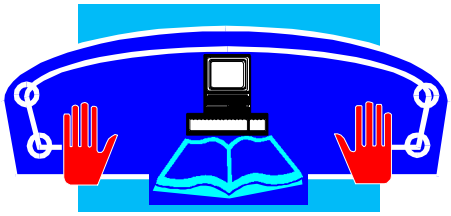


A Strategic Plan For Forestry Development In The Lower Liard Area Of The Northwest Territories; Volume 2; Appendix Catalogue Number: 4-2-3

Library Managed By Economic Planning Section, Economic Development and Tourism Government of the NWT, and by:
The Inuvaluit Community Economic Development Organization (CEDO)
Financial assistance provided by the NWT EDA, Inuvik Regional Office of ED&T and DIAND, Indian and Inuit Services.

PLANNING MODEL

The Planning Model consists of a series of computer programs to permit assessment of the main variables of a logging, lumber manufacturing, and marketing operation.

It has been used to develop the Base Case and conduct the sensitivity analyses described in the Development Program, Section 3.4.5 of the main report.

1.0 Operational Plan (Page 2)

A summary of the main elements of the Operational Plan evaluated by the Model.

2.0 Capital Cost Summary (Page 3)

A summary of the total capital costs involved. These costs include a portion of the training costs, namely: recruitment of the key management staff and two houses for the two permanent outside staff.

3.0 Operating Statement (Page 4)

A statement of the predicted financial performance of the Operational Plan. For this study it is presented separately for each of the three phases of the Development Program.

4.0 Sales Operation (Pages 5 and 6)

A summary of the predicted total sales performance of lumber, timber, ties, firewood and export logs. Estimates of lumber out-turn by dimension and grade realisation are included.

5.0 Operating Cost Summary (Page 7)

A summary of the estimated operating costs described in Sections 6.0 and 7.0 below.

6.0 Logging Costs (Pages 6 and 7)

A listing of the predicted logging costs based on a contract operation.

7.0 Sawmilling Costs

A summary of the total lumber manufacturing costs for sawmilling, drying, planing and shipping; these costs being developed by the Sawmill Production Simulation described in Section 11.0 of the Appendix.

8.0 Training Costs

A summary of the estimated costs of the training program described by the Development Program, Section 3.4.4.

This does not include the cost of recruitment of the management staff, who are trainers during the Development and Growth phases, nor the cost of the management houses. These costs are included in the Capital Costs, Section 2.0 of the Appendix.

9.0 Sawmill Production Schedule

This summarizes the results of the Sawmill Production Simulations described in Section 11.0 of this Appendix, which are used in the economic evaluation.

10.0 Sawmill Manning Schedules

The manning, and the projected salary levels used in the economic evaluation, are tabulated for the three phases of Development, Growth and Maturity. It will be noted that 50% of the salaries of the Manager and Production Supervisor have been allocated to the training budget during the Development and Growth phases. Because the Controller/Sales and Maintenance functions have been considered to be wholly training functions, 100% of their costs have also been included in the training budget.

11.0 Sawmill Production Simulation

Production simulations have been modelled for each phase. The tabulated results record:

- The characteristics of the sawlogs which have been derived from the logging data;
- The lumber production, recovery and throughput time required for the primary breakdown headrig and carriage;
- The loading of the other main machine centres.

12.0 Capital Cost Estimates

This section is a summary of the estimated capital costs of the manufacturing facility as described in Section 3.2 of the main report. It includes:

- Sawmill and planermill equipment;
- Heat, power and refuse equipment;
- Mobile equipment and buildings.

13.0 Logging Inputs

This section provides detailed information on unit and phase costs, productivity, manpower and machine requirements, and scheduled durations of the various phases of contract reading, logging, and hauling operations associated with the project during development, growth, and maturity. Capital road construction is excluded.

Woodbridge, Reed & Associates
Division of
H.A. Simons Ltd.

P.8926A - LOWER LIARD FORESTRY DEVELOPMENT PROJECT
Operational Plan Summary

Issue : **10-Year Development Program - Base Case**

Dated : t4ay 10, 1986

Description : **Combination Sawmill/Planermill operating in separate sequence as set-out in the overall Operating Schedule.**
Interest Free Financing
Log Export not included.
Lumber Sales - 5.2 MMfbm per year

Table of Contents

Note: Inputs are marked *

1.0 OPERATIONAL PLAN (Ten Year Period)

1.1 Implementation Schedule

Phase of Operation:	Duration (months)	
- Planning	6	*
- Construction	9	*
- Start-up	3	*
- Development	12	*
- Growth	12	*
- Maturity	78	

1.2 Production Schedule

Phase of Operation		Development	Growth	Maturity
Operating Period: (per year)				
- Sawmill:	days	130	104	75
	shifts	130	104	130
- Planing:	days	65	52	40
	shifts	65	52	65
- Drying:	days	130	140	208
	shifts	130	140	208
- Shipping:	days	130	130	65
	shifts	130	130	90
Lumber Production (Mfbm/year)		2,604	3,125	5,208
Export Log Production (m3/Year)				
Firewood Production (Cords/Year)		3,066	3,679	6,132

1.3 Log Consumption (m3/Year)

	Development	Growth	Maturity
- Sawlogs	12,500	15,000	25,000
- Export logs			
Total Logs	12,500	15,000	25,000

1.4 Lumber Recovery (fbm/m3)

	Development	Growth	Maturity
- On Sawlogs	208.33	208.33	208.33
- On Total logs	208.33	208.33	208.33

1.5 Sawmill Productivity (fbm/Manday)

	Development	Growth	Maturity
- Production Workers	4,006	3,215	2,465
- Total Staff	1,541	1,732	2,158
- Total (including trainees)	1,002	1,234	2,158

1.6 Sales Schedule

	Development	Growth	Maturity
- Lumber Sales (Mfbm/Year)	2,600	3,120	5,200
- Log Sales (m3/Year)			
- Firewood Sales (Cords/Year)	800	800	800

1.7 Manning Schedule (All Seasons)

	Development	Growth	Maturity
- Forestry & Logging		Contract	
- Management Staff	4	4	4
- Sawmill Workers (per/shift)	2	3	8
- Planer Workers (per/shift)	2	2	7
- Yard (per/shift)	1	1	1
- Shipping (part time)	1	2	2
- Maintenance (year round)		1	2
- Training Staff	4	4	
- Trainees	7	7	
Total (for all seasons)	21	24	24

2.0 CAPITAL COST SUMMARY

2.1 **Logging:**			
- Logging Road Development	$181,500		*
- Forestry Equipment	$15,000		*
Total Logging Capital		$196,500	
2.2 **Sawmill:**			
- Sawmill	$1,818,000		*
- Power Systems & Refuse Handling	$788,000		*
- Mobile Equipment	$200,000		*
- Site & Buildings	$561,000		*
Total Sawmilling Capital		$3,367,000	
2.3 Transportation:			
- Barge Loading Facilities	$20,000		*
- Trucking			*
Total Transportation Capital		$20,000	
2.4 **Training:**			
- Recruitment	$50,000		*
- Housing	$160,000		*
Total Training Capital		$210,000	
2.5 Operating Capital (not included)			*
2.6 **Development:**			
- Planning	$63,000		*
- Engineering	$173,250		*
Total Development Capital		$236,250	
2.7 **Total Capital Cost (Before Grants)**		$4,029,750	
2.8 **Capital Cost Grants**			
- Special A.R.D.A.	$720,000		*
- N.E.D.P.	$1,294,875		*
Total Capital Cost Grants		62,014,875	
2.9 Net Capital Cost (After Grants)		$2,014,875	

3.0 OPERATING STATEMENT ($/Year)

Phase of Operation:	Development	Growth	Maturity
3.1 Duration of Phase (Months)	12	12	78
3.2 Revenue			
Lumber Sales	$677,798	$813,729	$1,355,513
Log Sales			
Firewood Sales	$16,000	$16,000	$16,000
Power Sales			
Other Sales			
Operating Grants			
Training Grants			
Other Revenue			
Total Revenue	$693,798	$829,729	$1,371,513
3.3 Operating Costs			
- Logging	$264,757	$346,257	$506,322
- Sawmilling	$304,830	$351,987	9585,609
- Financing			
Total Operating Costs	$569,586	$698,244	$1,091,931
3.4 Before Tax Profit (Loss)	$124,212	$131,485	$279,582
3.5 Taxes			
- Local			
- Provincial			
- Federal			
Total Taxes			
3.6 After Tax Profit (Loss)	$124,212	$131,485	@279, 582
3.7 Return On Investment			
- Percent per annum	6. 16%	6. 53%	13. 88%
- Months to Pay-Back	194.66	183.89	86.48
- Bank Interest Rate			

4 0 SALES OPERATION

Phase of Operation:	Development	Growth	Maturity
4 Lumber Sales			
u,mber Production (Mfbm/Year)	2,604	3,125	5,208
Lumber Sales (Mf bin/Year)			
- 2x4, 6 & 8 inch:			
- #2 and Better	1,268	1,522	2,535
- utility	287	344	575
- Economy	135	162	270
- 2X10:			
- #2 'and Better	281	337	562
- utility	75	88	148
- Economy	35	41	71
- 1" Boards	260	313	520
- Timbers	259	313	519
T tal Lumber Sales	2,600	3,120	5,200
Av'erage Lumber Values ($/Mfbm)			
- 2x4, 6 & 8 inch:			
- #2 and Better	$294	$294	6294
- utility	$200	$200	$200
- Economy	$95	$95	$95
- 2X10:			
- #2 and Better	$368	$368	$368
- utility	$168	$168	$168
- Economy	$95	$95	$95
- 1" Boards	$284	$284	$284
- Timbers	$252	$252	$252
Lumber Revenue ($/Year)			
- #2 and Better	$476,200	$571,484	$952,106
- utility	$70,000	$83, 584	$139,864
- Economy	$16,150	$19,285	$32, 395
- 1" Boards	$73,840	$88, 892	$147,680
- Timbers	$65,268	$78,876	$130,788
T tal Lumber Revenue	$701,458	$842,121	$1,402,833
C st of Lumber Sales ($/Mfbm)			
- Agency Fees	$0.31	$0.31	$0.31
- Sales Expenses	$8.79	$8.79	$8.79
T tal Sales Cost ($/Year)	$23,660	$28,392	647,320
Net Lumber Revenue	S677, 798	$813,729	61,355,513
Av'erage Realization ($/Mfbm)	$260.28	$260.40	$260.27

4.2 Export Log Sales	Development	Growth	Maturity
Total Log Production (m3/Year)	12,500	15,000	25,000
Export Log Sales (m3/Year)			
8" to 11"			
- 11" Plus			
Total Log Sales			
Percent 8" to 11"			
Average Log Values ($/m3)			
8" to 11"	$42	$42	$42
- 11" Plus	$42	$42	$42
Export Log Revenue ($/Year)			
Cost of Log Sales			
Net Log Revenue ($/Year)			
4.3			
Firewood Sales			
Wastewood Productlon(Mcf/Yr SWE)	285	342	570
Wastewood Production(Cords/Year)	3,066	3,679	6,132
Firewood Production (Pick-up/Yr)	6,132	7,358	12,264
Firewood Sales (Pick -up/Yr)	800	800	800
Firewood Value ($/Pick-up)	$20	$20	$20
Firewood Revenue ($/Year)	$16,000	$16,000	$16,000
4.4			

5.0 OPERATING COST SUMMARY

Phase of operation:	Development	Growth	Maturity
5.1 Logging Costs:			
$/Cubic Metre	$21.18	$23.08	$20.25
$/Mfbm	$101.67	$110.81	$97.22
$/Year	$264,757	$346,257	$506,322
5.2 Sawmilling Costs:			
$/Mfbm	$117.05	$112.64	$112.44
$/Year	$304,830	$351,987	$585,609
5.3.Financing Costs:			
$/Year			
5.4 Total Operating Costs:			
$/Mfbm	$218.72	6223.45	$209.66
$/Year	$569,586	$698,244	$1,091,931

6.0 LOGGING COSTS (sub-contracted to Beaver Enterprises Ltd.)

Phase of Operation:	Development	Growth	Maturity	
Production Level (m3/Year)	12,500	15,000	25,000	
6.1 Development Costs ($/Year)				
- Main & -Spur Roads	$17,750	$18,300	$20,500	*
- Block Roads	$58,050	$53,750	$67,187	*
Total Development Costs				
- $/m3	$6.06	$4. 80	$3• 51	
- $/Year	$75,800	$72,050	$87,687	
6.2 Operating Costs				
- Felling & Skidding				
- $/m3	$6.02	$7.13	$6.24	*
- $/Year	$75,251	$106,948	$155,999	
- Loading				
- $/m3	$2.00	$2.00	$2.29	*
- $/Year	$25,000	$30,000	$57,250	
- Hauling				
Average haul (KM) (l-way)	12	30	35	*
Average load (m3)	40	40	40	*
Loads/Year	313	375	625	
Haul cycle time (hours)	1.60	2.50	2.75	*
- $/Hour	$80.00	$80.00	$80.00	*
- $/m3	$3.20	$5.00	$5.50	
- $/Year	$40,001	674,999	$137,499	
Total Operating Costs				
- $/m3	$11.22	$14.13	$14.03	
- $/Year	$140,253	$211,947	$350,748	

Phase of Operation:	Development	Growth	Maturity
6.3 Maintenance Costs ($/Year)			
- Roads and Landings	$8,704	$21,760	$25,387
- Snow Clearing			
- Fire Protection			
Total Maintenance Costs			
- $/m3	$0.70	$1.45	$1.02
- $/Year	$8,704	$21,760	$25,387
6.4 Forestry ($/Year)			
- Planning and Engineering			
- Site Preparation			
- Silviculture			
Total Forest Costs			
- $/m3			
- ~/Year			
6.5 Stumpage Costs			
- $/m3	$0.20	$0.20	$0.20
- $/Year	$2,500 ● 05	$2,999.95	$5,000
6.6 Management and overhead ($/Year)			
- Management	$37,500	$37,500	$37,500
- Overhead			
Total Management and Overhead			
- $/m3	$3.00	$2• 50	$1• 50
- 9/Year	$37,500	$37,500	$37,500
6.7 Total Logging Costs			
- $/m3	$21.18	$23.08	$20.25
- $/Year	$264,756.60	$346,256.77	$506,321.61

7.0 SAWMILLING COSTS

Phase of Operation:	Development	Growth	Maturity	
Production Level (Mfbm/Year)	2,604	3,125	5,208	
7.1 Manning ($/Year)				
Salaried Staff	$76,692	$76,692	$101,400	
Sawing	$19,500	$23,400	$83,261	
Planing	$9,750	$7,800	$35,557	
Yard	$13,122	$14,132	$20,996	
Shipping	$9,750	$19,500	$13,500	
Maintenance		$15,747	$39,367	
Total Manning	$128,814	$157,270	$294,080	
$/Mfbm	$49.46	$50.33	$56.46	
7.2 Operating & Maintenance ($/Year)				
Office	$2,000	$3,000	$5,000	*
Sawing	$16,146	$19,374	$32,291	
Planing	64,167	$5,000	$8, 333	
Yard	$2,839	$3,406	$5,677	
Shipping	$1,562	$1,875	$3, 125	
Mobile Equipment	$9,115	$10,937	$18,229	
Power Generation	$6,500	$6,500	$6,500	*
Yard & Roads	$4,687	$5,625	$9,375	
Administration	$30,000	$40,000	$60,000	*
Total Operating Expenses	$77,016	$95,717	$148,529	
$/Mfbm	$29.57	$30.63	$28.52	
7.3 Fuel ($/Year)				
Building Heating				*
Lumber Drying				*
Mobile Equipment	$21,000	$21,000	$33,000	*
Power generation	$78,000	$78,000	$110,000	*
Total Fuel	$99,000	$99,000	$143,000	
$/Mfbm	$38.02	$31.68	$27.46	
7.4 Total Sawmill Costs				
$/Year	$304,830	$351,987	$585,609	
$/Mfbm	$117 ● 05	$112.64	$112 ● 44	

8.0 TRAINING COSTS ($/Year)

Phase of Operation:	Development	Growth	Maturity	
8.1 Training Staff Salaries	$110,532	$110,532		
8.2 Trainee Wages	$71,500	$57,200		
8.3 Training Expenses	$50,000	$50,000	$50,000	*
8.4 Housing Maintenance	$16,000	$16,000	$16,000	*
8.5 Total Training Costs	$248,032	$233,732	$66,000	

9.0 SAWMILL PRODUCTION SCHEDULE

9.1 Operation					
Sawmill:					
	- Days/Year	130	104	75	*
	- shifts/Year	130	104	130	*
Planing:					
	- Days/Year	65	52	40	*
	- Shifts/Year	65	52	65	*
Drying:					
	- Days/Year	130	140	208	*
	- Shifts/Year	130	140	208	*
Shipping:					
	- Days/Year	130	130	65	*
	- Shifts/Year	130	130	90	*
9.3 Sawlog	Consumption (Mcf/Year)	441	530	883	
Sawlog	Consumption (M3/Year)	12,500	15,000	25,000	
9.4 Lumber	Production (fbm/Shift)	20,032	30,047	40,063	*
Lumber	Production (Mfbm/Year)	2,604	3,125	5,208	
9.5 Lumber	Recovery Factor (fbm/cf)	5.90	5.90	5.90	*
Lumber	Recovery Factor (fbm/M3)	208.33	208.33	208.33	

10.0 Sawmill Manning Schedules

Phase of Operation:	Development	Growth	Maturity
10.1 Salaried Staff:			
- Number		4	1
- $/Month	$6,39;	$6, 391	$8, 45;
10.2 Production:			
Sawmill:			
- Number	2		
- $/Day	$150.00	$225 .0;	$640 .4!
Planing:			
- Number	2		7
- $/Day	$150000	$150 0:	$547 .03
Yard:			
- Number	1		
- $/Day	$100 .94	$100 .9:	$100 9:
Shipping:			
- Number			
- $/Day	$75 .0;	$150 0:	$150 0:
Maintenance:			
- Number			
- $/Day		$100 .9:	$201 .8;
10.3 Training Program			
Training Staff:			
- Number		4	
- $/Month	$9, 21:	$9, 211	
Trainees:			
- Number			
- $/Day	$550 .0:	$550 .0:	

DEVELOPMENT

10.1 Salaried Staff

Position		Salary $/Month	cost $/Month
Manager	50%	$1,666	$2,166
Clerk - Production & Sales	100%	$1,000	$1,300
Clerk - Payroll & Accounts	100%	$1,000	$1,300
Production Supervisor	50%	$1,250	$1,625
Total Salaried Staff :	4	$4,916	$6,391
Salary Benifits as :	30.00%		

10.2 Training Staff

Position			Salary $/Month	Cost $/Month
Manager		50%	$1,667	$2,167
Production Supervisor		50%	$1,250	$1,625
Controller/Sales		100%	$2,084	$2,709
Maintenance Supervisor		100%	$2,084	$2,709
Total Training Staff :	4		$7,085	$9,211
Salary Benifits as :	30.00%			

10.3 **Sawing**

Position	Pay $/Hour	cost $ per Manshlft	<- Shift Manning --> Day	Aft	Night	Total	OT Rate	cost ($/Day)
Greenchain	$7.50	$75.00	2			2		$150.00
Payroll Benefits as :		25.00%	2			2		$150.00
Average hours/shift :		8.00						

10.4 Planing

Position	Pay $/Hour	cost $ per Manshift	<- Shift Manning --> Day	Aft	Night	Total	OT	OT Rate	Cost ‘ ($/Day)
Dry Chain	$7.50	$75.00	2			2			$150.00
Payroll Benefits as :		25.00%	2			2			$150.00
Average hours/shift :		8.00							

10.5 **Yard**

Position	Pay $/Hour	cost $ per Manshift	<- Shift Manning --> Day	Aft	Night	Total	OT	OT Rate	cost ($/Day)
Utility Driver	$8.50	$85.00	1			1	1.0	1.5	$100.94
Payroll Benefits as :		25.00%	1			1	1.0		$100.94
Average hours/shift :		8.00							

10.6 Shipping

Position	Pay $/Hour	cost $ per Manshift	<- Shift Manning --> Day	Aft	Night	Total	OT	OT Rate	cost ($/Day)
Packaging	$7.50	$75000	1			1			$75.00
Payroll Benefits as :		25.00%	1			1			$75.00
Average hours/shift :		8.00							

10.7 Maintenance

Position	Pay $/Hour	cost $ per Manshift	<- Shift Manning --> Day	Aft	Night	Total	OT	OT Rate	Cost ($/Day)

Payroll Benefits as : 25.00%
Average hours/shift : 8.00

10.8 Trainees

Position	Pay $/Hour	cost $ per Manshift	<- Shift Manning --> Day	Aft	Night	Total	OT Rate	cost ($/Day)
Operators	$7.50	$75.00	2			2		$150.00
Sawfiler	$8.00	$80.00	2			2		$160.00
Millwright/EL	$8.00	$80.00	2			2		$160.00
Utility Driver"	$8.00	$80.00	1			1		$80.00
Payroll Benefits as :		25.00%	7			7		$550.00
Average hours/shift :		8.00						

GROWTH

10.1 Salaried Staff

Position		Salary $/Month	cost $/Month
Manager	50%	$1,666	$2,166
Clerk - Production & Sales	100%	$1,000	$1,300
Clerk - Payroll & Accounts	100%	$1,000	$1,300
Production Supervisor	50%	$1,250	$1,625
Total Salaried Staff :	4	$4,916	$6,391
Salary Benifits as :	30.00%		

10.2 **Training Staff**

Position		Salary $/Month	Cost $/Month
Manage r	50%	$1,667	$2, 167
Production Supervisor	50%	$1,250	$1,625
Controller/Sales	100*	$2,084	$2,709
Maintenance Supervisor	100'%	$2,084	$2,709
Total Tralnlng Staff :	4	$7,085	$9,211
Salary Benifits as :	30.00%		

10.3 **Sawing**

Position	Pay $/Hour	cost $ per Manshift	<- Shift Manning --> Day	Aft	Night	Total	OT Rate	Cost ($/Day)
Greenchain	$7*50	$75.00	3			3		$225 ●00
Payroll Benefits as :		25.00%	3			3		$225.00
Average hours/shift :		8.00						

10.4 Planing

Position	Pay $/Hour	cost $ per Manshift	<- Shift Manning --> Day	Aft	Night	Total	OT Rate	cost ($/Day)
Dry Chain	$7.50	$75.00	2			2		$150.00
Payroll Benefits as :		25.00%	2			2		$150.00
Average hours/shift :		8.00						

10.5 **Yard**

Position	Pay $/Hour	cost $ per Manshift	<- Shift Manning --> Day	Aft	Night	Total	OT	OT Rate	Cost ($/Day)
Utility Driver	$8.50	$85.00	1			1	1.0	1.5	$100.94
Payroll Benefits as :		25.00%	1			1	1.0		$100.94
Average hours/shift :		8.00							

10.6 Shipping

Position -	Pay '$/Hour	cost $ per Manshift	<- Shift Manning --> Day	Aft	Night	Total	OT	OT Rate	cost ($/Day)
Packaging	$7.50	$75.00	2	"		2			$150.00
Payroll Benefits as :		25.00%	2			2			$150.00
Average hours/shift :		8.00							

10.7 Maintenance

Position	Pay $/Hour	cost $ per Manshift	<- Shift Manning --> Day	Aft	Night	Total	OT	OT Rate	cost ($/Day)
Millwrigth E/L	$8.50	$85.00	1			1	1.0	1.5	$100.94
Payroll Benefits as :		25.00%	1			1	1.0		$100.94
Average hours/shift :		8.00							

10.8 Trainees

Position	Pay $/Hour	cost $ per Manshlft	<- Shift Manning --> Day	Aft	Night	Total	OT Rate	Cost ($/Day)
Operators	$7"50	$75000	2			2		$150.00
Sawfiler	$8.00	$80.00	2			2		$160.00
Millwright/EL	$8.00	$80.00	2			2		$160.00
Utility Driver	$8.00	$80.00	1			1		$80.00
Payroll Benefits as :		25.00%	7			7		$550.00
Average hours/shift :		8.00						

MATURITY

10.1 Salaried Staff

Position			Salary $/Month	cost $'/Month
Manager		100%	$2,500	$3,250
Clerk - Production & Sales		100%	$1,000	$1,300
Clerk - Payroll & Accounts		100$	$1,000	$1,300
Production Supervisor		100%	$2,000	$2,600
Total Salaried Staff :			$6,500	$8,450
Salary Benifits as :		30.08%		

10.2 Training Staff

Position	Salary $/Month	cost $/Month

Total Training Staff :	
Salary Benifits as :	30.00%

10.3 Sawing

Position	Pay $/Hour	cost $ per Manshift	<-Shift Manning--> Day	Aft	Night	Total	OT	OT Rate	Cost ($/Day)
Head Sawyer	$8.50	$85.00	1			1	0.5	1.5	$92.97
C.O. Saw	$8.00	$80.00	1			1			$80.00
Edger Resaw	$8000	$80.00	1			1			$80.00
Trimmerman	$8.00	$80.00	1			1	0.5	1.5	$87.50
Greenchain	$7.50	$75.00	4			4			$300.00
Payroll Benefits as :		25.00%	8			8	1.0		$640.47
Average hours/shift :		8.00							

0 4 Planing

Position	Pay $/Hour	cost $ per Manshift	<- Shift Manning --> Day	Aft	Night	Total	OT	OT Rate'	cost ($/Day)
Tilt Hoist	$7.50	$75.00	1			1			$75.00
Planer/Feeder	$8.00	$80.00	1			1			$80.00
Grader	$8.50	$85.00	1			1			$85.00
Trixnmerman	$7.50	$75.00	1			1	0.5	1.5	$82.03
Dry Chain	$7.50	$75.00	3			3			$225.00
Payroll Benefits as :		25.00	$ 7			7	0.5		$547.03
Average hours/shift :		8.00							

10.5 Yard

Position	Pay $/Hour	cost $ per Manshift	<- Shift Manning --> Day	Aft	Night	Total	OT	OT Rate	, cost ($/Day)
Utility Driver	$8.50	$85.00	1			1	1.0	1.5	$100.94
Payroll Benefits as :		25.00%	1			1	1.0		$100.94
Average hours/shift :		8.00							

10.6 Shipping

Position	Pay $/Hour	cost $ per Manshift	<- Shift Manning --> Day	Aft	Night	Total	OT	OT Rate	cost ($/Day)
Packaging	$7.50	$75.00	2			2			$150.00
Payroll Benefits as :		25.00%	2			2			$150.00
Average hours/shift :		8.00							

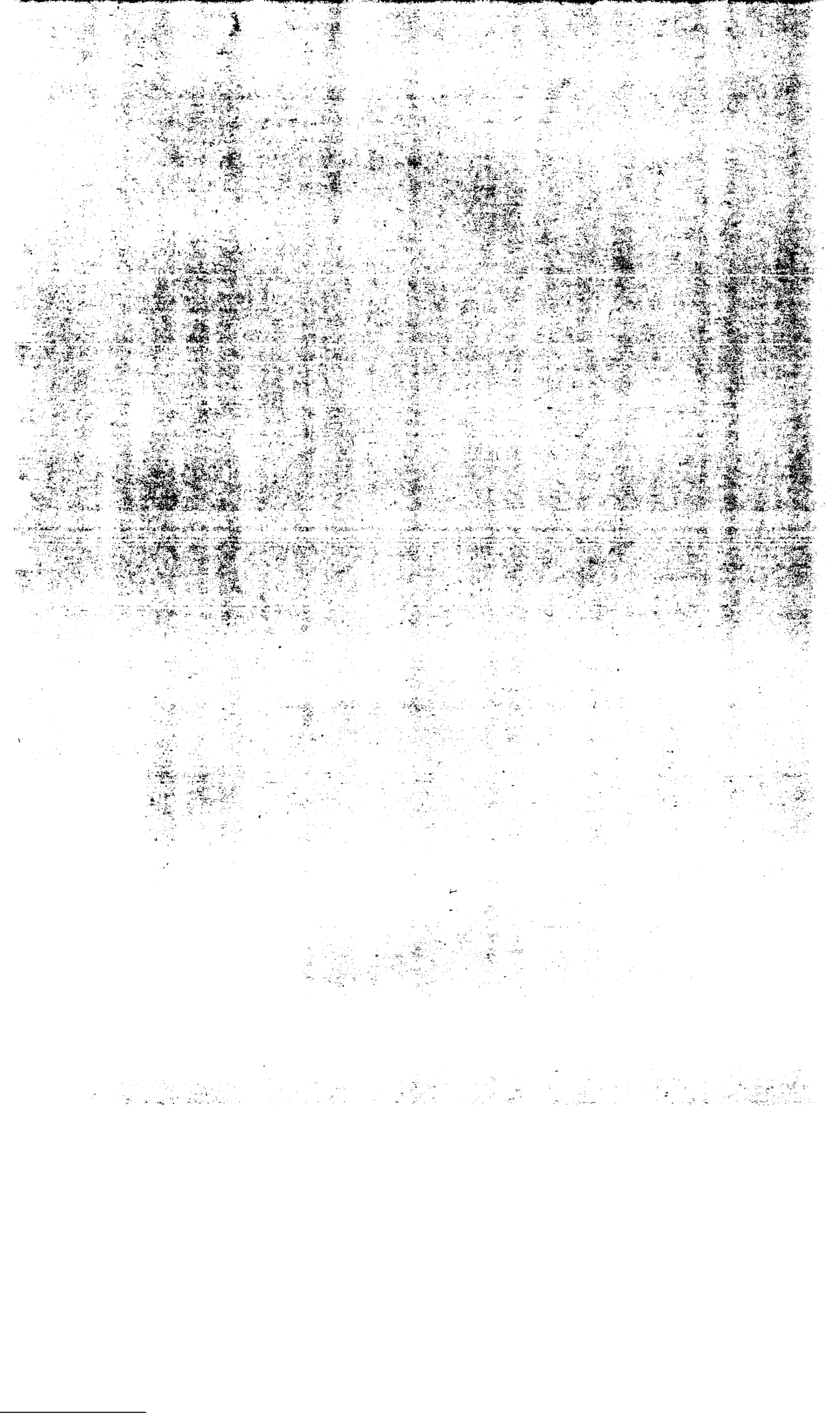
10.7 **Maintenance**

Position	Pay $/Hour	cost $ per Manshift	<- Shift Manning --> Day	Aft	Night	Total	OT	OT Rate	cost ($/Day)
Saw Filer	$8.50	$85.00	1			1	1.0	1.5	$100.94
Millwright/EL	$8.50	$85.00	1			1	1.0	1.5	$100.94
Payroll Benefits as :		25.00%	2			2	2.0		$201.88
Average hours/shift :		8.00							

10.8 Trainees

Position	Pay $/Hour	cost $ per Manshlft	<- Shift Manning --> Day	Aft	Night	Total	OT	OT Rate	Cost ($/Day)

Payroll Benefits as : 25.00%
Average hours/shift : 8.00



11.0 Sawmill Production Simulations

Sawmill Production Simulation - Sawmill Sawlog Allocation

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Based on: Development Stage
Total shifts per year of 130.0
Calculated average length of 16.00

ToP Diameter (inches)	Percent Volume (%)	MCF per Year	<------Logs per Shift--------> Diameter Class	Accumulated Forward	Reverse
4- 4.99					
5- 5.99	0.200	0.9	1.46	1.46	277.05
6- 6.99	7.300	32.2	42.83	44.29	275.59
7- 7.99	7.500	33.1	35.03	79.32	232.75
8- 8.99	12.500	55.1	47.55	126.87	197.72
9- 9.99	12.500	55.1	39.45	166.33	150.17
10-10.99	12.000	52.9	31.92	198.25	110.72
11-11.99	10.000	44.1	22.72	220.97	78.79
12-12.99	10.500	46.3	20.61	241.58	56.07
13-13.99	5.500	24.3	9.42	251.00	35.47
14-14.99	6.000	26.5	9.04	260.04	26.05
15-15.99	3.500	15.4	4.68	264.71	17.01
16-16.99	3.500	15.4	4.17	268.89	12.33
17-17.99	3.000	13.2	3.21	272.10	8.16
18-18.99	1.500	6.6	1.45	273.55	4.94
19-19.99	2.000	8.8	1.76	275.31	3.49
20-20.99	0.500	2.2	0.40	275.71	1.74
21-21.99	1.000	4.4	0.73	276.44	1.34
22-22.99	0.500	2.2	0.34	276.78	0.60
23-23.99	0.100	0.4	0.06	276.84	0.27
24-24.99	0.100	0.4	0.06	276.90	0.21
25-25.99	0.100	0.4	0.05	276.95	0.15
26-26.99	0.100	0.4	0.05	277.00	0*10
27+	0.100	0.4	0.05	277.05	0.05
Totals	100	441.00	277.05		

Sawmill Production Simulation - Lumber and Chip Production

****

Based on: Machine Type	Log Diameter Range	Production Time (min.)	Logs pex Shift
HEADRIG			
2 SIDED	4.00-27+	339	, 277
3 **SIDED**		0	0
4 SIDED		0	0
Total HEADRIG		339	277

ToP Diameter (inches)	Logs per Shift	<--Recovery---> fbm/CF	BDU/MCF	<----Production----> fbm/shift	BDU/shift
4.00- 4.99					
5.00- 5.99	1.46	4.73	0.50	32.06	0.003
6.00- 6.99	42.83	5.57	0.50	1,379.47	0.124
7.00- 7.99	35.03	5.44	0.50	1,384.19	().127
8.00- 8.99	47.55	5.62	0.50	2,381.40	0.212
9.00- 9.99	39.45	5.68	0.50	2,408.96	0.212
10.00-10.99	31.92	5.90	0.50	2,402.57	0.204
11.00-11.99	22.72	5.93	0.50	2,010.96	0.170
12.00-12.99	20.61	6.14	0.50	2,185.60	0.178
13.00-13.99	9.42	6.07	0.50	1,132.71	0.093
14.00-14.99	9.04	6.10	0050	1,242.30	0.102
15• 00-15.99	4.68	6.22	0.50	738.56	0.059
16.00-16.99	4.17	6.25	0.50	741.65	0.059
17.00-17.99	3.21	6.42	0.50	653.56	0.051
18.00-18.99	1.45	6.52	0.50	331.74	0.025
19.00-19.99	1.76	6.47	0.50	438.80	0.034
20.00-20.99	0.40	6.61	0.50	112.12	0.008
21.00-21.99	0.73	6.62	0.50	224.47	0.017
22.00-22.99	0.34	6.63	0.50	112.46	0.008
23.00-23.99	0.06	6.64	0.50	22• 54	0.002
24.00-24.99	0006	6.72	0.50	22.80	0.002
25.00-25.99	0.05	6.66	0.50	22.58	0.002
26.00-27.00	0.05	6.75	0.50	23.12	0.002
27+	0.05	6.75	0.50	22.89	0.002

Totals	LRF	BDU/Mfbm	fbm/shift	BDU/shift
HEADRIG	5.90	0.08	20,028	1.70
Total Sawmill	5.90	0.08	20,028	1.70

Sawmill Production Simulation - Machine Centre loading

Machine centre name: EDGER

Data	Value	Units'
Utilization this simulation	68	%
Optimum production rate	5.00	pieces per minute
Production rate this simulation	3.41	pieces per minute
	1,193.23	pieces per shift
	68.19	feet per minute

Sawmill **Production Simulation - Machine Centre loading**

Machine centre name: CUT-OFF SAW

Data	Value	Units
Utilization this simulation	16	%
Optimum production rate	2.00	cycles per minute
Production rate this simulation	0.32	cycles per minute

Sawmill Production Simulation - Machine Centre loading

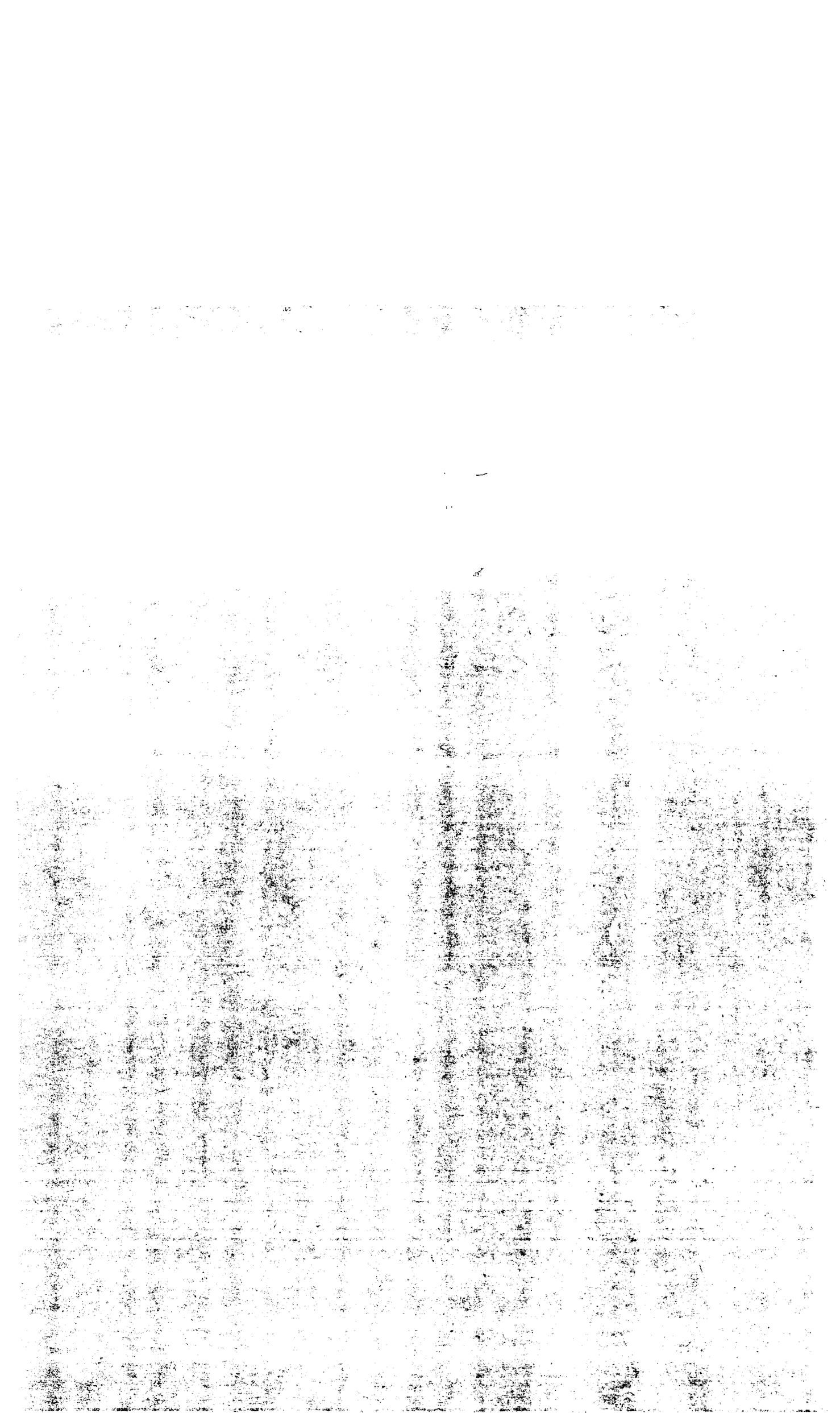
Machine centre name: RESAW

Data	Value	Units'
Utilization this simulation	12	%
Optimum production rate	5.00	pieces per minute
Production rate this simulation	0.61	pieces per minute
	212.44	pieces per shift
	13.35	feet per minute

Sawmill Production Simulation - Machine Centre loading

Machine centre name: TRIMMER

Data	Value	Units
Utilization this simulation	14	%
Optimum production rate	40.00	pieces per minute
Production rate this simulation	5.64	pieces per minute
	1,973.36	pieces per shift



Sawmill Production Simulation - Sawmill Sawlog Allocation

Based on: Growth Phase
Total shifts per year of 104.0
Calculated average length of 16.00

Top Diameter (inches)	Percent Volume (%)	MCF per Year	<------Logs per Shift--------> Diameter Class	Accumulated Forward	Reverse
4- 4.99					
5- 5.99	0.200	1.1	2.19	2.19	416.20
6- 6.99	7.300	38.7	64.34	66.54	414.00
7- 7.99	7.500	39.8	52.63	119.17	349.66
8- 8.99	12.500	66.3	71.43	190.60	297.03
9- 9.99	12.500	66.3	59.27	249.87	225.60
10-10.99	12.000	63.6	47.96	297.83	166.33
11-11.99	10.000	53.0	34.13	331.96	118.37
12-12.99	10.500	55.7	30.96	362.92	84.24
13-13.99	5.500	29.2	14.15	377.07	53.28
14-14.99	6.000	31.8	13.58	390.65	39.13
15-15.99	3.500	18.5	7.02	397.67	25.55
16-16.99	3.500	18.5	6.27	403.94	18.53
17-17.99	3.000	15.9	4.83	408.77	12.25
18-18.99	1.500	8.0	2.18	410.95	7.43
19-19.99	2.000	10.6	2.64	413.59	5.25
20-20.99	0.500	2.6	0.60	414.19	2.61
21-21.99	1.000	5.3	1.10	415.29	2.01
22-22.99	0.500	2.6	0.51	415.79	0.91
23-23.99	0.100	0.5	0.09	415.89	0.40
24-24.99	0.100	0.5	0.09	415.97	0.31
25-25.99	0.100	0.5	0.08	416.05	0.22
26-26.99	0.100	0.5	0.07	416.13	0.14
27+	0.100	0.5	0.07	416.20	0.07
Totals	100	530.00	416.20		

Sawmill Production Simulation - Lumber and Chip Production
****

Based on: Machine Type	Log Diameter Range	Production Time (min.)	Logs per Shift
HEADRIG			
2 SIDED	4.00-27+	370	416
3 SIDED		0	0
4 SIDED		0	0
Total HEADRIG		370	416

ToP Diameter (inches)	Logs per Shift	<--Recovery---> fbm/CF	BDU/MCF	<----Production----> fbm/shift	BDU/shift
4.00- 4.99					
5.00- 5.99	2.19	4.73	0.50	48.16	0.005
6.00- 6.99	64.34	5.57	0.50	2,072.33	0.186
7.00- 7.99	52.63	5.44	0.50	2,079.42	0.191
8.00- 8.99	71.43	5.62	0.50	3,577.50	0.319
9.00- 9.99	59.27	5.68	0.50	3,618.91	0.319
10.00-10.99	47.96	5.90	0.50	3,609.30	0.306
11.00-11.99	34.13	5.93	0.50	3,021.00	0.255
12.00-12.99	30.96	6.14	0.50	3,283.35	0.268
13.00-13.99	14.15	6.07	O*5O	1,701.63	0.140
14.00-14.99	13.58	6.10	0.50	1,866.26	0.153
15.00-15.99	7.02	6.22	0.50	1,109.52	0.089
16.00-16.99	6.27	6.25	0.50	1,114.16	0.089
17.00-17.99	4.83	6.42	0.50	981.82	0.076
18.00-18.99	2.18	6.52	0.50	498.37	0.038
19.00-19.99	2.64	6.47	0.50	659.19	0.051
20.00-20.99	0.60	6.61	0.50	168.44	0.013
21.00-21.99	1.10	6.62	0.50	337.21	0.025
22.00-22.99	0.51	6.63	0.50	168.94	0.013
23.00-23.99	0.09	6.64	0.50	33.85	0.003
24.00-24.99	0.09	6.72	0.50	34.25	0.003
25.00-25.99	0.08	6.66	0.50	33.92	0.003
26.00-27.00	0.08	6.75	0.50	34.74	0.003
27+	0.07	6.75	0.50	34.38	0.003

Totals	LRF	BDU/Mfbm	fbm/shift	BDU/shift
HEADRIG	5.90	0.08	30,087	2.55
Total Sawmill	5.90	0.08	30,087	2.55

Sawmill Production Simulation - Machine Centre loading

Machine centre name: EDGER

Data	Value	Units
Utilization this simulation	%102	%
Optimum production rate	5.00	pieces per minute
Production rate this simulation	5.12	pieces per minute
	1,792.55	pieces per shift
	102.44	feet per minute

Sawmill Production Simulation - Machine Centre loading

Machine centre name: CUT-OFF SAW

Data	Value	Units
Utilization this simulation	24	%
Optimum production rate	2.00	cycles per minute
Production rate this simulation	0.48	cycles per minute

Sawmill Production Simulation - Machine Centre loading

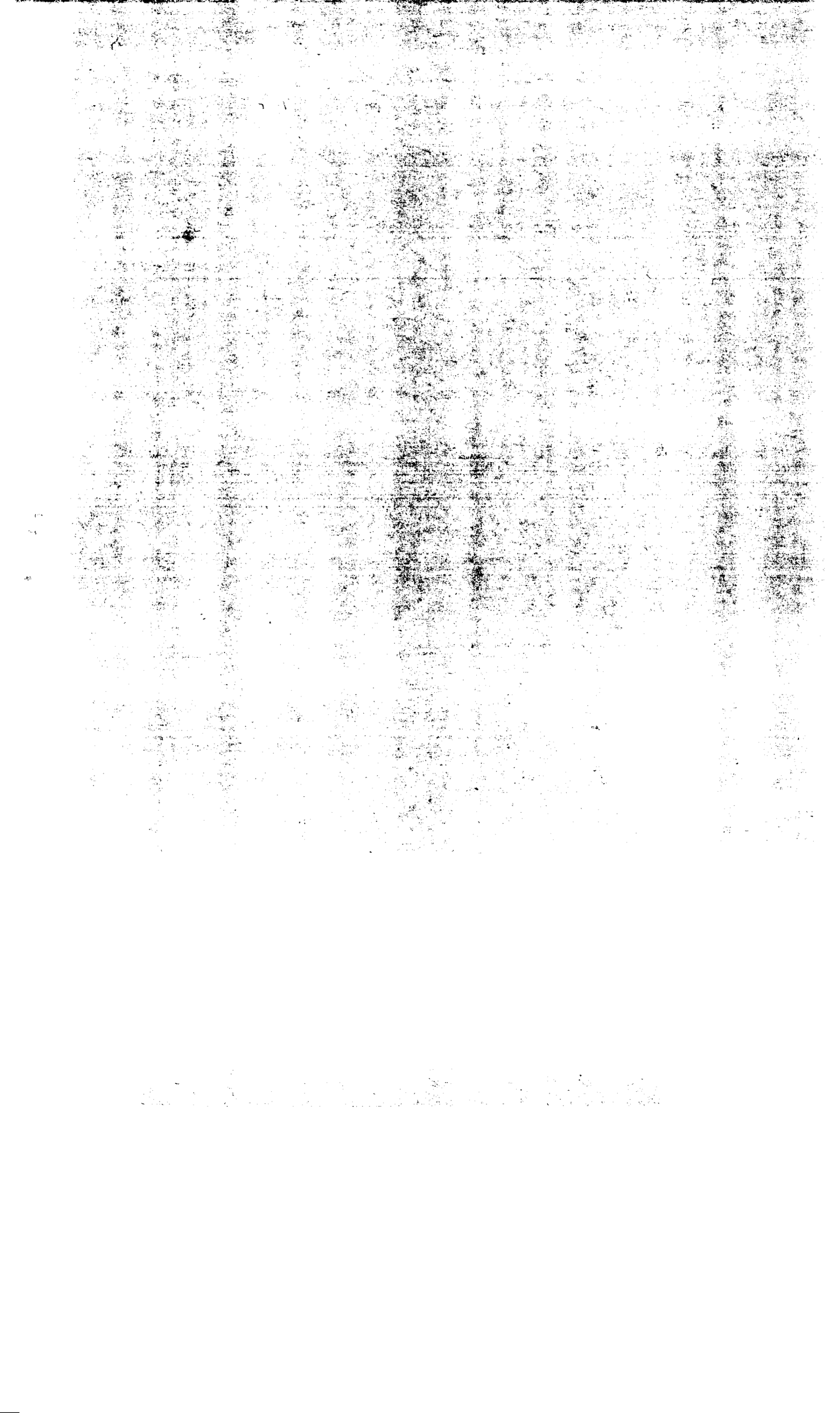
Machine centre name: RESAW

Data	Value	Units
Utilization this simulation	18	%
Optimum production rate	5.00	pieces per minute
Production rate this simulation	0.91	pieces per minute
	319.14	pieces per shift
	20.06	feet per minute

Sawmill Production Simulation - Machine Centre loading

Machine centre name: TRIMMER

Data	Value	Units
Utilization this simulation	21	%
Optimum production rate	40.00	pieces per minute
Production rate this simulation	8.47	pieces per minute
	2,964.51	pieces per shift



Sawmill Production simulation - Sawmill Sawlog Allocation
****

Based on: Maturity Phase
Total shifts per year of 130.0
Calculated average length of 16.00

ToP Diameter (inches)	Percent Volume (%)	MCF per Year	<------Logs per Shift--------> Diameter Class	Accumulated Forward	Reverse
4- 4.99					
5- 5.99	0.200	1.8	2.92	2.92	554.72
6- 6.99	7.300	64.5	85.76	88.68	551.80
7- 7.99	7.500	66.2	70.15	158.83	466.04
8- 8.99	12.500	110.4	95.21	254.04	395.89
9- 9.99	12.500	110.4	79.00	333.03	300.68
10-10.99	12.000	106.0	63.92	396.95	221.68
11-11.99	10.000	88.3	45.49	442.45	157.77
12-12.99	10.500	92.7	41.26	483.71	112.27
13-13.99	5.500	48.6	18.86	502.56	71.01
14-14.99	6.000	53.0	18.10	520.67	52.15
15-15.99	3.500	30.9	9.36	530.03	34.05
16-16.99	3.500	30.9	8.36	538.39	24.69
17-17.99	3.000	26.5	6.43	544.82	16.33
18-18.99	1.500	13.2	2.91	547.73	9.90
19-19.99	2.000	17.7	3.52	551.24	6.99
20-20.99	0.500	4.4	0.80	552.04	3.48
21-21.99	1.000	8.8	1.47	553.51	2.68
22-22.99	0.500	4.4	0.67	554.18	1.21
23-23.99	0.100	0.9	0.12	554.31	0.54
24-24.99	0.100	0.9	0.11	554.42	0.41
25-25.99	0.100	0.9	0.11	554.53	0.30
26-26.99	0.100	0.9	0.10	554.63	0.19
27+	0.100	0.9	0.09	554.72	0.09
Totals	100	883.00	554.72		

Sawmill Production Simulation - Lumber and Chip Production

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Based on: Machine Type	Log Diameter Range	Production Time (min.)	Logs per Shift
HEADRIG			
2 SIDED	4.00-27+	395	555
3 SIDED		0	0
4 SIDED		0	0
Total HEADRIG		395	555

ToP Diameter (inches)	Logs per Shift	<--Recovery---> fbm/CF	BDU/MCF	<----Production----> fbm/shift	BDU/shift
4.00- 4.99					
5.00- 5.99	2.92	4.73	0.50	64.19	0.007
6.00- 6.99	85.76	5.57	0.50	2,762.07	0.248
7.00- 7.99	70.15	5.44	0.50	2,771.52	0.255
8.00- 8.99	95.21	5.62	0.50	4,768.20	0.425
9.00- 9.99	79.00	5.68	0.50	4,823.39	0.425
10000-10.99	63.92	5.90	0.50	4,810.58	0.408
11.00-11.99	4!5.49	5.93	0.50	4,026.48	0.340
12.00-12.99	41.26	6.14	0.50	4,376.15	0.357
13.00-13.99	18.86	6.07	0.50	2,267.99	0.187
14• 00-14.99	18.10	6.10	0.50	2,487.41	0.204
15.00-15.99	9.36	6.22	0.50	1,478.80	0.119
16.00-16.99	8.36	6.25	0.50	1,484.99	0.119
17.00-17.99	6.43	6.42	0.50	1,308.61	0.102
18.00-18.99	2.91	6.52	0.50	664.24	0.051
19.00-19.99	3.52	6.47	0.50	878.59	0.068
20.00-20.99	0.80	6.61	0.50	224.50	0.017
21.00-21.99	1.47	6.62	0.50	449.45	0.034
22.00-22.99	0.67	6.63	0.50	225.17	0.017
23.00-23.99	0.12	6.64	0.50	45.12	0.003
24.00-24.99	0.11	6.72	0.50	45.65	0.003
25.00-25.99	0.11	6.66	0.50	45.21	0.003
26.00-27.00	0.10	6.75	0.50	46.30	0.003
27+	0.09	6.75	0.50	45.83	0.003

Totals	LRF	BDU/Mfbm	fbm/shift	BDU/shift
HEADRIG	5.90	0.08	40,100	3.40
Total Sawmill	5.90	0.08	40,100	3.40

Sawmill Production Simulation - Machine Centre loading

Machine centre name: EDGER

Data	Value	Units
Utilization this simulation	98	%
Optimum production rate	7.00	pieces per minute
Production rate this simulation	6.83	pieces per minute
	2,389.17	pieces per shift
	136.54	feet per minute

Sawmill Production Simulation - Machine Centre loading

Machine centre name: CUT-OFF SAW

Data	Value	Units
Utilization this simulation	32	%
Optimum production rate	2.00	cycles per minute
Production rate this simulation	0.63	cycles per minute

Sawmill Production Simulation - Machine Centre loading

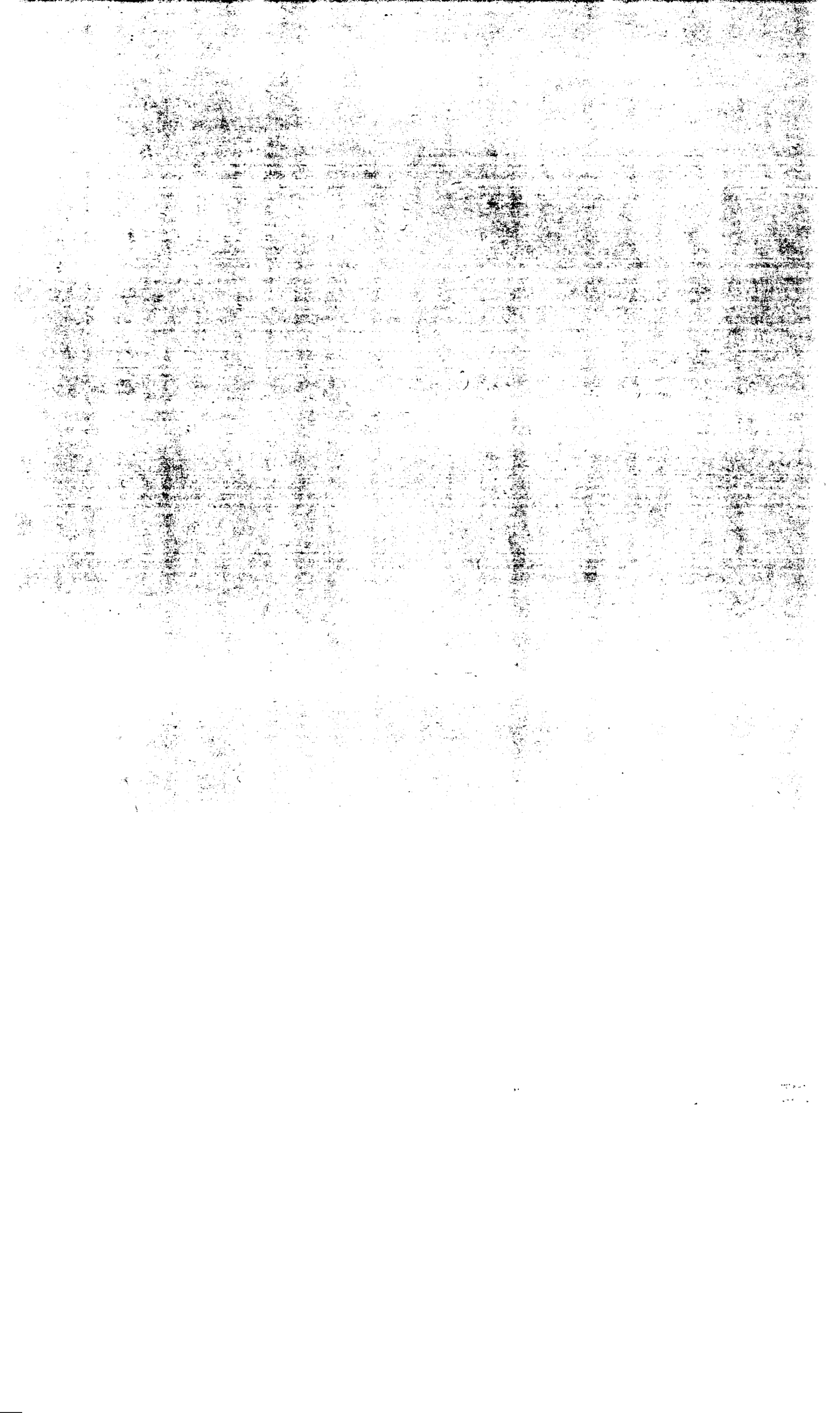
Machine centre name: RESAW

Data	Value	Units
Utilization this simulation	24	%
Optimum production rate	5.00	pieces per minute
Production rate this simulation	1.22	pieces per minute
	425.36	pieces per shift
	26.74	feet per minute

Sawmill Production Simulation - Machine Centre loading

Machine centre name: TRIMMER

Data	Value	Units
Utilization this simulation	28	%
Optimum production rate	40.00	pieces per minute
Production rate this simulation	11.29	pieces per minute
	3,951.19	pieces per shift



12.0 Capital Cost Estimates

Sawmill & Planer
May 5/86

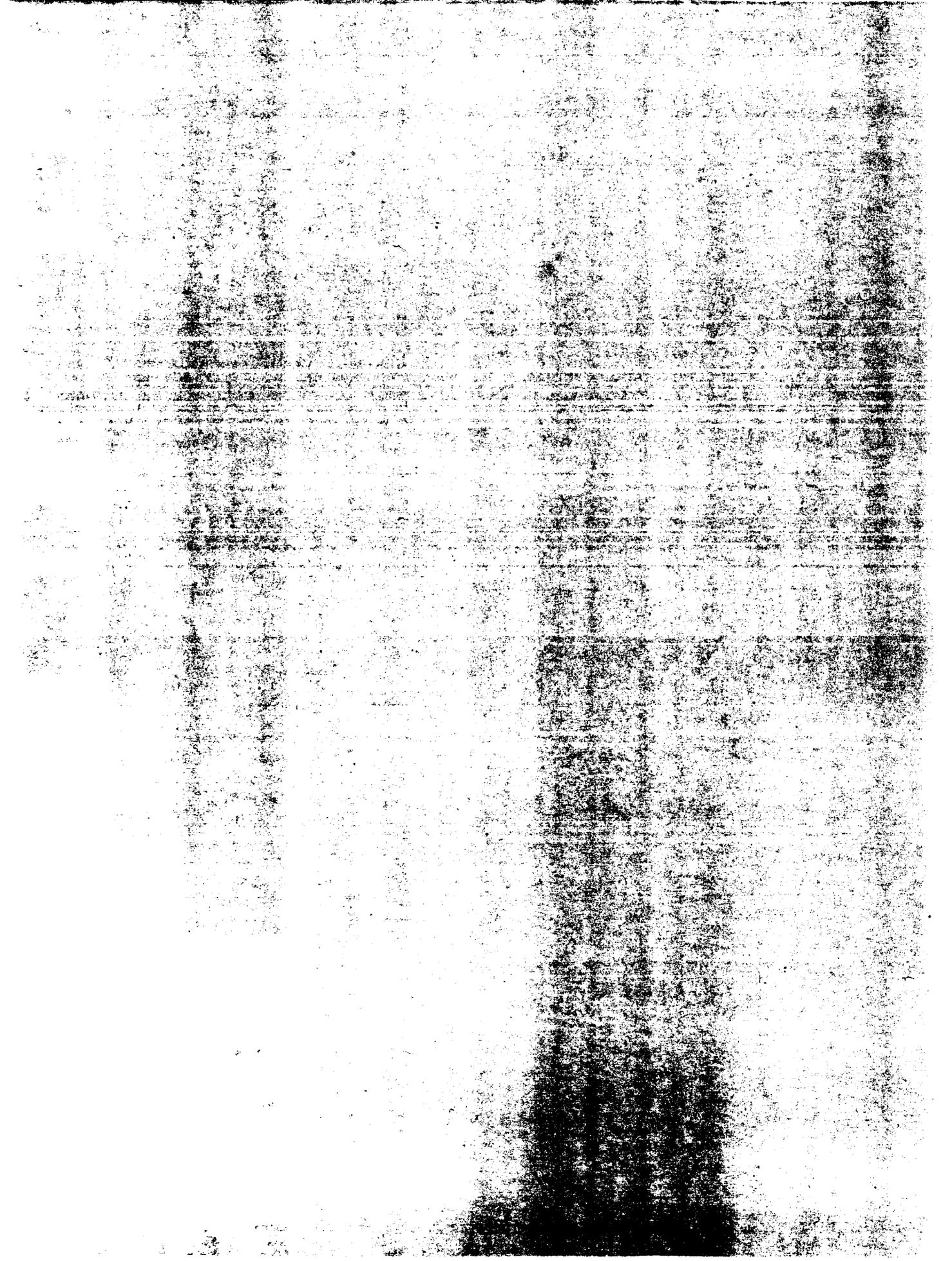
#	JOB	LABOUR	MATERIAL	TOTAL
1	Long log infeed deck	21,000	55,000	76,000
2	Cut-off-saw infeed conveyor	12,000	37,000	49,000
3	Chain Cut-off-saw	3,000	9,000	12,000
4	Log bucking conveyor	19,000	72,000	91,000
5	Log bunks (2 sets)	8,000	7,000	15,000
6	Log lnfeed conveyor	25,000	87,000	112,000
7	Put & take deck	12,000	38,000	50,000
8	Log infeed deck to Headrig	6,000	20,000	26,000
9	Headrig & Carriage	39,000	155,000	194,000
10	Outfeed Rollcase 1st Section	3,000	9,000	12,000
11	Outfeed Rollcase 2nd Section	7,000	26,000	33,000
12	Timber Chute	3,000	3,000	6,000
13	Transfer Deck to Edger	3,000	10,000	13,000
14	Transfer Deck to Resaw	3,000	10,000	13,000
15	Transfer Deck to Planer	3,000	10,000	13,000
16	Tilt Hoist	5,000	12,000	17,000
17	Edger Infeed	4,000	14,000	18,000
18	Combination Edger	13,000	115,000	128,000
19	Edger Infeed	2,000	6,000	8,000
20	Resaw Infeed	4,000	14,000	18,000
21	Circular Saw - Resaw	4,000	40,000	44,000
22	Planer Infeed	11,000	44,000	55,000
23	Planer (Used)	48,000	75,000	123,000
24	Planer Outfeed Belt	2,000	5,000	7,000
25	Planer Slowdown Belt	2,000	8,000	10,000
26	Landing Deck	3,000	9,000	12,000
27	Grading Deck	3,000	10,000	13,000
28	Lugged Trim Deck	3,000	11,000	14,000
29	Multi Saw Trimmer	13,000	30,000	43,000
30	Trimmer Outfeed Deck	3,000	10,000	13,000
31	Lumber Pull Chain	10,000	34,000	44,000
32	Lumber Carts		18,000	18,000
33	Cart Tracks	4,000	4,000”	8,000
34	Dry Kiln		178,000	178,000
35	Inground System & Installation		109,000	109,000
36	Strip Conveyor	1,000	5,000	6,000
	Sawmill & Planer Spares (4%)		51,960	51,960
	Sub Total	302,000	1,350,960	1,652,960
	Contingency (10%)	30,200	135.096	165.296
	Total Sawmill & Planer	332,200	1,486,056	1,818,256

#	JOB	LABOUR	MATERIAL	TOTAL
37	Headrlg Refuse Conveyor	6,000	13,000	19,000
38	Edger/Resaw Refuse Conveyor	7,000	16,000	23,000
39	Energy System		230,000	230,000
40	Incline Refuse Conveyor	6,000	17,000	23,000
41	Fuel Silo		60,000	60,000
42	Conveyor to Energy System	4,000	12,000	16,000
43	Planer Blower System	6,000	21,000	27,000
44	Trim Saw Conveyor	2,000	6,000	8,000
45	Air Compressor	6,000	23,000	29,000
46	Air Dryer	4,000	14,000	18,000
47	Diesel Generator (320 KW)		81,000	81,000
48	Hog	3,000	29,000	32,000
49	Hog Infeed & By-pass	5,000	3,000	8,000
50	Electrical Power Distribution		117,000	117,000
	Power & Refuse Spares (4%)		25,680	25,680
	Sub Total	49,000	667,680	716,680
	Contingency (10%)	4,900	66,768	71,668
	Total Power & Refuse	53,900	734,448	788,348

LIARD FORESTRY PROJECT Sheet 3 of 3

Site, Building & Mobile Equip.
May 5/86

#	JOB	LABOUR	MATERIAL	TOTAL
1	Sawmill/Planer Building	66,000	176,000	**242,000**
2	Offices & Shops	20,000	31,000	**51,000**
3	Sawmill Site Development		33,000	**33,000**
4	Lumber Storage Site		22,000	**22,000**
5	Log Storage Site		94,000	**94,000**
6	Saw File Room Equipment		30,000	**30,000**
7	Mechanical Room Equipment		10,000	**10,000**
8	Water & Sanitary System		28,000	**28,000**
9	IT28 Log Loader		149,000	**149,000**
10	3 Ton Truck		33,000	**33,000**
	Sub Total	86,000	606,000	692,000
	Contingency (10%)	8,600	60,600	69,200
	Total Power & Refuse	94,600	666,600	761,200



13.0 Logging Inputs

LOGGING COSTS - DEVELOPMENT

MAIN ROADS

Phase	cost /hr	cost /m.d.	Km/ m. d.	Total Km	Total m.d.	Phase cost($)	cost/ Km($)
Excavation	125.00	1000.00	0.50	1.25	2.50	2500	2000
Serv.truck		100.00		1.25	2.50	250	200
Bridges				1.25		15000	12000
Sub-total				1.25		17750	14200

BLOCK RDS

Excavation	95.00	760.00			67.50	51300	
Serv.truck		100.00			67.50	6750,	
Sub-total						58050	
RD. MAINT.	85.00	680.00	15.00	192.00	12.80	8704	

CUT-SKID

Phase	Trees /m.d.	cost /m.d.($)	cost /tree	Trees /m3	Cost /m3($)	Harvest level	Phase cost($)	Total m.d.	# men/ units	# days
Felling	200.00	240.00	1.20	0.81	0.97	12500	12150	50.6	1.00	50.62
Topping	150.00	100.00	0.66	0.81	0.54	12500	6750	67.5	1.00	67.5C
Skid. op.	150.00	150.00	1.00	0.81	0.81	12500	10125	67.5	1.00	67.5C
Skidder	150.00	585.18	3.90	0.81	3.16	12500	39500	67.5	1.00	67.5C
Serv.truck		100.00			0.54	12500	6750	67.5	1.00	67.5C
Sub-total					6.02	12500	75275			
LOADING		800.00			2.00	12500	25000	31.2	1.00	31.25

HAULING

One-way dist.(Km)	Av.load (m3)	Loads/ year	Cycle (hrs)	$/truck hour	Cost/ m3($)	Harvest level	Phase cost($)	Truck days	# trucks	# days
12.00	40.00	312.50	1.60	80.00	3.20	12500	40000	62.5	2.00	31.25

MANAGEMENT

Technician						$	37500			
Foreman		0.00 days				$	0			
Sub-total						$	37500			

TOTALS

ROADS						$	75800		$/M3	6.06
OPERATING						$	140275		$/M3	11.22
MAINTENAN .						$	8704		$/M3	0.69
STUMPAGE						$	2500		$/M3	0.20
MANAGEMENT						$	37500		$/M3	3.00
TOTAL						$	264779		$/M3	21.18

LOGGING COSTS - GROWTH

MAIN ROADS

Phase	cost /hr	cost /m.d.	Km/ m.d.	Total Km	Total m.d.	Phase cost($)	cost/ Km($)
Excavation	125.00	1000.00	0.50	1.50	3.00	3000	2000
Serv.truck		100.00		1.50	3.00	300	200
Bridges				1.50		15000	10000
Sub-total				1.50		18300	12200

BLOCK RDS

Excavation	95.00	760.00		62.50	47500	
Serv.truck		100.00		62.50	6250	
Sub-total					53750	

RD. MAINT.	85.00	680.00	15.00	480.00	32.00	21760

CUT-SKID

Phase	Trees /m.d.	cost /m.d.($)	cost /tree	Trees /m3	Cost /m3($)	Harvest level	Phase cost($)	Total m.d.	# men/ units	# days
Felling	200.00	240.00	1.20	1.00	1.20	15000	18000	75.0	1.00	75.00
Topping	160000	100.00	0.62	1.00	0.62	15000	9375	93.7	1.50	62.50
Skid. op.	160.00	150.00	0.93	1.00	0.93	15000	14062	93.7	1.50	62.50
Skidder	160.00	632.00	3.95	1.00	3.95	15000	59250	93.7	1.50	62.50
Serv.truck		100.00			0.41	15000	6250	62.5	1.00	62.50
Sub-total					7.12	15000	106937			

LOADING		800.00			2.00	15000	30000	58.5	1.00	58.59

HAULING

One-way dist.(Km)	Av.load (m3)	Loads/ year	Cycle (hrs)	$/truck hour	Cost/ m3($)	Harvest level	Phase cost($)	Truck days	# trucks	# days
30.00	40.00	375.00	2.50	80.00	5.00	15000	75000	117.1	2.00	58.59

MANAGEMENT

Technician						$	37500			
Foreman		0.00	days			$	0			
Sub-total						$	37500			

TOTALS

ROADS						$	72050		$/M3	4.80
OPERATING						$	211937		$/M3	14.12
MAINTENAN.						$	21760		$/M3	1.45
STUMPAGE						$	3000		$/M3	0.20
MANAGEMENT						$	37500		$/M3	2.50
TOTAL						$	346247		$/M3	23.08

LOGGING COSTS - MATURITY

MAIN ROADS

Phase	cost /hr	cost /m.d.	Km/ m.d.	Total Km	Total m.d.	Phase cost($)	Cost/ Km($)
Excavation	125.00	1000.00	0.50	2.50	5.00	5000	2000
"Serv.truck		100.00		2.50	5.00	500	200
Bridges				2.50		15000	6000
Sub-total				2.50		20500	8200

BLOCK RDS

Excavation	95.00	760.00			78.12	59375	
Serv.truck		100.00			78.12	7812	
Sub-total						67187	
RD. MAINT.	85.00	680.00	15.00	560.00'	37.33	25386	

CUT-SKID

Phase	Trees /m.d.	cost /m.d.($)	cost /tree	Trees /m3	Cost /m3($)	Harvest level	Phase cost($)	Total m.d.	# men/ units	# days
Felling	200.00	240.00	1.20	1.00	1.20	25000	30000	125.0	2.00	62.50
Topping	160.00	100.00	0.62	1.00	0.62	25000	15625	156.2	2.00	78.12
Skid. op.	160.00	150.00	0.93	1.00	0.93	25000	23437	156.2	2.00	78.12
Skidder	160.00	505.60	3.16	1.00	3.16	25000	79000	156.2	2.00	78.12
Serv.truck		100.00			0.31	25000	7812	78.1	1.00	78.12
Sub-total					6.23	25000	155875			
LOADING		800.00			2.29	25000	57291	71.6	1.00	71.61

HAULING

One-way dist.(Km)	Av.load (m3)	Loads/ year	Cycle (hrs)	$/truck hour	Cost/ m3($)	Harvest level	Phase cost($)	Truck days	# trucks	# days
35.00	40.00	625.00	2.75	80.00	5.50	25000	137500	214.8	3.00	71.61

MANAGEMENT

Technician					$	37500				
Foreman		0.00	days		$	0				
Sub-total					$	37500				

TOTALS

ROADS					$	87687			$/M3	3.50
OPERATING					$	350666			$/M3	14.02
MAINTENAN .					$	25386			$/M3	1.01
STUMPAGE					$	5000			$/M3	0.20
MANAGEMENT					$	37500			$/M3	1.50
TOTAL					$..	506240			$/M3	20.24