
Scaling Studies at MWFP
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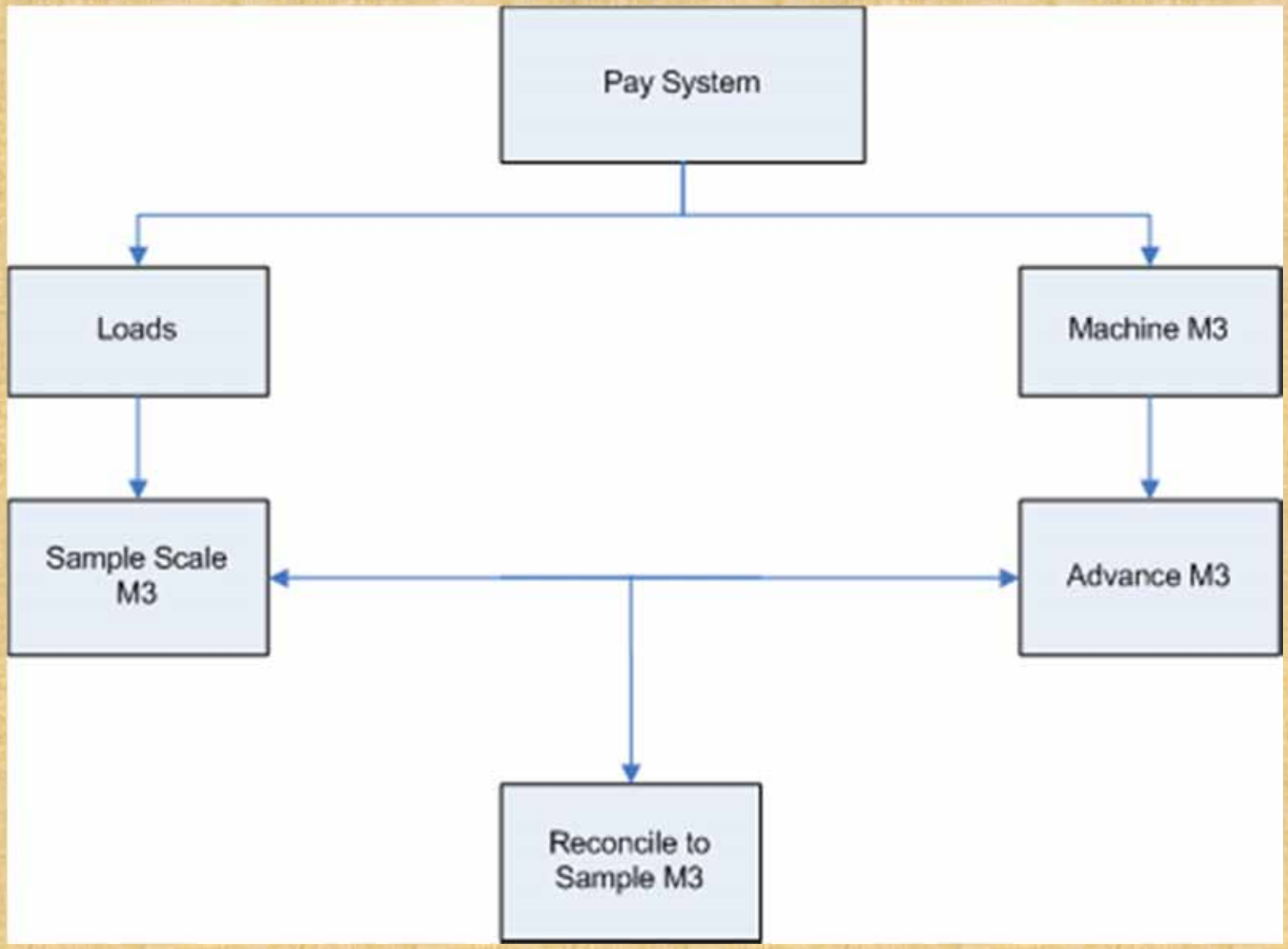
Two Studies

- Processors as a payment system
- Fiber gain in undersize material

Processor vs Stick Scale

- Payment system for loggers
  - Advances based on processor outputs
  - Reconciled to stick scale
  - Outages

Logger Payment System



Processor Trials

- Compare the volumes calculated by processor head software to the volumes generated using a scale stick

Processor

- There are volume differences from processor readings and the final reconciliation of payment
- Processor volume calculations use same formulas as stick scale
- However applications of formulas are different

Processors and measuring systems - Waratah with TimberRite 30 Lite

Measuring and Control System Vrs 1.5.9

Trial 1

- For this trial the contractor's processor operator had processed 15 CTL pieces and recorded the volume per piece. The machine was zeroed out prior to trial and the final volume read out was for 1.85m3
- This did not match volume of the stick scale:

Camparison Between Scaler and Processor:	
	Volume Without Trim
Scaler	1.84116255
Processor	1.614
% Difference	13.15%

DATA

Log #	Butt	Top	Lgth (CM)	Length Class Without Trim Applied	Length with Trim Applied	Length Class	Feet	Inch	Stick Scale Volume Without Trim	Stick Scale Volume With Trim	Processor Volume	% Difference Without Trim	% Difference With Trim Applied
1	24	13	554	5.6	539	5.4	18	2	0.163751	0.157903	0.1	48%	45%
2	31	23	436	4.4	426	4.2	14	4	0.257323	0.245627	0.189	31%	26%
3	21	18	500	5.0	485	4.8	16	5	0.150131	0.144126	0.134	11%	7%
4	18	14	382	3.8	372	3.8	12	6	0.077558	0.077558	0.06	26%	26%
5	20	15	503	5.0	488	4.8	16	6	0.122656	0.11775	0.12	2%	-2%
6	15	10	382	3.8	372	3.8	12	6	0.048474	0.048474	0.037	27%	27%
7	22	18	495	5.0	480	4.8	16	3	0.15857	0.152227	0.144	10%	6%
8	17	12	496	5.0	481	4.8	16	3	0.084976	0.081577	0.082	4%	-1%
9	18	16	502	5.0	487	4.8	16	6	0.113825	0.109272	0.113	1%	-3%
10	16	12	502	5.0	487	4.8	16	6	0.0785	0.07536	0.066	17%	13%
11	22	12	499	5.0	484	4.8	16	5	0.123245	0.118315	0.095	26%	22%
12	24	16	500	5.0	485	4.8	16	5	0.16328	0.156749	0.167	-2%	-6%
13	19	15	380	3.8	370	3.8	12	6	0.087402	0.087402	0.068	25%	25%
14	15	9	377	3.8	367	3.6	12	4	0.04564	0.043238	0.043	6%	1%
15	22	19	500	5.0	485	4.8	16	5	0.165831	0.159198	0.196	-17%	-21%
								Totals	1.841163	1.774775	1.614	13%	9%

Trial 2

- Trial # 2 was conducted with the same processor but a recording of the individual logs measurements was made available as well as a summary by preferred length class. This enabled more reference to explain outages.

DATA

Smalian Volume Calculator Scaler's Measurements											Smalian Volume Calculator As Per Processor Individual Log Measurements										Difference	
Log #	Butt	Top	Lgth (CM)	Length Class Without Trim	Length with Trim Applied	Length Class	Feet	Inch	Volume Without Trim	Volume With Trim	Butt	Top	Lgth (CM)	Length Class Without Trim	Length with Trim Applied	Length Class	Feet	Inch	Volume Without Trim	Volume With Trim	% Dif Without Trim	% Dif With Trim Applied
1	18	12	436	4.4	426	4.2	14	4	0.081	0.077	19	13	437	4.4	427	4.2	14	4	0.088	0.084	9%	9%
2	22	17	497	5.0	482	4.8	16	4	0.152	0.146	21	17	499	5.0	484	4.8	16	5	0.143	0.138	-6%	-6%
3	16	12	430	4.4	420	4.2	14	1	0.069	0.066	17	11	436	4.4	426	4.2	14	4	0.071	0.068	2%	2%
4	18	15	374	3.8	364	3.6	12	3	0.082	0.078	17	14	377	3.8	367	3.6	12	4	0.072	0.069	-12%	-12%
5	14	11	437	4.4	427	4.2	14	4	0.055	0.052	14	11	427	4.2	417	4.2	14	0	0.052	0.052	-5%	0%
6	35	27	498	5.0	483	4.8	16	4	0.383	0.368	36	28	500	5.0	485	4.8	16	5	0.408	0.392	6%	6%
7	27	19	498	5.0	483	4.8	16	4	0.214	0.205	28	17	500	5.0	485	4.8	16	5	0.211	0.202	-2%	-2%
8	18	16	373	3.8	363	3.6	12	3	0.087	0.082	17	16	377	3.8	367	3.6	12	4	0.081	0.077	-6%	-6%
9	16	13	435	4.4	425	4.2	14	3	0.073	0.070	16	12	437	4.4	427	4.2	14	4	0.069	0.066	-6%	-6%
10	20	14	499	5.0	484	4.8	16	5	0.117	0.112	17	14	500	5.0	485	4.8	16	5	0.095	0.091	-21%	-21%
	204	156	4477						1.312	1.256	202	153	4490						1.291	1.239	2%	1%

DATA

- Summary by Length Sort:

Scaler Per Log Volumes				Printout				Processor Per Log Volumes			
Length Sorts	Tolerance	# Logs	Volume (M^3)	Length Sorts	Tolerance	# Logs	Volume (M^3)	Length Sorts	Tolerance	# Logs	Volume (M^3)
5.00	No Data	4	0.9	5.00	No Data	4	0.9	5.00	No Data	4	0.9
4.37	No Data	4	0.3	4.37	No Data	2	0.2	4.37	No Data	4	0.3
3.77	No Data	2	0.2	3.77	No Data	4	0.3	3.77	No Data	2	0.2
3.14	No Data	0	0	3.14	No Data	0	0	3.14	No Data	0	0
Unclassified		0	0	Unclassified		0	0	Unclassified		0	0
Total With Unclassified		10	1.31	Total With Unclassifiec		10	1.40	Total With Unclassif		10	1.29
Total Without Unclassif		10	1.31	Total Without Unclassi		10	1.40	Total Without Uncla		10	1.29
	Print out reads:		1.3		Print out reads:		1.3		Print out reads:		1.3

Trial 3

- Conducted on tree length aspen
- Scalers pencil bucked aspen into 5 m bolts and did a Smalian scale
- Processor used a newer software – TimberRite
- Segmented volume calculation was done by processor and compared to stick scale

Results

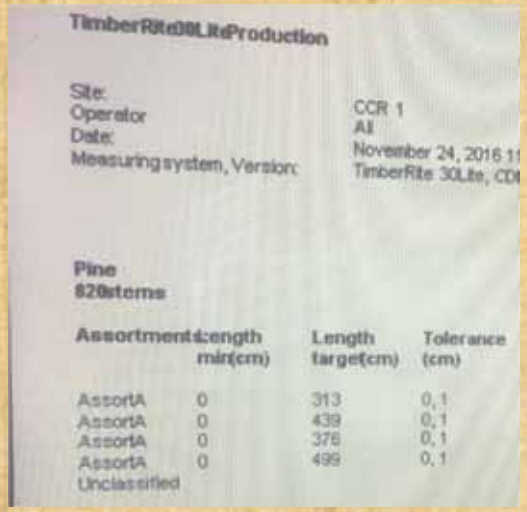
Comparison Between Scaler and Processor:	
	Volume Without Trim
Scaler	3.46
Processor	3.27
% Differen	5.72%

Trial 4

- This trial was conducted with a different contractor
- The processor was using the new Waratah software - TimberRite 30
- There was no per log comparisons at this time and the stick scale was compared to a length class production report.

Data

Comparison of Piece Scale and Processor									
Length Sorts	# Logs	Volume Without Trim (M^3)	Volume With Trim (M^3)	Processor # of Logs	Processor Volumes	Log Count Difference	% Difference in # of Logs	% Difference of Volume Without Trim	% Difference of Volume With Trim
313	4	0.21	0.21	3	0.22	1	28.57%	-4.20%	-4.20%
439	3	0.23	0.23	3	0.31	0	0.00%	-29.04%	-31.28%
376	4	0.28	0.28	2	0.12	2	66.67%	81.36%	78.89%
499	17	2.83	2.76	12	2.43	5	34.48%	15.05%	12.73%
Unclassified	0	0.00	0.00	8	0.59	-8	-200.00%	-200.00%	-200.00%
Total:	28	3.55	3.47	28	3.67	0	0.00%	-3.26%	-5.49%


TimberRite30LiteProduction

Site:
Operator
Date:
Measuring system, Version:

CCR 1
All
November 24, 2016 11
TimberRite 30Lite, CD

Pine
820stems

Assortments	Length min(cm)	Length target(cm)	Tolerance (cm)
AssortA	0	313	0, 1
AssortA	0	439	0, 1
AssortA	0	376	0, 1
AssortA	0	499	0, 1
Unclassified			

Butt	Top	Lgth (CM	Feet	Inches	V
22	18	318	10	5	
14	10	379	12	5	
16	12	379	12	5	
21	17	498	16	4	
27	20	504	16	6	
22	14	504	16	6	
17	12	506	16	7	

What Now?

- Options for the future
  - Do we take on the responsibility and cost of designing cut specs to install into the contactor's processors.
  - How invasive do we become with checking calibrations

- Better education on software limitations but more importantly software potential.

There is enough fiber left in the forest to shelter a child.

Small Log Stands- Potential Gains In Undersize Material

Example of Small Diameter Stand

- Is it worth the trouble?

Current Timber Supply Analysis

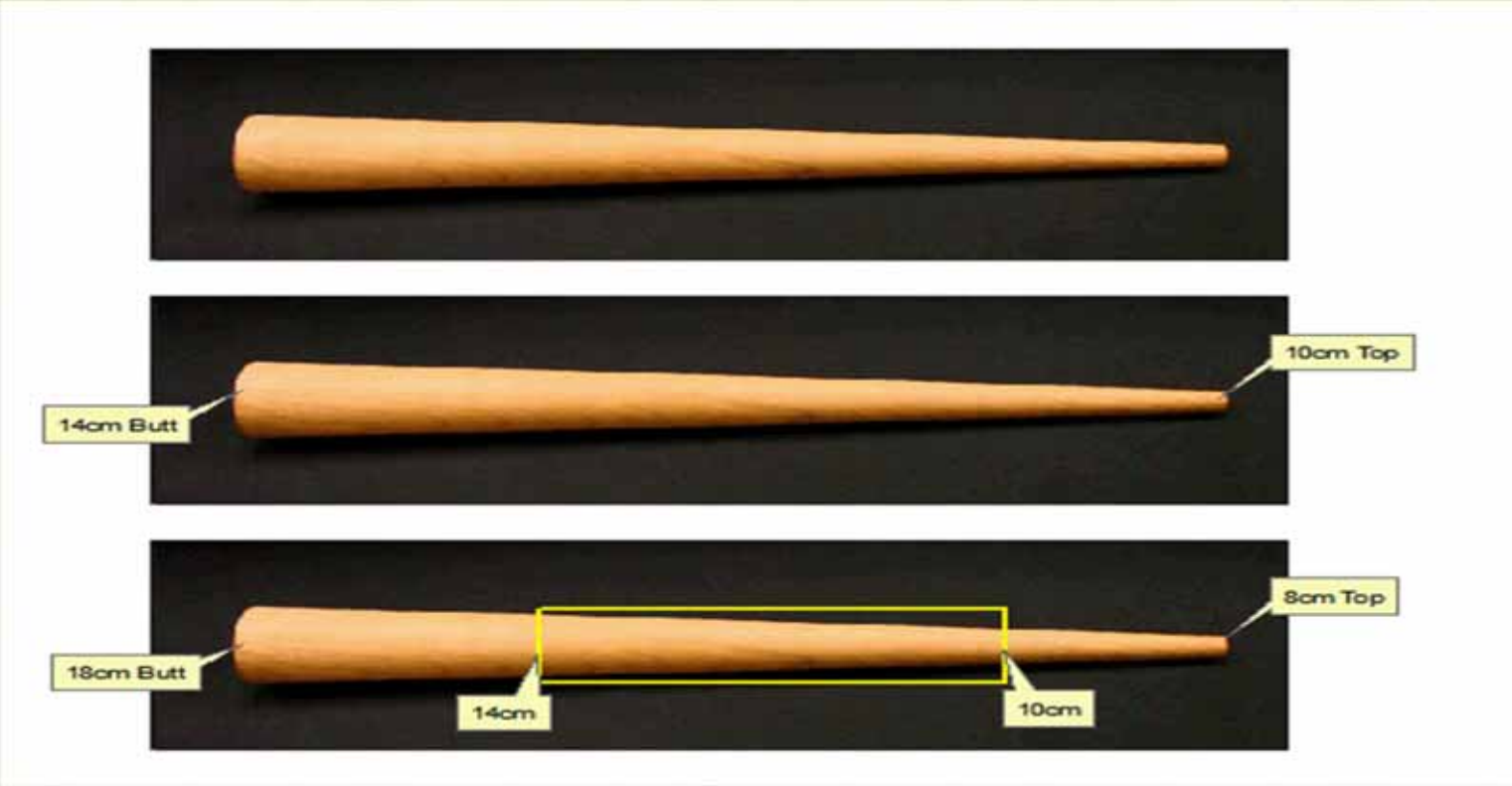
- Based on those trees having a butt of 15cm and top of 10cm.

Example of Merchantable log in Scale Yard

Example of Undersize Log

What do we want to achieve

- Obtain volume generated by stems harvested below current utilization standards.



Small Log Trial

- Select a sample size of 10,000M3 contained in two blocks averaging 5 trees/M3.

Small Log Trial

- Conventional logging equipment
- Skid trees into test piles (samples)

Small Log Trial

- Paint butts below current utilization standard of 15 cm

Small Log Trial

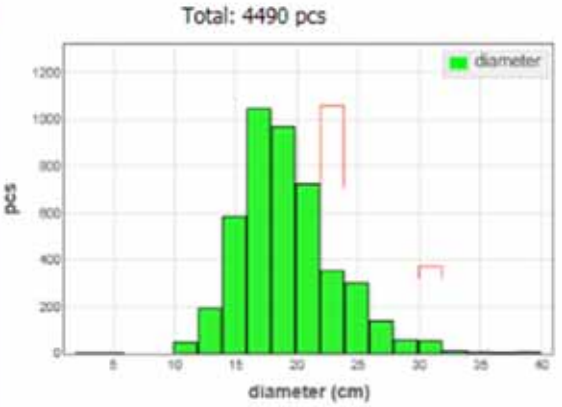
- Field testing of Trestima smart phone volume calculator.

Base data: 0 pcs

+

9cm_trial_deck_3_redo.__

stack volume:846.6 m^3(Σ)
avg. diameter:18.8 cm
logstack length:6.5 m
stems:4490 pcs
gross volume:1439.2 m^3(Σ)
CF:0.5883
stack volume:47.0 m^3(x̄)
v:0.189 m^3
samples:18 pcs (0 invalid)
verified:100 %



Small Log Trial

- Use Processor software to determine volume generated by undersize

Processor data

- Import files into Excel
- Total Volume
- Volume generated by undersize

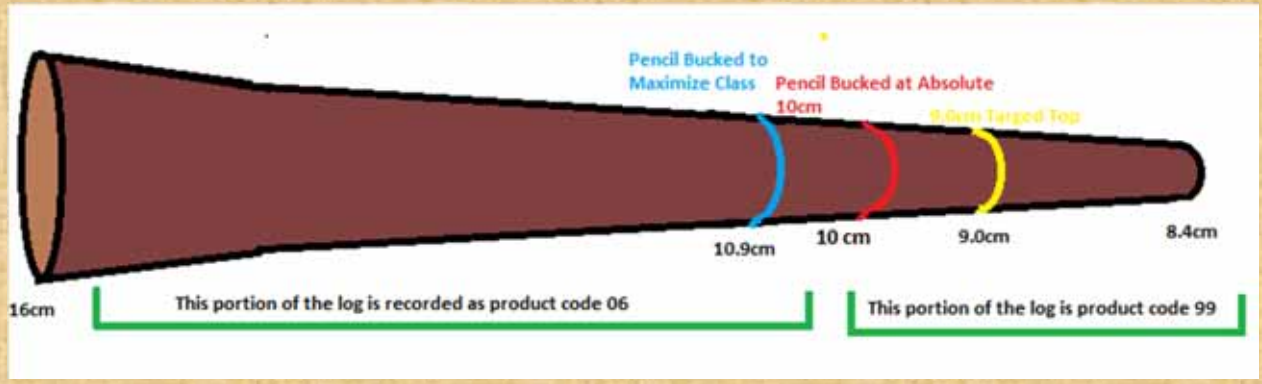
Small Log Trial

- The desired outcome was to obtain small stem volume cut from undersized trees.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1	assort (1)	diaTopOb	diaTopUb	diaMidOb	diaMidUb	lengthCm	volumem'	volumem'	volumem'	volumem'	volumem'	volumem'	volumeCy	volumeCy	volumeCy	volumeCy	volumeSm	volumeSm	volumeSm	volumeSm	stemNo (1	logNo (50	forcedCut	800	
2	1	103	103	106	106	500	0	45	0	45	0	45	0	41	0	41	0	44	0	44	1	1	50	1	
3	1	92	92	95	95	500	0	35	0	35	0	35	0	33	0	33	0	35	0	35	1	2	0	1	
4	0	222	222	0	0	12	0	4	0	4	0	4	0	4	0	4	0	0	0	0	2	1	50	0	
5	1	145	145	183	183	499	0	133	0	133	0	133	0	82	0	82	0	131	0	131	2	2	0	1	
6	1	125	125	144	144	437	0	66	0	66	0	66	0	53	0	53	0	71	0	71	2	3	0	2	
7	1	94	94	107	107	437	0	40	0	40	0	40	0	30	0	30	0	39	0	39	2	4	0	2	
8	0	170	170	0	0	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	2	5	250	0	
9	0	198	198	0	0	3	0	2	0	2	0	2	0	0	0	0	0	0	0	0	2	5	250	0	
10	0	195	195	0	0	4	0	1	0	1	0	1	0	1	0	1	0	0	0	0	2	6	250	0	
11	3	192	192	192	192	500	0	147	0	147	0	147	0	144	0	144	0	144	0	144	3	1	0	1	
12	3	190	190	192	192	503	0	145	0	145	0	145	0	142	0	142	0	145	0	145	3	2	50	1	
13	3	159	159	164	164	376	0	86	0	86	0	86	0	74	0	74	0	79	0	79	3	3	0	3	
14	1	105	105	121	121	499	0	56	0	56	0	56	0	43	0	43	0	57	0	57	4	1	0	1	
15	1	96	96	96	96	436	0	32	0	32	0	32	0	31	0	31	0	31	0	31	4	2	0	2	
16	1	111	111	120	120	499	0	57	0	57	0	57	0	48	0	48	0	56	0	56	5	1	0	1	
17	1	94	94	102	102	499	0	41	0	41	0	41	0	34	0	34	0	40	0	40	5	2	0	1	

Sample Scale

- Select 4 samples from the 10,000M3 trial
- Sticks scale and obtain volumes generated by small tops and butts.




Mill Run
• Product recovery
• Does it pay