1/14

- Between 0-50 tons per month (gate rate) ..... \$46 per ton
- Between 51-100 tons per month ..... \$41 per ton
- Between 101 - 400 tons per month ..... \$36 per ton
- Greater than 400 tons per month ..... \$36 per ton (all tons)
- FY Average greater than 400 tons per month ..... \$36 per ton (all tons)

**Municipal Solid Waste (mixed)**

- Commercial (gate rate) ..... \$55 per ton

### Recycling Summary (Tons)

	FY 06	FY07	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13
MSW Tons	10,369	10,045	9,157	9,044	7,949	8,655	7,741	9,794
C&D Tons	--	--	24,791	15,581	10,388	11,618	14,240	14,676
<b>Total Tons</b>	<b>10,369</b>	<b>10,045</b>	<b>33,948</b>	<b>24,625</b>	<b>18,337</b>	<b>20,273</b>	<b>21,981</b>	<b>24,470</b>

Note: C&D Recycling Facility - Startup July 2, 2007

### Sanitary Landfill #149 - Project Area

### Mining/Piggyback Schematic Cross Section

### Management Decision: Closure versus Mining/Expansion

Landfill Closure	C&D Mining - Landfill Expansion
Closure Cost: \$3,500,000	Mining 20+ Years; Defer Closure 30 - 40 years
Post-Closure Cost: \$70,000 per year	Defer Post-Closure 30 - 40 years
Relocate collection site: \$1,000,000	Add 4 million cubic yards of landfill volume
	Continue landfill operations in locally accepted areas
	Environmental improvements
	Recycling: ferrous & nonferrous scrap, inerts, wood, plastic
	Recover 500,000 - 800,000 cubic yards of fines (soil) for landfill operations.

### Landfill Mining → Extreme Recycling

### Landfill Mining Pilot Operation Efficiency

	2011	2012	2013			
Mining Period	June 6 - Sept 2	July 12 - Aug 28	Sept 7 - Oct 29			
Weeks	11	6	9			
Volume Recovered (Cubic Yards)	Not reported	4,607	16,700			
Processing (PI) - Available (Blends)	1,488	286	50			
Processing (PI) - Actual (Blends, % FRR)	217	89%	171	27%	25%	100%
Recovery Loading (Blends, % FRR)	361	59%	163	27%	25%	100%
Recovery Picking (Blends, % FRR)	289	57%	224	37%	26%	87%
Plant - Loading (Blends, % FRR)	278	62%	288	49%	26%	93%
Mining Efficiency - Total (C)	20,476	20,000	20,000			
Efficiency, % (C)	111,511	110	88,648	77%	82,570	76%
Plant % (C)	11,421	17%	6,944	7%	14,824	17%
Planting/Triple (Blends (C, %))	27,660	13%	12,211	17%	4,268	6%
Plant - Ground (C, %)	1,576	2%	1,128	1%	1,726	2%
Plant - Inerts (C, %)	1,268	1%	1,164	2%	884	6%
Mining Efficiency (C, %)	12,013	100%	12,000	100%	12,000	100%
Volume Recovered (C&D, Piggyback)	---	---	---			
Mining Efficiency (C&D, Total)	---	15.5%	10.0%			

### C&D Landfill Mining Development Process

#### Milestones

**Key Events:** (1) HB 1205 landfill (C&D waste only) from July 2001 thru June 2007  
(2) C&D recycling plant approved in 2006; operational in July 2007

**Proof of Concept (Feasibility Study):** November 2, 2007

**Notice of Intent:** September 2, 2008

**Permit Application:** May 2009 through May 2010 (Plans Submittal - Operations, Stormwater, Odor/Hydrogen Sulfide, Methane, Fines Sampling, Contingency)

**Permit Approval:** August 11, 2010

**Procurement & Training:** August 2010 - May 2011

**Startup:** June 1, 2011; in 2011, operate 2-3 months - \$150,000 budget; future years, operate 3-9 months

### Excavator Loading Powerscreen Warrior

### Pre-Sorted Non-Recyclable Oversized Materials



Pre-Sorted Recyclable Oversized Materials

GBB

5+” Material Separation

GBB

5+” Sorted Material

GBB

1 - 5 Inch Materials Conveyor with Cross-Belt Magnet

GBB

1” – 5” Sorted Material

GBB

Processed Fines

GBB

Hauling 5+” Material to the C&D Recycling Plant

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C&D Delivery & Loading

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Star Screen Separation of 0-2” Material

GBB

8+” Material to Manually Sort Line

GBB

Sorting Operations: 8+” and 2-8”

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Non-Recyclable Loads Out

GBB

Mining Recycling Study  
The 5+” Powerscreen-Sorted Material

Material	Tons	Percent	Disposition
C&D Material Hauled Off LF #149	251	100	
Fines (0-2 inch)	56	22	Recyclable – Testing Required
Mid Size (2-8 inch)	95	38	Recyclable – Processing Required
8+ inch Available to Recycle	100	40	Recyclable – Manual Sorting
Recycled Materials	61	24	
Plastic	<1	<1	
Metal (nugget)	6	2	
Metal (nugget)	8	3	
Wood (nugget)	16	6	
Wood	8	3	
Tires	23	9	
Residue (8+”)	27	16	

GBB

Landfill Mining Project Revenue & Expenses

Category	3-Month Project Estimate
<b>Expenses</b>	
Power/Screen/Washer Rental	\$55,000
Excavator Rental	\$14,000
Contractor Equipment Support	\$45,000
Fuel	\$26,000
Temp Staff & Contract Labor	\$16,000
<b>Total Expense*</b>	<b>\$150,000</b>
<b>Revenue</b>	
Plastic (1.2 Tons @ \$120 per Ton)	\$145
Ferrous Scrap (14 Tons @ \$250 per Ton)	\$3,500
White Wood (27 Tons @ \$1 per Ton)	\$27
<b>Total Revenue</b>	<b>\$3,672</b>
<b>Net Expense*</b>	<b>\$146,328</b>

\*Excludes – Existing staff, equipment, disposal operations

GBB

Fauquier Co. VA Landfill Mining 2011 Operation Summary Report Notes...

- Minimal odor & dust generation; no operating or public impact
- Mining operating expenses exceed recycling sales revenue by 7+ to 1
- Mixed C&D landfill mining can only be justified by landfill airspace recovery and unique financial parameters

GBB

**Subject Matter - Item 7**

**General comment on C&D industry equipment and system vendors**

With the "recession" and reduced amount of construction with near-term expectations for slow economy, quantities are down, markets very local, and disposal options very competitive.

**GBB**

**General C&D Industry Issues w.r.t. "System Vendors"**

**Remember:** The System Developer's Business Must be Financeable and Sustainable...The Vendor's Equipment must only pass the Acceptance Test --- they are not part of your long-term business venture!

**GBB**

**Permitted Landfills are Still the Competition (from Part 1)**

- MSW Landfills...GBB recent review of 1600 MSW LF's - Gate Rates!
  - 1200 < \$50/ton
  - 925 < \$40/ton
  - 500 < \$30/ton
  - 150 < \$20/ton
- C&D Landfills...Recent Database review of 390 C&D landfills had an average gate fee of \$30 per ton

**GBB**

**General C&D Industry Issues: Technical Innovation**

- Eddy Current Separation for non-ferrous, air density separators and optical sorters for plastics recovery beginning considered for use at C&D Processing Plants

**GBB**

**Asphalt Shingle Recycling**

- CDRA ran their 6<sup>th</sup> ASR Forum and >250 attended and 16 exhibitors were present in Denver, CO.
- Bill Turley noted that at least 90% are processed/recycled back into hot mix asphalt

Source: C&D World Magazine: Nov.-Dec., 2013

**GBB**

**C&D Landfilling Bans & Legislation**

**GBB**

**Subject Matter - Item 8**

**General comments of "potential next steps" if the C&D Industry has you on the doorstep of developing a facility**

**GBB**

- Thank You ---- Contact Info:
- Bob Brickner 703-573-5800
- [bbrickner@gbinc.com](mailto:bbrickner@gbinc.com)

**GBB**

## Phone Survey Frequency Report and Answers

1

**WIWMD GBB SURVEY**  
**[FREQUENCY REPORT OF SURVEY RESPONSES – 400 SAMPLE – ERROR ±4.9%]**  
**Polling Dates: March 18, 2022, through March 26, 2022**  
*(70% completed via cell phones)*

SAMPLE: 1=Cell/2=Land                      DATE: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

PHONE: \_\_\_\_\_                      ZIP CODE: \_\_\_\_\_

JURIS: \_\_\_\_\_                      INTERVIEWER: \_\_\_\_\_

Hello, this is (Name) from EPIC-MRA, an independent survey research firm. We're conducting a survey among area residents on behalf of the Wasatch Integrated Waste Management District, a local governmental entity in charge of waste management services in Morgan and Davis counties. Please note that your city or town is a member of the District, and your trash and recyclables go to the District's central facilities for processing. Currently, the District receives the residential waste and yard waste generated in 15 cities within those 2 counties.

All responses to questions for this survey will be reported only by aggregate and we will not ask you for any information that could identify you or any members of your household. We are not trying to sell anything, you will not be asked for a donation, and you will not be called again because you participated in a survey. This is strictly research and I'd like to take about 10 minutes to include the opinions of your household.

We need to have a balance of men and women in this survey, and we also need to have young residents represented. May I please speak to the youngest [MALE/FEMALE, depending on quota specified on list] adult, age 18 or older who is at home now?

**IF YES: REPEAT INTRODUCTION FOR NEW RESPONDENT AND CONTINUE**

**IF NO, ASK:** "Is there any other [MALE/FEMALE, as specified] adult, age 18 or older who is at home right now?" **IF NOT, THANK AND TERMINATE INTERVIEW**

Are you currently a permanent, full-time resident of (MORGAN or DAVIS) county in Utah?

**IF YES ----- CONTINUE**

**IF NO ----- THANK AND TERMINATE INTERVIEW**

*WIWMD – GBB Survey  
March 2022 – Frequency of Survey Responses*

2

Would you say that you play a primary, or joint, role in the waste management decisions in your household – including decisions about trash, recycling, and yard waste collection and disposal?

**IF YES ----- CONTINUE**

**IF NO ----- IF NO, ASK:** "Is there any other [MALE/FEMALE, as specified] adult, age 18 or older that plays a primary, or joint, role in the waste management decisions in the household that I could speak with?"

**IF YES: REPEAT INTRODUCTION FOR NEW RESPONDENT AND CONTINUE**

**IF NOT, THANK AND TERMINATE INTERVIEW**

\_\_01. Overall, how would you rate the job that your city or town does in providing basic solid waste management services to its residents – including household trash, recycling, and yard waste collection, processing, and disposal services? Would you give your city or town a positive rating of excellent or pretty good, or a negative rating of only fair or poor?

39% Excellent  
48% Pretty good  
**87% TOTAL POSITIVE**  
**12% TOTAL NEGATIVE**  
11% Only fair  
1% Poor  
1% Undecided/Refused

\_\_02. Thinking about the quality of services provided by your City in return for the fees you pay, do you think your fees are too high, too low, or about right for what you get in services?

**[IF RESPONSE IS TOO HIGH, ASK: "Would that be much or somewhat too high?" AND CODE BEST RESPONSE]**

3% Much too high  
16% Somewhat too high  
**19% TOTAL TOO HIGH**  
70% About right  
0% Too low  
11% Undecided/Refused

\_\_03. In your household, do you separate recyclable materials from the trash?

60% Yes **GO TO INTRO TO Q.5**  
40% No  
--- Undecided/Refused **GO TO INTRO TO Q.5**

*WIWMD – GBB Survey  
March 2022 – Frequency of Survey Responses*

\_\_ 04. What is the main reason why your household does NOT separate recyclable materials from the trash? [WRITE COMMENT AS STATED – GO TO Q.8]

**N=161**

- 1% None; no reason
- 37% Unavailable to me – Not offered in my area – Have no bin
- 25% Cost of it
- 11% No interest/desire – Laziness
- 6% Little to none to recycle
- 5% Inconvenient – Too time consuming
- 4% Inefficient – Just ends up in landfills anyway
- 4% No drop-off location
- 2% Collector handles separation of recycling materials
- 1% Combined with outdoor waste
- 1% Lack of storage space for recyclable materials at residence
- 1% Landlord will not pay for it
- Other (*less than 1% each*)
- 2% Undecided/Refused

**INTRO TO Q.5:**

Next, I would like to ask you about curbside recycling collection. “Curbside collection” is a term that means collection of your household recyclable materials that is typically placed in a bin or a cart that you place along a curb near your home, or along your alleyway beside or behind your home.

\_\_ 5. Do you currently use a recycling bin for curbside recycling collection at your residence?

**N=239**

- 85% Yes
- 15% No **GO TO Q.7**
- Undecided/Refused **GO TO Q.7**

\_\_ 6. How often do you use curbside recycling collection at your residence? [READ 1 THROUGH 4]

**N=204**

- 83% All of the time **INTRO TO Q.9**
- 13% Most of the time **INTRO TO Q.9**
- 3% Seldomly **INTRO TO Q.9**
- 1% Never **ASK Q.7**
- Undecided/Not sure **INTRO TO Q.9**
- 0% Refused **INTRO TO Q.9**

*WIWMD – GBB Survey  
March 2022 – Frequency of Survey Responses*



\_\_7. What is the main reason why your household does NOT use curbside recycling collection at your residence? [WRITE COMMENT AS STATED – IF RESPONSE IS “We don’t have one/Not available to me” ASK Q.8 – OTHERWISE GO TO INTRO TO Q.9]

**N=36**

- 33% Cost of it
- 19% Prefer to drop-off (less costly)
- 17% Little to none to recycle
- 14% Unavailable to me – Not offered in my area – Have no bin
- 5% Need more detailed information – Unaware of it
- 3% Bin is too small
- 3% Have another source for that – Homeowners association/landlord/service handles
- 3% No interest/desire – Laziness
- 3% Reside in a rural area
- Other (*less than 1% each*)
- Undecided/Refused

\_\_8. If curbside recycling collection was available at your residence for an additional \$5.00 per month, would you use that service?

**N=168**

- 46% Yes
- 38% No
- 16% Undecided/Refused

**INTRO TO Q.9:**

Next, I would like to ask you about Green Waste, also known as yard waste (like grass cuttings, brush, pruning, etc.).

\_\_09. At your household, do you separate yard waste from the trash for curbside collection (for instance, in your Green Waste cart), backyard composting, do you haul it to the landfill yourself for composting, or is it collected by a yard service or landscaping company? [IF YES, PROBE FOR BEST RESPONSE]

- |     |   |                   |
|-----|---|-------------------|
| 3%  | This question does not apply to me because I do NOT have a yard at my residence | <b>GO TO Q.13</b> |
| 21% | Yes, curbside Green Waste collection  | <b>ASK Q.10</b>   |
| 15% | Yes, backyard composting  | <b>GO TO Q.12</b> |
| 16% | Yes, haul to a landfill myself for composting                                   | <b>GO TO Q.12</b> |
| 8%  | Yes, yard service or landscaping company takes it away                          | <b>GO TO Q.12</b> |
| 2%  | Yes, more than one ( <b>volunteered</b> )                                       | <b>GO TO Q.12</b> |
| 34% | No  | <b>GO TO Q.11</b> |
| 1%  | Undecided/Refused   | <b>GO TO Q.12</b> |

WIWMD – GBB Survey  
March 2022 – Frequency of Survey Responses

5

\_\_10. How often do you use curbside Green Waste collection at your residence? **[READ 1 THROUGH5]**

**N=83**

63%	Every week	<b>GO TO Q.13</b>
22%	Every other week	<b>GO TO Q.13</b>
7%	Monthly	<b>GO TO Q.13</b>
6%	Seldom	<b>GO TO Q.13</b>
---	Never	<b>ASK Q.11</b>
2%	Undecided/Not sure	<b>GO TO Q.12</b>
---	Refused	<b>GO TO Q.12</b>

\_\_11. What is the main reason why your household does NOT separate yard waste for collection or composting? **[WRITE COMMENT AS STATED]**

**N=137**

1%	None; no reason
31%	Unavailable to me – Not offered in my area – Have no bin
15%	Little to none to recycle
10%	Just toss it in with the trash
9%	No interest/desire – Laziness
8%	We compost/mulch our yard waste
7%	Have another source for that – Homeowners association/landlord/service handles
5%	Cost of it
4%	Need more detailed information – Unaware of it
2%	Lack of storage space for recyclable materials at residence
2%	No drop-off location
2%	Prefer to drop-off (less costly)
1%	Inefficient – Just ends up in landfills anyway
1%	Reside in a rural area
---	Other ( <i>less than 1% each</i> )
2%	Undecided/Refused

\_\_12. If curbside Green waste recycling collection was available at your residence for an additional \$5.00 per month, would you use that service?

**N=305**

36%	Yes
56%	No
8%	Undecided/Refused

*WIWMD – GBB Survey  
March 2022 – Frequency of Survey Responses*

6

\_\_13. The Wasatch Integrated Waste Management District owns and operates the Davis Landfill, located in Layton, Utah, serving Davis and Morgan Counties. Residential customer services include, residential waste disposal, green waste drop off, sale of compost and wood chips from recycled green waste, and a landfill thrift store. Services offered at no charge include, recycling drop off, and household hazardous waste drop off and Reuse Shed. Have you ever used the services or facilities offered at the Davis Landfill?

- 74% Yes
- 24% No **GO TO Q.17**
- 2% Not sure/Cannot recall **GO TO Q.18**
- 0% Refused **GO TO Q.18**

\_\_14. What was the main reason for your most recent visit to the Davis Landfill? **[DO NOT READ - RECORD RESPONSE OR WRITE IN UNDER 'OTHER']**

**N=294**

- 37% Drop off residential waste
- 23% Yard waste disposal (also known as "Green Waste" disposal)
- 15% Drop off household hazardous waste disposal (like batteries, paint, etc.)
- 6% Drop off recyclables into the bin
- 6% Purchase compost or wood chips or mulch
- 3% Dispose of "large items"
- 2% Dispose of construction waste/materials
- 2% Dispose of electronic devices/appliances
- 1% All of them
- 1% Carpet disposal
- 1% Dispose of household medical waste, like sharps and expired medications
- 1% Make a thrift store purchase/donation
- Visit the Reuse Shed
- Other (*less than 1% each*)
- 2% Undecided/Refused

\_\_15. Generally speaking, how often would you say you visit the Davis Landfill? **[IN TIMES PER YEAR – ROUND TO NEAREST WHOLE NUMBER – IF UNDECIDED/REFUSED, CODE "99" – IF 100 OR MORE TIMES CODE "98"]**

**N=294**

- 53% Twice per year or less
- 23% Three to five times per year
- 20% Six to ten times per year
- 4% More than ten times per year

**MEAN: 3.810      MEDIAN: 2.0**

*WIWMD – GBB Survey  
March 2022 – Frequency of Survey Responses*

7

\_\_16. Thinking about the residential customer services and facilities offered at the Davis Landfill, would you give them a positive rating of excellent or pretty good, or a negative rating of only fair or poor?

**N=294**

- 54% Excellent
- 40% Pretty good
- 94% TOTAL POSITIVE**
- 3% TOTAL NEGATIVE**
- 3% Only fair
- 0% Poor
- 3% Undecided/Refused

**ALL Q.16 RESPONDENTS GO TO Q.20**

\_\_17. What is the main reason why you have never used the services or facilities offered at the Davis Landfill? [WRITE COMMENT AS STATED]

**N=96**

- 30% No need/reason to use it
- 22% Need more detailed information – Unaware of it
- 15% Location – Too far away
- 9% Have another source for that – Homeowners association/landlord/service handles
- 6% Have no vehicle to haul waste – Do not drive
- 3% No interest/desire – Laziness
- 3% Use Bountiful instead
- 1% Cost of it
- 1% Curbside recycling is sufficient
- 1% Davis would not accept the items to be disposed of
- 1% We compost/mulch our yard waste
- 1% Other (*less than 1% each*)
- 7% Undecided/Refused

\_\_18. If similar residential customer services and facilities to those currently offered at the Davis Landfill were made available closer to your home – say, within 10 miles of your residence – how likely would you be to use those services and facilities? Would you say ... [READ 1 THROUGH 4]

**N=106**

- 20% Very likely
- 26% Somewhat likely
- 46% TOTAL LIKELY**
- 17% Only a little likely
- 28% Not likely at all
- 9% Undecided/Refused

**GO TO Q.20**

**GO TO Q.20**

*WIWMD – GBB Survey  
March 2022 – Frequency of Survey Responses*

8

\_\_19A-I. If similar residential customer services and facilities to those currently offered at the Davis Landfill were made available closer to your home, which ones would you use most often? **[READ 1 THROUGH 8 – CODE ALL RESPONSES MENTIONED OR WRITE IN UNDER ‘OTHER’]**

N=66

- 19% Drop off recyclables into the bin
- 17% Drop off household hazardous waste disposal (like batteries, paint, etc.)
- 15% Yard waste disposal (also known as “Green Waste” disposal)
- 14% Drop off residential waste
- 11% Purchase compost or wood chips or mulch
- 8% Make a thrift store purchase/donation
- 5% Dispose of household medical waste, like sharps and expired medications
- 4% All of them
- 2% Visit the Reuse Shed
- Other (*less than 1% each*)
- 5% Undecided/Refused

\_\_20A-C. People get information about local issues from many sources, but where do you get the information that influences your opinions the most? **[DO NOT READ -- RECORD RESPONSES OR WRITE IN UNDER ‘OTHER’ – PROBE WITH: ‘Is there anywhere else?’ UNTIL 3 RESPONSES CODED OR UNPRODUCTIVE]**

- 3% None; have no source of information
- 22% Word of mouth (family member or friend)
- 17% Television
- 16% Social media (Facebook, Twitter, Instagram, Reddit, etc.)
- 11% Google/Internet searches
- 7% Direct mail
- 5% City/Town website
- 4% Radio
- 3% Local government officials/meetings
- 2% Email
- 2% Standard Examiner
- 1% Davis Journal
- 1% Desert News
- 1% Morgan County News
- 1% Salt Lake Tribune
- 2% Other (*less than 1% each*)
- 2% Undecided/Refused

WIWMD – GBB Survey  
March 2022 – Frequency of Survey Responses



9

21. Are there any other comments you would like to make about waste management in your area?  
[WRITE COMMENT AS STATED]

*Verbatims provided to the client*

- 71% None; nothing
- 5% Overall positive remarks
- 3% Increased communication/awareness of services offered/what can be recycled
- 2% Concerns about cost of recycling/curbside – Should be reduced/free
- 2% Want Green Waste collection
- 1% Appreciate the low-cost/affordability of services
- 1% City/town should offer/provide more recycling/trash removal services
- 1% Concerns about high winds spreading trash – Should be covered
- 1% Concerns about the smell of the landfill
- 1% Concerns about waste/recycling collection being “messy”
- 1% Want cans/bins to be provided/paid for
- 1% Want curbside collection made available to me
- 1% Want glass recycling
- 1% Want increased availability of recycling options all around
- 1% Want recycling drop-off locations
- 1% Want weekly curbside pickup
- 2% Other (*less than 1% each*)
- 4% Undecided/Refused

Finally, I would like to ask you some questions for statistical purposes only.

22. Are you currently registered to vote in (MORGAN or DAVIS) county in Utah?

- 93% Yes
- 6% No
- 1% Undecided/Refused

23. Do you have children under the age of 18 living in your home?

- 42% Yes
- 56% No
- 2% Undecided/Refused

*WIWMD – GBB Survey  
March 2022 – Frequency of Survey Responses*

10

\_\_24. Including yourself, how many people currently live in your household? [WRITE NUMBER BELOW – IF UNDECIDED/REFUSED, CODE “99”]

- 7% One
- 31% Two
- 16% Three
- 17% Four
- 26% Five or More
- 3% Undecided/Refused

MEAN: 3.437      MEDIAN: 3.0

\_\_25. Could you please tell me in what year you were born? [IF REFUSED, ASK: ‘Would you please tell me into which of the following categories your age would fall? Please stop me when I get to a category that applies to you.’ AND READ 1 TO 4]

[RECORD YEAR HERE \_\_\_\_\_ AND THEN CODE BELOW]

- 6% 18 to 24      (2004 to 1998)
- 23% 25 to 34      (1997 to 1988)
- 25% 35 to 49      (1987 to 1973)
- 25% 50 to 64      (1972 to 1958)
- 15% 65 to 79      (1957 to 1943)
- 6% 80 or older      (1942 or before)
- 0% Undecided/Refused

\_\_26. What is the highest grade or level of schooling you completed? [DO NOT READ]

- 0% 1st to 11th Grade
- 13% High School Graduate
- 4% Non-college post high school (technical training)
- 30% Some college
- 36% College graduate
- 13% Post graduate school
- 4% Undecided/Refused

\_\_27. Do you own your own home, are you buying a home, or do you lease or rent where you live?

- 84% Own/Buying
- 11% Rent/Lease
- 2% Living with a relative/Other (volunteered)
- 3% Undecided/Refused

WIWMD – GBB Survey  
March 2022 – Frequency of Survey Responses

11

\_\_28. Which of the following best describes where you live? [READ 1 THROUGH 5]

- 91% A single-family home
- 4% A multi-family building like an apartment or condo building
- 3% A single-family home with multiple units, such as a duplex or triplex
- 0% A mobile home or RV
- Other (*less than 1% each*)
- 2% Undecided/Refused

\_\_29. Which racial or ethnic group best describes you? [READ 1 THROUGH 7]

- 82% White
- 3% Hispanic or Latino (Puerto Rican, Mexican-American, etc.)
- 2% Asian or Pacific Islander
- 1% African American or Black
- 1% Mixed race
- 0% Arab American or Middle Eastern
- 0% Native American or Alaskan Native
- Other (**volunteered**)
- 11% Undecided/Refused

\_\_30. Would you please tell me into which of the following categories your total yearly household income falls, including everyone in the household? Please stop me when I get to the category that applies to you? [READ 1 THROUGH 7]

- 2% Under \$25,000
- 6% \$25,000 to \$50,000
- 14% \$50,000 to \$75,000
- 15% \$75,000 to \$100,000
- 19% \$100,000 to \$150,000
- 11% \$150,000 to \$200,000
- 7% Over \$200,000
- Retired (**VOLUNTEERED - ASK: "But is there an income category I read that would apply to your household?" AND CODE BEST RESPONSE**)
- 26% Undecided/Refused

\_\_31. How would you describe your gender? [READ 1 THROUGH 4 – CODE BEST RESPONSE]

- 50% Female
- 50% Male
- Non-binary
- Or something else (*less than 1% each*)
- Undecided/Refused

**THANK RESPONDENT FOR HIS/HER/THEIR TIME AND TERMINATE**

*WIWMD – GBB Survey  
March 2022 – Frequency of Survey Responses*

## Online Survey Engagement Metrics Summary

Prepared by Doug Barton, Saltworks, Inc.

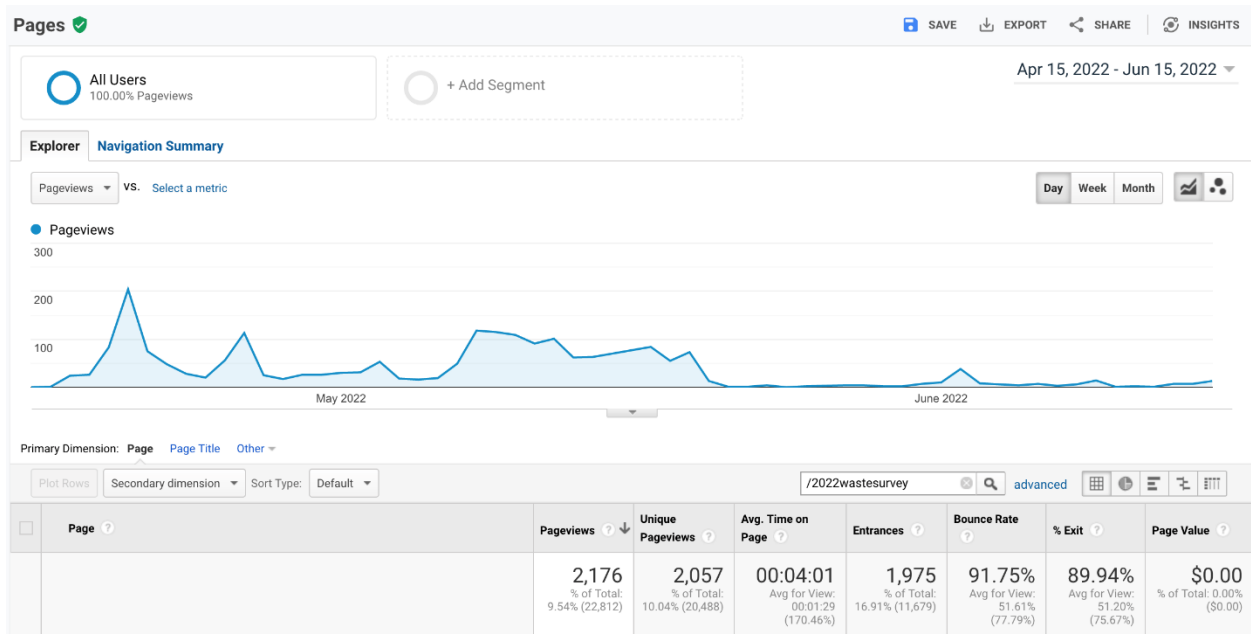
### Web Traffic

The Waste Survey Landing page garnered 2,176 views from 2,057 visitors during the online survey’s open period, April 15 to June 15, 2022. According to the Google Analytics data, the users spent an average of four (4) minutes reviewing the landing page. Details on additional engagement metrics, such as entrances, bounce rate, and exit percentage, are as follows:

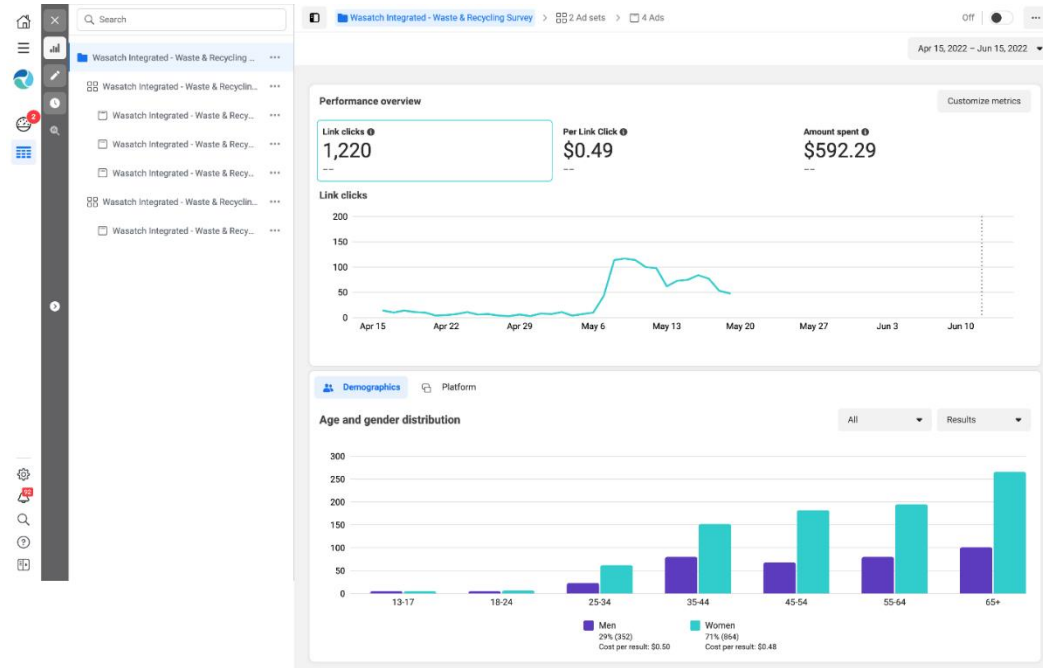
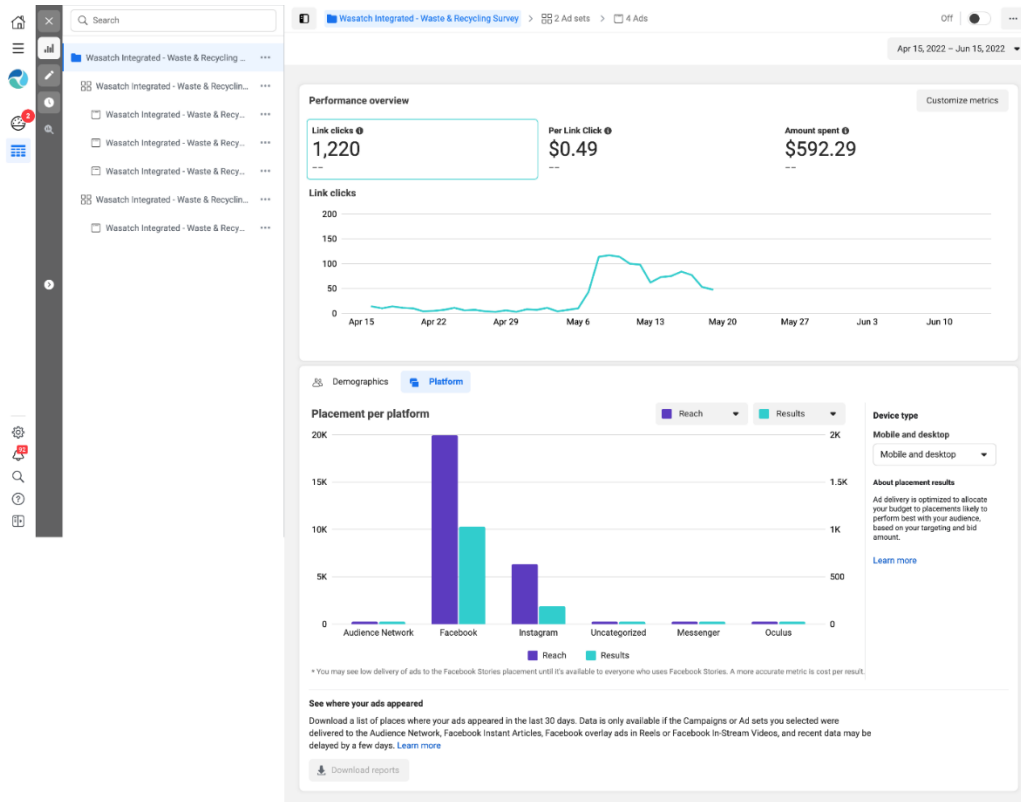
- The number of entrances, which is the number of times visitors visited the Wasatch website through the Waste Survey Landing page, **was 1,975**.
- The bounce rate, which is the percentage of single-page visits, visits where users entered and exited without reviewing other areas of the website, **was 91.75%**
- The percent exit (%Exit), the percentage of exits from the webpage, **was 89.84%**.

### Social Media Promotion and Participation

- Social media accounts, primarily Facebook and Instagram, were used to promote the survey. According to the Google Analytics data, the website page link garnered 1,220 clicks from promotional viewers. A significant majority of these viewers was identified as women (71%) and were between the ages of 25 and 65+ years old.
- The final screenshot of the Google Analytics metrics on the Waste Survey Landing page is included below.



Screenshots of the Facebook and Instagram ads' performance





Samples of Facebook posts and ads



**Wasatch Integrated Waste Management District and  
Landfill Thrift Store**



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Davis and Morgan County residents!  
We want your feedback on the trash and recycling services provided by  
Wasatch Integrated Waste Management District.

We value your opinion and are committed to improving Wasatch's  
Solid Waste Management Plan. ... **See more**

**Davis & Morgan County Residents!**

Please take the  
**2022 WASTE AND  
RECYCLING SURVEY**

**WASATCH**  
**INTEGRATED**  
waste management district

WASATCHINTEGRATED.ORG  
**2022 Waste Survey - Wasatch Integrated  
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**Wasatch Integrated Waste Management District and  
Landfill Thrift Store**



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Davis and Morgan County residents! We want your feedback on the trash and recycling services provided by Wasatch Integrated Waste Management District.

We value your opinion and are committed to improving Wasatch's Solid Waste Management Plan.

Please click the link to take our short, 10-minute survey:

<http://www.wasatchintegrated.org/2022wastesurvey/>

**We want your feedback...**

Take the  
**2022  
WASTE AND  
RECYCLING  
SURVEY**

**WASATCH**  
**INTEGRATED**  
waste management district

**Wasatch Integrated Waste Management  
District and Landfill Thrift Store**  
Waste Management Company

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Davis and Morgan County residents!  
We want your feedback on the trash and recycling services provided by Wasatch Integrated Waste Management District.  
We value your opinion and are committed to improving Wasatch's Solid Waste Management Plan. ... **See more**



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**2022 Waste & Recycling Survey**

At Wasatch Integrated Waste Management Distri...

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## Jacobs Engineering Group Inc. Technical Memorandum

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Wasatch Integrated Waste Management and Wasatch Resource Recovery Business Case Evaluation

Date: September 30, 2022

Project name: Anaerobic Digestion of the Organic Fraction of Municipal Solid Waste

Attention: Nathan Rich, PE, Executive Director, Wasatch Integrated Waste Management District  
Matt Myers, PE, Acting General Manager, South Davis Sewer District  
Jeff Whitbeck, Wasatch Resource Recovery

Prepared by: Lyndsey Lopez, Senior Consultant, Jacobs  
Juliet Ohemeng-Ntiamoah, Process Engineer, Jacobs

Reviewed by: Dave Parry, Technology Senior Fellow, Jacobs

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Wasatch Integrated Waste Management District (WIW) and Wasatch Resource Recovery (WRR) selected Jacobs Engineering Group Inc. (Jacobs) to serve as owners' engineer for a joint project to evaluate the feasibility of anaerobically digesting the organic fraction of municipal solid waste (OFMSW) from WIW's Davis Material Recovery and Transfer Facility (Davis Facility) using the existing digester capacity at WRR. Jacobs performed the following tasks:

- Evaluated the business case for WIW
- Evaluated the business case for WRR
- Determined if the partnership is economically feasible for both parties

This technical memorandum (TM) presents the findings of Task 4 – Business Case Evaluation (BCE) and is the final TM for this project. For the findings of the OFMSW feedstock characterization and OFMSW digestion at WRR, see the TM regarding Organic Fraction of Municipal Solid Waste Feedstock Characterization and Projections (Task 2 TM; Appendix A) (Jacobs 2022a) and the TM regarding WRR Assets and Projections Evaluation (Task 3 TM; Appendix B) (Jacobs 2022b). The Task 2 and Task 3 TMs were also sent to Anaergia, as a courtesy, since the evaluation was based on their equipment. The comments received from Anaergia and our responses are presented in Appendix C. Task 2 and 3 TMs have not been revised but inputs and assumptions have been updated as needed in this TM.

### Background

#### Davis Material Recovery and Transfer Facility

WIW owns the Davis Facility, which is a mixed waste receiving and processing facility located in Layton, Utah. The facility processes residential waste generated in Davis and Morgan Counties. WIW wants to evaluate diverting the OFMSW from landfills to WRR for biogas production. For this project, Jacobs assumes WIW will operate an organics extrusion press (OREX) system that will preprocess 2-inch minus OFMSW into a wet cake product that will be trucked to WRR for further polishing through Anaergia's organics polishing system (OPS) prior to digestion. Details on OREX preprocessing and OFMSW characterization are presented in the Task 2 TM (Jacobs 2022a).

#### Wasatch Resource Recovery

WRR is an existing anaerobic digestion facility located in North Salt Lake, Utah, next to the South Davis Sewer District's South Plant Wastewater Treatment Facility. WRR has anaerobic digesters that became operational in March 2019. WRR receives organic waste streams, such as fats, oils, and grease; food scraps; liquid waste; pre-consumer food waste; and bottled waste. The organic waste streams received at WRR are processed through anaerobic digestion, and renewable energy is recovered in the form of biogas. Jacobs assumed that WRR will operate an OPS that will polish OFMSW wet cake to remove contaminants prior to digestion at WRR.

Proposed Process Flow Diagram for the Business Case Evaluation

Figure 1 shows the proposed overall process flow that was evaluated for the BCE. The 2-inch minus OFMSW from WIW’s Davis Facility would get sent into the new preprocessing equipment. There are several types of preprocessing equipment (see Appendix D for an equipment list with summary level information) that could be used, but this preliminary analysis is based on Anaergia’s organics extrusion press, OREX 500 (WIW has sent some material to an operating OREX 500 for preliminary testing). The OREX 500 would be used to remove contaminants and separate material into a wet (cake) and dry (rejects) stream. Processed OFMSW (cake) would be transported to WRR for additional preprocessing using Anaergia’s OPS, which is designed to remove film plastic and grit. Finally, the polished stream would be sent to the anaerobic digestion system at WRR. Rejects from the OREX 500 and the OPS would be trucked back to WIW’s landfill for disposal.

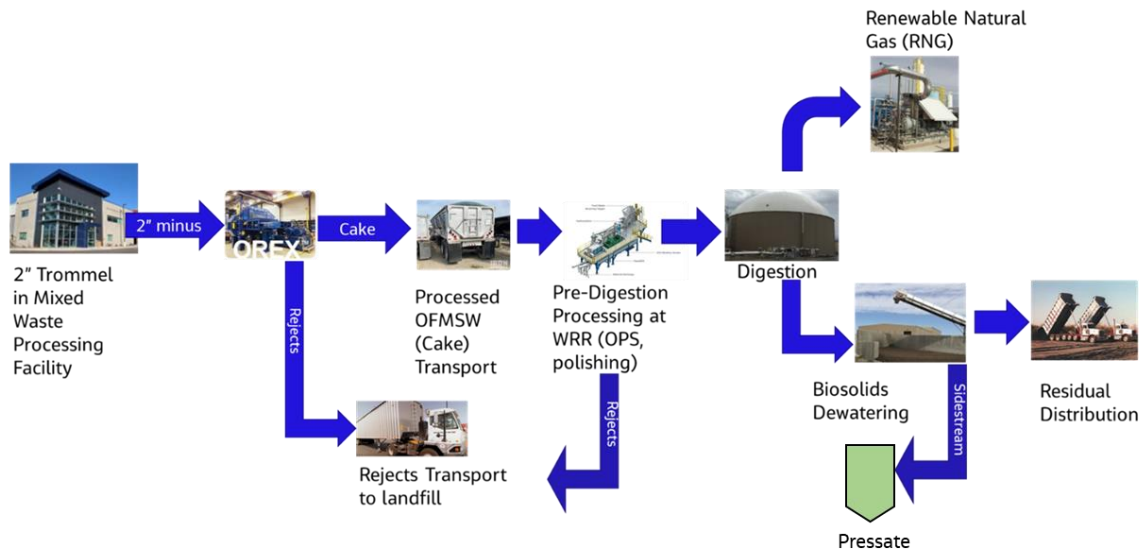


Figure 1. Proposed Process Flow Diagram for the Business Case Evaluation



Business Case Evaluation Base Case

The key assumptions of the BCE for both facilities are summarized in this section. In addition, the revised BCE following the Business Case Evaluation workshop (between WIW, WRR, and Jacobs) is provided below.

OFMSW Preprocessing and Polishing

Table 1 summarizes the OFMSW quantities and characteristics, and assumptions that were made for the preprocessing and polishing portions of this analysis.

Table 1. Summary of OFMSW Quantities, Characteristics, and Assumptions for the Predigestion Portion

Parameter	Units	Quantity	Comments
From 2-inch minus into OREX Press			
OFMSW to feed the OREX Press	wtpd	168.3	Corrected typo that was in TM2
OFMSW to feed the OREX Press	wtpy	43,750	
Outputs from OREX Press			
Cake Yield	%	46.0	
Cake Yield	wtpd	77.4	
Cake Yield	wtpy	20,125	
Trucks to Haul Cake	Trucks/day, assuming 15 tons per truck	5	Revised after TM3 was submitted
Rejects Yield	%	54.0	
Rejects Yield	wtpd	90.9	
Rejects Yield	wtpy	23,625	
Trucks to Haul Rejects	Trucks/day	N/A – Hauling costs for hauling the cake (above) include the round-trip cost; rejects will be back-hauled	Revised after TM3 was submitted
Outputs from OPS			
OPS Output, 42% TS	wtpy	17,911	
OPS Output, 42% TS	wtpd	68.9	
Rejects from OPS	wtpy	2,214	
Rejects from OPS	wtpd	9	
Trucks to Haul Rejects from OPS	Trucks/day, assuming 15 tons per truck	0.6	Revised after TM3 was submitted
OPS to Digestion, 10% TS	wtpy	75,227	
OPS to Digestion, 10% TS	gallons per day	69,385	
OPS to Digestion, 10% TS	VS/TS	70	

TS = total solids

VS = volatile solids

wtpd = wet tons per day

wtpy = wet tons per year

OFMSW Digestion at WRR

Table 2 summarizes the OFMSW digestion and key assumptions that were made for digestion at WRR.

Table 2. Summary of OFMSW Digestion and Assumptions for the Business Case

Parameter	Units	Quantity	Comments
<b>OFMSW (OPS Output Slurry) Quantity and Characteristics</b>			
Maximum OFMSW to digestion	wtpd	289	
Maximum OFMSW to digestion	wtpy	75,227	
Total Solids	%	10	
TS Load to digesters	lb/d	57,867	
VS Load to digesters	lb/d	40,702	
Estimated chemical oxygen demand load	lb/d	61,053	
Biogas Production from OFMSW	scfm	289	Revised after Anaergia’s review of TM 3
Biosolids Production from OFMSW	dtpd	13.7	
<b>Digestion-Related Assumptions for Business Case Evaluation</b>			
OFMSW Volatile Solids Reduction	%	75	
OFMSW Biogas Production	cf/lb VS destroyed	13.64	Based on Anaergia biomethane potential results with an assumed biogas methane content of 65%
HSW Volatile Solids Reduction	%	80	Only used in HSW sensitivity analysis
HSW Biogas Production	cf/lb VS destroyed	15	Only used in HSW sensitivity analysis
Biogas Higher Heating Value	BTU/cf	550	
RNG Value (Total)	\$/MMBTU	22	
RNG Capture	%	94	
RNG Revenue fraction for WRR	%	100	
Dewatering cake solids	%	15	Based on WRR dewatering performance
Dewatering electricity use	kwh/wet ton	40	
Dewatering electricity cost	\$/kwh	0.12	
Polymer use	lb/dry ton	20	
Polymer cost	\$/lb	1.5	Based on WRR chemical use data
Sidestream use	Gal/dry ton	1,082	Based on WRR chemical use data
Sidestream cost	\$/gal	0.23	Based on 2022 Brenntag chemical cost

BTU = British thermal unit

cf = cubic feet

d = day

dtpd = dry tons per day

gal = gallon

HSW = higher-strength waste

kwh = kilowatt-hour

lb = pound

MMBTU = million British thermal units

scfm = standard cubic feet per minute

Base Case Summary

Jacobs presented the original base case scenario at the BCE workshop on August 30, 2022. Based on discussions at the workshop, the base case scenario was revised to reflect near-term conditions that represent our best estimate of reasonable costs. One of the key items that was revised was how the residual and rejects from WRR would be managed. Prior to the workshop, it was assumed that there would be no change in the handling of residuals. Currently WRR pays \$27/ton to haul and land apply (\$12/ton for the hauling). This results in significant costs. During the BCE workshop, the team decided to assume that the residual and rejects distribution cost for all scenarios would include WIW backhauling the rejects and residual from WRR. Since the cost of trucking the cake material from WIW to WRR includes the round-trip mileage and costs for going from the Davis Facility to WRR to the landfill/compost facility to the Davis Facility, we assumed that there were not any additional costs to backhaul. Table 3 summarizes the key costs and parameters of the final base case.

Table 3. Summary of Business Case for Base Case

Costs/Key Parameters	Wasatch Integrated Waste	Wasatch Resource Recovery	Notes
Capital Cost (PPU and OPS), \$	\$6,000,000	\$2,250,000	Using Anaergia June 2022 quote and assuming using existing building
Capital Recovery, \$/year	\$480,000	\$180,000	Using Anaergia June 2022 quote and assuming 20 years at 5% interest
PPU and OPS O&M, \$/year	\$130,000	\$20,000	Using Anaergia June 2022 quote
Trucking from WIW to WRR, \$/year	\$120,000	N/A	5.0 trucks/d, assuming \$5.76/ton trucking cost; includes the round-trip cost for going from WIW to WRR to Landfill/Compost to WIW,
Trucking from WRR to landfill	N/A	N/A	6.7 trucks/d WRR, costs included in round-trip hauling costs above.
Dewatering, \$/year	\$0	\$220,000	
Sidestream, \$/year	\$0	\$880,000	100% of chemical cost representing near-term operations
Residual and Rejects, \$/year	N/A	\$0	WIW backhauls residuals and rejects Note: if WIW does not backhaul, they would need to pay for a tipping fee
Tipping Fee WIW to WRR, \$/year	\$0	\$0	
RNG Revenue, \$/year	N/A	(\$1,230,000)	\$22 per deca-therm
Net Cost/Revenue, \$/year	\$720,000	\$80,000	
OFMSW diversion, wtpy	20,000	N/A	
Diversion cost, \$/wtpy	\$36	N/A	
Simple Payback, years	N/A	N/A	No payback

O&M = operations and maintenance

PPU = Preprocessing unit

RNG = renewable natural gas

#### Sensitivity Analysis of Business Case Evaluation

Jacobs conducted multiple sensitivity analyses to evaluate how the business case shifts with different parameters. These results were shared at the BCE workshop. Workshop participants discussed key parameters that appeared to have significant impact on the business case, including residual distribution cost, OFMSW material quality, RNG value, and the chemical cost used in sidestream treatment at WRR. The parameters of capital cost and O&M were also discussed.

During the BCE workshop, the team decided that for residual distribution cost (which could be a major cost under certain circumstances would assume that WIW would backhaul the rejects and residual (see Section 2.3 for further discussion). This residual distribution cost assumption is continued through the sensitivity analyses.

The sensitivity analysis was refined to focus on the following parameters:

HSW (assumes the quality of the OFMSW could be improved)

Sidestream chemical costs are offset by revenue from recovered ammonia

RNG value appreciates higher

High capital cost with sidestream offset

High O&M cost with sidestream offset

The summaries of the sensitivity analysis are summarized below. The parameters that changed are highlighted in bold in each scenario.

High Strength Waste

Throughout the project, Jacobs has considered the potential option of providing HSW as the feedstock to the OREX. One of the recommendations from the Task 2 TM was to “compare the organic fraction of the material from the 2-inch trommel with the organic fraction from the last chance conveyor to determine the best source of OFMSW for future potential processing in the OREX Press and OPS system” (Jacobs 2022a) There may be other ways to get HSW. While that is out of the scope of this project, we did evaluate the potential impact of this by running a sensitivity analysis that assumed HSW that has higher volatile solids reduction (80 percent) and higher biogas potential (15 cf biogas/VS destroyed) than the OFMSW, as shown in Section 2.2. The higher volatile solids reduction of HSW reduces dewatering and sidestream costs due to the reduction in residuals. In addition, its higher biogas potential increases the revenue from RNG as shown in Table 4.

Table 4. Summary of Business Case for Higher-Strength Waste

Costs/Key Parameters	Wasatch Integrated Waste	Wasatch Resource Recovery	Notes
Capital Cost (PPU and OPS), \$	\$6,000,000	\$2,250,000	Using Anaergia June 2022 quote
Capital Recovery, \$/year	\$480,000	\$180,000	Using Anaergia June 2022 quote
PPU and OPS O&M, \$/year	\$130,000	\$20,000	Using Anaergia June 2022 quote
Trucking from WIW to WRR, \$/year	\$120,000	N/A	5.0 trucks/d, includes round-trip hauling cost
Trucking from WRR	N/A	N/A	6.2 trucks/d, assume backhauling
Dewatering, \$/year	N/A	\$200,000	
Sidestream, \$/year	N/A	\$820,000	100% of chemical cost representing realistic operations
Residual and Rejects, \$/year	N/A	\$0	WIW backhaul's residuals and rejects
Tipping Fee WIW to WRR, \$/year	\$0	\$0	
RNG Revenue, \$/year	N/A	(\$1,440,000)	\$22 per deca-therm
Net Cost/Revenue, \$/year	\$720,000	(\$220,000)	
OFMSW diversion, wtpy	20,000	N/A	
Diversion cost, \$/wtpy	\$36	N/A	
Simple Payback, years	N/A	10	

In this scenario, there is a diversion cost of \$36 per wtpy for WIW and a simple payback of 10 years for WRR.

Sidestream Chemical Costs Offset by Revenue from Recovered Ammonia

Workshop participants discussed sidestream chemical costs. Originally, Jacobs assumed that 90 percent of the sidestream chemical cost would be absorbed by revenue from ammonia recovery (selling ammonia sulfate fertilizer). WRR deemed that this was too optimistic for the base case. However, Jacobs decided to represent this potential scenario in the sensitivity analysis as shown in Table 5.

Table 5. Summary of Business Case for Recovery of Sidestream Chemical Costs

Costs/Key Parameters	Wasatch Integrated Waste	Wasatch Resource Recovery	Notes
Capital Cost (PPU and OPS), \$	\$6,000,000	\$2,250,000	Using Anaergia June 2022 quote
Capital Recovery, \$/year	\$480,000	\$180,000	Using Anaergia June 2022 quote
PPU and OPS O&M, \$/year	\$130,000	\$20,000	Using Anaergia June 2022 quote
Trucking from WIW to WRR, \$/year	\$120,000	N/A	5.0 trucks/d, , includes round-trip hauling cost
Trucking from WRR	N/A	N/A	6.7 trucks/d, backhaul
Dewatering, \$/year	N/A	\$220,000	



Sidestream, \$/year	N/A	\$90,000	10% of chemical cost based on ammonia recovery
Residual and Rejects, \$/year	N/A	\$0	WIW backhaul's residuals and rejects
Tipping fee WIW to WRR, \$/year	\$0	\$0	
RNG Revenue, \$/year	N/A	(\$1,230,000)	\$22 per deca-therm
Net Cost/Revenue, \$/year	\$720,000	(\$720,000)	
OFMSW diversion, wtpy	20,000	N/A	
Diversion cost, \$/wtpy	\$36	N/A	
Simple payback, years	N/A	3	

In this scenario, there is a diversion cost of \$36 per wtpy for WIW and a simple payback of 3 years for WRR.

#### Renewable Natural Gas Value Appreciates Higher

During the BCE workshop, the team decided to use a value of \$22/MMBTU for the RNG value for the base case. This was chosen to be more in-line with the research that WRR has completed regarding likely RNG values. WRR recently signed a contract for their gas that is \$9/MMBTU, plus the cost of natural gas, for a total of \$17/MMBTU. WRR is not yet U.S. Environmental Protection Agency-certified for the Renewable Fuel Standard program. Additional work is needed to align with the Renewable Fuel Standard program. Costs have fluctuated over the past several years and are dependent on many factors. As a result, this scenario represents the potential for the RNG value to be \$28 per deca-therm as shown in Table 6.

Table 6. Summary of Business Case for Higher RNG Value

Costs/Key Parameters	Wasatch Integrated Waste	Wasatch Resource Recovery	Notes
Capital Cost (PPU and OPS), \$	\$6,000,000	\$2,250,000	Using Anaergia June 2022 quote
Capital Recovery, \$/year	\$480,000	\$180,000	Using Anaergia June 2022 quote
PPU and OPS O&M, \$/year	\$130,000	\$20,000	Using Anaergia June 2022 quote
Trucking from WIW to WRR, \$/year	\$120,000	N/A	5.0 trucks/d, includes round-trip hauling cost
Trucking from WRR	N/A	N/A	6.7 trucks/d, backhauled
Dewatering, \$/year	N/A	\$220,000	
Sidestream, \$/year	N/A	\$880,000	100% of chemical cost based on ammonia recovery
Residual and Rejects, \$/year	N/A	\$0	WIW backhaul's residuals and rejects
Tipping fee WIW to WRR, \$/year	\$0	\$0	
RNG Revenue, \$/year	N/A	(\$1,570,000)	\$28 per deca-therm
Net Cost/Revenue, \$/year	\$720,000	(\$260,000)	
OFMSW diversion, wtpy	20,000	N/A	
Diversion cost, \$/wtpy	\$36	N/A	
Simple payback, years	N/A	9.0	

In this scenario, there is a diversion cost of \$36 per wtpy and a simple payback of 9 years.

High Capital Cost with Recovery of Sidestream Costs

As shown in the previous scenarios, the recovery of sidestream costs scenario had the biggest impact on the simple payback. As a result, Jacobs decided to run the remaining two scenarios using those conditions represented in the sidestream scenario but varying the capital cost and O&M cost. As shown in Table 7, the capital cost for this scenario was doubled, to account for potential variability in capital expenditures, which could be associated with price increases, use of alternate technology, or other factors.

Table 7. Summary of Business Case for Higher Capital Cost

Costs/Key Parameters	Wasatch Integrated Waste	Wasatch Resource Recovery	Notes
Capital Cost (PPU and OPS), \$	\$12,000,000	\$4,500,000	Double Anaergia Quote
Capital Recovery, \$/year	\$960,000	\$360,000	Double Anaergia Quote
PPU and OPS O&M, \$/year	\$130,000	\$20,000	Using Anaergia June 2022 quote
Trucking from WIW to WRR, \$/year	\$120,000	N/A	5.0 trucks/d, includes round-trip hauling cost
Trucking from WRR	N/A	N/A	6.7 trucks/d, backhauled
Dewatering, \$/year	N/A	\$220,000	
Sidestream, \$/year	N/A	\$90,000	10% of chemical cost based on ammonia recovery
Residual and Rejects, \$/year	N/A	\$0	WIW backhaul's residuals and rejects
Tipping fee WIW to WRR, \$/year	\$0	\$0	
RNG Revenue, \$/year	N/A	(\$1,230,000)	\$22 per deca-therm
Net Cost/Revenue, \$/year	\$1,200,000	(\$540,000)	
OFMSW diversion, wtpy	20,000	N/A	
Diversion cost, \$/wtpy	\$60	N/A	
Simple payback, years	N/A	8	

In this scenario, there is a diversion cost of \$60 per wtpy and a simple payback of 8 years. This results in a longer payback than the sidestream scenario and a diversion cost that is nearly double.

High O&M Cost with Recovery of Sidestream Costs

In this scenario, the O&M cost was doubled as shown in Table 8 to account for potential variability in O&M, which could be associated with prices increases, alternate assumptions for O&M, or other factors.

Table 8. Summary of Business Case for Higher RNG Value

Costs/Key Parameters	Wasatch Integrated Waste	Wasatch Resource Recovery	Notes
Capital Cost (PPU and OPS), \$	\$6,000,000	\$2,250,000	Using Anaergia June 2022 quote
Capital Recovery, \$/year	\$480,000	\$180,000	Using Anaergia June 2022 quote
PPU and OPS O&M, \$/year	\$250,000	\$40,000	Double Anaergia quote

Trucking from WIW to WRR, \$/year	\$120,000	N/A	5.0 trucks/d, includes round-trip hauling cost
Trucking from WRR	N/A	N/A	6.7 trucks/d, backhauled
Dewatering, \$/year	N/A	\$220,000	
Sidestream, \$/year	N/A	\$90,000	10% of chemical cost based on ammonia recovery
Residual and Rejects, \$/year	N/A	\$0	WIW backhaul's residuals and rejects
Tipping fee WIW to WRR, \$/year	\$0	\$0	
RNG Revenue, \$/year	N/A	(\$1,230,000)	\$22 per deca-therm
Net Cost/Revenue, \$/year	\$850,000	(\$700,000)	
OFMSW diversion, wtpy	20,000	N/A	
Diversion cost, \$/wtpy	\$42	N/A	
Simple payback, years	N/A	3.0	

In this scenario there is a diversion cost of \$42 per wtpy for WIW and a simple payback of 3 years for WRR. This results in the same payback as the sidestream scenario but a diversion cost that is \$6 wtpy higher.

Summary, Recommendations and Next Steps

Table 9 compares the diversion cost and simple payback that was associated with the base case scenario and the five sensitivity analysis scenarios.

Table 9. Summary of Business Case for Higher RNG Value

Results	Base Case	High-Strength Waste	Sidestream Chemical Costs are Offset	Renewable Natural Gas (RNG) Value Appreciates Higher	High Capital Cost with Sidestream	High O&M Cost with Sidestream
WIW Diversion cost, \$/wtpy	WIW: \$36 WRR: N/A	WIW: \$36 WRR: N/A	WIW: \$36 WRR: N/A	WIW: \$36 WRR: N/A	WIW: \$60 WRR: N/A	WIW: \$42 WRR: N/A
WRR Simple payback, years	WRR: N/A	WRR: 10	WRR: 3	WRR: 9	WRR: 8	WRR: 3

As shown in Table 9, the best scenario was the one with sidestream chemical costs being offset. This suggests that a reasonable cost for OFMSW is possible, with the right conditions. Distribution costs of residuals and rejects are a major cost and back hauling of materials is a crucial element of a successful project. Additionally, a higher value for RNG is necessary, as well as revenue from ammonia recovery, to offset the sidestream chemical cost. Finding ways of increasing the quality of the organic feedstock also improves the economics of this project. A tipping fee is necessary for profitable WRR operation, unless WIW takes the residuals and rejects.

Recommendations

The recommendations for future evaluations are presented below:

From TM 2 (Appendix A):

Obtain a better understanding of the quantity of material that can be processed through the trommel and what percentage of it is organic.

Compare the organic fraction of the material from the 2-inch trommel with the organic fraction from the last-chance conveyor to determine the best source of OFMSW for future potential processing in the OREX Press and OPS system.

From TM 3 (Appendix B):

Perform pilot testing of the compatibility of WRR feedstock with OFMSW to validate specific chemical oxygen demand loading rate limits and compatibility of OFMSW with WRR feedstock. The pilot tests should also include biomethane potential tests.

Conduct additional biomethane potential testing on OFMSW, with varying fractions of green waste to help in future sensitivity analyses:

About 30 percent green waste (assuming current green waste content is cut in half)

5 percent green waste (assuming curbside green waste program is started to improve quality of OFMSW)

Last-chance material

From this TM:

Explore ways to improve business case, such as higher value for RNG, revenue from ammonia recovery, backhaul of residual and rejects, and improved HSW.

References

Jacobs Engineering Group Inc. 2022a. Technical Memorandum regarding Organic Fraction of Municipal Solid Waste Feedstock Characterization and Projections. Prepared for Wasatch Integrated Waste Management and Wasatch Resource Recovery. August 8.

Jacobs Engineering Group Inc. 2022b. Technical Memorandum regarding Wasatch Resource Recovery Assets and Projections Evaluation. Prepared for Wasatch Integrated Waste Management and Wasatch Resource Recovery. August 10.

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