

## VALLEY WASTE RESOURCE MANAGEMENT

# Wood Waste Study

Final Report



November 6, 2023

Valley Waste-Resource Management 90 Donald E. Hiltz Connector Road Kentville Industrial Park P.O. Box 895 Kentville, Nova Scotia B4N 4H8

Attention: Andrea Garrett, Project Manager

Wood Waste Study

Dillon Consulting Limited (Dillon) is pleased to submit our Wood Waste Study report to Valley Waste-Resource Management (Valley Waste). This report provides a summary of the information gathered from select wood waste management sites throughout Nova Scotia. Based on this data, as well as other available background information, the document presents key observations and recommendations related to improved diversion of wood waste materials from landfill disposal.

Should you have any questions, please feel free to contact me at <u>emance@dillon.ca</u>.

Sincerely,

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# Table of Contents

#### **Executive Summary**

1.0	Introdu	Iction	1
	1.1	Project Purpose	1
	1.2	Project Approach	1
2.0	Applica	ble Regulations and Guidelines	3
	2.1	Province of Nova Scotia	3
	2.2	Municipalities	4
	2.3	Management Regions	4
3.0	Questio	onnaire	7
	3.1	Methodology	7
	3.2	Results	9
	3.2.1	Receiving and Sorting	9
	3.2.2	Storage	10
	3.2.3	Transportation	10
	3.2.4	On-site Usage of Wood Waste	13
	3.2.5	Estimated Costs to Manage Wood Waste	13
	3.2.6	Disaster Debris Preparedness	14
4.0	Wood V	Waste Characterization	15
	4.1	Methodology	15
	4.2	Results	16
5.0	Facility	Material Flow Analysis	19
	5.1	Brush	19
	5.2	Clean, Untreated and Uncoated Wood	22
	5.3	Painted/Coated Wood	26
	5.4	Chemically Treated/Oversized Wood	27



	/		
	5.5	Pressboard/Plywood	29
6.0	Regior	nal Material Flow Analysis	31
7.0	Policie	s Supporting Wood Waste Diversion	34
	7.1	National	
	7.2	Provincial and Territorial	35
	7.3	Municipal	
9.0	Challe	nges and Opportunities for Improved Wood Waste Diversion	38
	9.1	Key Challenges	
	9.2	Key Opportunities	
	9.3	Next Steps	40

#### Figures

Figure 1: Nova Scotia's Solid Waste-Resource Management Regions	5
Figure 2: Nova Scotia C&D Facilities	8
Figure 3: Average Distribution of Wood Waste	. 18
Figure 4: Sankey Diagram for Wood Waste Material Flow	. 20
Figure 5: Brush Diverted by End Use and Available Markets in Nova Scotia	. 24
Figure 6: Clean Wood Diverted by End Use and Available Markets in Nova Scotia	. 25
Figure 7: Diverted vs. Disposed Wood Waste by Category	. 33

#### Tables

Table 1: Tipping Fees from Participating Facilities (\$/tonne)	11
Table 2: Costs to Manage Wood Waste	13
Table 3: Summary of Wood Waste Characterization Results	17
Table 4: Percentage of Wood Waste in Mixed C&D Stream	18
Table 5: Brush Diverted by End Use	21
Table 6: Clean Wood Diverted by End Use	23
Table 7: Painted Wood Diverted by End Use	26
Table 8: Chemically Treated/Oversized Wood Diverted by End Use	28
Table 9: Pressboard/Plywood Diverted by End Use	29
Table 10: Quantities of Wood Waste by Material Category	31
Table 11: Estimated Regional Diversion and Disposal Rates	32
Table 12: Estimated Diversion and Disposal by Waste Category	32



#### Appendices

- A Meeting Minutes Project Initiation Meeting
- B Site Visit Reports

#### Contacts

# **Executive Summary**

Valley Waste-Resource Management (Valley Waste) initiated the Wood Waste Study (Study) with the goal of gaining a better understanding of how wood waste is being managed throughout Nova Scotia. The project focused on understanding the quantity and composition of a select number of types of

wood waste (see inset) in the province, while seeking to identify efficiencies in wood waste management, including increased opportunities for diverting wood waste from landfill. The intent of the study was to support collaboration between waste regions, waste facilities, and construction and demolition (C&D) material disposal sites by identifying stable and sustainable markets for wood waste. With a focus on Nova Scotia, a final objective was the identification of a set of best practices for wood waste management.

#### Categories of Wood Waste of Interest

- 1. Brush
- 2. Clean/untreated/uncoated wood
- 3. Painted/coated wood
- 4. Chemically treated wood originating from:
  - a. Residential sources
  - b. Commercial sources
  - c. Oversized
- 5. Pressboard/plywood

In Nova Scotia, wood waste materials are typically managed as part of the C&D waste stream. The requirements for the design and operation of C&D management facilities fall under the province and individual municipalities, as follows:

- **Province of Nova Scotia:** In July 2023, the Nova Scotia Department of Environment and Climate Change (NSECC) issued the *Solid Waste Guidelines for Construction and Demolition Debris Storage, Transfer, Process and Disposal;*
- Municipalities: Individual municipalities can establish bylaws and policies related to the establishment and operation of solid waste management facilities. The Halifax Regional Municipality (HRM) is unique in its establishment of a licensing and reporting regime for C&D management facilities, including a prescribed operational and diversion performance requirement; and
- Management regions: Each of Nova Scotia's seven Solid Waste-Resource Management Regions is represented on the Regional Chairs Committee and oversees reporting of diversion and disposal tonnages to Divert NS. Divert NS uses funds to enhance waste diversion performance within the province through efforts related to education, collaboration, pilot project funding and research.

To gain an understanding of wood waste management, diversion, and disposal in Nova Scotia, Dillon, using a list provided by Valley Waste, distributed a questionnaire to 29 C&D facilities in the province. The questionnaire asked facilities to share specifics regarding their facility type, quantities and characterization of wood waste, handling and facility operations, end markets and disposal destinations, costs and factors influencing fees, and disaster debris management. Completed questionnaires were received from 13 facilities representing six of the seven solid waste-resource management regions.

These responses provided valuable insights into current practices and challenges related to the management and diversion of wood waste in the province.

A waste characterization field program involving eight facilities was undertaken to gain an understanding of the proportion of the wood waste categories of interest received and managed by C&D facilities in the province. Through the field program, an average distribution of wood waste by category was estimated, as illustrated in Figure ES-1. The percentage of wood waste present in the Mixed C&D stream was found to average approximately 49.9%.



Based on the responses to the questionnaires and the results of the waste characterization study, Material flow diagrams were developed to illustrate the estimated generated, diverted, and disposed quantities as well as end markets for each of the major wood waste categories of interest at the facility level. The results of the material flow analyses indicated that most of the diversion occurring is for brush and clean wood, with these streams being chipped and used on-site (landfill cover, compost amendment/biofilter) or being transported off-site for biomass. Some additional diversion is occurring across all wood waste streams as part of Reuse Centres or local reuse initiatives (e.g., farmers making use of old telephone poles).

Dillon obtained additional data from Divert NS's public portal and Halifax Regional Municipality (HRM) to develop an understanding of wood waste flow at the regional level. Making use of this data along with the facility-specific information collected as part of this study, an estimated total of 54,054 tonnes of wood waste is generated (on average) in Nova Scotia each year. Out of this total, approximately half (26,568 tonnes) is diverted.



Through the completion of this study, a select number of challenges to achieving improved diversion of wood waste from disposal in Nova Scotia were identified, as follows:

- Limited regulatory obligations: There are no specific provincial stipulations defining categorization and reporting requirements associated with the management of wood wastes. This limits the ability to establish a clear understanding of the quality and quantity of these potentially divertible materials;
- **Partial use of differential tipping fees:** There is a lack of widespread financial incentives for source separation of wood waste at the facility level;
- **Processing, storage and end markets limitations:** Facilities generally lack the necessary equipment on-site to process chipped wood waste for various end-use applications. Relying on third parties can present challenges with regards to scheduling and storage; and
- **Urban/rural practices:** Different population densities necessitate different approaches. Progressive policies, as established within HRM, while appropriate and effective for their unique context, are not necessarily practical or applicable in all areas of the province.

In recognition of the primary challenges noted above, and acknowledging best practice approaches identified during the course of this study, the following opportunities were identified for enhancing the diversion of wood waste materials in Nova Scotia:

- Enhanced regional collaboration: The Regional Chairs Committee can promote collaboration opportunities amongst regions, including: 1) standardization of wood waste management categorization and record keeping protocols, 2) investigating the acquisition of a mobile grinding unit complete with an identified host municipality and shared use agreement, 3) investigating and approaching other industries (e.g., forestry) to seek efficiencies and/or collaboration opportunities and 4) direct engagement with Divert NS regarding specific funding support opportunities associated with improved wood waste diversion (e.g., including mobile grinder capital and operating costs, identifying/securing viable end markets and research to investigate innovative diversion opportunities);
- **Preferential tipping fees:** Incentivising customers to bring in pre-sorted loads of wood waste and having dedicated stockpiles for the types received could increase diversion with relatively low facility effort;
- Direct-to-stockpile: Having a clean wood stockpile area is a relatively low effort management practice that supports increased diversion by incentivising customers to pre-sort materials;
- Drop-off procedures: Clarity, consistency and supervision of customers are valuable practices in relation to public drop-off and sorting of materials;
- **Dedicated tipping areas and sorting staff:** Having a defined tipping area with staff dedicated to sorting is a technique that can lead to increased diversion;
- Sorting material on the working face: Sorting of mixed C&D wood waste material by site staff at the working face of the C&D landfill could create efficiencies and increase diversion for facilities that do not have staff capacity to accept and sort material in multiple locations; and



• Controlled public access to segregated materials: At locations where wood wastes are segregated, providing an opportunity for the public to access select materials for off-site use.

As a first step towards implementing some of the actions or opportunities identified above, it is recommended that Regional Chairs meet to review and discuss the findings presented in this report, focusing on multi-regional collaboration and defining a potential path forward. This initial effort would serve as a foundation to the future assessment of more detailed actions, including standardization of data collection procedures and the shared use of specialized processing equipment. Additionally, it is recommended that the Regional Chairs meet with NSECC to present the findings from this study and to work collaboratively on policy/regulatory changes that could be enacted in support of shared goals.



# 1.0 Introduction

## 1.1 Project Purpose

Valley Waste-Resource Management (Valley Waste) initiated the Wood Waste Study (Study) with the goal of gaining a better understanding of how wood waste is being managed throughout Nova Scotia. Specifically, there were five objectives of the study:

- 1. Identify the quantities and composition of wood waste in Nova Scotia;
- 2. Foster collaborative partnerships to explore stable end markets for wood waste;
- 3. Support the development of a more sustainable diversion market for different categories of wood waste;
- 4. Develop a set of best practices for the management of wood waste; and
- 5. Communicate findings of the Wood Waste Study to all stakeholders.

The project focused on understanding the quantity and composition of a select number of types of wood waste (see inset) in the province, while seeking to identify efficiencies in wood waste management, including increased opportunities for diverting wood waste from landfill. The intent of the study was to support collaboration between waste regions, waste facilities, and construction and demolition (C&D) material disposal sites by identifying stable and sustainable markets for wood waste. With a

#### Categories of Wood Waste of Interest

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focus on Nova Scotia, a final objective was the identification of a set of best practices for wood waste management.

## 1.2 Project Approach

In order to fulfil the objectives of the project, the work was completed through the following three phases:

- 1. Project Planning and Management;
- 2. Data Collection; and
- 3. Research and Reporting.

A project initiation meeting was held on May 10, 2023, that served to review and confirm the project objectives, methodology, schedule and project management related topics. Meeting minutes are provided in Appendix A.



Data collection was completed through a questionnaire and field sampling of select waste facilities that receive and manage wood waste. Research and review of background information was conducted to further the understanding of how wood waste is managed in the province. Analysis was completed to estimate the quantity and composition of wood waste in the province, identify challenges and efficiencies in wood waste management, and identify opportunities for diverting wood waste from landfill.

# 2.0 Applicable Regulations and Guidelines

In Nova Scotia, wood waste materials are typically managed as a component of the C&D material waste stream. Requirements for the design and operation of C&D material management facilities in Nova Scotia fall under two primary jurisdictions: the province and individual municipalities. The following section summarizes the key roles and responsibilities of these two entities, with a focus on elements related to the management of wood waste materials.

### 2.1 **Province of Nova Scotia**

Under Nova Scotia's Environment Act, the Province has established a number of regulations and guidelines that are relevant to the management of wood waste materials. The Nova Scotia Department of Environment and Climate Change (NSECC) is responsible for the enforcement of requirements under the Act. Notably, the Solid Waste-Resource Regulations include wood waste materials within the overall definition of "construction and demolition debris;"

...materials which are normally used in the construction of buildings, structures, roadways, walls and other landscaping material, and includes, but is not limited to, soil, asphalt, brick, mortar, drywall, plaster, cellulose, fibreglass fibres, gyproc, lumber, wood, asphalt shingles, and metals.

In July 2023, NSECC issued a document entitled *Solid Waste Management Guidelines for Construction and Demolition Debris Storage, Transfer, Process and Disposal.* This document represented an updated and expanded version of a previous C&D material management guideline (focused on disposal site siting and operations) issued by the province in 1998.

The 2023 NSECC guidelines are quite prescriptive in terms of the siting, design and operational requirements for C&D material (and thus wood waste) management facilities. Key obligations, which must be met to receive Provincial Approval to construct or expand a C&D management facility, include the following:

- Compliance with local municipal zoning requirements;
- Meeting facility set back/separation distance stipulations;
- Design and certification following construction by a professional engineer;
- Defined infrastructure components including groundwater monitoring wells, scales, access controls and signage;
- Incoming material inspection/rejection/management and record keeping protocols;
- A groundwater, surface water and leachate monitoring program;
- Material stockpile (including lumber, brush, wood chips and pallets) size and separation distance limits;



- Liner and capping design requirements if the facility includes a landfill disposal cell; and
- Financial security, insurance and reporting requirements.

With respect to wood waste materials, in addition to storage pile size and separation distance stipulations, the 2023 guidelines include obligations related the management of treated wood, defined as "wood chemically treated during manufacturing for the purpose of resisting decay." The guidelines stipulate that as of July 5, 2023, treated wood was banned from all C&D facilities in Nova Scotia. Appendix C of the guidelines provides details on a staged compliance approach for the treated wood materials. It is noted that the guidelines state that treated wood can be accepted at C&D facilities for storage, transfer and processing, but can only be accepted for disposal with written authorization from NSECC.

## 2.2 Municipalities

Municipalities in Nova Scotia are obliged to provide solid waste management services to their residents, consistent with requirements under the Municipal Government Act. The Act also gives individual municipalities the ability to establish bylaws and policies related to the establishment and operation of solid waste management facilities, including those accepting wood waste materials. While specific requirements vary throughout the province, municipal planning approval and zoning stipulations are often applicable to existing and proposed wood waste (often as a component of the C&D stream) management facilities.

The Halifax Regional Municipality (HRM) is unique in its establishment of a licensing and reporting regime for C&D material management facilities, including transfer stations, processing sites and landfills. HRM has prescribed specific operational and diversion performance requirements as a licensing stipulation. Further discussion on HRM's C&D management requirements is included in Section 7.3.

## 2.3 Management Regions

In Nova Scotia, municipalities are required to report annual solid waste diversion and disposal tonnage information, including C&D waste, to Divert NS. In some instances, and in accordance with the province's seven defined waste management regions (see Figure 1), regional representatives consolidate information from individual municipalities in support of the reporting effort. In other cases, municipalities provide their annual tonnage data directly to Divert NS. The regions were originally established in 1996 as a component of Nova Scotia's Solid Waste-Resource Management Regulations. Each region is represented by a regional chair. A Regional Chairs Committee was established in 1998 to provide a communication channel for elected officials at the regional level (the municipalities) and the provincial level; Department of Municipal Affairs, the Nova Scotia Federation of Municipalities (NSFM), NSECC and Divert NS.





### VALLEY WASTE RESOURCE MANAGEMENT

NOVA SCOTIA WOOD WASTE STUDY

#### WASTE REGIONS OF NOVA SCOTIA

FIGURE 1

•	City/Town
	1 - Cape Breton Region
	2 - Eastern Region
	3 - Northern Region
	4 - Halifax Region
	5 - Valley Region
	6- South Shore/West Hants Region
	7 - Western Region
	USA
	Atlantic Ocean
	Canada



Based on reported annual diversion performance from each region and using a portion of the funds generated through the province's beverage container and used tire programs, Divert NS administers a diversion credits program. Beyond the credits program, collected funds are also used to enhance waste diversion performance within the province through efforts related to education, collaboration, pilot project funding and research. Over the last several years, opportunities to identify practical opportunities to divert C&D materials (including wood wastes) from disposal have been a noted area of focus.



# 3.0 **Questionnaire**

To obtain an understanding of wood waste management, diversion, and disposal in Nova Scotia, a questionnaire was distributed to all C&D facilities in the province. The following section outlines the overall methodology and key results from the questionnaire.

## 3.1 Methodology

Valley Waste provided contact information for 29 waste facilities (both public and private) that accept wood waste in Nova Scotia (Figure 2). Dillon subsequently prepared an introductory email and a Microsoft Excel-based questionnaire. The facility contacts were emailed by Dillon in late May 2023 explaining the purpose of the project, the types of information requested as well as attaching the questionnaire itself. Contacts were asked to populate and return the completed questionnaires to Dillon by mid-June.

The information request was in the form of a standardized questionnaire that was developed to gain an understanding of the types and quantities of wood waste managed, operational procedures of wood waste management, end markets for wood waste, and wood waste management challenges. The questionnaire was broken out into six parts as follows:

- Administrative: name of facility, type of facility, operator, and contact information;
- **Quantities and Characterization:** Wood waste characterization and quantities data including current and historic wood waste tonnages from 2017-2022 (by wood type);
- Handling and Facility Operations: Operational approaches to receiving, sorting, storage, transportation, recycling/diverting, and disposal of wood waste;
- End Markets and Disposal Destinations: End markets and disposal destinations of wood waste including quantity estimates for end market types (i.e., reuse, recycle, recovery), and challenges and opportunities for wood waste diversion;
- Costs and Factors Influencing Fees: Costs associated with managing, transporting, diverting and/or disposing wood waste; and
- Disaster Debris Management: Measures taken to address disaster debris management and the impacts of Hurricane Fiona on site operations and wood waste quantities and management.

Dillon extended the questionnaire deadline to mid-July and followed up twice with each participating facility to encourage the participation and provision of data. It is noted that Nova Scotia had been subject to major natural disaster events prior to and during the project. This resulted in fewer waste facilities having the time and ability to participate in the project which reduced the number of questionnaires received. Completed questionnaires were received from 13 waste facilities, representing six of the seven solid waste-resource management regions (45% participation rate).





### VALLEY WASTE RESOURCE MANAGEMENT

NOVA SCOTIA WOOD WASTE STUDY

### WASTE FACILITY LOCATIONS OF NOVA SCOTIA

FIGURE 2





Information and data received through the questionnaire was supplemented by follow-up communication with facility contacts and general research. The information presented in this section is based on the responses received to the questionnaire and represents our understanding of general wood waste management practices for the participating facilities at the time of the study.

### 3.2 Results

The following section provides an overview of the responses received from the questionnaire, focusing on facility operation, fees, and disaster debris preparedness. It is noted that end markets and diversion are discussed as part of Section 5.

#### 3.2.1 Receiving and Sorting

With the exception of brush, wood waste is most often received as part of the general mixed C&D waste stream. Approximately half of the participating facilities reported not sorting wood waste from the mixed C&D waste stream due to challenges associated with lack of capacity for staff and equipment, space constraints, availability of end markets and operational cost.

The following provides a summary of the general receiving and sorting procedures for wood waste at the participating facilities:

- Direct to stockpile: This method includes directing customers to deposit pre-sorted categories to the appropriate stockpiles. Eleven of the facilities indicated using this form of receiving for leaf and yard waste (including brush). Six facilities indicated use of this method for pre-sorted clean wood and two facilities indicated use of this method for treated, painted, or glued wood (or 'dirty' wood);
- Sorting on the working face: Two C&D landfills sort mixed C&D on the working face of the C&D cell using an excavator. One of the facilities noted that this approach benefits them by having both sorting and working face management occurring in the same area by one operator, allowing them to switch tasks easily based on workflow demands;
- Tipping areas (not on the landfill face): Five facilities use tipping areas that are not located on the working face of the landfill to sort mixed waste streams. Generally, the scale house directs the customer to the tipping area where facility staff sort the waste either by hand or using machinery. The degree of sorting varies by facility. One challenge noted at a facility that sorts by hand is safety concerns due to handling heavy materials and/or hazardous materials; and
- Public drop off area: Two facilities indicated using public drop off bins to sort wood waste. In this case, the public is responsible for sorting their materials into labelled bins.

Multiple facilities noted the positive affect of having staff in public sorting and drop off areas. Even if the staff weren't actively involved in the unloading or sorting, their presence is thought to improve the public's compliance with proper unloading and sorting.



Multiple facilities have preferential tipping fees for sorted wood, most commonly for brush (yard and garden waste) and clean/uncoated/untreated wood. Table 1 provides an overview of the tipping fees associated with wood waste at the participating facilities. Tipping fee rates are presented as fee (\$) per tonne. Facilities note that offering lower tipping fees for pre-sorted materials has been an effective approach for supporting diversion initiatives.

#### 3.2.2 Storage

Facilities that segregate or sort their wood waste most often store the material in stockpiles. Some notable observations on storage procedures included the following:

- One facility stores brush and clean wood separately, even though the materials are now diverted to the same location (they were originally going to different end markets). This strategy is advantageous in the case that the facility needs to change the end market for either material, in addition to keeping consistency with the public on facility operations; and
- One facility that stores "good condition" wood for resale was initially keeping the diverted wood in stockpiles; however, the piles would often get confused by the public or site operators and inadvertently mixed with other materials. The facility invested in portable storage racks and have found this to be a successful approach to managing the wood.

A challenge raised by several facilities was the space needed to store the wood. One facility reported that their small footprint creates a barrier to storage when considering NSECC regulations, fire code requirements, Town Bylaws and approvals. Further, scheduling contracted chipping services was identified as a contributor to this challenge, as availability constraints could mean long waits between visits.

#### 3.2.3 Transportation

Facilities were asked to share the details regarding their operational procedures for preparing wood waste for transport. Commonly, for wood being diverted, chipping and transportation services are contracted. The contractor chips the material on site prior to transporting. Halifax C&D Recycling Ltd. (Halifax C&D) is often engaged for this task and includes sourcing an end market for the material. It was reported that SF Rendering Ltd. (SF Rendering) used to be an end market for diverted clean wood that would chip the wood upon receipt. SF Rendering suffered a fire recently, and it is uncertain if they will continue to accept material in the future. Identifying end markets that do not require material to be chipped prior to sending is valuable due to the challenges in scheduling on-site chipping services.



Facility Type	Org. Type	Facility	Mixed C&D	Sorted C&D*	Sorted Clean Wood	Sorted Brush**	Notes	
		Richmond Solid Waste Management Facility	90	50	Not specified	Not specified	Fees are for ICI loads greater than 200 kg	
		Baddeck Waste Management Facility	85	Not specified	Not specified	40	Leaf and Yard Waste, not brush	
		Region of Queens Waste Management Facility	Region of Queens Waste 68.05 0/42.08 Management (65.04) Facility		/42.08 65.04)	Not Specified	Residential/commercial (generated outside of Queens County)	
C&D Landfill	Public	Kaizer Meadow Solid Waste Management Facility	60	Not specified	0 35 38.29 40	Not specified	Wood: residents of the Municipality of Chester (MOC) below the maximum limit Wood: MOC for commercial sources and for residents over max Wood: town of Lunenburg – intermittent dirt wood Wood: coming from outside MOC	
		Yarmouth County Solid Waste Park	128.50	Not specified	58.70	0	Wood: Sorted Clean or painted/plywood/treated	
			Colchester Waste Management Park	75 113	35	35	35	Mixed C&D – to public sorting bin or direct to C&D landfill Mixed C&D – mixed with MSW or to tipping area
		East Hants Waste Management Centre <sup>2</sup>	100/97 (125)	70/68 (95)	Not specified	Not specified	East Hants Commercial & Industrial Gate Fee/East Hants Commercial & Industrial Account Holder Rate (External Residential, Commercial & Industrial)	
			Pictou County Solid Waste	75 55	Not specified	Scaled as mixed C&D	Not Specified	Mixed C&D: 75 typical rate

Valley Waste Resource Management Wood Waste Study - Final Report November 2023 – 23-6152



Facility Type	Org. Type	Facility	Mixed C&D	Sorted C&D*	Sorted Clean Wood	Sorted Brush**	Notes	
		Management Facility					Mixed C&D: 55 for large disposal job (i.e., house, bridge, wharf demolition)	
	Private	Guysborough Waste Management Facility	91.60	Not Specified	NA	46	Municipal residents and commercial don't pay a tipping fee	
		Cumberland Central Landfill	89.01	Not Specified	36.44	0		
	<sup>.r</sup> Public	Valley East Management Centre	135/179		75/100		Authority members <sup>1</sup> /non-members Minimum fee: 10.00	
Transfer Station		Valley West Management Centre	135/179		75/100		Authority members <sup>1</sup> /non-members Minimum fee: 10.00	
3141011		Lunenburg Regional Community Recycling Centre	120.25/ 171.75	NA	96/150 176.50/206 216.25/263.25	44/93.50	Wood: Untreated Wood: Painted, Stained Plywood Wood: pressure treated All: partner municipalities/outside partner municipalities boundaries	

#### Notes:

\* Sorted C&D can be separately delivered lumber, wood products, asphalt, gypsum or other sorted C&D waste material.

\*\* Sorted brush might include yard and garden waste.



### 3.2.4 On-site Usage of Wood Waste

Reported on-site usage for diversion of wood waste included the following:

- Use of chipped clean wood and/or brush at on-site compost facilities (used for biofilters, bulking agent, and for odour control);
- Use of chipped wood in landfill cover;
- Use of chipped wood as the underpad for future lifts in a C&D landfill cell;
- Reuse of pallets for on-site storage and transportation of electronics and Household Hazardous Waste (HHW); and
- Use of telephone poles as onsite barriers or area delineating features.

#### 3.2.5 Estimated Costs to Manage Wood Waste

Select facilities shared costs and details related to the management of wood waste at their sites, including processing, transportation, and disposal. Table 2 provides a summary of the information provided. As illustrated in the table, cost information is defined in a variety of ways amongst the reporting locations, illustrative of the challenge of characterizing current management approaches of Nova Scotia's wood waste stream.

#### Table 2: Costs to Manage Wood Waste

Regions	Facility Name	Costs to Manage Wood Waste			
1	Baddeck Waste Management Facility	C&D is hauled to Baddeck or Guysborough, \$100,000 (minimum)			
2	Guysborough Waste Management Facility	The facility eliminated the cost associated with grinding the C&D for landfill cover by simply direct hauling it to the active landfill face and using the landfill compactor as our grinder, this goes for all the below items			
2	Pictou County Solid Waste Management Facility	Brush and Clean wood waste: Chipping \$500-\$1000 per hour			
3	Colchester Waste Management Park	Brush, clean wood, painted/coated wood, and pressboard/plywood: \$30-\$35 per tonne to grind and remove from the site			
3	Cumberland Central Landfill	Brush and Clean wood waste: \$20 - \$40 per tonne			
5	Valley East and West Management Centres	<ul> <li>Brush &amp; Clean wood for grinding (2021 to present ~\$25-\$30 per tonne), with transportation free to SF Rendering. Pre 2020, processing and transportation costs by Halifax C&amp;D: ~\$25-\$30 per tonne</li> <li>Painted/coated wood: Transported to 2nd generation landfill as-is @ ~\$80 per Tonne (tip fees + transport fees)</li> </ul>			



Regions	Facility Name	Costs to Manage Wood Waste
6	Kaizer Meadow Solid Waste Management Facility	Clean/untreated/uncoated wood: Chipping \$500-\$1000 per hour
6	Lunenburg Regional Community Recycling Centre	<ul> <li>Brush: \$32.50 grinding, transport: \$0.00 to Brooklyn Energy or \$20.00 to Port Hawkesbury</li> <li>Painted/coated wood: \$25.00 disposal, \$17.35 transportation</li> <li>Chemically treated wood: \$54.44 disposal, \$17.35 transportation</li> <li>Pressboard/plywood: \$32.50 grinding, \$25.00 disposal, \$17.35 transportation</li> </ul>
6	Region of Queens Waste Management Facility	Cost of operating the C&D Landfill for fiscal year 2021-22 was approximately \$150,000. Roughly 65% of this could be attributed to the management, diversion, and disposing of wood waste.
7	Yarmouth County SW Park	Brush: the cost to chip \$8,000 Clean/untreated/uncoated wood: \$60,000 for chipping of all wood products

#### *3.2.6* Disaster Debris Preparedness

Extreme weather events and natural disasters can have a dramatic impact on wood waste quantities and flow. Although most participating facilities reported not having disaster debris management plans in place, many of those contacted confirmed that such plans were considered a priority given recent challenges managing materials during and after disaster events.

As a recent example, Hurricane Fiona made landfall in Nova Scotia on September 24, 2022, and resulted in large quantities of debris, primarily trees and brush, being transported to C&D facilities province-wide. Although most participating facilities did not track storm debris separately, the Colchester Waste Management Facility reported 10,853 tonnes of wood debris received as a result of the hurricane. This resulted in the annual tonnage of wood waste received at the site in 2022 being three to four times higher than what would be recorded in a typical year. It was further noted by multiple facilities that impacts from the hurricane persisted into 2023, with debris still being brought in for disposal.

Diversion practices can be impacted when large volumes of debris are accepted following a disaster event. A substantial influx of material can lead to clean waste streams being mixed with "dirty," and challenges related to resources and space requirements. Robust planning is needed to ensure that fluctuations in quantities do not unduly impact diversion activities and markets.



# 4.0 Wood Waste Characterization

To obtain an understanding of the proportion of the wood waste categories of interest received and managed by waste facilities, a wood waste characterization field program was completed. The following section outlines the overall approach and results from the field program.

## 4.1 Methodology

Valley Waste identified eight facilities that were interested and available to participate in the field program (see Figure 2 above). The participating facilities were as follows:

- 1. Pictou County Solid Waste Management Facility (Region 2);
- 2. Colchester Waste Management Park (Region 3);
- 3. Cumberland Central Landfill (Region 3);
- 4. East Hants Waste Management Centre (Region 3);
- 5. Valley Waste Western Waste Management Centre (Region 5);
- 6. Valley Waste Eastern Waste Management Centre (Region 5);
- 7. Lunenburg Regional Community Recycling Centre (Region 6); and
- 8. Yarmouth County Solid Waste Park (Region 7).

The field program also provided an opportunity to have discussions with site managers and staff to develop an understanding of site operations and get further insight into the challenges and opportunities of wood waste management.

In the project kickoff meeting, it was communicated that acceptance and sorting operations for each facility are unique, thus requiring flexibility in the method for collecting wood waste characterization data through the field program. It was also pointed out that material accepted at the facilities can fluctuate week-to-week which is typical of this sector and type of waste received. Generally, the methodology for the characterization involved the following steps with some deviations based on individual site operational practices:

- Facility staff collected, stored, and separated wood waste over a period of four to six days;
- Facility staff separated wood waste into individual piles according to the wood waste categories:
  - Dillon staff conducted a visual assessment of the separated materials and furthered understanding through discussions with site staff. Some adjustments to the piles were made.
- The facilities recorded the weights for each wood waste category and provided the data to Dillon. Not all facilities could weigh the materials on the day of the site visit due to operational capacity, scale issues or site workflow;
- The facilities sent scale data for the sorted waste categories received during the collection period to Dillon; and



• The facilities sent scale data for their mixed C&D waste streams recorded during the collection period to Dillon.

Dillon worked with facilities to adjust the characterization study methodology to meet facility constraints including sorting capability, space restrictions for sorting and stockpiling, staff availability, and limiting disruption of normal operations. Common adjustments to the methodology included the following:

- No separation of residentially generated vs. commercially generated treated wood;
- Many facilities that accept brush as a pre-sorted category during regular operations continued with their regular management of it (usually sending directly to a long-term stockpile area) and scale quantities of brush received were sent to Dillon; and
- Obtaining data over a defined period either through auditing select C&D loads (in the case of facilities that do not stockpile for an extended period) or by weighing pre-existing stockpiles.

It is noted that a site visit was not completed for the Lunenburg Regional Community Recycling Centre. The Recycling Centre had stockpiled wood waste materials over the period of January 2022 to the end of May 2023 and segregated it into the following categories: brush, clean/untreated wood, painted wood and plywood, residential pressure treated wood, and commercial pressure treated (oversized) wood. The Lunenburg Joint Services Board provided Dillon with weights for the stockpiled materials along with scale data for their mixed C&D stream.

## 4.2 Results

Site visit reports were prepared for the eight participating facilities that document when the site visit occurred, results from the waste characterization study, observations regarding site operations, and information gathered through discussions with site staff. The site visit reports are provided in Appendix B.

A summary of the distribution of wood waste by category for each of the participating facilities is presented in Table 3. A provincial average has been estimated based on the data from each facility, as illustrated in Figure 3.



Facility (Waste Region)	Brush (%)	Clean Wood (%)	Treated Wood – Residential (%)	Treated Wood – Commercial (%)	Treated Wood – Oversized (%)	Painted/ Coated Wood (%)	Pressboard/ Plywood (%)
Pictou County Solid Waste Management Facility (2)	22.2	15.1	17.1		10.0	27.4	8.1
Colchester Waste Management Park (3)	8.8	29.4	32.3		3.1	14.9	11.6
Cumberland Central Landfill (3)	15.0	43.6	12.7		2.6	18.1	8.0
East Hants Waste Management Centre <sup>1</sup> (3)	-	-	-	-	-	-	-
Valley Waste Western Waste Management Centre (5)	21.8	14.1	6.3		0	57.2	0.5
Valley Waste Eastern Waste Management Centre (5)	11.7	21.2	27.8		3.04	22.4	13.9
Lunenburg Regional Community Recycling Centre <sup>2</sup> (6)	3.7	36.3	2.7 8.9		)		48.5
Yarmouth County Solid Waste Park (7)	8.5	44.2	13.5	6.7	0	14.6	12.4
Average	14.7	27.9	19.4		3.1	25.8	9.1

Table 3: Summary of Wood Waste Characterization I	Results
---	---------

Notes:

1 – Percentages were not available from East Hants due to the methodology of the wood waste characterization undertaken for the facility.

2 – Lunenburg data was not included in the averages, as the distribution of wood types did not align with the categories selected for this study.





The percentage of wood waste present in the Mixed C&D stream was possible to calculate for three of the participating facilities, as summarized in Table 4. The average percentage from the three facilities (49.9%) is consistent with a generally recognized (based on Dillon team experience) industry standard estimate of 50%.

Facility	Wood (T)	Mixed C&D (T)	Percentage of Wood in Mixed C&D (%)
Pictou County Solid Waste Management Facility	34.15	165.15	20.7
Cumberland Central Landfill	22.74	32.86	69.2
East Hants Waste Management Centre	1.80	3.01	59.8
		Average	49.9

#### Table 4: Percentage of Wood Waste in Mixed C&D Stream



# 5.0 Facility Material Flow Analysis

A Sankey diagram presents a visual representation of large data sets and illustrates the flow of materials from generation through to end use. For this project, the Sankey diagram (Figure 4), represents the estimated generated, diverted, and disposed quantities, in terms of tonnages, for each of the major wood waste categories of interest. The first column displays the wood waste received at the facilities, the second column displays the management location for the wood waste, and the third column reports the end destination/use.

As C&D facilities do not specifically track the wood waste categories specific to this study, it was found that only the eight facilities that participated in both the questionnaire as well as the characterization study provided information and data complete enough for inclusion in the Sankey diagram. The facilities are listed as follows (see also Figure 2 above):

- 1. Pictou County Solid Waste Management Facility (Region 2);
- 2. Colchester Waste Management Park (Region 3);
- 3. Cumberland Central Landfill (Region 3);
- 4. East Hants Waste Management Centre (Region 3);
- 5. Valley Waste Western Waste Management Centre (Region 5);
- 6. Valley Waste Eastern Waste Management Centre (Region 5);
- 7. Lunenburg Regional Community Recycling Centre (Region 6); and
- 8. Yarmouth County Solid Waste Park (Region 7).

The following sub-sections summarize diversion methods for each wood waste category as reported by the 13 facilities that responded to the questionnaire. In addition, a data summary is provided for the eight facilities included in the Sankey diagram.

## 5.1 Brush

The following provides a summary of the brush diversion methods as reported by the 13 facilities that participated in the questionnaire:

- Brush is often received as a segregated stream, as a component to yard and garden waste. The material is chipped, by Halifax C&D or by the facility itself if equipment and space are available;
- The chipped product serves as an important asset for composting operations, either as a bulking agent or as part of a biofilter. Compost plants can be on-site as part of facility operations, or can be located off-site;
- Chipped brush can be blended with chipped clean wood waste and used as a biomass fuel source, providing heat/power. Material destinations include Brooklyn Power, Port Hawkesbury Paper, and Scott Farms Rendering; and



WOOD RECEIVED

HANDLING LOCATION

FINAL DESTINATION



OFF-SITE

• Local opportunities for brush include transformation to mulch and/or offering it free of charge to residents for gardening and landscaping purposes.

Table 5 presents the estimated diverted tonnage for brush and end use applications for the eight facilities represented in the Sankey diagram. The end use destinations are further illustrated on Figure 5.

Facility Type	Org. Type	Comp <sup>1</sup>	Facility	On-Site Diverted (T/yr.)	Transferred Diverted (T/yr.)	Transferred Location	End Use
C&D Landfill	Public	~	Yarmouth County Solid Waste Park	273	-		Compost
		$\checkmark$	Colchester Waste Management Park	-	217	Brooklyn Power, Port Hawkesbury Paper	Biomass
			East Hants Waste Management Centre	-	-	Previously Fundy Compost	Currently stockpiled
		~	Pictou County Solid Waste Management Facility <sup>2</sup>	-	-		Compost
	Private	~	Cumberland Central Landfill	222	-		Compost
Transfer Station	Public		Valley Waste East Management Centre	-	234	Scott Farms Rendering	Biomass, Mulch <sup>3</sup>
			Valley Waste West Management Centre	-	74	Scott Farms Rendering	Biomass, Mulch <sup>3</sup>
		~	Lunenburg Regional Community Recycling Centre	2	33	Brooklyn Power Port Hawkesbury Paper	Biomass, Compost

#### Table 5: Brush Diverted by End Use

Notes:

1 – The brush is stored on-site and chipped. It is then used as a bulking agent/amendment for a compost operation (Comp), either on-site or in close proximity.

2 – Tonnage of brush diverted to compost is unknown.

3 – Scott Farms Rendering recently experienced a fire and has stopped accepting wood waste. Moving forward, Valley Waste is planning on creating mulch and offering to the local public.



# 5.2 Clean, Untreated and Uncoated Wood

The following provides a summary of the clean wood diversion methods used as reported by the 13 facilities that participated in the questionnaire:

- The primary approach for managing clean wood waste involves either receiving the material as a pre-sorted stream or conducting sorting of the wood waste prior to processing;
- In instances where Reuse Centres (or equivalent) are present, clean wood and pallets can be resold and/or used on-site;
- Sorted clean wood is often chipped, either overseen by Halifax C&D, or by the facility itself if the necessary equipment and space are available;
- Chipped wood can serve as a fuel source for biomass plants and pulp mills, such as Brooklyn Power, Port Hawkesbury Paper and Scott Farms Rendering; and
- Chipped wood is also reported to be used in on-site applications, such as for a compost facility biofilter or as alternative cover for a C&D landfill. Further uses for compost include as an amendment.

Table 6 presents the estimated diverted tonnage for clean wood and end use applications for the 8 facilities represented in the Sankey diagram. The end use destinations are further illustrated on Figure 6.



Table 6: Clean Wood Diverted by End Use									
Facility Type	Org. Type	Comp <sup>1</sup>	Facility	On-Site Diverted (T/yr.)	Transferred Diverted (T/yr.)	Transferred Location	End Use		
	Public	~	Yarmouth County Solid Waste Park	-	373	Brooklyn Power	Biomass		
		~	Colchester Waste Management Park	-	49	Port Hawkesbury, Brooklyn Power	Biomass		
C&D Landfill			East Hants Waste Management Centre	-	-	Previously Fundy Compost, Brooklyn Power	Currently landfilled		
		~	Pictou County Solid Waste Management Facility	132	-		Compost, Landfill cover		
	Private	~	Cumberland Central Landfill	44	-		Compost		
			Valley Waste East Management Centre	4	686	Scott Farms rendering, Brooklyn Power, Reuse Center	Biomass, Reuse		
Transfer Station	n Public		Valley Waste West Management Centre	1	106	Scott Farms rendering, Brooklyn Power, Reuse Center	Biomass, Reuse		
		~	Lunenburg Regional Community Recycling Centre	83	750	Brooklyn Power, Port Hawkesbury	Biomass, Compost		

#### Notes:

1 – The clean wood is stored on-site and chipped. It is then used as a bulking agent/amendment for a compost operation (Comp), either on-site or in close proximity.





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### VALLEY WASTE RESOURCE MANAGEMENT

NOVA SCOTIA WOOD WASTE STUDY

#### BRUSH DIVERTED BY END USE AND AVAILABLE MARKETS IN NOVA SCOTIA

FIGURE 5

😑 Brush Waste												
🛨 End Market Destina	ations											
<ul> <li>City/Town</li> </ul>												
TransferRoute												
End Use												
Compost												
Biomass	Biomass											
Reuse	Reuse											
Waste Region	Waste Region											
1 - Cape Breton I	1 - Cape Breton Region											
2 - Eastern Regio	2 - Eastern Region											
🔲 3 - Northern Reg	3 - Northern Region											
4 - Halifax Region	4 - Halifax Region											
5 - Valley Region	5 - Valley Region											
6- South Shore/V	6- South Shore/West Hants Region											
7 - Western Region												
Note:												
* - Currently Stockpiled												
SCALE 1:2,000,000	N A											
0 15 30 60 Ki	lometres											
	s											
MAP DRAWING INFORMATION: DATA PROVIDED BY DILLON CONSULTING MANAGEMENT.	IMITED, VALLEY WASTE RESOURCE											
MAP CREATED BY: RB MAP CHECKED BY: HS MAP PROJECTION: NAD 1983 (CSRS) v6	UTM Zone 20N											
	PROJECT: 23-6152											
CONSULTING	DATE: 2023-11-02											



### VALLEY WASTE RESOURCE MANAGEMENT

NOVA SCOTIA WOOD WASTE STUDY

#### CLEAN WOOD DIVERTED BY END USE AND AVAILABLE MARKETS IN NOVA SCOTIA

FIGURE 6



# 5.3 Painted/Coated Wood

The following provides a summary of the painted/coated wood diversion methods used as reported by the 13 facilities that participated in the questionnaire:

- Diversion of painted/coated wood is more limited than for clean wood. One facility reported chipping the material for use as landfill cover; and
- Select facilities reported chipping the painted/coated wood and sending to Port Hawkesbury Paper or Brooklyn Power for biomass energy production. It is important to note, that within the scope of our study, we did not receive any information or have contact with these facilities regarding their processes and lack information on how they ensure that the painted or coated wood waste is processed to minimize emissions and reduce environmental impact. It is important to emphasize that compliance with emissions regulations is of utmost importance.

Table 7 presents the estimated diverted tonnage for painted/coated wood and end use applications for the 8 facilities represented in the Sankey diagram.

Facility Type	Org. Type	Comp <sup>1</sup>	Facility	On-Site Diverted (T/yr.)	Transferred Diverted (T/yr.)	Transferred Location	End Use
C&D Landfill	Public	~	Yarmouth County Solid Waste Park	-	117	Port Hawkesbury	Biomass
		~	Colchester Waste Management Park	-	722	Port Hawkesbury, Brooklyn Power	Biomass
			East Hants Waste Management Centre	-	-		Landfilled at C&D Site
		~	Pictou County Solid Waste Management Facility	-	-		Landfilled at C&D Site
	Private	~	Cumberland Central Landfill	-	-		Landfilled at C&D Site
Transfer Station	Public		Valley Waste East Management Centre	-	-	Previously Brooklyn Power, now Kaizer Meadow	Landfilled at Kaizer Meadow

#### Table 7: Painted Wood Diverted by End Use



Facility Type	Org. Type	Comp <sup>1</sup>	Facility	On-Site Diverted (T/yr.)	Transferred Diverted (T/yr.)	Transferred Location	End Use
			Valley Waste West Management Centre			Previously Brooklyn Power, Now Kaizer Meadow	Landfilled at Kaizer Meadow
		~	Lunenburg Regional Community Recycling Centre	-	-		Landfilled at C&D Site

Notes:

1 – The clean wood is stored on-site and chipped. It is then used as a bulking agent/amendment for a compost operation (Comp), either on-site or in close proximity.

## 5.4 Chemically Treated/Oversized Wood

The following provides a summary of the chemically treated/oversized wood diversion methods used as reported by the 13 facilities that participated in the questionnaire:

- The majority of chemically treated wood is disposed of in landfills. It is noted that with the new NSECC guidelines in place, treated wood will be directed to MSW landfills for disposal;
- In one case, chemically treated wood was reported to be chipped and utilized as part of landfill cover material;
- One facility also reported chipping the wood for diversion to Port Hawkesbury Paper; and
- Other alternative uses for chemically treated wood waste involve collaborating with local farmers who repurpose oversized wood pieces for applications such as fencing, poles, and barn construction. In areas where Reuse Stores are available, longer wood lengths can be made accessible for sale.

Table 8 presents the estimated diverted tonnage for chemically treated/oversized wood and end use applications for the 8 facilities represented in the Sankey diagram.


Facility Type	Org. Type	Comp <sup>1</sup>	Facility	On-Site Diverted (T/yr.)	Transferred Diverted (T/yr.)	Transferred Location	End Use
		~	Yarmouth County Solid Waste Park	-	88	Port Hawkesbury	Biomass
		~	Colchester Waste Management Park	-	52	Port Hawkesbury, Brooklyn Power	Biomass
C&D	Public		East Hants Waste Management Centre	-	-		Landfilled a C&D Site
Landfill		V	Pictou County Solid Waste Management Facility	88	-	Local Farmers	Landfilled a C&D Site, only oversized is repurposed by Farmers (fence, barns)
	Private	~	Cumberland Central Landfill	-	-		Landfilled a C&D Site
Transfer Station	<sup>:r</sup> Public -		Valley Waste East Management Centre	-	-	Reuse Center, Kaizer Meadow	Good lengths are salvaged at sold at Reuse Center, Remaining are landfill at Kaizer Meadow
			Valley Waste West Management Centre	-	-	Reuse Center, Kaizer Meadow	Good lengths are salvaged a sold at Reuse Center, Remaining are landfill at Kaizer Meadow



Facility Type	Org. Type	Comp <sup>1</sup>	Facility	On-Site Diverted (T/yr.)	Transferred Diverted (T/yr.)	Transferred Location	End Use
		~	Lunenburg Regional Community Recycling Centre	-	-		Landfilled at C&D Site

Notes:

1 – The clean wood is stored on-site and chipped. It is then used as a bulking agent/amendment for a compost operation (Comp), either on-site or in close proximity.

## 5.5 Pressboard/Plywood

The following provides a summary of the pressboard/plywood diversion methods used as reported by the 13 facilities that participated in the questionnaire:

- The majority of pressboard/plywood waste is reported to be disposed in C&D landfills. Nevertheless, there are some alternative practices being employed such as chipping and utilizing as landfill cover, or chipping and transporting to Port Hawkesbury Paper as a feedstock for biomass energy production; and
- In areas where Reuse Stores are available, good quality plywood and pegboards are salvaged and made accessible for resale.

Table 9 presents the estimated diverted tonnage for pressboard/plywood and end use applications for the eight facilities represented in the Sankey diagram.

Fa T	acility Гуре	Org. Type	Comp <sup>1</sup>	Facility	On-Site Diverted (T/yr.)	Transferred Diverted (T/yr.)	Transferred Location	End Use
	C&D Landfill Public		~	Yarmouth County Solid Waste Park	-	30	Port Hawkesbury (2023 only)	Biomass, remaining landfilled at C&D site
C& Lan		Public	~	Colchester Waste Management Park	-	262	Port Hawkesbury	Iandfilled at C&D site Biomass
			East Hants Waste Management Centre	East Hants Waste Management Centre	-	-		Landfilled at C&D Site
			~	Pictou County Solid Waste	-	-		Landfilled at C&D Site

#### Table 9: Pressboard/Plywood Diverted by End Use



Facility Type	Org. Type	Comp <sup>1</sup>	Facility	On-Site Diverted (T/yr.)	Transferred Diverted (T/yr.)	Transferred Location	End Use
			Management Facility				
	Private	~	Cumberland Central Landfill	-	-		Landfilled at C&D Site
			Valley Waste East Management Centre	3	-	Reuse Center, Kaizer Meadow	Landfilled at C&D Site Good plywood & pegboard are salvaged and sold at the Reuse Centre, remaining landfilled at Kaizer Meadow Good plywood & pegboard are salvaged and sold at the Reuse Centre, remaining landfilled at Kaizer Meadow
Transfer Station	Public		Valley Waste West management Centre	0.02	-	Reuse Center, Kaizer Meadow	Good plywood & pegboard are salvaged and sold at the Reuse Centre, remaining landfilled at Kaizer Meadow
		~	Lunenburg Regional Community Recycling Centre	-	1		Landfilled at C&D Site

Notes:

1 – The clean wood is stored on-site and chipped. It is then used as a bulking agent/amendment for a compost operation (Comp), either on-site or in close proximity.



# 6.0 Regional Material Flow Analysis

As the questionnaire and wood waste characterization study yielded participation from only 13 of the 29 contacted C&D facilities, Dillon obtained additional data from Divert NS's public portal and HRM to develop an understanding of wood waste flow at the regional level. While the facilities provided details related to on-site procedures as well as disposal and diversion handling locations and end-uses, the regional data was useful in providing an understanding of the volume of wood waste managed and the potential scale of diversion initiatives in the province.

The data obtained from Divert NS's public portal, as confirmed by Divert NS, is representative of the mixed C&D tonnages generated in each municipality in the province for the years 2017 to 2022. The information was then averaged and consolidated to the seven solid waste-resource management regions.

The results from the wood waste characterization field program were averaged to provide an estimated breakdown of wood waste composition for the mixed C&D tonnages for each of the regions. These results are presented in Table 10 and show an estimated total of 54,054 tonnes of wood waste generated in Nova Scotia per year.

Region	Mixed C&D (t/yr.)	Brush (t/yr.)	Clean Wood (t/yr.)	Painted/ Coated Wood (t/yr.)	Chemically Treated (t/yr.)	Chemically Treated (Oversized) (t/yr.)	Pressboard/ Plywood (t/yr.)
1	18,434	1,290	2,922	2,747	2,301	517	906
2	8,867	621	1,405	1,321	1,107	248	436
3	23,800	1,666	3,772	3,547	2,971	667	1,170
4	34,416	2,409	5,455	5,129	4,296	964	1,692
5	3,587	251	569	535	448	101	176
6	1,354	95	215	202	169	38	67
7	2,810	197	445	419	351	79	138
Total	93,269	6,529	14,782	13,900	11,643	2,614	4,586

#### Table 10: Quantities of Wood Waste by Material Category

Making use of the compiled facility-specific data, average diversion and disposal rates were calculated for each of the seven regions and applied to the Divert NS data (Table 11). A provincial average was calculated for those regions that did not have sufficient data for a regional average. Based on discussions with HRM, a 75% diversion rate was selected for Region 4. It is noted that the diversion rates are for all wood categories except for brush. Brush was assumed to have a 100% diversion rate.



Table II. Estimat	Table 11. Estimated Regional Diversion and Disposal Rates					
Region	Estimated Diversion Rate	Estimated Disposal Rate				
1	23%	77%				
2	23%	77%				
3	23%	79%				
4	75%	25%				
5	23%	77%				
6	37%	63%				
7	16%	84%				

			1.01	1.0.1
lable 11: Estimated	Regional	Diversion	and Dis	posal Rates

Based on the above, estimated diversion and disposal quantities for the different wood waste streams were calculated for the province. As indicated in Table 12, estimates indicate wood waste diversion occurring for approximately half of the provincial wood waste stream.

Waste Category	Generated (t/yr.)	Diverted (t/yr.)	Disposed (t/yr.)
Brush (Leaf & Yard Waste)	6,529	6,529	0
Clean Wood	14,782	8,671	6,111
Painted/Coated Wood	13,900	4,995	8,905
Chemically Treated Wood	14,257	4,593	9,664
Pressboard/Plywood	4,586	1,780	2,806
Total	54,054	26,568	27,486

#### Table 12: Estimated Diversion and Disposal by Waste Category

Figure 7 illustrates the variance in diversion and disposal ratios across the different wood waste categories in Nova Scotia.







## 7.0 **Policies Supporting Wood Waste Diversion**

Over the past three decades, all levels of government have acknowledged the importance of developing and implementing policies that are consistent with the concept of waste reduction and sustainability. With a focus on efforts to enhance diversion performance associated with the management of C&D materials (including wood wastes), the following section presents some noted best practice examples being led at the federal, provincial and municipal levels.

### 7.1 National

Greening Government Strategy: In 2017, the Canadian government launched the Greening Government Strategy, a pan-Canadian sustainable development strategy aimed at reducing environmental impact and transitioning to low-carbon, climate-resilient operations. The strategy targets a net-zero and climate-resilient federal property, with specific objectives including reducing embodied carbon in projects to 30% by 2025, diverting 90% of C&D waste from landfills by 2030, and using life cycle costbenefit analysis to inform building decisions.

Canada is also in the process of developing the Canada Green Buildings Strategy, a comprehensive effort aimed at mobilizing national climate action in the built environment. The strategy's key objectives are to transform markets, decrease costs, and align with the target of achieving a net-zero emissions and climate-resilient buildings sector by 2050.

Other federal initiatives include the following:

- The Canada Mortgage and Housing Corporation (CMHC) has released best-practice guidelines for C&D diversion;
- Buy Clean Strategy, as referenced in the mandate letters of the Ministers of Natural Resources Canada, Infrastructure Canada, and Public Services and Procurement Canada. The strategy instructs Ministers to develop a Buy Clean Strategy to support the use of made-in-Canada low-carbon products in Canadian infrastructure projects. This could be developed into an important driver for increased use of recycled content in construction materials;
- The Construction Resources Initiative (CRI) Council has engaged in a Canada-wide voluntary industry initiative to eliminate C&D waste from landfills. This initiative aims to encourage decision-makers in building and product design, construction practices, purchasing, policy, operations, and maintenance to reduce C&D waste to landfills by 75% by 2025 and 100% by 2030; and
- The Canadian Council of Ministers of Environment (CCME) developed a guide for decision-makers on effective policies to influence C&D waste management (Guide for Identifying, Evaluating and Selecting Policies for Influencing Construction, Renovation and Demolition Waste Management).



## 7.2 Provincial and Territorial

Provincial governments across Canada are developing policies that apply circular economy principles and encourage the reuse and recycling of C&D waste. Currently, there are only a few EPR programs related to C&D waste products in Canada, which include products generated during construction, renovation and demolition activities (e.g., thermostats, fluorescent lamps, paint products, solvents and flammable liquids). However, the application of producer responsibility to C&D materials is expected to expand in the coming years.

Canada-wide Action Plan (CAP) for Extended Producer Responsibility (EPR): In 2009, the CCME released a Canada-wide Action Plan (CAP) for EPR, which commits provinces and territories to work. toward the implementation of EPR programs for priority products and materials in two phases. Phase 1 includes materials such as packaging, electrical products, and household hazardous waste, among others. Phase 2 includes C&D materials, among others. As part of Phase 2, provinces and territories agreed to implement EPR programmes for C&D waste by 2017. While there have been some studies, small pilot programs and private initiatives, little progress has been made on this commitment. By contrast, provinces and territories made significant progress on implementing Phase 1 of the Action Plan, with nine out of ten provinces having implemented EPR programs for Phase 1 materials. This highlights that there is no lack of willingness among provinces and territories to address C&D waste, but rather suggests that the end-of-life management of these materials pose a unique challenge and may require a diverse set of policy levers to minimize C&D waste and improve material circularity. As such, in 2019, the CCME developed a guide for decision-makers on effective policies to influence C&D waste management, which include limiting the quantity of waste generated by C&D activities, lowering the amount of C&D waste disposed, minimizing the environmental consequences of C&D waste, and enhancing the market value of diverted C&D products.

Examples of measures undertaken by provinces and territories to support C&D waste management include:

- Innovative financing mechanisms to help municipalities establish the infrastructure, processes, and plans needed for improved waste management. For example, within the Quebec Residual Materials Management Policy, a framework was developed to provide regional municipalities with financial support for the development of residual materials management plans through landfill royalties applied to C&D materials;
- Setting aspirational C&D waste diversion targets. For example, the Quebec Residual Materials Management Policy's Action Plan for 2019-2024 presents a target of recycling and valorizing 70% of all C&D residuals by 2023. The Government of Northwest Territories identified C&D waste as a targeted material stream to divert waste from landfills according to its 2019 Waste Resource Management Strategy and Implementation Plan and identified diversion targets as part of the 10year roadmap; and



• The development of studies, guidelines, and other tools and initiatives that help to identify and prioritize action on C&D waste management. In Manitoba, for example, the provincial government is looking to establish a task force to address C&D waste and develop recommendations on options for a C&D waste management program.

## 7.3 Municipal

In addition to applying municipal landfill bans as a policy lever, local leading jurisdictions such as Vancouver, Victoria, Toronto, Montreal and Halifax have included considerations around demolition material salvage and C&D waste in their development planning and, in some cases, economic strategies. Canadian municipalities have a strong influence on C&D waste reuse and recycling as many management facilities are located in or near major cities. Local governments are driving diversion practices through bylaws, landfill bans, high tipping fees, and construction permits. Two noted examples include the member municipalities of Metro Vancouver and HRM. Select components of their current programs are provided below.

Metro Vancouver: In some cases, complementary policy efforts are being applied to support reuse market development. For instance, Metro Vancouver has proactively prohibited the disposal of wood and gypsum, while establishing wood and gypsum processing capacity that diverts the materials to be recycled or processed into alternative fuels.

In terms of municipal leadership, local governments and businesses across Metro Vancouver and Victoria are exemplifying policy and business models that incentivize C&D waste diversion tracking and recycling and reuse of C&D materials. A few examples are as follows:

- The City of Port Moody: In 2022, the City of Port Moody implemented the Deconstruction Waste Management Bylaw to regulate and minimize waste sent to landfills from new construction or deconstruction. The bylaw requires a waste management fee with permit applications, creating a financial incentive to reduce waste;
- The City of Burnaby has adopted a new Construction and Demolition Bylaw, which requires a minimum of 70% diversion of demolition waste to an approved disposal and recycling facility for all structures being demolished. This bylaw went into effect on June 20, 2022; and
- The City of Surrey has introduced a new Demolition Waste Disposal and Recycling Bylaw, which requires a minimum of 70% of demolition materials to be taken to a licensed recycling facility or reused.



Halifax Regional Municipality: In 2002, HRM established a bylaw and associated planning stipulations focused on the improved management of construction and demolition materials. Referred to as By-Law L-200, it served to define siting, design and operational requirements for three distinct types of C&D material management facilities: 1) Transfer Stations, 2) Processing Operations, and 3) Disposal Sites. Facility operators are obliged to hold a license with HRM, which includes annual reporting requirements to confirm compliance with the bylaw; most notably (as of 2006) diverting a minimum of 75% (by weight) of the material arriving at a Processing Facility or Transfer Station from disposal.

# 9.0 **Challenges and Opportunities for Improved** Wood Waste Diversion

## 9.1 Key Challenges

Through the completion of this assignment, a select number of key challenges to achieving the improved diversion of wood waste materials from disposal (e.g., landfilling) in Nova Scotia were identified; they are summarized below:

- Limited Regulatory Obligations: With the recent exception of the treated wood disposal ban, there are no specific provincial stipulations defining categorization and reporting requirements associated with the management of wood wastes. As a result, the ability to establish a clear understanding of the quality and quantity of these potentially divertible materials is compromised;
- Partial Use of Differential Tipping Fees: At facilities including Kaizer Meadow, Yarmouth, Colchester, Cumberland, Valley East and West, and Lunenburg, where reduced tipping fees are offered for sorted clean wood and, to some extent, for sorted brush, there is evidence of improved waste diversion performance. The greater the difference between tipping fees for sorted wood waste and mixed C&D waste, the more effective it appears to be in encouraging diversion and responsible waste management practices. However, this is not a common practice, the lack of widespread financial incentives for source separation of wood waste at facilities, as evidenced by the lack of variable tipping fees throughout the province, poses a significant challenge. Therefore, disposing of wood waste is often more economically efficient than diverting it;

**Processing, Storage and End Markets Limitations:** A majority of the contacted facilities lack the necessary equipment on-site to process chipped wood waste for various end-use applications. Instead, they often rely on a limited number of private contractors, primarily Halifax C&D, to handle the grinding of wood waste. Halifax C&D also plays an important role in connecting these facilities with end markets for their wood waste streams, essentially acting as an intermediary. One shared issue among these facilities is the coordination of chipping services, which has proven to be particularly challenging. This difficulty in coordinating the timing of chipping operations – ensuring there is an adequate amount of stockpiled material on site to warrant retaining contract processing services - adds to the storage-related issues that facilities face. This challenge has become further complicated with the recent increase in significant storm events (e.g., Hurricane Fiona), resulting in large quantities of brush and associated wood wastes arriving at existing management sites; and

• Urban/Rural Practicalities: Nova Scotia's population is heavily concentrated in HRM, with more than 40% of the province's one million residents residing in the region. Further, growth within HRM has been dramatic over the last decade, leading to a significant increase in the generation of construction and demolition waste materials. In contrast, the remaining population is primarily dispersed across the province with a select number of smaller urban centres, leading to low population densities and, consequently, low volumes of wood waste generation in comparison to the



HRM. Thus, progressive approaches established within HRM since 2002, while appropriate and effective for their unique context, are not necessarily practical or applicable in all areas of the province.

### 9.2 Key Opportunities

In recognition of the primary challenges noted above, and acknowledging best practices approaches identified during the course of this assignment, the following key opportunities to enhance the diversion of wood waste materials in Nova Scotia are presented below. It is noted that the opportunities presented focus on actions to be led at the regional/municipal and individual site level, versus those within the mandate (e.g., the establishment of expanded regulatory requirements) of the Province of Nova Scotia.

<u>Enhanced regional collaboration</u>: The Regional Chairs Committee serves as a forum for representatives from each of the province's seven regions to discuss current solid waste management challenges and to identify opportunities for individual and collaborative solutions. With respect to wood waste materials, there is an opportunity for the Committee, with the support of their respective municipalities, to promote collaboration opportunities amongst the regions, including; 1) standardization of wood waste management categorization and record keeping protocols, 2) investigating the acquisition of a mobile grinder unit complete with an identified host municipality and shared use agreement, 3) collaboration with other levels of government and industries (e.g., forestry), and 4) direct engagement with Divert NS regarding specific funding support opportunities associated with improved wood waste diversion (e.g., including mobile grinder capital and operating costs, identifying/securing viable end markets and research to investigate innovative diversion opportunities).

<u>Preferential tipping fees:</u> The study has found that the more significant the differential between the tipping fee for sorted wood waste and that for mixed C&D waste, the more it appears to incentivize diversion and responsible waste management practices. Incentivising customers to bring in pre-sorted loads of wood waste and having dedicated stockpiles for the types received could increase diversion with relatively low facility effort.

<u>Direct-to-stockpile</u>: A source of pre-sorted clean wood comes from businesses that often are only disposing of clean wood (e.g., pallets). Having a clean wood stockpile area is a relatively low effort (assuming available space) management practice that supports increased diversion. This technique can also create an incentive for customers to pre-sort materials, because dropping off directly to a stockpile may result in avoiding line ups and/or time associated with tipping areas or public sorting stations.

<u>Drop-off procedures:</u> Clarity, consistency and supervision of customers were identified as valuable practices in relation to public drop-off and sorting of materials. This includes practices such as labelling drop off stockpiles or bins, refraining from frequent changing of drop-off locations, and having staff in public drop-off or sorting areas to guide customers and/or increase compliance. It was noted by staff at



multiple facilities that the instances of incorrectly dumped or sorted waste increases when a facility staff member is not present in the location and that compliance improves even if a staff is just present in the area without directly supervising. One facility noted that often incorrect dumping or sorting is the result of the public's unawareness of the correct procedure.

<u>Dedicated tipping areas and sorting staff</u>: Having defined tipping areas with staff dedicated to sorting is a technique that can lead to increased diversion, assuming the presence of available end markets.

<u>Sorting material on the working face:</u> Sorting of mixed C&D wood waste material by site staff at the working face of the C&D landfill could create efficiencies and increase diversion for facilities that do not have staff capacity to accept and sort material in multiple locations. A facility that uses this technique has one facility staff responsible for managing the working face and sorting wood waste. They noted that having these tasks occur in the same location was a benefit as it allowed them to switch tasks depending on demand.

<u>Controlled public access to segregated materials</u>: At locations where wood wastes are segregated (either upon or following arrival), there is an opportunity for the public to access select materials for offsite use. This includes untreated dimensional lumber for rough carpentry applications or as a fuel source and treated wood for select landscaping projects. It is acknowledged that allowing the public on an active waste management site necessitates appropriate staff supervision and enforcement of health and safety protocols. It is noted that these requirements can be partially mitigated through the establishment of a formal reuse location separate from the active waste management area (e.g., similar to the Valley Waste's Last ReSort ReUse Centre)

## 9.3 Next Steps

Founded on information and observations gathered during the completion of this assignment, Section 9.2 presents seven proposed actions to enhance the diversion of wood waste materials from landfill disposal in Nova Scotia. These actions, or opportunities, are admittedly practical in nature – acknowledging what can reasonably be investigated and/or implemented at the regional or municipal/site level in the near term.

As a first step, it is recommended that Regional Chairs meet to review and discuss the findings presented in this report, focusing on items based on multi-regional collaboration and defining a potential path forward. This initial effort would serve as a foundation to the future assessment of more detailed actions, including standardization of data collection procedures and the shared use of specialized processing equipment.

Additionally, it is recommended that the Regional Chairs meet with NSECC to present the findings from this study and to work collaboratively on policy/regulatory changes that could be enacted in support of shared goals.



# Appendix A

Meeting Minutes – Project Initiation Meeting

# **Meeting Minutes**



Subject:	Wood Waste Study Project Kick-off Meeting
Date:	May 10, 2023
Location:	Virtual Meeting
Our File:	23-6512
Distribution:	Email

#### Attendees

Elisabeth Mance (EM)	Dillon
Betsy Varghese (BV)	Dillon
Jenny Bowie (JB	Dillon
Andrea Gibson-Garrett (AGG)	Valley Waste-Resource Management (VWRM)
Andrew Garrett (AG)	Valley Waste-Resource Management (VWRM)
Andrew Wort (AW)	Valley Waste-Resource Management (VWRM)
Kurt Laskow-Pooley (KL)	Divert NS
Glendon Ring (GR)	Yarmouth County Solid Waste Park (YCSWP)
Phillip Redden (PR)	Municipality of Colchester
Jessica Rushton (JR)	Municipality of Colchester
Lesley McFarlane (LMC)	Municipal Joint Services Board – Lunenburg Region

#### Notes

Item	Discussion	Action by
1.	Team Introduction	
1.1.	Reporting Structure	
	<ul> <li>See the slides for details on project communications.</li> </ul>	
	<ul> <li>Elisabeth Mance (EM) will be the main contact at Dillon.</li> </ul>	
	<ul> <li>Andrea Gibson-Garrett (AGG) will be the main contact at Valley Waste-Resource Management.</li> </ul>	
	<ul> <li>Dillon will update Andrea with weekly email reports and monthly virtual meetings.</li> </ul>	Dillon
	<ul> <li>VWRM to circulate information to the other study participants when required.</li> </ul>	VWRM
1.2.	Communication Protocol	
	<ul> <li>VWRM to supply Dillon with the contacts for the facilities.</li> <li>There are currently 27 facilities included to contact (2 having closed since 29 was stated in the project plan) and there are currently 5 facilities confirmed to participate in the waste characterization. VWRM is working to find 5 additional facilities for a total of 10.</li> </ul>	VWRM
2.	Project Objectives	
	• See slide for details.	

ltem	Discussion	Action by
	<ul> <li>Dillon noted that the upcoming changes to the C&amp;D guidelines would be an important factor to consider when establishing best practices and considering how current practices at the facilities will need to change.</li> <li>A discussion occurred noting that the effects of Hurricane Fiona and the seasonal fluctuation of wood waste experienced at the facilities will be something to consider. It was also noted, that at the time of the wood characterization field program, wood waste from Hurricane Fiona could still be coming into the facilities in some areas.</li> <li>Dillon intends to consider Hurricane Fiona in the data review portion and during the wood characterization program.</li> </ul>	Dillon
3.	<ul> <li>Project Schedule</li> <li>See slides for details.</li> <li>It was noted that the milestone dates were revised and postponed to a month after the dates in the RFP, consistent with the delayed project kick-off.</li> </ul>	
4.	Methodology	
	See slides for details.	
	<ul> <li>A discussion occurred about the strategy involved in the waste characterization phase. It was noted that acceptance and sorting operations for each facility are unique and therefore the processes involved in the waste characterization need to be facility specific. The current acceptance and sorting processes at facilities with members present were discussed. It was also noted that material accepted at the facilities can fluctuate week to week and a week collection time interval may not be the most representative period.         <ul> <li>Dillon intends to include an opportunity for each facility to provide suggestions regarding the logistics of the wood characterization in the questionnaire.</li> <li>Dillon has allotted research and planning time to determine the strategy for the waste characterization logistics at each facility will be submitted to VWRM.</li> <li>It was also noted that a week would be the minimal time frame for the collection of the waste characterization samples. Longer time frames can be considered.</li> </ul> </li> </ul>	Dillon Dillon
	<ul> <li>VWRM inquired about who would be completing the sorting.</li> <li>Dillon clarified that the expectation is that each facility will do the sorting and Dillon will complete an inspection of the sorted wood materials and the facility team will work with Dillon to make final adjustments.</li> </ul>	
	<ul> <li>There was a discussion about the basis of the wood categories (brush, clean/untreated/uncoated wood, painted/coated wood, chemically</li> </ul>	

ltem	Discussion	Action by			
	treated wood, and pressboard/plywood). Categories were determined by VWRM and the Working Group. VWRM noted that the categories were determined based on which wood products could have a similar market.				
	• A discussion occurred about the markets for wood waste.				
5.	Next Steps				
	<ul> <li>Confirm 10 participating facilities for the waste characterization</li> <li>Share contacts for 27 facilities</li> <li>Prepare draft questionnaire for data collection and submit to VWRM</li> <li>Begin research of best practices for management of wood waste</li> </ul>	VWRM VWRM Dillon Dillon			

### Errors and/or Omissions

These minutes were prepared by Jenny Bowie who should be notified of any errors and/or omissions.

# Appendix B

Site Visit Reports

### Pictou County Solid Waste Management Facility – 220 Landfill Rd, Trenton, NS

The site visit to the Pictou County Solid Waste Management Facility (the facility) occurred on June 26, 2023. The site visit included a visual inspection of sorted wood waste material from a five-day collection period and an interview with the Regional Coordinator, Deborah Searle.

The facility separated and sorted wood waste material from Monday June 19, 2023, to Friday June 23, 2023. The wood waste material was sorted into the following categories (see photos below):

- Clean Wood;
- Treated Wood:
  - o Regular; and
  - o Oversized.
- Painted wood; and
- Pressboard/Plywood.

It is noted that the facility does not track the source of C&D loads and therefore treated wood was not sub-categorized into residential and commercial streams. It is also noted that the facility's brush processing procedures were not altered, and brush was not sorted and stored during the collection period. Brush was diverted to the compost facility where it is used for bulking. The facility's brush category includes leaf and yard waste as well as larger diameter wood (exceeding 8 inches).

The facility sorted wood from mixed C&D loads. The total weight of the mixed C&D loads received during the sorting period was 165.15 tonnes. The sorted wood waste material could not be weighed on the day of the site visit due to the large size of the piles and the facility's operational capacity. The results of the material weighing, sent to Dillon in the days following the site visit, are presented in Table B-1.

Material	Weight (T)	Percent of Wood Waste Stream (%)	Percent of C&D Waste Stream (%)
Clean Wood	6.62	15.1	4.0
Treated Wood	7.52	17.1	4.6
Treated Wood (oversized)	4.40	10.0	2.7
Painted Wood	12.05	27.4	7.3
Pressboard/Plywood	3.56	8.1	2.2
Brush <sup>1</sup>	9.75 <sup>2</sup>	22.2	_3
Total	43.90	100	20.7

#### Table B-1: Wood Waste Characterization Results

Notes:

1 - Brush included leaf and yard waste and material exceeding 8 inches

2 - The brush weight was the total from the scale data during the collection period (not stockpiled and weighed)

3 - Brush is tracked separately from Mixed C&D



The facility was asked to note any anomalies during the collection week or notable waste. It was noted that there were no house demolitions or wharf debris accepted to the facility during the collection period (which would have increased tonnages). It was also noted that there were telephone poles accepted to the facility during the collection period which occurs on an unpredictable irregular basis.



Photo 1: Clean Wood



Photo 2: Treated Wood





Photo 3: Oversized Treated Wood Pile



Photo 4: Painted Wood





Photo 5: Plywood/Chipboard

#### Notes from Site Interview

Impact of nearby C&D Facility Closures on Wood Waste Quantities

- The recent closure of two local C&D facilities within the past year has resulted in a substantial increase in mixed C&D waste; and
- As a consequence of the closures, the role of the operator responsible for separating and extracting clean wood from the Mixed C&D stream, previously designated as a part-time position, has become a full-time position.

Impact of Hurricane Fiona on Operations and Waste Management

- The occurrence of Hurricane Fiona had a notable impact on the facility's operations. Following Hurricane Fiona, the facility promptly responded to the situation by waiving their tipping fees for a period of five weeks. This measure aimed to support the community and ease the burden on residents dealing with the aftermath of the hurricane. As a result of this fee waiver, the facility experienced a substantial surge in incoming waste;
- Even as of the latest available information on June 26, there were inquiries from the public regarding the continued waiving of tipping fees for Fiona-related debris. This indicates that the hurricane's effects have had a lasting impact on waste quantities in the region; and
- A significant portion of the hurricane debris was managed by Langille's Wood Yard, located in close proximity to the facility.

Seasonal Fluctuations and County Voucher Program

 Under the County Voucher Program, residents are provided with four 250 kg vouchers for C&D or MSW waste disposal after paying their property taxes. As a direct consequence of the County Voucher Program, the facility experiences a noticeable increase in waste quantities during the designated period from May 1 through November 30.



Wood Sorting Process and Quantity of Diverted Material

- The facility's wood sorting process predominantly involves dealing with mixed C&D loads, as clean wood deliveries are infrequent. Notably, there is no specific scale category or separate tipping fee for clean wood, resulting in all wood being diverted from mixed C&D loads. Upon arrival, the loads are directly deposited on the working face at the site and are subsequently sorted by the operator; and
- It is important to highlight that there is no formal separation goal in place, meaning there is no predefined threshold, such as "if the load visually contains X percent wood, separate it." Despite the absence of a fixed guideline, the facility strives to effectively sort and divert the clean wood they can identify within the mixed C&D loads.

**Current Waste Diversion Programs** 

- The facility diverts clean wood, brush, and telephone poles from the waste stream;
- Telephone Poles Diversion: Telephone poles are diverted and put to use around the facility or are given to local farmers. While the demand for telephone poles is evident, the quantity received remains inconsistent, making it challenging to provide an accurate estimate of their annual intake. Interestingly, the inception of this market was initiated by public observation of the poles on site, which led to inquiries and subsequent word-of-mouth dissemination;
- Brush: At the facility, brush contains leaf and yard waste along with oversized wood materials. Brush is diverted to the compost facility where it is used for bulking; and
- To date, the facility has not made any attempts to divert painted or treated wood. Interest in Diverting and Challenges Faced
- The facility's motivation to sort and divert stems from a combination of objectives: firstly, the aim to conserve valuable space in the landfill, and secondly, the utilization of the diverted materials for on-site purposes; and
- Regarding the interest in diverting wood waste if more markets become available, the facility expresses affirmative interest. However, the primary consideration for them is cost-effectiveness. The process of grinding wood waste proves to be high-cost, and the challenge lies in finding viable markets to make it economically feasible.

Effective and Ineffective Strategies in Wood Waste Management and Diversion

- Among the strategies implemented, sorting on the working face has proven to be effective in managing wood waste. The procedure involves directly dumping incoming loads onto the working face, where the operator in charge efficiently separates the clean wood. This approach minimizes handling and streamlines the sorting process, as the operator and equipment are readily available for the task. However, with the implementation of new regulations, they may need a separate space for the sorting process; and
- Chipping poses a significant barrier in wood waste diversion. The high cost and difficulty in scheduling chipping services presents challenges for the facility. Previously, they relied on Verhagen Demolition Ltd., a local company with a chipper operator; however, the unavailability of the operator has hindered the chipping process.



## <u>Colchester Waste Management Facility – 188 Mingo Road, Kemptown,</u> <u>Colchester, NS</u>

The site visit to the Colchester Waste Management Facility (the facility) occurred on July 18, 2023. The site visit included a visual inspection of sorted wood waste material from a six-day collection period and an interview with the Site Manager, Jessica Rushton.

The facility separated and sorted wood waste material from Monday July 10, 2023, to Saturday July 15, 2023. The wood waste material was sorted into the following categories (see photos below):

- Clean Wood;
- Treated Wood:
  - o Regular;
  - o Oversized;
- Painted wood;
- Pressboard/Plywood; and
- Brush.

The wood that was sorted as a part of the characterization study included loads brought into the facility under the following scale categories: clean wood, mixed wood, brush, MSW, and mixed C&D brought into the facility from licensed and unlicensed haulers. Mixed C&D brought into the facility by some licensed haulers was brought directly to the working face of the C&D landfill and was not sorted as part of the study. Licensed haulers are licensed with the Municipality of Colchester and the facility and largely consists of companies such as waste container companies and construction companies.

It is noted that some wood waste that arrived in pre-sorted loads was not sent to the characterization study area. These included:

- Brush sent to brush pile;
- Clean pallets sent to clean wood stockpile; and
- Telephone poles sent to C&D area.

Some adjustments were made to the sorted stockpiles while Dillon personnel was on site and further adjustments were made by on-site staff during weighing. The piles were not weighed while Dillon personnel was on site in order to avoid interrupting the facility's workflow. The results of the material weighing, sent to Dillon in the days following the site visit, are presented in Table B-2.



Material	Weight Of Materials Sorted in Wood Characterization Study Area (T)	Weight Of Materials Sent Directly to Stockpile or Disposal Area (T)	Total Weight² (T)	Percent of Wood Waste Stream (%)
Clean Wood	8.20	5.74	13.94	29.4
Treated Wood	15.35	0.00	15.35	32.3
Treated Wood (oversized)	0.00	1.46	1.46	3.1
Painted Wood	7.07	0.00	7.07	14.9
Pressboard/Plywood	5.51	0.00	5.51	11.6
Brush <sup>1</sup>	1.69	2.47	4.16	8.8
Total	37.82	9.67	47.49	100

#### **Table B-2: Wood Waste Characterization Results**

Notes:

1 - Brush included material exceeding 8 inches

2 - Does not account for wood from certain licensed haulers that was brought directly to the C&D disposal site

As indicated in Table B-2, A total of 47.49 tonnes of wood waste was collected as part of the characterization study. The facility provided Dillon with the scale data for the collection period for their scale categories that include only wood waste (i.e., brush, wood, and a load of oversized wood). These categories made up 32.1 tonnes of the total. The remaining material would have come from mixed material loads that were sorted. The facility was asked to note any anomalies during the collection period, and it was perceived to be a typical week. It was noted that the brush quantities are still observed to be high, likely due to Hurricane Fiona.



Photo 6: Clean Wood





Photo 7: Treated Wood



Photo 8: Painted Wood





Photo 9: Pressboard/Plywood



Photo 10: Brush

#### Notes from Site Interview

During the site visit, one of the notable findings discussed in the questionnaire pertains to the presence of licensed haulers. These licensed haulers have a specific arrangement for their mixed C&D loads, which do not go to the regular tipping area. Instead, they are allowed to go directly to the C&D landfill for dumping.



Licensed Haulers Definition

• A licensed hauler is a waste management entity that holds a valid license with both the municipality and the facility. To obtain this license, the haulers pay a yearly licensing fee of \$50 (\$50 for a C&D license and \$50 for a garbage/organics/recycling license). These licensed haulers typically include waste container companies and construction firms.

Monitoring and Compliance

- The facility maintains records and relevant information about the licensed haulers to ensure proper waste disposal practices. In the event that a licensed hauler mistakenly disposes of inappropriate materials in the C&D area, the facility takes appropriate actions to address the infraction.
   Procedures for Misdirected Materials
- If a mixed C&D/MSW load is inadvertently dumped in the C&D area by a licensed hauler, several procedures are in place to rectify the situation:
  - The customer is requested to return, and their load will be reloaded into their vehicle to be taken to the tipping area. They will then be charged at the MSW rate;
  - Alternatively, the customer may be asked to sort the MSW from the C&D materials. The sorted MSW will then be reweighed and redirected to the appropriate location, with the customer paying the MSW rate;
  - In more severe cases, the entire load may be brought to the tipping floor, and the customer will be charged at the MSW rate; and

License Revocation for Non-Compliance: Repeated instances of improper dumping in the C&D area by licensed haulers may lead to the revocation of their license.

Material Sorting and Diversion Practices

• The facility employs specific practices to handle loads that contain mixed garbage or are brought in by the public and non-licensed haulers. In such cases, the material is sorted either on the tipping floor or within the public drop-off containers. During this sorting process, wood is diverted and directed to the facility's wood piles.

Extent of Material Sorting at the Tipping Area

- The degree of material sorting at the tipping area is based on practical considerations. The facility's sorting efforts encompass extracting usable materials from the incoming waste as much as possible. However, if the wood is heavily mixed with shingles, wire, insulation, or similar materials, making it challenging to separate, it may not be sorted; and
- The diverted wood from the tipping area is combined into a mixed pile, which includes both clean and dirty wood. Due to space constraints and the perceived scarcity of entirely clean wood, there is no separate clean wood pile in the tipping area. However, the facility foresees the establishment of a separate treated wood pile in the near future to comply with the new provincial regulations.
   Impact of Baler Availability on Diversion
- During a specific period without a baler, the facility experienced a reduction in diversion rates. The limited space in the tipping area during that time led to more material being sent directly to the working face, resulting in less diversion.



Tipping Fees and Duration of Lower Fee for Sorted Wood

- The facility's tipping fees for various materials are as follows:
  - Clean wood: \$35
  - Mixed wood: \$35
  - Sorted C&D (concrete/aggregate, shingles, clean unpainted/non-papered drywall, scrap metal):
     \$35
  - Mixed C&D directed to C&D face or sorting bins (sorted by the customer): \$75
  - MSW, Mixed loads, or mixed C&D sent to the tipping floor: \$113

Post-Hurricane Fiona: Impact on Wood Waste and Waived Fees

- There was a notable increase in wood waste after Hurricane Fiona, reaching approximately 3-4 times the normal volume experienced in a typical year. This surge in wood waste began immediately after the hurricane, with the facility receiving a substantial influx of 200-300 customers per day during the week following the event;
- A fee waiver for brush disposal during Fiona was estimated to have been in effect for approximately 10 months after the hurricane; and
- When asked about the specific waste types that experienced an increase, it was clarified that the increase was primarily in brush waste, not C&D materials.

Wood Waste Handling and Composting Practices

Brush and Clean Wood Waste

- Regarding brush size limitations, the facility does not impose any specific size restrictions. However, if a load contains predominantly oversized brush, it will be categorized as clean wood. The facility accepts leaf and yard waste separately, including brush up to 1 inch in size, which is directed to the compost facility;
- While brush and wood waste are kept separate, they are ultimately sent to the same end market. The facility's reasoning for maintaining this separation despite the common destination is to preserve their established procedure for customer convenience. Additionally, the separation allows for potential adaptation if the need arises to access separate markets in the future;
- Regarding the use of wood waste as compost amendment, the facility previously employed wood chips for this purpose. However, they discontinued this practice due to the presence of high arsenic levels in some compost batches, which resulted in the compost being categorized as Class B. Once the use of wood chips was stopped, the issue ceased to occur; and
- The main sources of clean wood include brush, Christmas trees, unpainted pallets, and truss ends. The facility receives truss ends once a week, while the volume of pallets is decreasing, as businesses find other end markets for them.

Exploring Potential End Markets and Wood Management Practices

• Regarding other end markets in the province, the facility had previously utilized a local company called Nova Tree in the Glenholme area for processing brush waste. Nova Tree specialized in creating mulch and other products from waste generated by the logging industry. However, it was observed that Nova Tree stopped processing the facility's brush waste, possibly due to a shift away from on-site chipping operations;



- After Hurricane Fiona, the facility had an abundance of brush waste and explored the possibility of connecting with additional forestry-based resources. They reached out to Langille's in Pictou and Delco in New Brunswick, both forestry companies capable of grinding and marketing the material. However, upon careful evaluation, the costs involved were found to be similar to the existing service provider, Halifax C&D, which has been handling the facility's needs satisfactorily. Moreover, Delco could not accommodate the grinding of shingles, which Halifax C&D is capable of doing in addition to processing wood waste. During this period, the facility also considered partnering with the Town of Truro, which stores brush and leaf and yard waste and would have received brush waste from Hurricane Fiona as well;
- Aside from the mentioned possibilities, the facility acknowledges limited options for end markets in the province; and
- The facility's painted wood is sent for energy generation to Port Hawkesbury Paper, where it is utilized as hog fuel. The handling of this process is managed by Halifax C&D. It has been observed that approximately 95% of the time, the painted wood is directed to Port Hawkesbury Paper for its energy utilization.

Facility's Motivation for Wood Waste Sorting and Diversion

• The primary motivations for sorting and diverting wood waste are: conserving landfill space and promoting diversion practices.

Effectiveness of Wood Management Practices

- The use of the tipping floor has proven to be an effective method for diversion, allowing for the efficient sorting and diversion of wood waste; and
  - Preferential tipping fees for sorted wood has been effective.

### Cumberland Central Landfill – 2052 Little Forks Road, Cumberland County, NS

The site visit for Little Forks Landfill (the facility) occurred on June 28, 2023. The site visit included a visual inspection of sorted wood waste material from a five-day collection period and an interview with the Facility Manager, Stephen Rayworth.

The facility separated and sorted wood waste material from Wednesday June 21, 2023, to Monday June 26, 2023. The facility has three scale categories that include wood waste; brush, clean wood, and C&D. The wood waste material was sorted into the following categories (see photos below):

- Clean wood;
- Treated wood (mixed residential and commercial);
- Treated wood (oversized);
- Painted wood; and
- Pressboard/Plywood.

It is noted that there were two piles of material that had not been sorted at the time of the site visit. The facility sorted these piles prior to weighing the material. It is also noted that the brush and clean wood accepted under the clean wood scale category were diverted to the compost facility rather than being sorted and stored separately during the collection period. The scale data for these categories was provided to Dillon for the study period.

The facility sorted wood from mixed C&D loads. The total weight of mixed C&D loads received during the sorting period was 32.86 tonnes. The sorted wood waste material could not be weighed on the day of the site visit due to a scale issue. The results of the material weighing, sent to Dillon in the days following the site visit, are presented in Table B-3.

Material	Weight (T)	Percent of Wood Waste Stream (%)	Percent of C&D Waste Stream (%)
Clean Wood	11.66	43.6	35.5
Treated Wood	3.41	12.7	10.4
Treated Wood (oversized)	0.69	2.6	2.1
Painted Wood	4.84	18.1	14.7
Pressboard/Plywood	2.14	8.0	6.5
Brush	4.02	15.0	_1
Total	26.76	100	69.2

#### Table B-3: Wood Waste Characterization Results

Notes:

1 – Brush tracked separately from Mixed C&D



The facility was asked to note any anomalies during the collection week or notable waste. No anomalies were noted.



Photo 11: Clean Wood Pile 1





Photo 13: Treated Wood





Photo 14: Painted Wood Pile



Photo 15: Plywood/Pressboard





Photo 16: Brush Pile (not from the study period)



Photo 17: Mixed Pile

#### Notes from Site Interview

Brush and Clean Wood Waste Diversion and Markets

- The facility utilizes clean wood and brush as composting bulking agents. They are not aware of other local markets for their excess material. However, Athol Forestry had once explored the idea of establishing a biomass facility in the area, but unfortunately, this venture did not come to fruition due to funding constraints;
- GFL is open to seeking viable markets if it proves economically feasible;
- The primary motivation behind the commitment to sort and divert wood waste is the cost savings achieved from utilizing the materials as a bulking agent; and



• The facility does not handle grinding internally. Instead, they enlist the services of Halifax C&D, who conducts the grinding process every two years. The infrequency of grinding is not due to scheduling challenges; rather, it is attributed to the facility's extensive storage space, negating the need for frequent grinding operations.

Impact of Hurricane Fiona on Facility Operations and Increased Waste Volumes

- Evaluating the effect of the hurricane on C&D waste proved challenging due to a significant portion of their C&D waste being sourced from transfer stations. In 2022, approximately 27.3% of the C&D waste accepted by the facility originated from transfer stations;
- While the precise impact of Hurricane Fiona on C&D waste was challenging to discern, the facility did observe a noticeable increase in brush waste;
- The data received, reflecting the quantities of brush waste, highlights the following trends:
  - o January to June 2022: 17.58 metric tonnes;
  - July to December 2022: 43.43 metric tonnes; and
  - o January to June 2023: 135.03 metric tonnes.

Effective Practices in Wood Waste Management

• It was highlighted that the facility's large storage area serves as a significant advantage, enabling them to schedule grinding operations more strategically.

Challenges Faced in Wood Waste Management

- Sorting mixed material was identified as a difficult task, posing hurdles in the separation of different waste components; and
- Another challenge relates to the absence of a tipping fee for brush, causing customers to arrive with loads of mixed MSW and brush (difficult to sort).



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## East Hants Waste Management Centre - 1306 Georgefield Road, Hants County

The site visit for the East Hants Waste Management Center (the facility) occurred on July 19, 2023. The site visit included a visual inspection of sorted wood waste material from pre-selected loads.

The facility separated and sorted wood waste material from select loads determined by the facility. The wood waste material was sorted into the following categories, which were further sorted by commercial vs. residential (see photos below):

- Brush
- Clean Wood;
- Treated Wood;
- Painted Wood;
- Pressboard/Plywood; and
- Non-wood C&D material.

The facility's general procedure included the scale operator selecting loads to send to the sorting area to be sorted into the categories listed above. The piles appeared generally well sorted with some adjustment made prior to weighing. Painted and clean plywood were initially combined. Dillon personnel and site staff resorted the plywood pile prior to weighing the material.

The week of the composition study (July 12 to July 18) the facility received 74 loads of residential mixed C&D weighing a total of 26.5 tonnes and 34 loads of commercial mixed C&D that weighed a total of 51.28 tonnes. This yielded a total mixed C&D tonnage for the facility during the week of 77.78 tonnes. It is noted that this total includes 7.68 tonnes of brush and 7.32 tonnes of clean wood loads.

During the composition study period, the facility sorted 1.93 tonnes of residential C&D and 0.88 tonnes of commercial C&D, for a total of 3.01 tonnes. The results of the material weighing are presented in Table B-4.

Material	Source	Weight (T)	Percent in the Mixed C&D Stream (%)
Brush	Residential	0.20	6.6
	Commercial	0	0
	Total	0.20	6.6
Clean Wood	Residential	0.29	9.6
	Commercial	0.48	15.9
	Total	0.77	25.6
Treated Wood	Residential	0.31	10.3
	Commercial	0	0

## Table B-4: Wood Waste Characterization Results





Material	Source	Weight (T)	Percent in the Mixed C&D Stream (%)
	Total	0.31	10.3
	Residential	0.4	13.3
Painted Wood	Commercial	0.13	4.3
	Total	0.53	17.6
	Residential	0.13	4.3
Pressboard/Plywood	Commercial	0.04	1.3
	Total	0.17	5.6
	Residential	0.8	26.6
Other (non-wood)	Commoraial	0.22	7/

0.23

1.03

1.15

0.65

1.80



Commercial

Total

Residential

Commercial

Total

#### Photo 20: Residential Clean Wood – View 1



Valley Waste Resource Management Wood Waste Study - Final Report November 2023 – 23-6152

Total Wood

C&D

7.6

34.2 38.2

21.6

59.8



Photo 21: Commercial Treated Wood



Photo 22: Residential Painted Wood





Photo 23: Residential Pressboard/Plywood



Photo 24: Non-wood C&D Materials



Clean Wood Separation and Pre-Covid End Markets

- The facility ceased separating clean wood due to the impact of the Covid-19 pandemic;
- Before discontinuing clean wood separation, the facility had an established end market for this waste stream. Clean wood was being directed to Minas Basin Pulp and Paper, where it found utilization in their processes; and
- Additionally, the municipality had an end market for mulched brush waste and was actively involved in diverting brush waste for beneficial reuse within the local community.



# Valley Waste Western Management Centre – 343 Elliot Road, Lawrencetown, NS

The site visit for Valley Waste Western Management Centre occurred on July 13, 2023. The site visit included a visual inspection of sorted wood waste material from a four-day collection period and an interview with the Manager, Andrea Garrett.

The facility separated and sorted wood waste material from Friday, July 7 to Wednesday, July 12, 2023. The wood waste material was sorted into the following categories (see photos below):

- Clean Wood;
- Treated Wood;
- Painted Wood;
- Pressboard/Plywood; and
- Brush.

During the composition study period, the facility received a total of 63.59 tonnes of waste. Of the waste received by the facility, 3.25 tonnes were mixed C&D, clean wood and brush.

The sorted material stockpiles were mixed residential and commercial with the exception of brush, which was primarily residential. It was estimated by Andrea Gibson-Garrett, that overall, wood customers at the facility would be 90% residential and 10% commercial. It is noted that no oversized treated wood was received during the collection period. There was no treated wood pile, but approximately 10% of the painted pile was estimated to be treated wood. The results of the material weighing are presented in Table B-5.

Material	Weight (T)	Percent of Wood Waste Stream (%)
Clean Wood	0.78	14.1
Treated Wood	0.35	6.3
Painted Wood	3.17	57.2
Pressboard/Plywood	0.03	0.5
Brush <sup>1</sup>	1.21	21.8
Total	5.54	100

#### Table B-5: Wood Waste Characterization Results

The facility was asked to note any anomalies during the collection week or notable waste. It was noted that the collection period was a typical week.





Photo 25: Clean Wood



Photo 26: Painted Wood





Photo 27: Pressboard/Plywood



Photo 28: Brush

Lower Tipping Fees and Clean Wood Diversion Practices

- The facility offers lower tipping fees for sorted C&D waste. This practice has been in effect since 1999;
- The scale operator assesses the load based on visible contents. If on-site workers identify additional materials in the load, they communicate this to the scale operator via radio. In cases where the load contains multiple waste categories, it is categorized based on the material with the highest tipping fee;



- Customers who bring in pre-sorted clean wood are motivated by the lower tipping fee, which provides them with a cost-saving advantage. Another compelling factor is the convenience of skipping the tipping area, particularly when it becomes busy and lined up. Customers with sorted wood can proceed directly to the designated C&D area, streamlining their waste disposal process;
- The pre-sorted clean wood primarily originates from businesses, such as garden centers and farms; and
- For the facility, the primary motivations for diverting clean wood are two-fold: waste diversion and cost savings.

**Clean Wood Diversion** 

- The facility diverts clean wood to Scott Farms. Scott Farms accepts all the clean wood provided by the facility, but it remains uncertain whether Valley Waste meets their clean wood demand entirely;
- Valley Waste management centers receive minimal oversized treated wood, as it is typically diverted to local private C&D facilities or 2nd generation landfills;
- The quantity of materials diverted to the Reuse Center from the facility is not as significant as the materials diverted from Valley Waste Eastern Management Centre due to the Reuse Center being located at Valley Waste Eastern Management Centre. The operator of the Reuse Center visits the facility once a week to collect diverted materials; and
- The challenges associated with giving away brush mulch primarily revolve around quality expectations. The mulch provided is a 3-inch coarse variety, which requires meeting certain standards for recipients. In the past years, the facility has generally been successful in giving away all the brush mulch generated.

Painted and Treated Wood Markets

- When Brooklyn Energy communicated that they would no longer accept painted and treated wood, the facility sent material to Arlington C&D (2021) and thereafter to Kaizer Meadow landfill. Challenges Faced by the Facility
- Scheduling Chipping Services: One prominent challenge pertains to the scheduling of chipping services. Coordinating the timing for chipping operations can be complex and demanding, impacting the efficiency of waste management processes; and
- **Manual Handling for Diversion and Sorting:** Another significant challenge revolves around manual handling during the diversion and sorting processes. The safety and time constraints associated with manually handling heavy pieces of waste pose obstacles to the execution of waste diversion efforts.



# Valley Waste Eastern Management Centre – 100 Donald Hiltz Connector Road, Kentville, NS Transfer Station

The site visit for Valley Waste Eastern Management Centre (the facility) occurred on July 14, 2023. The site visit included a visual inspection of sorted wood waste material and an interview with the Manager, Andrea Gibson-Garrett.

The facility separated and sorted wood waste material from Friday July 7, 2023, to Thursday July 13, 2023. The wood waste material was sorted into the following categories (see photos below):

- Clean Wood;
- Treated Wood:
  - Normal sized residential and commercial;
  - Oversized (no oversized wood was received);
- Painted Wood;
- Pressboard/Plywood; and
- Brush.

The sorted stockpiles were mixed residential and commercial with the exception of brush, which was primarily residential. It was estimated by Andrea Gibson-Garrett, that overall, wood customers at the facility would be 60% residential and 40% commercial.

The facility was asked to note any anomalies during the collection week or notable waste. It was noted that it was a somewhat typical week. One house demolition came in. They did not pile this and sort it. They estimated percentages and processed it according to regular operating procedures. The results of the material weighing are presented in Table B-6.

Material	Stockpile Weight (T)	Estimated Weight from House Demolition Loads (T)	Total Weight (T)	Percent of Wood Waste Stream (%)
Clean Wood	10.06	1.01	11.07	21.2
Treated Wood	14.55	0	14.55	27.8
Treated Wood (oversized)	1.59	0	1.59	3.04
Painted Wood	10.70	1.01	11.71	22.4
Pressboard/Plywood	7.30	0	7.30	13.9
Brush <sup>1</sup>	6.12	0	6.12	11.7
Total	50.32	2.02	52.34	100

## Table B-6: Wood Waste Characterization Results

Notes:

1 - Brush included leaf and yard waste and material exceeding 8 inches





Photo 29: Clean Wood



Photo 30: Treated Wood







Photo 32: Painted Wood



**B** – 31



Photo 33: Pressboard/Plywood



Photo 34: Pressboard/Plywood



Photo 35: Brush



Sources of Pre-sorted Clean Wood

• The pre-sorted clean wood at the facility originates from various sources, including businesses, garden centers, and farms. Specifically, pallets play a crucial role in supplying clean wood for diversion (e.g., Scotian Gold brings pallets).

Reuse Center

- The Reuse Centre has been operational since 2012, with a temporary closure during the Covid-19 pandemic;
- During its establishment and ongoing operation, the center encountered various challenges. Pricing
  has been a continuous obstacle, requiring careful consideration and adjustment to ensure a balance
  between affordability and sustainability. Additionally, storage of materials posed a challenge before
  the acquisition of storage racks. Previously, materials picked out for the Reuse Centre were piled
  together, resulting in potential damage and contamination. However, with the introduction of
  storage racks, this issue was successfully addressed;
- The Reuse Centre has witnessed high demand wood;
- Materials that are removed from the tipping room floor and qualified for the Reuse Center include brush, clean wood, and items deemed to be in "good condition," such as clean or treated wood suitable for reuse;
- The definition of "good condition" varies on a case-by-case basis, with the presence of nails considered acceptable;
- In the case of pressboard/plywood, stringent quality standards are imposed, requiring the material to be in excellent condition, akin to new. Used pressboard/plywood is typically brittle and deemed unsuitable for the Reuse Center;
- While painted wood is occasionally sold at the Reuse Center, the focus primarily remains on selling clean and high-quality wood. Additionally, some specialty items, such as staircase wood and furniture, may also find their way into the center;
- The Reuse Center has engaged in trial and error with regards to selling lower-quality wood, primarily for non-plywood items. Identifying market demand and suitable materials have been essential factors in these endeavours; and
- While materials are primarily diverted from the Valley Waste Eastern Management Centre, the Western Management Centre also contributes to the Reuse Center's supplies.

Challenges in Managing Wood Waste

- Grinding and Chipping Services Scheduling: Coordinating the schedule for grinding and chipping services poses a significant challenge;
- Limited Space: Space constraints at the facility present an ongoing challenge in managing wood waste. The availability of adequate space is essential for organized waste sorting and storage; and
- Impact of Provincial C&D Guidelines: With the implementation of new C&D guidelines limiting pile sizes, managing wood waste could become more challenging. Compliance with these guidelines may require careful planning and adaptation to ensure effective waste management.



# Yarmouth County Solid Waste Park – 1934 Hardscratch Road, Yarmouth

The site visit for Yarmouth County Solid Waste Park (the facility) occurred on July 12, 2023. The site visit included a visual inspection of sorted wood waste material from a five-day collection period and an interview with the Manager, Glendon Ring.

The facility separated and sorted wood waste material from Monday June 26, 2023, to Saturday July 1, 2023. The wood waste material was sorted into the following categories (see photos below):

- Clean Wood;
- Treated Wood:
  - Residential;
  - o Commercial;
  - Oversized (no oversized wood was received);
- Painted Wood; and
- Pressboard/Plywood.

The facility's general procedure included informing the facility customers of the wood waste study and directing them to a designated sorting area. Facility staff helped them unload, sorting as they went where possible. This process provided context to the sorting staff of the material source and helped them to sort. The piles appeared generally well sorted. Clean and painted plywood was combined when Dillon personnel arrived on site. Painted plywood/pressboard and furniture was moved into the painted pile prior to and during weighing of the plywood pile. An estimate was made of the remaining painted portion in the plywood pile.

The facility did not separate wood waste out of their C&D loads. During the collection week there was 42.37 tonnes of C&D waste. Glendon Ring noted that C&D loads don't typically contain a large portion of wood; however, if the C&D load is coming from a house demolition it may contain a large portion of wood. The facility sorted wood that came into the facility as wood loads. The total wood that came into the facility under the wood category during the study period was 40.87 tonnes from 129 loads.

It is noted that the facility's brush processing procedures were not altered and brush was not sorted and stored during the collection period. Brush was diverted to the compost facility where it is used as a bulking agent. The facility received 3.7 tonnes of brush during the study period.

The results of the material weighing are presented in Table B-7.



Material	Weight (T)	Percent of Wood Waste Stream (%)
Clean Wood	19.28	44.2
Treated Wood (residential)	5.88	13.5
Treated Wood (commercial)	2.94	6.7
Painted Wood	6.35	14.6
Pressboard/Plywood	5.41	12.4
Brush	3.70	8.5
Total	43.56	100

#### Table B-7: Wood Waste Characterization Results

The facility was asked to note any anomalies during the collection week or notable waste. It was noted that the collection period was a slow week, inferred by the facility staff to be due to rain that week. It was also noted that a large portion of the clean wood was from a barn demolition.



Photo 36: Clean Wood





Photo 37: Residential Treated Wood



Photo 38: Commercial Treated Wood







Photo 39: Painted Wood



Photo 40: Plywood/Pressboard

Scale Categories and Motivation for Separating Clean Wood

- The scale categories that include wood at the facility are as follows: brush, mixed wood (this category comprises both clean and dirty wood, with an estimated split of 60% clean and 40% dirty. However, these components are not separately categorized at the scale), and mixed C&D;
- The facility is motivated to separate wood primarily due to landfill space concerns. By diverting wood from mixed loads, they can conserve valuable landfill space and promote more sustainable waste management practices;



- The scale operator plays a crucial role in directing mixed wood loads to the appropriate wood piles, classifying them as either clean or dirty. However, further sorting is conducted by staff after the drop-off to ensure proper segregation. To be directed to the clean wood pile, a load must consist of 100% clean wood. However, the facility encounters challenges with customers inadvertently mixing up the piles, leading to potential contamination;
- Clean wood loads primarily come from the construction and renovation industry, as well as pallets sourced from various commercial entities, including fish plants and Acadian Seaplants Ltd.; and
- The facility does not offer a lower tipping fee for clean wood compared to mixed wood. This decision is attributed to concerns that such a policy might incentivize individuals to misrepresent the content of their loads as clean wood when they contain mixed materials. Additionally, the wood piles are not continuously supervised by staff, creating a potential risk of misclassification.

Clean Wood Separation and Wood Diversion Practices

- Clean wood from the facility is sent to Brooklyn Energy. This practice has been in place since at least 2010. The connection with Brooklyn Energy was reportedly established through Halifax C&D;
- Brooklyn Energy accepts clean wood with up to 3% contamination, and to date, none of the loads have been rejected;
- Brush waste is sent to the compost facility. In most years, the facility meets its amendment needs
  with the brush. However, there have been instances, such as the current year, where the brush did
  not fully meet the requirements. In such cases, the facility does not hesitate to explore alternative
  materials, including cardboard or oversize materials, to meet their needs. It is important to note that
  the compost facility is owned separately from the facility;
- In the past, dirty wood was used as cover material, but this practice was recently halted in compliance with NSECC's treated wood disposal ban. During the spring of 2023, dirty wood was sent to Port Hawkesbury Paper (connection was made through Halifax C&D). This arrangement proved successful, with Port Hawkesbury Paper purchasing the material at a rate of \$20/tonne. Prior to 2023, Port Hawkesbury Paper sourced wood waste locally, but due to increased demand, they sought additional sources for supply; and
- As for wood diversion practices and end markets, the facility has not attempted any other methods beyond those already mentioned. Similarly, there are no other wood diversion markets in the province that the facility is aware of beyond the ones previously discussed.

Wood Diversion and Management Barriers

- Currently, the primary barrier faced by the facility in terms of wood diversion is the finding and availability of suitable end markets. Identifying outlets for the diverted wood remains a challenge;
- Sorting is not seen as a barrier for wood diversion at the facility. They have a well-established and efficient management system in place, which has been utilized;
- The facility is open to exploring and utilizing more end markets for different types of wood if such markets are identified. They are receptive to opportunities that can enhance their wood diversion efforts;
- Hurricane Fiona did not significantly impact their region, so there were no adverse effects on their operations;



- In terms of the percentage of wood diverted from the C&D stream, it is estimated that less than 0.5% of the total mixed C&D is diverted as clean wood. However, pulling out the wood for diversion can be challenging, as it often turns out to be contaminated and not worth the effort; and
- The non-diverted wood goes to the C&D landfill.



# <u>Lunenburg Regional Community Recycling Centre – 908 Mullock Road Whynotts</u> <u>Settlement, Lunenburg, NS</u>

There was no site visit undertaken for the Lunenburg Regional Community Recycling Centre (the facility), as the Chief Operating Officer for the Municipal Joint Services Board, Lesley MacFarlane, suggested an alternative approach which could yield a more accurate representation of their wood waste characterization.

As part of standard operating procedures, the facility separates and stockpiles the following categories of wood waste:

- Clean wood;
- Treated wood (residential);
- Treated wood (commercial, oversized);
- Painted wood and plywood; and
- Brush.

The above categories were stockpiled over the period of January 2022 to the end of May 2023. The Lunenburg Joint Services Board provided Dillon with weight for the stockpiled materials, along with scale data for their mixed C&D stream. The results are presented in Table B-8.

Material	Weight (T)	Percent of Wood Waste Stream (%)
Clean Wood	1,092.08	36.3
Treated Wood (residential) <sup>1</sup>	81.94	2.7
Treated Wood (commercial, oversized) <sup>2</sup>	267.02	8.9
Painted Wood and Plywood	1,460.80	48.5
Brush	110.00	3.7
Total	3,011.84	100

#### Table B-8: Wood Waste Characterization Results

Notes:

1 - Treated wood (residential) tracked as of April 1, 2023 (scale code did not exist prior to this date)

2 – Treated wood (commercial, oversized), January 2022 to June 30, 2023



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