

2022 City of Helena Sustainability Report

Created by Miranda Griffis, City of Helena Sustainability and Recycling Coordinator

In 2017, the City Commission adopted Resolution 20347, requiring the preparation of an annual report to document specific activities implemented by the City, track greenhouse gasses, water, and energy usage, and recommend future sustainability measures for the City of Helena. In 2022, the City of Helena continued to make energy efficiency and sustainability upgrades to buildings, parks, and practices. The information below outlines upgrades and efficiencies for the calendar year as well as purposed projects for the future.

Energy Efficiency & Municipal Operations

Electricity usage for City facilities:

- Water Treatment Plants used a total of 2,860,528 kWh.
 - 9.94% increase from 2021
- Wastewater Treatment Plant used a total of 3,444,240 kWh.
 - 7.29% decrease from 2021.
- Facilities used a total of 1,774,690 kWh.
 - Chamber Building: 69,040 kWh.
 - City/County Building: 514,570 kWh.
 - Civic Center: 280,880 kWh.
 - Fire: 51,440 kWh.
 - Golf/Parks: 464,741 kWh.
 - Solid Waste: 147,616 kWh.
 - Transportation: 177,483 kWh.
 - Utility Maintenance: 68,920 kWh.
- Streets, parking, and miscellaneous lighting used a total of 1,204,325 kWh.

Total electricity consumption: 9,283,783 kWh

Total electricity consumption was reduced by 1.24% from 2021.

- **Total cost of electricity: \$1,055,879, a reduction of 3.50%.**

Total natural gas consumption: 211,243 therms

Total natural gas consumption increased by 17.50% from 2021.

- **Total cost of natural gas: \$199,677, an increase of 25.54%**

Water Supply, Treatment, & Delivery (WTR)

A Xeriscaping project was completed at the Law and Justice Center in Summer 2022. This project was used to raise public awareness on how native plants and grasses can be used in landscaping practices to improve water conservation abilities.



- In 2022, the population of Helena grew by 765 people.
- The average city-wide water use per person per day was 137 gallons.
 - This number includes all residential and commercial properties.
- The average residential water use per person per day was 81-90 gallons.
 - The City believes this number is a better representation of actual day to day water usage for each resident, as it only includes residential use.

In 2022, the City of Helena experienced more precipitation, and lower average temperatures than the previous two years. A total usage chart is located in the methodology section of this report.

- Tenmile Water Treatment Plant: 47.6 million gallons more.
 - A 3.37% increase from 2021.
- Missouri River Water Treatment Plant: 179.2 million gallons less.
 - A 13.39% decrease from 2021.
- Eureka Well: 35.6 million gallons less.
 - A 6.40% decrease from 2021.

Transportation, Waste, Recycling, and Public-Private Partnerships (TWRPP)

In 2021, City Commission adopted Resolution 20643 which established a goal for the City to reduce solid waste disposal to landfills by 50% by 2040, with an interim target of 35% reduction by 2030. The resolution also called for the development of a Strategic Plan for Waste Reduction, designed to achieve the City's goals. This plan was completed in June of 2022 on schedule and within the \$60,000 budget.

In 2022, the City and County began work on an Integrated Solid Waste Master Plan. The results of this project are to be available in Spring of 2024.

In 2022, the City made agreements with two private companies to provide curbside collection of compost to residents.

Recycling

Diversions amounts through City of Helena Transfer Station and drop-off locations.

- 6,760 total tons diverted in FY '22
 - 2,246 tons from recycling:
 - 351 tons of aluminum, tin, glass, and plastic
 - 190 tons of paper
 - 5.9 tons of e-waste
 - 618 tons of household appliances
 - 919 tons of cardboard
 - 161 tons of tires, batteries, oil, and antifreeze
 - 19 tons of scrap metal
 - 4,133 tons of compost.

Self-haul recycling and curbside recycling collection comparison: To keep comparisons fair, only items accepted in the Curbside program were compared to the same City diversion items:

- Curbside Recycling: diverted a total of 428.16 tons in FY 22, at a cost of \$519.73* per ton.
- Drop-Off Sites and the Transfer Station: diverted a total of 1,461 tons in FY '22 at a cost of \$159.55* per ton.

Curbside diversion rates increased by 11.23% from 2021.

City diversion rates decreased by 2.68% from 2021.

*cost to the City

Solid Waste

Commercial Solid Waste: 5,134.96 tons.

Residential Solid Waste: 10,0192.66 tons.

- The average amount of solid waste produced per household in FY22 was 153.80 pounds per month,
- The average amount of solid waste produced per person per day in FY22 was 2.49 pounds.

Energy Use and Green House Gas Assessment

In 2021, the City of Helena along with the City of Missoula, Missoula County, and the City of Bozeman entered an interlocal agreement with the purpose of advancing clean energy goals. This includes hiring a consultant to inform the development of a well-designed green tariff. In FY '22 the City of Helena allocated \$8,000 to support this project.

Plans to install a Solar Project at the City Transportation Shop began in 2022. Projected completion date for this project is Summer 2023.

Plans to install two Electrical Vehicle Charging Stations, one at Bill Roberts Golf Course, and the other at Jackson Street Parking Garage began in 2022. Projected completion date for this project is Summer 2023.

Natural Gas CO₂ Emissions

Since 2001, the City of Helena has reduced its CO₂ emissions, produced by natural gas consumption in all buildings and facilities, by 31.14%.

The 2022 CO₂ emissions are as followed:

- All Facilities: 1,123 metric tons

Electricity CO₂ Emissions

Since 2001, the City of Helena has reduced its CO₂ emissions, produced by electrical consumption in all buildings and facilities, by 43.84%

Since 2001, the City of Helena has reduced its CO₂ emissions, produced by electrical consumption at both the Water and Wastewater Treatment Plants, by 70.86%

The 2022 CO₂ emissions are as followed:

- Water Treatment Plants: 828 metric tons

- Wastewater Treatment Plant: 997 metric tons
- Buildings & Facilities: 511 metric tons
- Streets, Parking and Miscellaneous Lighting: 348 metric tons

Solid Waste CO₂ Emissions

- Residential: 8,607 metric tons
- Commercial: 4,642 metric tons

Fleet CO₂ Emissions

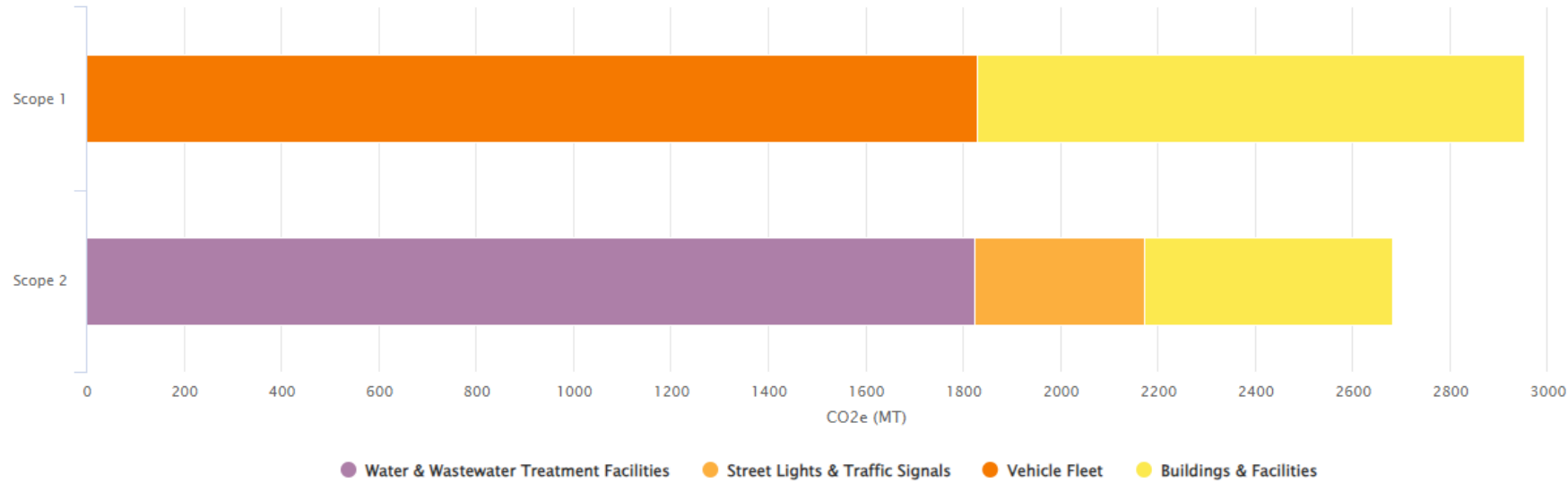
- 1,830 metric tons

**Data tables and graphs for these comparisons are located on the next 3 pages.

Inventory By Scope And Sector

CO2e by scope and sector for the selected inventory year.

Scope	Sector	CO2e
Scope 1	Buildings & Facilities	1,123
Scope 1	Vehicle Fleet	1,830
Scope 2	Buildings & Facilities	510
Scope 2	Street Lights & Traffic Signals	348
Scope 2	Water & Wastewater Treatment Facilities	1,825

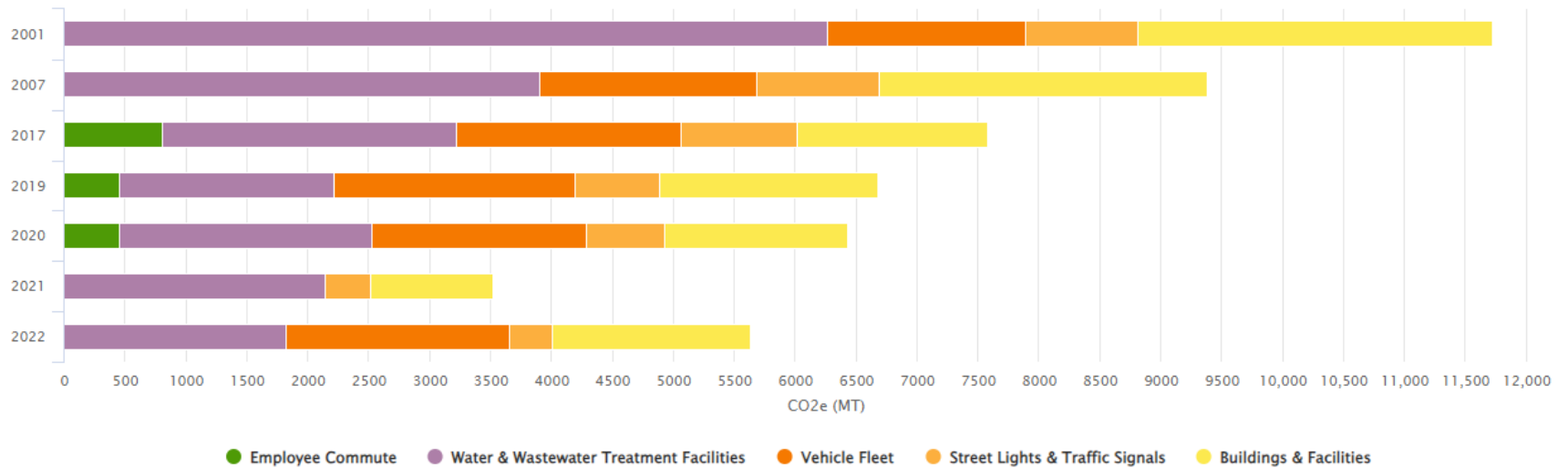


2001- 2022

Inventory Comparison By Sector

Comparison of CO2e by sector and year over all official inventories

Year	Buildings & Facilities	Street Lights & Traffic Signals	Vehicle Fleet	Water & Wastewater Treatment Facilities	Employee Commute
2001	2,910	922	1,631	6,263	
2007	2,691	1,005	1,788	3,902	
2017	1,561	951	1,842	2,415	808
2019	1,787	700	1,975	1,760	455
2020	1,508	641	1,760	2,070	455
2021	1,003	375		2,146	
2022	1,634	348	1,830	1,825	

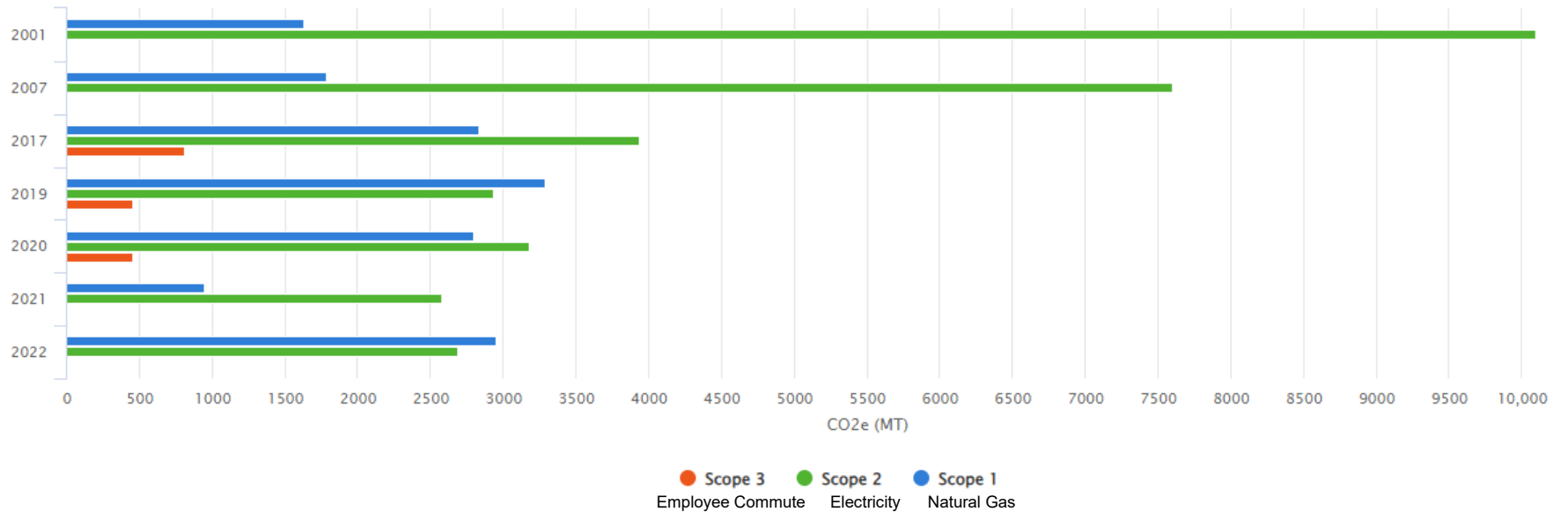


Inventory Comparison By Scope

2001- 2022

Comparison of CO2e by scope and year over all official inventories

Year	Scope 1	Scope 2
2001	1,631	10,095
2007	1,788	7,598
2017	2,831	3,939
2019	3,290	2,934
2020	2,801	3,178
2021	945	2,579
2022	2,953	2,684



Looking Forward: Plans for 2023

The City of Helena will be partnering with a group of Engineering students from MSU to work on a capstone project aimed at improving glass recycling procedures.

Re-establishment of the Citizen Conservation Advisory Board is planned for 2023.

Methodology

Energy and Natural Gas usage collected from Montana Department of Environmental Quality DEQ.

UTIL_TYPE														
E													-Y	
ACCOUNT_NUMBER	(All)													
Sum of TOTAL_USAGE	Column Labels													
Row Labels	1	2	3	4	5	6	7	8	9	10	11	12	Grand Total	% Change
2016	703,563	697,137	714,036	910,989	685,266	809,210	1,053,246	1,173,840	1,079,342	785,329	632,864	752,635	9,997,457	
2017	790,676	725,204	669,237	649,737	633,349	860,225	1,055,529	1,266,158	1,168,562	845,419	956,417	1,206,108	10,826,621	8.93%
2018	734,237	662,911	715,733	773,697	661,330	721,598	876,365	1,131,802	564,079	357,846	752,239	764,271	8,716,108	-22.73%
2019	796,982	742,187	767,033	726,255	710,986	809,651	934,039	1,107,657	1,025,339	757,004	907,533	783,475	10,068,141	14.56%
2020	835,688	921,705	762,636	744,035	711,766	819,092	947,079	1,475,887	1,049,089	731,910	637,547	693,273	10,329,707	2.82%
2021	860,684	666,532	541,105	694,472	622,688	693,828	1,155,865	1,141,600	933,782	842,696	593,294	652,021	9,398,567	-10.03%
2022	751,216	622,586	669,615	687,478	645,730	803,179	862,877	1,049,047	1,099,414	764,380	607,442	720,819	9,283,783	-1.24%
Grand Total	5,473,046	5,038,262	4,839,395	5,186,663	4,671,115	5,516,783	6,885,000	8,345,991	6,919,607	5,084,584	5,087,336	5,572,602	68,620,384	

UTIL_TYPE														
G													-Y	
ACCOUNT_NUMBER	(All)													
Sum of TOTAL_USAGE	Column Labels													
Row Labels	1	2	3	4	5	6	7	8	9	10	11	12	Grand Total	% Change
2016	26,656	21,647	13,910	14,389	8,347	11,131	21,080	15,126	5,415	5,847	9,793	16,668	170,009	
2017	35,008	30,112	20,900	11,583	8,282	5,531	10,491	6,371	5,488	9,350	17,195	25,506	185,817	7.48%
2018	35,431	25,931	33,206	24,583	12,066	6,221	20,386	9,903	804	5,514	19,105	25,945	219,095	15.75%
2019	30,149	31,382	36,732	24,256	15,501	14,121	18,430	13,018	6,693	10,035	21,315	28,332	249,964	14.61%
2020	33,176	25,990	25,150	25,606	11,159	9,802	10,750	6,513	3,772	4,863	16,647	33,579	207,007	-20.34%
2021	30,956	25,431	22,559	19,701	12,800	9,976	8,883	5,099	3,446	3,999	13,184	18,241	174,275	-15.49%
2022	35,371	25,634	25,389	19,099	16,111	12,786	11,491	7,971	4,894	5,991	15,575	30,931	211,243	17.50%
Grand Total	226,747	186,127	177,846	139,217	84,266	69,568	101,511	64,001	30,512	45,599	112,814	179,202	1,417,410	

Data from DEQ inputted into ClearPath under “City Government Analysis” to calculate Greenhouse Gas Emissions.

- Electricity factor set: WECC NWPP eGrid 2022: 634.6 CO₂ lbs./MWh.

eGRID Subregion Total Output Emission Rates (lb/MWh)

Show entries Search:

eGRID Subregion	CO ₂	CH ₄	N ₂ O	CO ₂ e	Annual NO _x	Ozone Season NO _x	SO ₂
HIOA	1633.1	0.176	0.027	1645.5	3.9	3.9	6.5
MROE	1582.1	0.148	0.022	1592.3	0.9	1.0	0.4
MROW	995.8	0.107	0.015	1003.1	0.8	0.8	1.0
NEWE	539.4	0.072	0.009	544.0	0.3	0.3	0.1
NWPP	634.6	0.058	0.008	638.5	0.6	0.6	0.3
NYCW	816.8	0.019	0.002	817.9	0.2	0.3	0.0
NYLI	<small>Saved to H: Drive</small> .126	0.016	0.016	1218.9	0.9	0.9	0.3

Showing 8 to 14 of 28 entries

Previous 1 **2** 3 4 Next

Water production chart provided by Ten Mile Water Treatment Plant Superintendent

Water Usage from Each Source							
City of Helena, Montana							
Water Usage from each Source							
(Million Gallons)							
2022							
Month	Ten Mile	Eureka	Missouri River	M RTP Acre Ft	Monthly Total	Peak Day Demand	Average Day
January 2022	93.1	16.5	0.0	0.0	109.6	4.1	3.5
February 2022	83.9	14.9	0.0	0.0	98.8	3.9	3.5
March 2022	95.4	16.5	0.0	0.0	111.9	4.0	3.6
April 2022	95.5	16.0	0.0	0.0	111.5	4.4	3.7
May 2022	123.8	16.5	46.3	142.1	186.6	10.1	6.0
June 2022	159.4	15.9	78.0	239.4	253.3	11.9	8.4
July 2022	181.9	16.2	130.1	399.3	328.2	13.1	10.6
August 2022	185.4	16.2	167.8	515.0	369.4	13.6	11.9
September 2022	149.5	15.6	82.9	254.4	248.0	11.3	8.3
October 2022	92.2	16.0	14.8	45.4	123.0	5.4	4.0
November 2022	96.2	4.3	0.0	0.0	100.5	3.7	3.4
December 2022	102.5	4.8	0.0	0.0	107.3	3.9	3.5
Totals to Date:	1458.8	169.4	519.9	1595.5	2148.1	13.6	5.6

Monthly and Daily water usage comparison. Data collected from utility billing.

Total Gallons by Month (units x 748)													
Total Gallons	January	February	March	April	May	June	July	August	September	October	November	December	Total
Single Family (9,436)	27,420,932	30,577,492	25,194,136	26,601,872	26,234,604	62,437,804	96,060,404	154,910,052	131,003,224	73,270,340	24,949,540	25,348,972	704,009,372
Multi Family (1,535)	17,553,316	19,208,640	16,402,144	16,898,816	16,449,268	25,754,388	31,522,964	46,313,916	41,451,168	32,055,540	16,203,176	16,917,516	296,730,852
Commercial (1,926)	21,211,036	26,574,196	23,932,260	26,046,856	27,923,588	72,777,408	98,765,920	144,135,112	120,813,220	88,334,312	24,060,168	19,498,864	694,072,940
Total Gallons	66,185,284	76,360,328	65,528,540	69,547,544	70,607,460	160,969,600	226,349,288	345,359,080	293,267,612	193,660,192	65,212,884	61,765,352	1,694,813,164
													Total
Total Residential Gallons	44,974,248	49,786,132	41,596,280	43,500,688	42,683,872	88,192,192	127,583,368	201,223,968	172,454,392	105,325,880	41,152,716	42,266,488	1,000,740,224
Monthly Average Per Household	2,992	3,312	2,767	2,894	2,840	5,867	8,487	13,386	11,472	7,007	2,738	2,812	
Monthly Average Per Person	1,474	1,632	1,363	1,426	1,399	2,890	4,181	6,594	5,651	3,452	1,349	1,385	Average
Daily Average Per Person	48	53	44	48	45	96	135	213	188	111	45	45	90
Sample Size: 169 Residents	50							214					
Average Monthly per person	1,327	1,469	1,228	1,284	1,260	2,603	3,765	5,938	5,089	3,108	1,214	1,247	Average
Average Daily per person	43	52	40	43	41	87	121	192	170	100	40	40	81
Monthly Average City-wide Per Person	1,953	2,254	1,934	2,052	2,084	4,750	6,680	10,192	8,655	5,715	1,925	1,823	Average
Daily Average City-wide Per Person	63	80	62	68	67	158	215	329	288	184	64	59	137
Water Produced by Month													
Source	January	February	March	April	May	June	July	August	September	October	November	December	Total
Ten Mile	81,733,000	74,941,000	82,159,000	81,528,000	101,797,000	131,855,000	156,352,000	160,802,000	131,957,000	82,109,000	85,565,000	91,441,100	1,262,239,100
Eureka	16,493,000	14,934,000	16,484,000	15,974,000	16,503,000	15,871,000	16,158,000	16,190,000	15,606,000	15,944,000	4,253,000	4,816,000	169,226,000
Missouri River	0	0	0	0	45,493,000	73,400,000	124,434,600	162,298,000	79,696,400	13,733,000	0	0	499,055,000
Total Produced Gallons	98,226,000	89,875,000	98,643,000	97,502,000	163,793,000	221,126,000	296,944,600	339,290,000	227,259,400	111,786,000	89,818,000	96,257,100	1,930,520,100
													Total
Monthly Gallons Lost	32,040,716	13,514,672	33,114,460	27,954,456	93,185,540	60,156,400	70,595,312				24,605,116	34,491,748	389,658,420
													Average
Daily Gallons Lost	1,033,571	482,667	1,068,208	931,815	3,005,985	2,005,213	2,277,268	0	0	0	820,171	1,112,637	1,061,461
1 unit = 748 gallons Census Data 2022 Population: 33,885 Number of Households 15,032 Per Household 2.03													

Diversion amounts in tons, from Transfer Station and drop-off locations.

	ALUMINUM	TIN	GLASS	PLASTICS	PAPER	EWASTE	WHITE GOODS	CARDBOARD	TIRES	A. BATTERIES	Lith. Batteries	OIL	ANTIFREEZE	GRS/LEAVES	WOOD CHIPS	BIO-SOLIDS	XMAS TREES	Landfill	Landfill/MV
																		Compost Accts	Scrap Metal
JULY	3.1	1.53	26.2	8.6	17.8	0.0	56.2	87.2	5.9	2.2	0.0	8.8	0.00	220.9	70.8	0.0	0.0	55.27	0.0
AUG	2.3	0.39	19.4	6.0	15.5	0.0	80.2	64.9	17.8	1.1	0.03	0.0	1.14	112.8	0.0	41.0	0.0	56.59	7.54
SEPT	3.1	1.62	22.0	4.6	14.2	0.0	52.4	78.3	11.1	0.6	0.0	13.1	0.00	72.8	0.0	0.0	0.0	31.64	0.0
OCT	2.3	1.68	21.1	5.2	15.2	0.0	76.7	76.3	14.3	1.2	0.0	1.2	0.00	205.8	0.0	148.1	0.0	10.03	1.84
NOV	2.3	0.44	18.0	4.5	18.3	3.0	46.6	80.6	5.8	1.8	0.02	0.0	0.00	118.3	0.0	123.0	0.0	11.03	0.0
DEC	2.1	1.94	18.2	6.4	13.6	0.0	27.6	71.0	5.9	0.0	0.0	0.0	0.00	13.7	1,039.9	322.2	0.0	2.73	0.0
JAN	2.4	1.98	23.0	4.7	16.2	0.0	27.8	82.3	4.8	1.0	0.0	6.2	0.72	0.0	0.0	302.0	0.2	2.64	0.0
FEB	1.9	1.86	12.7	4.1	16.0	0.0	25.6	69.1	0.0	0.4	0.0	0.0	0.9	2.9	0	354.6	11.3	1.94	3.07
MAR	2.4	1.88	17.3	5.3	16.5	0.0	37.5	64.1	7.2	1.2	0.0	0.0	0.0	24.3	0.0	324.9	0.0	23.19	0.0
APR	1.9	2.11	21.1	3.8	15.0	0.0	58.5	74.2	8.1	0.7	0.04	0.0	0.0	86.4	0.0	44.6	0.0	96.44	0.0
MAY	2.7	1.48	22.2	4.9	19.2	0.0	54.7	83.0	8.2	2.2	0.0	6.8	0.8	100.8	0.0	75.5	0.0	37.61	4.32
JUNE	5.2	1.90	16.9	5.1	12.9	2.9	74.5	88.1	11.1	1.9	0.0	0.0	7.0	147.4	0.0	169.3	0.0	50.94	2.65
	31.6	18.81	238.0	63.3	190.4	5.9	618.4	919.0	100.2	14.2	0.09	36.1	10.5	1,106.2	1,110.7	1,905.3	11.5	380.1	19.4
DIVERSION BY FISCAL YEAR														Varies					
	CONTAINER	PAPER	EWASTE	TEXTILES	WHT GOODS	*LF/MV WHT GOODS	CRDBOARD	AUTO	VAL. SCRAP	RECYCLING	COMPOST	*LF COMPOST	TOTAL						
FY22	351.7	190.40	5.9	N/A	618.4	19.4	919.0	161.2	0.0	2,246.5	4,133.7	380.1	6,760.3	TOTAL TONNAGE DIVERTED					
FY21	402.4	175.70	8.0	N/A	604.5	17.4	923.3	177.2	0.0	2,325.9	5,373.8	594.1	8,293.8	RECYCLEABLE ITEMS DIVERTED					

Diversion amounts in tons, through Curbside Recycling program.

Month	Mixed Paper	Cardboard	Plastic	Aluminum/Tin	Glass
January	9	12	4.05	1.875	9
February	7	12	3.27	1.755	7
March	8	13	3.81	1.975	8
April	8	11	3.645	2.075	8
May	8	14	4.125	2.22	8
June	9	17	4.35	2.855	9
July	8	13	3.605	2.25	8
August	8	18	4.125	3	10
September	7	15	3.395	2.4875	8
October	8	14	3.88	2.325	8
November	7	12	3.095	2.04	7
December	7	14	2.475	2.145	8
Totals	95	165	44	27	97

Residential and commercial Solid waste amounts for FY 22.

Solid Waste- FY 2022													
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Totals
Commercial Collection	444.20	471.42	458.35	391.80	394.95	401.62	412.88	406.83	400.34	431.17	447.85	473.55	5,134.96
Commercial Roll-Offs	134.59	173.48	166.55	156.12	170.90	128.00	98.74	135.48	110.20	796.69	124.52	150.30	2,345.57
Residential Collection	832.15	957.47	929.30	939.29	932.09	761.55	743.84	746.95	687.97	735.02	902.17	1,024.86	10,192.66
Residential Permits	389.43	409.09	395.41	362.08	316.37	186.29	144.24	162.69	221.04	296.93	376.12	419.19	3,678.88
Total Residential (Tons)	1,221.58	1,366.56	1,324.71	1,301.37	1,248.46	947.84	888.08	909.64	909.01	1,031.95	1,278.29	1,444.05	13,871.54
Total Residential Pounds	2,443,160.00	2,733,120.00	2,649,420.00	2,602,740.00	2,496,920.00	1,895,680.00	1,776,160.00	1,819,280.00	1,818,020.00	2,063,900.00	2,556,580.00	2,888,100.00	27,743,080.00
													Average
Monthly Average Per Person	72.10	80.66	78.19	76.81	73.69	55.94	52.42	53.69	53.65	60.91	75.45	85.23	68.23
Daily Average Per Person	2.40	2.60	2.52	2.56	2.38	1.86	1.69	1.73	1.92	1.96	2.51	2.75	2.24
													Average
Monthly Average Per Household	162.53	181.82	176.25	173.15	166.11	126.11	118.16	121.03	120.94	137.30	170.08	192.13	153.80
Monthly Average Per Person	80.06	89.57	86.82	85.29	81.83	62.12	58.21	59.62	59.58	67.64	83.78	94.65	75.76
Daily Average Per Person	2.67	2.89	2.80	2.84	2.64	2.07	1.88	1.92	2.13	2.18	2.79	3.05	2.49
Census Data													
2022 Population: 33,885													
Number of Households 15,032													
Per Household 2.03													