

Woodchip Volume Measurement System (WVMS) as Alternate Method of Scale

Purpose & General Description of Method

The primary purpose of the Woodchip Volume Measurement System (WVMS) is to authorize an alternate method of scale for low-quality timber harvested on the Coast as per Section 5(1)(c)(iii) of the *Scaling Regulation* to improve the utilization of forest resources.

The use of the WVMS has the potential to provide efficiencies for the transport, scaling and billing of low-quality timber that is transported unscaled by water before being turned into woodchips for use in pulp and paper mills on the Coast. Concurrent with normal block harvesting activities unscaled timber can be delivered directly to a wood-chipping facility, thereby eliminating multiple log handling touches that can increase delivered log costs. Weight-scaling infrastructure and sample scaling are not required as part of this method of scale.

The measurement of the fibre is taken after the logs have been chipped by measuring the volume of the woodchips. The volume of the woodchips is then converted to a solid wood equivalent volume for billing using the methodology described below.

This process is designed to be revenue and cut control neutral and cannot be applied to BC Timber Sale Licences.

Requirements

- Using the WVMS is voluntary and must have a business to business agreement between the primary harvester and a wood-chipping facility.
- The licensee must receive a mark/scale site designation to transport unscaled timber to the chipping facility scale site.
- Before transporting the unscaled timber by water the Licensee must complete a WVMS bundle addendum and submit it to the originating and destination FLNRORD District.
- Bundle volumes must be consistent for all bundles in a WVMS project. The Load Description Slip (LDS) for each load must provide details on how consistent load size was achieved, (for example, by recording load Width x Height x Length or on-board scale readings).
- Qualified personnel must take responsibility for completing bundle addendum information at the origin, (including correct stratification of loads).

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- The destination chipping facility must employ qualified, independent third-party woodchip volume measurement personnel to measure woodchip volume upon the WVMS project production cut-off and produce a barge scale report and/or volume in pile report.
- To facilitate billing in the Harvest Billing System (HBS) the chipping facility must be authorized as a weight scale site in the Scale Administration and Control System (SCS) and be set up to submit weigh scale returns as part of their HBS site profile. The weight scale site authorization must include the WVMS method of scale condition.

WVMS Procedure Steps

- **Application to use WVMS** - A licensee's submission of a mark/site designation application and a WVMS Bundle Addendum for each WVMS project acts as an application to use the WVMS method of scale. A project corresponds to a set of bundles that will have its woodchip out-turn volume measured and applied to a specific Transport ID.
- **WVMS Bundle Addendum Submission** - Before transporting the unscaled timber by water, the licensee must complete a detailed WVMS Bundle Addendum and submit it to the originating and destination FLNRORD Districts in the original Excel file format. The addendum must include the project description, estimated bundle volume, Load Description Slip (LDS) number, bundle tag number, Truck ID, Cutblock, Timber Mark, WVMS Stratum, estimated Species percentages and date watered for each bundle in the WVMS project. Responsibility for complete and accurate WVMS Bundle Addendum information must be taken by an individual trained and qualified to confirm WVMS strata, by completing the certification section of the form. The ministry may inspect the boom to verify proper stratification and accuracy of the submission.
- **WVMS Strata - (Grades and Species)** - The general WVMS strata descriptions and their corresponding grade profiles are attached in Appendix #2. The grade profiles for the strata are based on average weighted grade profiles and have been derived from HBS and observed data. The applicable *Species* percentages will be determined

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by the Species percentages in the submitted WVMS Bundle Addendum and set up in HBS by the Coast Area staff. See Appendix #3 for an example of a WVMS HBS stratum setup. A separate Coast Area population will be used for WVMS strata.

- **HBS Version 1 Submission** - Concurrent with the submission of a WVMS Bundle Addendum the licensee is responsible for submitting each bundle into HBS as a Version 1 weigh event. This initial return must use a static (00001) kg in the weight field on all slips. The stratum must be consistent with the corresponding bundle addendum.
- **Bundle Reconciliation** – After arriving at the chipping facility scale site, and before the bundles are chipped, a reconciliation of the bundles must be completed. The reconciliation, which confirms the status of each bundle, is entered on the WVMS Bundle Addendum. A reconciled addendum must be submitted to the originating and destination FLNRORD Districts in the original Excel format concurrent with the HBS Version 2 data submission. The reconciliation submission must also include copies of all corresponding barge scale reports and volume in pile reports.
- **HBS Version 2 Submission** - Once the average bundle volume has been determined, (as detailed in the measurement methodology below), a Version 2 scale return is submitted into HBS by replacing the original static weight of (00001) kg with the calculated “average bundle volume” represented as a weight in kilograms. For example an average bundle size of 45.321 m³ is entered as 45.321 kg. The volume/weight ratio in HBS will always be set at 1.00000. That is, 1.000 m³ is represented by 1.0000 Tonne (i.e. 1000kg). In the above example the ratio of 1.00000 applied to the weight of 45321 kg would result in a billing volume of 45.321 m³. All bundles listed on the addendum, including any lost or missing bundles, must have a Version 2 submission using the calculated average bundle volume.

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WVMS Measurement Methodology

- **Woodchip volume** must be measured by a qualified, independent third-party using the following approaches;
 - Measuring woodchip volume in a woodchip scow and producing a barge scale report (see Appendix #1 for an example barge scale report), or
 - Measuring woodchip pile volume on a flat surface employing a standard set of physical measurements and producing a volume in pile report.
- **The total measured woodchip volume** must correspond to a WVMS project production cut-off. That is, the woodchip volume created from all bundles in a Transport ID must form the WVMS project total woodchip volume.
- **A Volumetric Unit (VU)** is the common measurement that is used for woodchips and represents 200 cubic feet of space, ($1 \text{ VU} = 200 \text{ ft}^3 = 5.66337 \text{ m}^3$). Below are some equivalent measurements;

$$1 \text{ VU} = 200 \text{ ft}^3 = 5.664 \text{ m}^3$$

$$1 \text{ m}^3 = 35.315 \text{ ft}^3 = 0.177 \text{ VU} \quad 1 \text{ ft}^3 = 0.02832 \text{ m}^3$$

- **Total solid wood equivalent volume** for billing is derived by applying a woodchip out-turn ratio to the measured Volumetric Units. These ratios are derived from historic woodchip out-turn data from various Coastal chipping facilities and correspond to the type of log debarking that takes place before the production of the woodchips. Table #1 below shows the woodchip out-turn ratios by debarker type, as well as examples of some VU to solid log conversions.
- **Average solid wood bundle volume** is determined by dividing the total solid wood equivalent volume by the number of bundles in the WVMS project. This average solid volume per bundle is then used in the submission of Version 2 HBS returns.

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Table #1 - Woodchip Out-turn Ratios by Debarker Type			
Debarker Type	Chip Out-turn Ratio (Solid Log in m³ per VU of Woodchips)	Examples of Measured Woodchips in Volumetric Units (VU)	Corresponding Equivalent Volume of Logs in m³ (for HBS Billing)
Ring Debarker	1.95	100.00	195.000
Flail & Floor Debarkers	2.20	100.00	220.000

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Appendix #1

**Example of a Barge Scale Report
(Measurement of Woodchip Volume in a Barge)**

Barge Scale Report July-18-19

Customer: Name of Pulp/Paper Mill Scale Date:
Supplier: Scale Site Operator / Licensee Species: HemBal Pulp
Barge: Barge ID File #:

Crown Length: 4.0
10.6
Avg. Down on Sides: 6.05
Pile Length: 66.52

Box Width: 45.8 Box Length: 191 Box Height: 18.5

Forward Starboard Aft Starboard

6.0
Crown Width
5.0
6.1

Forward Port Aft Port

All Measurements in Feet

10.0	Freeboards	4.8
10.2		4.9

Volume of Barge in Units = **207.93**

Percent of Rated Capacity = 17.16%

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Appendix #2 – WVMS Grade Profile by Stratum Type

WVMS Grade Profile Table by Stratum Type

Stratum Description	Grade H %	Grade I %	Grade J %	Grade U %	Grade X %	Grade Y %	Grade Z %
HemBal Pulp(>50% HemBal Pulp & >10% X, Y, Z Grade)	2.0	2.0	21.0	53.0	8.0	13.0	1.0
HemBal CNS (>50% HemBal CNS & <5% X,Y, Z Grade)	9.0	3.0	63.0	23.0	1.0	1.0	0.0
Fir/Pine Pulp/CNS (>50% Fir & Pine Pulp/CNS)	0.0	0.0	25.0	65.0	6.0	3.0	1.0
Mixed Species Pulp (50% or less in each Species & >10% X, Y, Z Grade)	2.0	2.0	21.0	53.0	8.0	13.0	1.0
Cypress & Cedar Pulp(>50% Cyp/Ced Pulp & >50% X, Y, Z Grade)	0.0	1.0	15.0	1.0	35.0	47.0	1.0
*Mixed Species Log Salvage (>50% X, Y & Z Grade)	3.0	2.0	3.0	14.0	20.0	55.0	3.0

*Salvage - For the purpose of the **Mixed Species Log Salvage** stratum "salvage" is defined as harvesting logs under a Small-Scale-Salvage (SSS) tenure, or salvage harvesting residual logs after primary harvesting has been completed.

Strata descriptions in HBS will include the estimated species % for the strata used. Grade percentages within a stratum billed at the same percent for all species (eg. HemBal Pulp stratum U-Grade billed at 53% for all Species included in the stratum).

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Appendix #3 - Example of HBS Set-up for WVMS Stratum

Stratum	Volume/Weight Ratio	Ratio Table for Stratum							
HemBal Pulp	1.00000	Grade Profile							
		Species %	Grade H 2.0%	Grade I 2.0%	Grade J 21.0%	Grade U 53.0%	Grade X 8.0%	Grade Y 13.0%	Grade Z 1.0%
	HE	70	0.014	0.014	0.147	0.371	0.056	0.091	0.007
	BA	20	0.004	0.004	0.042	0.106	0.016	0.026	0.002
	CE	10	0.002	0.002	0.021	0.053	0.008	0.013	0.001
	Total	100	0.020	0.020	0.210	0.530	0.080	0.130	0.010

This Species/Grade and Ratio information will be entered into HBS by Area staff as:

Stratum	Stratum Name	Grade Schedule	Product Schedule
01	HemBal Pulp	Coast Grades	Logs

Species	Grade	Ratio	Fraction
Hemlock	H	0.014	1.40%
Hemlock	I	0.014	1.40%
Hemlock	J	0.147	14.70%
Hemlock	U	0.371	37.10%
Hemlock	X	0.056	5.60%
Hemlock	Y	0.091	9.10%
Hemlock	Z	0.007	0.70%
Balsam	H	0.004	0.40%
Balsam	I	0.004	0.40%
Balsam	J	0.042	4.20%
Balsam	U	0.106	10.60%
Balsam	X	0.016	1.60%
Balsam	Y	0.026	2.60%
Balsam	Z	0.002	0.20%
Cedar	H	0.002	0.20%
Cedar	I	0.002	0.20%
Cedar	J	0.021	2.10%
Cedar	U	0.053	5.30%
Cedar	X	0.008	0.80%
Cedar	Y	0.013	1.30%
Cedar	Z	0.001	0.10%
Totals		1.00000	100.00%