NSCC
Waste Audit Executive Summary:
2022-2023 Academic Year

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Nova Scotia Community College
Executive Summary

Annual Waste Audits for the
2022 -2023 Academic Year

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Report Date:
February 23, 2023

1   INTRODUCTION

In October and November 2022, Nova Scotia Community College (NSCC) Facilities Management completed Waste Audits at 16 buildings representing 13 campuses. The objectives of the waste audits were to:

- Determine the composition and quantities of waste being generated.

- Collect annual data for measuring the effectiveness of waste management systems; and,

- Identify areas for improving waste management systems and strategies.

1.1   Scope of Work

The following scope of work was completed as part of the Waste Audit:

- Coordination with NSCC facilities management staff to ensure that each campus held a quantity of waste before the site visit, representing the waste generated over at least 24 hours.

- Completion of a quantitative audit of the primary campus waste streams (landfill waste, compost, and recycling) to determine the current Waste Diversion Rate (WDR), Waste Capture Rates, and Waste Reduction Rates.

- Determination of an "optimum" Waste Diversion Rate (oWDR) based on accurate sorting of waste streams; and,

- Preparation of written reports for each campus with findings and general recommendations for the waste management programs at each site.

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NSCC audited the following campuses:

| Building	Location	Facility Manager	Audit Date	Building Area (ft₂)	Student Enrollment
Burridge	Yarmouth	Jamie Meister	11/17/2020	122,850	383
Shelburne	Shelburne	Jamie Meister	11/17/2020	51,736	43
Lunenburg	Bridgewater	Adam LePage	11/3/2020	140,388	289
COGS	Lawrencetown	Kevin Veinott	11/18/2020	58,700	120
Middleton	Middleton	Kevin Veinott	11/18/2020	115,000	152
Digby CLC Site	Digby	Jamie Meister	11/16/2020	21,952	38
Kingstec	Kentville	Glen Machan	11/19/2020	197,591	723
Cumberland	Springhill	Graham Allen	11/4/2020	52,796	157
Amherst CLC Site	Amherst	Graham Allen	11/4/2020	39,864	87
Pictou	Stellarton	Stuart MacDonald	11/10/2020	195,671	557
Truro	Truro	Glenn Taylor	11/20/2020	267,000	693
Marconi	Sydney	Dave Jolly	11/13/2020	233,427	929
Strait Area	Port Hawkesbury	Garett Beaton	11/12/2020	170,708	411
Ivany	Dartmouth	Darrell Stevens	11/26/2020	391,383	2286
Akerley	Dartmouth	Andrew Church	11/25/2020	281,867	913
ITC	Halifax	Robbie Isner	11/24/2020	273,094	909

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2   RESULTS

A summary of the overall Waste Diversion Rates, projected annual quantities, and relative composition of waste collected from the various campuses are included in Appendix A. The following sections include discussions and charts to illustrate the main findings of the audits.

3.1   Waste Diversion Rates

A Waste Diversion Rate (WDR) was calculated for each campus, representing the proportion of waste diverted from the landfill through recycling and composting. As shown in the Waste Diversion Rate Graph below, the WDRs ranged from a low of 44% (Pictou Campus) to a maximum of 89% (Digby Campus). The average WDR for all campuses is approximately 67%.
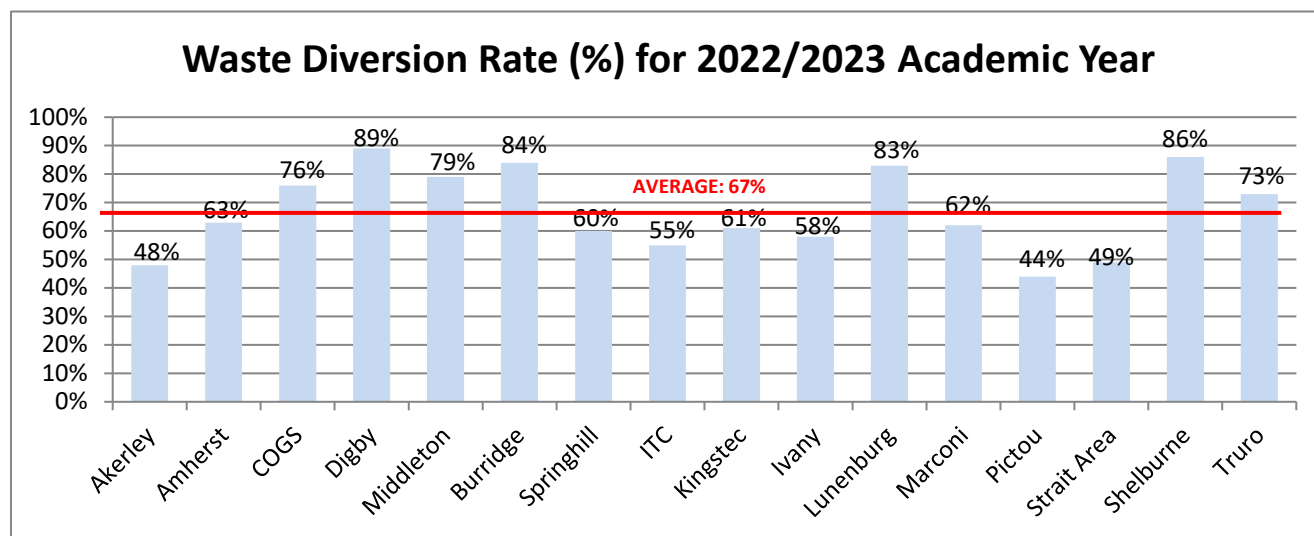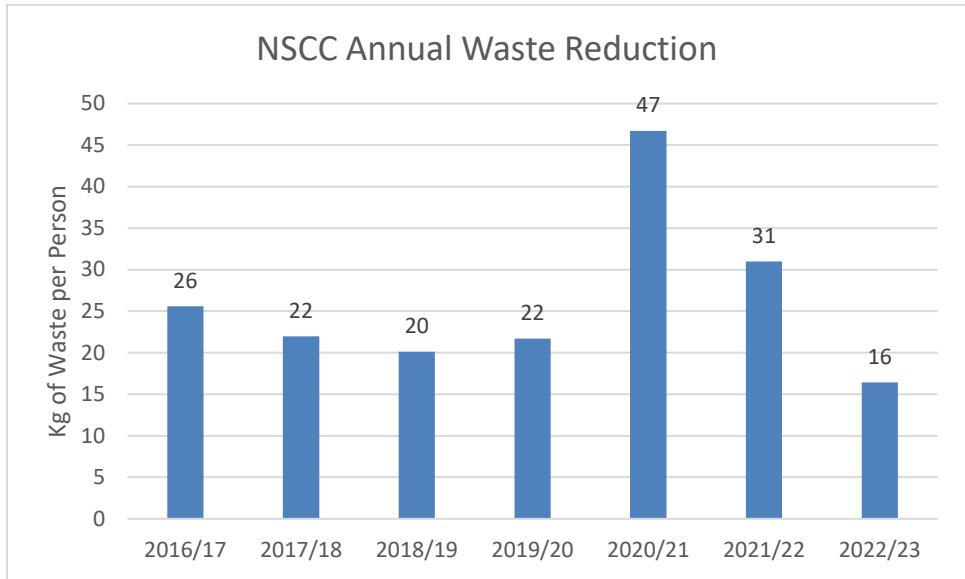

The graph below illustrates the breakdown of the waste profile into its primary waste streams (compost, recycling, and landfill). Note that the current WDR equals the total of the compost and recycling waste streams.
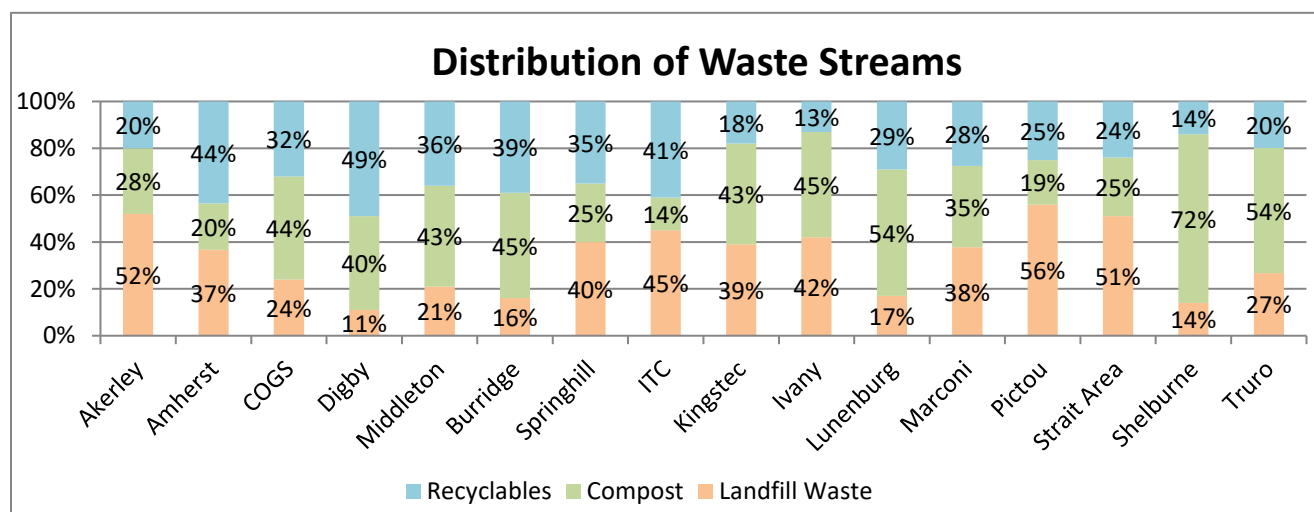
3.2   Waste Reduction

Waste reduction is measured in kilograms of waste disposed of annually by building occupants. The calculations are derived from the total student and staff population divided by the annual waste disposed of during the academic year. Each campus was assessed individually, and the College was also evaluated.

The waste reduction has decreased by 51% since the previous audit. This is primarily due to the campuses operating at full capacity compared to reduced numbers during the COVID-19 restrictions in 2020/21 and 2021/22.

NSCC Annual Waste Reduction

Year	Kg of Waste per Person
2016/17	26
2017/18	22
2018/19	20
2019/20	22
2020/21	47
2021/22	31
2022/23	16

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3.3   Contamination Levels

The accuracy of NSCC's current waste sorting practices has been evaluated by measuring the contamination present in each waste stream. Contamination represents the quantity of waste material that should have been diverted into the recycling or composting waste streams. The following graph illustrates the contamination found in the landfill waste stream.

The Shelburne and Digby Campuses reported the lowest contamination levels in their landfill waste streams. It should be noted that these campuses routinely perform secondary sorting of their waste before ultimate disposal. The campuses with the highest contamination levels in their landfill waste stream included: Strait Area, Pictou, Marconi, and Truro.

Contamination in Landfill Waste Stream (recyclable vs. compostable)

Campus	Recyclables	Compost
Pictou	11%	60%
Ivany	14%	25%
Strait Area	15%	53%
ITC	15%	34%
Marconi	15%	49%
Lunenburg	18%	39%
Akerley	13%	32%
Amherst	10%	21%
Truro	14%	52%
Springhill	6%	17%
COGS	11%	34%
Kingstec	10%	32%
Middleton		25%
Shelburne		0%
Burridge		3%
Digby		0%
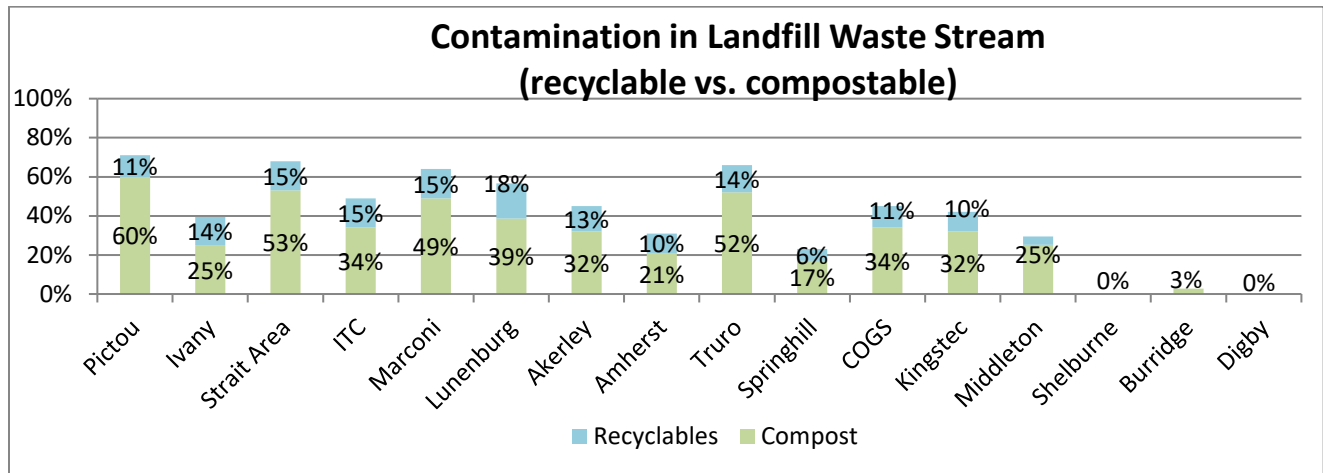
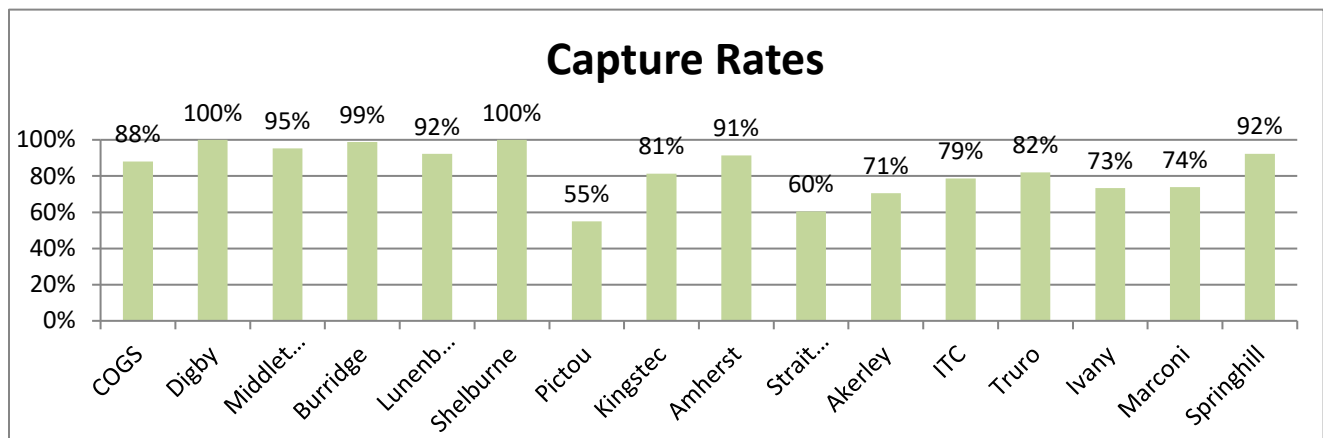## 3.4   Opportunities for Improvement

In addition to reducing overall volumes of waste generated at each campus, waste management practices can be improved by increasing the sorting accuracies of their waste streams. This will decrease contamination levels and increase Waste Diversion Rates.

Appendix A and the following chart show that "Optimum" Waste Diversion Rates (oWDR) have been calculated for each building, representing targets that could be achieved based on 100% accuracy in sorting practices. The oWDRs range from 65% to 90%. They reflect the types of waste generated at different buildings and the diversion opportunities in various geographical regions (e.g., some regional waste facilities accept disposable drink cups as compost, while others do not).

Waste Diversion Rates
Current vs. Optimum

Legend: Waste Diversion Rate (blue), Optimum Waste Diversion Rate (green)

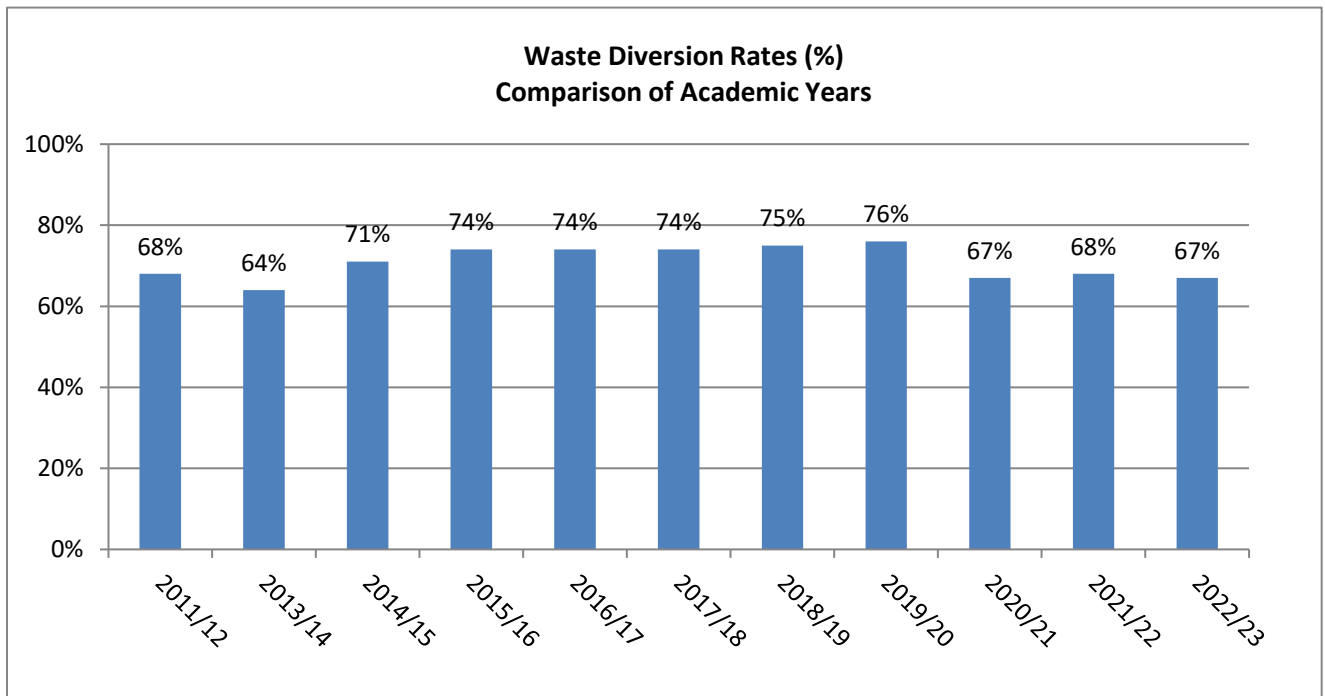| Campus	Waste Diversion Rate	Optimum Waste Diversion Rate
Akerley	48%	68%
Amherst	63%	69%
COGS	76%	86%
Digby	89%	89%
Middleton	79%	83%
Burridge	84%	84%
Springhill	60%	65%
ITC	55%	70%
Kingstec	61%	75%
Ivany	58%	79%
Lunenburg	83%	90%
Marconi	62%	84%
Pictou	44%	80%
Strait Area	49%	81%
Shelburne	86%	86%
Truro	73%	89%

The Capture Rate compares the optimum waste diversion rate (oWDR) and the waste diversion rate (WDR). By dividing the WDR by the oWDR, a percentage is determined. Where the oWDR is the maximum diversion the campus can achieve, this shows how accurate the campus' sorting is. As illustrated in the following graph, the most significant opportunities for improvements exist at the following sites: Pictou and Strait Area.

Capture Rates

Campus	Capture Rate
COGS	88%
Digby	100%
Middlet...	95%
Burridge	99%
Lunenb...	92%
Shelburne	100%
Pictou	55%
Kingstec	81%
Amherst	91%
Strait...	60%
Akerley	71%
ITC	79%
Truro	82%
Ivany	73%
Marconi	74%
Springhill	92%

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4   COMPARISONS WITH PREVIOUS AUDITS

The following section summarizes the results of the recent waste audits compared with the previous surveys conducted by WSP Consulting in 2012 and 2013 and NSCC in the next academic years.
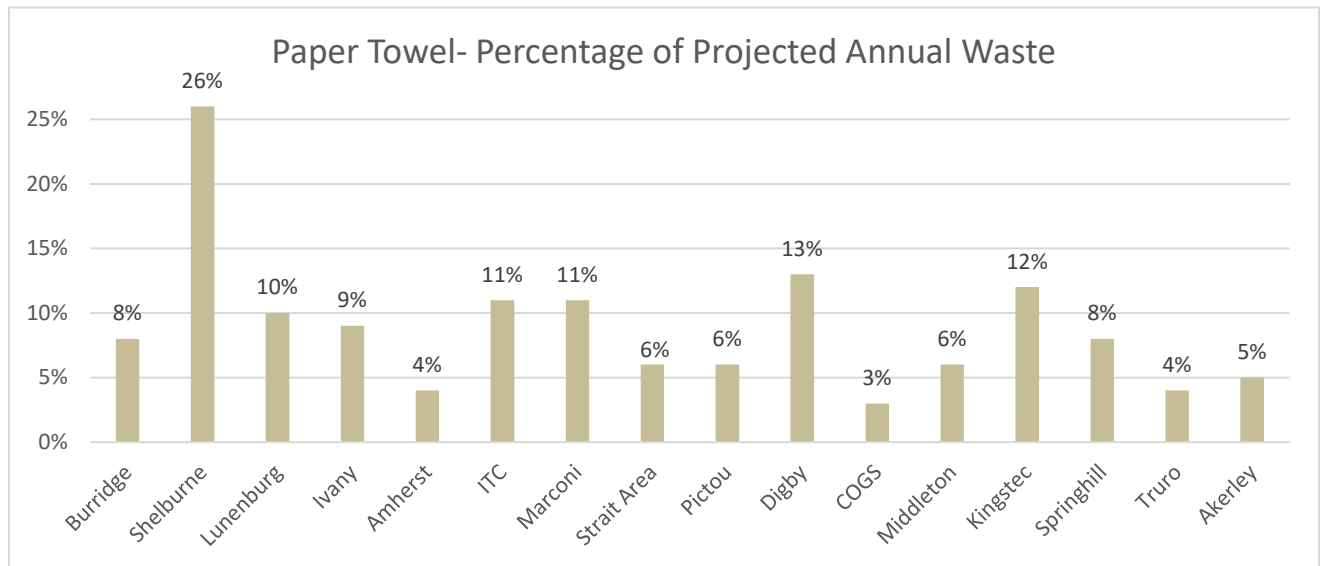
The following graph illustrates that the average waste diversion rate has decreased over the previous three academic years. Multiple campuses' waste diversion rates either remained approximately the same or decreased. The average WDR for all NSCC sites has decreased to 67%. The lower WDR is a significant decrease considering the College has maintained an average diversion rate of 74% for five academic years.

Waste Diversion Rates (%)
Comparison of Academic Years

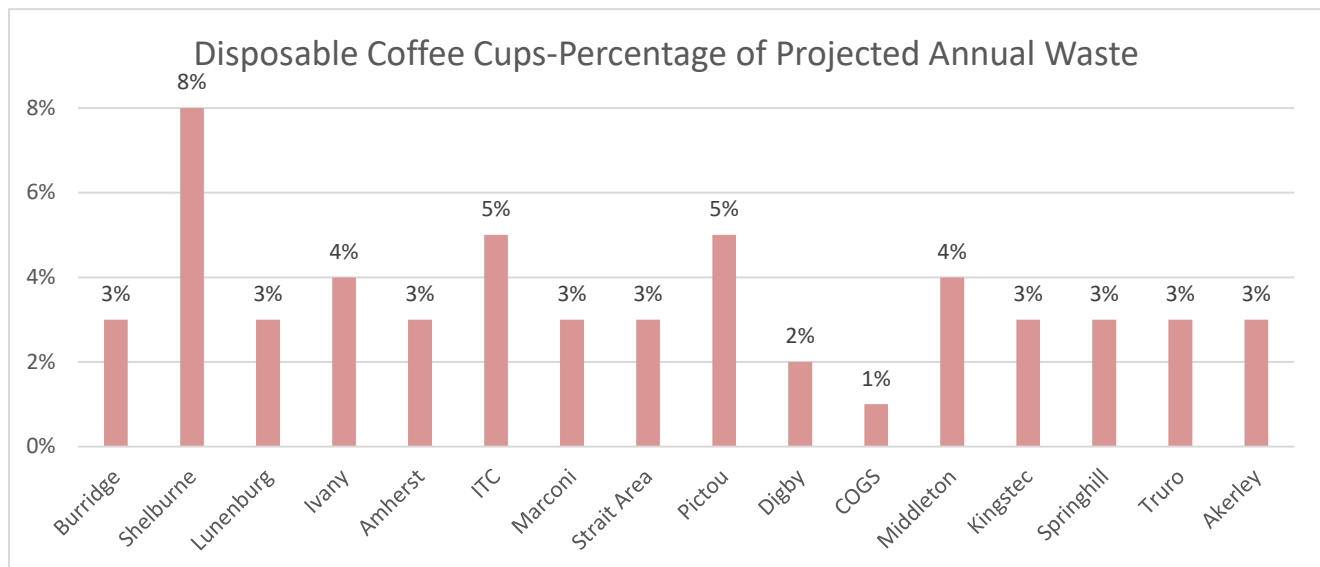| Academic Year	WDR
2011/12	68%
2013/14	64%
2014/15	71%
2015/16	74%
2016/17	74%
2017/18	74%
2018/19	75%
2019/20	76%
2020/21	67%
2021/22	68%
2022/23	67%

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5 QUANTITIES OF PAPER TOWELS AND COFFEE CUPS

Paper towels and disposable coffee cups comprise a significant portion of NSCC's waste streams. An average of 9% of NSCC's total projected annual waste was paper towels, and 4% was calculated to be disposable coffee cups.

The following chart illustrates what percentage of the audited waste at each campus was paper towels.

Paper Towel- Percentage of Projected Annual Waste

Campus	Percentage
Burridge	8%
Shelburne	26%
Lunenburg	10%
Ivany	9%
Amherst	4%
ITC	11%
Marconi	11%
Strait Area	6%
Pictou	6%
Digby	13%
COGS	3%
Middleton	6%
Kingstec	12%
Springhill	8%
Truro	4%
Akerley	5%

The following chart illustrates what percentage of the audited waste at each campus was disposable coffee cups. Coffee cups are a large portion of NSCC's waste.

Disposable Coffee Cups-Percentage of Projected Annual Waste

Campus	Percentage
Burridge	3%
Shelburne	8%
Lunenburg	3%
Ivany	4%
Amherst	3%
ITC	5%
Marconi	3%
Strait Area	3%
Pictou	5%
Digby	2%
COGS	1%
Middleton	4%
Kingstec	3%
Springhill	3%
Truro	3%
Akerley	3%

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6   CONCLUSIONS

NSCC is committed to waste reduction and sustainable operations, evident in all its campuses. Recycling and composting programs are active. Additional waste diversion programs have been implemented at some campuses (e.g., on-site composting, re-use of wood scraps, sawdust and compost being donated to local farms, etc.).

Waste Diversion Rates (WDRs) calculated for all campuses combined averaged 67%, from 44% to 89%. Improvements are possible at many of the campuses, although, in general, it can be stated that NSCC's waste diversion rate is high.

The current audit was conducted during the first fully operational academic year since COVID-19 restrictions were lifted. The average waste diversion rate has decreased from 74% to 67%.

NSCC's waste reduction has improved by 51% from 31 kg of waste to 16 kg of waste disposed of per person each year.

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7 RECOMMENDATIONS

Based on the 2022-2023 Waste Audit findings, several recommendations have been made for each NSCC-audited campus. These are described in detail in the individual campus waste audit reports. The executive summary recommendations are organized according to Education, Policy or Infrastructure Initiatives.

7.1 Education

Improvements in education and awareness should be the primary area of future focus. As with previous audits, the main recommendation is to educate the students yearly. Each campus should have outreach methods to inform the students about the proper usage of sorting stations. Examples include having the staff discuss waste practices with their students, having a booth during orientation week, and stationing staff or students at the sorting stations during lunch hour in the cafeteria. As the students are the primary users of the sorting stations (and many campuses cannot adopt a secondary sorting program), the students need to use the sorting stations effectively.

7.2 Policy

Policy-related recommendations include reviewing the waste management practices of contractors and suppliers, completing detailed reviews of waste hauling and waste billing practices, and introducing procedures focused on reducing/ eliminating prevalent single-use landfill items.

7.3 Infrastructure

Regarding infrastructure improvements, sorting stations should be organized with clear and concise eye-level signage. The signage should have photos of everyday items on each campus. They should be conveniently located in common areas on campus and be universal in nature, making them user-friendly. All campuses shall follow the same system for waste sorting and have the appropriate waste hauling dumpsters and hauling contracts to ensure all waste goes to the proper facilities.
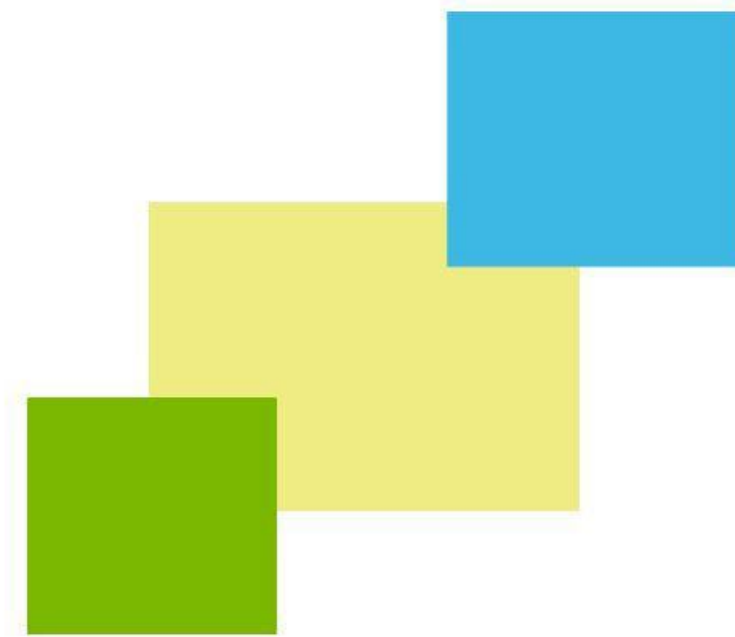
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Appendix A

Results Summary

Appendix A - Summary of Results - NSCC 2022/2023 Annual Waste Audits

Campus	Audit Summary			Projected Annual Quantities (kg)				Waste Stream Distribution			Contamination Levels		
	WDR*	Audit Quantity	Annual Multiplier**	Total	Landfill	Compost	Recycling	Landfill	Compost	Recycling	Landfill	Compost	Recycling
Burridge	84%	36	157.5	5,698	907	2,580	2,211	16%	45%	39%	2.80%	0.00%	0.00%
Shelburne	86%	10	157.5	988	139	715	134	14%	72%	14%	0.00%	0.00%	0.90%
Lunenburg	83%	57	153.75	8,825	1,531	4,769	2,525	17%	54%	29%	57.00%	3.94%	2.40%
COGS	76%	56	153.75	8,625	2056	3,787	2,783	24%	44%	32%	45.20%	0.56%	5.30%
Middleton	79%	24	153.75	1,825	377	789	660	21%	43%	36%	29.50%	2.70%	5.50%
Digby	89%	12	150	455	48	182	224	11%	40%	49%	0.00%	0.00%	0.00%
Kingstec	61%	87	157.5	13,778	5,320	5,922	2,536	39%	43%	18%	42.30%	1.40%	15.40%
Cumberland	60%	27	165	4,399	1,752	1,096	1,551	40%	25%	35%	23.30%	7.15%	23.70%
Amherst	63%	27	172.5	4,615	1,688	922	2,005	37%	20%	44%	31.00%	1.80%	18.00%
Pictou	44%	82	153.75	12,537	7,030	2,349	3,158	56%	19%	25%	70.70%	4.80%	29.92%
Truro	73%	47	159.75	7,479	1,984	4,019	1,476	27%	54%	20%	65.30%	2.13%	18.40%
Marconi	62%	131	151.5	19,774	7,460	6,869	5,445	38%	35%	28%	63.60%	1.89%	15.80%
Strait Area	49%	108	150	16,215	8,280	4,080	3,855	51%	25%	24%	68.20%	5.24%	8.90%
Ivany	58%	124	168.75	52,933	22,059	23,922	6,953	42%	45%	13%	39.50%	6.90%	21.50%
Akerley	48%	107	165	17,632	9,217	4,934	3,482	52%	28%	20%	45.00%	1.65%	23.80%
ITC	55%	52	153.75	7,977	3,598	1,082	3,296	45%	14%	41%	49.00%	17.16%	18.30%

Notes: * WDR = current Waste Diversion Rate

** annual multiplier calculated based on an approximate number of days in the year when a "full-time" student population occupies the school