"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal
Cost Summary
Rotorwash
Sale 341-04-07

District: Astoria **Date:** 6/27/03

	Conifer	Hardwood	Total
Gross Timber Sale Value	$647,028.81	$1,321,630.35	$1,968,659.16
		Project Work	($219,311.00)
		Advertised Value	$1,749,348.16

"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal
Timber Description
Rotorwash
Sale 341-04-07

District: Astoria

Location: Portions of Sections 9, 10, 11, 15, and 16, T4N, R7W, W.M., Clatsop County, OR

Date: 6/27/03 **Stand Stocking:** 80%

Species	Avg. DBH	Amortized%	Recovery%
Douglas - Fir	19	0	97
Western Hemlock / Fir	12	0	97
Sitka Spruce	15	0	97
Red Cedar	21	0	97
Alder (Red)	15	0	95

Volume by Grade	Douglas - Fir	Western Hemlock / Fir	Sitka Spruce	Red Cedar	Alder (Red)	Total
2S	1,229	125	0	0	0	1,354
3S	669	61	12	5	3,482	4,229
4S	75	52	0	1	23	151
Total	1,973	238	12	6	3,505	5,734

Comments: Pond Values Used: 2nd Quarter 2003

Log Markets: Mist, Clatskanine, Tillamook

Additional costs for Areas 1 - 6:
Costs with P&R:
100% branding and painting: $1/MBF x 5,734 = $5,734
Skyline placement of logs in 5 locations of Quartz Creek:
5 logs (each) x 5 sites = 25 logs x $60/log = $1,500
Total Cost w/P&R = $7,234
Costs without P&R:
Pile slash in Areas 1, 3, & 4 cable landings @ $130/landing x 9 landings = $1,170
Excavator move-in/move-out = $500
Site prep slash piling for Areas 1 - 4, 217 hours @ $95/hour = $20,615
Payment for access easement to Alice Gronnel = $5,000
Total Costs w/o P&R = $27,285

"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal
Logging Conditions
Rotorwash
Sale 341-04-07

Combination#: 1

	Douglas - Fir	44.00%
	Western Hemlock / Fir	44.00%
	Sitka Spruce	44.00%
	Red Cedar	44.00%
	Alder (Red)	44.00%

Yarding Distance: Long (1,500 ft) **Downhill Yarding:** No
Logging System: Cable: Large Tower >=70 **Process:** Stroke Delimber
Tree Size: Mature Private Forest / Regen Cut (250 Bft/tree), 6-11 logs/MBF
Loads/Day: 9 **Bd. Ft./Load:** 3,500
Cost/MBF: $118.88
Machines:
Log Loader (A)
Stroke Delimber (A)
Tower Yarder (Large)

Combination#: 2

	Douglas - Fir	10.00%
	Western Hemlock / Fir	10.00%
	Sitka Spruce	10.00%
	Red Cedar	10.00%
	Alder (Red)	10.00%

Yarding Distance: Short (400 ft) **Downhill Yarding:** Yes
Logging System: Shovel **Process:** Manual Delimbing
Tree Size: Mature / Regen Cut (900 Bft/tree), 3-5 logs/MBF
Loads/Day: 9 **Bd. Ft./Load:** 3,500
Cost/MBF: $73.70
Machines:
Shovel Logger

Combination#: 3

	Douglas - Fir	46.00%
	Western Hemlock / Fir	46.00%
	Sitka Spruce	46.00%
	Red Cedar	46.00%
	Alder (Red)	46.00%

Yarding Distance: Medium (800 ft) **Downhill Yarding:** Yes
Logging System: Track Skidder **Process:** Manual Falling/Delimbing
Tree Size: Mature / Regen Cut (900 Bft/tree), 3-5 logs/MBF
Loads/Day: 9 **Bd. Ft./Load:** 3,500
Cost/MBF: $103.66
Machines:
Log Loader (B)
Track Skidder

"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal
Logging Costs
Rotorwash
Sale 341-04-07

Date: 6/27/03

Operating Seasons: 2.0

Profit & Risk: 15%

Project Costs: $219,311

Other Costs (P/R): $7,234

Slash Disposal: $0

Other Costs: $27,285

Road Maintenance: $4.14

Miles of Road			
Dirt	**Rock (Contractor)**	**Rock (State)**	**Paved**
0.0	0.0	0.0	0.0

Hauling Costs

Species	$/MBF	Trips/Day	MBF/Load
Douglas - Fir	$0.00	2.0	4.5
Western Hemlock / Fir	$0.00	2.0	4.0
Sitka Spruce	$0.00	2.0	4.0
Red Cedar	$0.00	2.0	4.0
Alder (Red)	$0.00	2.0	3.5

"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal
Logging Costs Breakdown
Rotorwash
Sale 341-04-07

Costs	Douglas - Fir	Western Hemlock / Fir	Sitka Spruce	Red Cedar	Alder (Red)
Logging	107.36	107.36	107.36	107.36	107.36
Road Maintenance	4.27	4.27	4.27	4.27	4.36
Fire Protection	0.95	0.95	0.95	0.95	0.95
Hauling	52.68	59.28	59.28	59.28	69.16
Other (P/R appl.)	1.26	1.26	1.26	1.26	1.26
Profit & Risk	24.98	25.97	25.97	25.97	27.46
Slash Disposal	0.00	0.00	0.00	0.00	0.00
Scaling	2.00	2.00	2.00	2.00	2.00
Other	4.76	4.76	4.76	4.76	4.76
Total	198.26	205.85	205.85	205.85	217.31

Amortization	0.00	0.00	0.00	0.00	0.00
Pond Value	508.95	322.08	315.00	1,050.00	594.38
Stumpage	310.69	116.23	109.15	844.15	377.07
Amortized	0.00	0.00	0.00	0.00	0.00

"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal Summary Rotorwash Sale 341-04-07

Amortized

	Douglas - Fir	Western Hemlock / Fir	Sitka Spruce	Red Cedar	Alder (Red)
MBF	0.00	0.00	0.00	0.00	0.00
Value	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00

Unamortized

	Douglas - Fir	Western Hemlock / Fir	Sitka Spruce	Red Cedar	Alder (Red)
MBF	1,973.00	238.00	12.00	6.00	3,505.00
Value	310.69	116.23	109.15	844.15	377.07
Total	612,991.37	27,662.74	1,309.80	5,064.90	1,321,630.35

Gross Timber Sale Value

Recovery $1,968,659.16

Prepared by: Ty Williams Date: 6/27/03

District: Astoria Phone: (503) 325-5451

Road Maintenance Cost Summary

Sale: Rotorwash
Date: 2-Jun-03
By: Ty Williams

MBF: 5,734
$$/MBF: $4.14

Type	Equipment/Rationale	Move-in Rate	Times	Hours	Rate	Cost	
Progressive Operations Entries (2)	Grader 14G	$540	2	60	$80	$5,880	
	Dump Truck 12CY x 2	$228	2	40	$57	$2,736	
	FE Loader C966	$540	2	20	$75	$2,580	
Final Haul Road Maintenance Haul Route	Grader 14G	$540	1	40	$80	$3,740	
	Dump Truck 12CY x 3	$114	3	20	$57	$1,482	
	FE Loader C966	$540	1	20	$75	$2,040	
	Vibratory Roller	$540	1	40	$75	$3,540	
	Water Truck 2,500 gallon	$132	1	20	$67	$1,472	
	Labor			10	$25	$250	
Total							$23,720

Production Rates	Miles/day	Distance(miles)	Days
Grader	1.5	9.0	6.0
Vibratory Roller*	1.5	9.0	6.0

*Final Road Maintenance Only

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SUMMARY OF ALL PROJECT COSTS

SALE NAME: Rotowash

NEW CONSTRUCTION: **PROJECT NO. 1**

Road segment	Length/Sta	Cost
1A-1B, 3A-3B, 3C-3D, 3E-3F, 4A-4B, 4D-4E, 4F-4G, 4H-4I.	214.35	$164,611

ROAD IMPROVEMENT **PROJECT NO. 1**

Road segment	Length/Sta	Cost
I1-I2, I2-I3, I3-I4.	133.9	$35,998
TOTALS		$200,609

SPECIAL PROJECTS:

	Description	Cost	
Project No. 2	Road Vacating	$4,799	
Project No. 3	Gate Installation	$3,300	
	Road maintenance after project work	$4,565	
	TOTALS		$12,664

MOVE IN:

Equipment	Cost	
Dozer (Medium D7) x 2	$1,120	
Grader (Large 14G)	$540	
Rubber Tire Skidder	$520	
Vibratory Roller	$540	
Vibratory Grid Roller	$540	
Front End Loader x 2	$1,080	
Dump Trucks (6 x $114)	$684	
Excavator (Medium C325)	$900	
Water Truck (1500 gal)	$114	
TOTAL		$6,038

GRAND TOTAL **$219,311**

Compiled By: J. Long Date: 6/20/2003

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SUMMARY OF CONSTRUCTION COSTS

SALE NAME: Rotowash — **NEW CONSTRUCTION:** 214.35 **STATIONS** 4.06 **MILES**
ROAD: 1A-1B, 3A-3B, 3C-3D, 3E-3F, 4A-4B, 4D-4E, 4F-4G, and 4H-4I — **IMPROVEMENT:** _____ **STATIONS** _____ **MILES**

CLEARING & GRUBBING

Method	Acres/amount	x	Rate/Acre	=	Cost
Scatter Outside of R/W	18.00	x	$840.00	=	$15,120.00
Endhaul clearing debris between Stations	2.00	x	$1,980.00	=	$3,960.00
16+15 to 22+40 and 123+00 to 135+00		x		=	

SUB TOTAL FOR CLEARING & GRUBBING $19,080

EXCAVATION

	Material	Cy/amount	x	Rate	=	Cost
1A - 1B, 4A - 4B	Common Drift $$/cy	1,772.00	x	$1.35	=	$2,392.20
1A - 1B, 4A - 4B	Embankment Compaction $$/cy	1,040.00	x	$0.40	=	$416.00
3A - 3B	Common excavation $$/sta	171.40	x	$117.00	=	$20,053.80
1A - 1B, 3A - 3B	Cut Slope Rounding $$/sta.	47.00	x	$27.00	=	$1,269.00
3C-3D, 3E-3F, 4D-4E,	Common excavation $$/sta	25.60	x	$117.00	=	$2,995.20
4F-4G, & 4H-4I			x		=	
	Landing Construction $$/landing	9	x	$270.00	=	$2,430.00
			x		=	
			x		=	

SUB TOTAL FOR EXCAVATION $29,556

CULVERT MATERIALS AND INSTALLATION

	Location	Dia/type	Lineal ft.	Rate	Cost	No. bands	Rate	Cost
1A -1B	2+35	18"CPP	34	$11.00	$374.00			
3A - 3B	2+50	18"CPP	32	$11.00	$352.00			
3A - 3B	9+70	18"CPP	40	$11.00	$440.00			
3A - 3B	16+15	18"CPP	40	$11.00	$440.00			
3A - 3B	16+90	* 36"CSP	50	$33.00	$1,650.00			
3A - 3B	20+20	18"CPP	30	$11.00	$330.00			
3A - 3B	22+40	18"CPP	40	$11.00	$440.00			
3A - 3B	24+85	18"CPP	40	$11.00	$440.00			
3A - 3B	31+95	18"CPP	40	$11.00	$440.00			
3A - 3B	53+55	18"CPP	34	$11.00	$374.00			
3A - 3B	59+20	18"CPP	34	$11.00	$374.00			
3A - 3B	63+20	18"CPP	34	$11.00	$374.00			
3A - 3B	66+30	18"CPP	60	$11.00	$660.00			
3A - 3B	70+70	18"CPP	32	$11.00	$352.00			
3A - 3B	75+60	18"CPP	34	$11.00	$374.00			
3A - 3B	109+35	18"CPP	34	$11.00	$374.00			
3A - 3B	113+10	18"CPP	30	$11.00	$330.00			
3A - 3B	117+80	18"CPP	34	$11.00	$374.00			
3A - 3B	121+40	18"CPP	34	$11.00	$374.00			
3A - 3B	124+60	18"CPP	34	$11.00	$374.00			
3A - 3B	125+75	* 117 x 79 CSP	48	$172.55	$8,282.40	1	$258.85	$258.85
3A - 3B	126+36	18"CPP	30	$11.00	$330.00			
3A - 3B	131+00	18"CPP	34	$11.00	$374.00			
3A - 3B	149+10	* 48" CSP	56	$32.75	$1,834.00			
3A - 3B	149+90	18"CPP	34	$11.00	$374.00			
4H-4I	0+00	18"CPP	40	$11.00	$440.00			

	Description	Quantity	Rate	Cost
Other/miscellaneous:	Bevel culvert inlets for 36" and 48" culverts	2	$25.00	$50.00
	Bevel inlet and outlet for 117"x 79" arch pipe	2	$50.00	$100.00
	36" Aluminized Steel Tee, 12 gage. STA 16+	1	$240.00	$240.00
	36" Aluminized Steel Band for STA 16+90	1	$24.00	$24.00
	Debris Screens for inlet/outlet STA 16+90	2	$150.00	$300.00
Culvert stakes & markers:	6' x 2 1/2" White Fiberglass (Carsonite)	23	$14.10	$324.30

*Indicates culverts that do not require culvert markers.

SUB TOTAL FOR CULVERT MATERIALS & INSTALLATION $22,172

Subtotal **$70,808**

SURFACING

Subgrade prep:	Description	Stations/ amount	x	Rate/ sta/amt	Cost
	Grade, Shape and Ditch 16'	173.85	x	$15.20	$2,642.52
	Subgrade Compaction	173.85	x	$12.50	$2,173.13
	Grade and Shape - 14' outslope)	40.50	x	$15.20	$615.60

ROAD SEGMENT	1A to 1B			POINT TO POINT		Sta. to Sta.					
Application	Rock Size and Type	Location	Depth of Rock (inches)	1A to 1B Volume (CY) per		0+00 to 7+25 Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Base Rock	6"-0" Pit-run		10	station	63	stations	7.25	457	$3.53	$1,612	
Traction Rock	3/4"-0" Crushed	0+00 to 6+50	3	station	19	stations	6.50	124	$2.44	$301	
Turn Outs	6"-0" Pit-run		10	turnout	28	turnouts	1	28	$3.53	$99	
Junctions	1 1/2"-0" Crushed	0+00	3	junction	24	junctions	1	24	$2.44	$59	
Junctions	6"-0" Pit-run	1A	10	junction	30	junctions	1	30	$3.53	$106	
Turn-Arounds	6"-0" Pit-run		10	TA	30	TAs	1	30	$3.53	$106	
Landings	6"-0" Pit-run	1B	N/A	landing	80	landings	1	80	$3.53	$282	
Total Rock for Road Segment:			1A to 1B					772			$2,565
ROAD SEGMENT	3A to 3B			POINT TO POINT		Sta. to Sta.					
Application	Rock Size and Type	Location	Depth of Rock (inches)	3A to 3B Volume (CY) per		0+00 to 151+00 Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Base Rock	4"-0" Crushed	0+00 to135+00	10	station	63	stations	135.00	8,505	$2.44	$20,752	
Base Rock	6"-0" Pit-run	135+00 to 151+00	8	station	50	stations	16.00	800	$3.53	$2,824	
Traction Rock	3/4"-0" Crushed	26+50 to 38+00	3	station	19	stations	11.50	219	$2.44	$533	
Traction Rock	3/4"-0" Crushed	51+00 to 67+00	3	station	19	stations	16.00	304	$2.44	$742	
Traction Rock	3/4"-0" Crushed	86+50 to 105+50	3	station	19	stations	19.00	361	$2.44	$881	
Traction Rock	3/4"-0" Crushed[1]	112+50 to 135+00	3	station	19	stations	22.50	428	$2.44	$1,043	
Turn Outs	4"-0" Crushed		10	turnout	28	turnouts	23	644	$2.44	$1,571	
Turn Outs	6"-0" Pit-run		8	turnout	22	turnouts	3	66	$3.53	$233	
Turn Outs	3/4"-0" Crushed		3	turnout	10	turnouts	13	130	$2.44	$317	
Junctions	1 1/2"-0" Crushed	0+00	3	junction	24	junctions	1	24	$2.44	$59	
Junctions	4"-0" Crushed	0+00	10	junction	30	junctions	2	60	$2.44	$146	
Turn-Arounds	4"-0" Crushed		10	TA	30	TAs	2	60	$2.44	$146	
Curve widening	4"-0" Crushed		10		N/A			550	$2.44	$1,342	
Curve widening	3/4"-0" Crushed		3		N/A			180	$2.44	$439	
Culvert Bedding	1 1/2"-0" Crushed	16+90	N/A		N/A			100	$2.44	$244	
Culvert Bedding	1 1/2"-0" Crushed	25+75	N/A		N/A			120	$2.44	$293	
Culvert Bedding	1 1/2"-0" Crushed	149+10	N/A		N/A			65	$2.44	$159	
Landings	6"-0" Pit-run	4C	N/A	landing	130	landings	1	130	$3.53	$459	
Free Drain Fill	6"-2" Pit-run[2]	16+90	N/A		N/A			456	$3.19	$1,455	
Energy Dissipators	24"-6" Riprap		N/A		N/A			120	$5.25	$630	
Fill Armor	24"-6" Riprap	125+75	24		N/A			180	$5.25	$945	
Fill Armor	24"-6" Riprap	149+10	24		N/A			80	$5.25	$420	
Total Rock for Road Segment:			3A to 3B					13,581			$35,633

[1] 3/4"- 0" traction rock for Stations 112+00 to 135+00 is to be obtained from Flat Iron Stockpile.

[2] 6"- 2" pit run drain rock for Station 16+90 is to be obtained from the Sterling Quarry.

ROAD SEGMENT	4A to 4B			POINT TO POINT		Sta. to Sta.					
				4A to 4B		0+00 to 10+00					
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per		Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Base Rock	6"-0" Pit-run		8	station	50	stations	10.00	500	$3.53	$1,765	
Turn Outs	6"-0" Pit-run		8	turnout	24	turnouts	1	24	$3.53	$85	
Turn-Arounds	6"-0" Pit-run		8	TA	24	TAs	1	24	$3.53	$85	
Junctions	6"-0" Pit-run		8	junction	24	junctions	1	24	$3.53	$85	
Landings	6"-0" Pit-run	4A & 4B	N/A	landing	80	landings	2	160	$3.53	$565	
Total Rock for Road Segment:			4A to 4B					732			$2,584
ROAD SEGMENT	4D to 4E			POINT TO POINT		Sta. to Sta.					
				4D to 4E		0+00 to 2+90					
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per		Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Base Rock	6"-0" Pit-run		8	station	50	stations	2.90	145	$3.53	$512	
Junctions	6"-0" Pit-run		8	junction	24	junctions	1	24	$3.53	$85	
Landings	6"-0" Pit-run	4E	N/A	landing	80	landings	1	80	$3.53	$282	
Total Rock for Road Segment:			4D to 4E					249			$879
ROAD SEGMENT	4F to 4G			POINT TO POINT		Sta. to Sta.					
				4F to 4G		0+00 to 1+50					
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per		Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Base Rock	6"-0" Pit-run		8	station	50	stations	1.50	75	$3.53	$265	
Junctions	6"-0" Pit-run		8	junction	24	junctions	1	24	$3.53	$85	
Landings	6"-0" Pit-run	4G	N/A	landing	80	landings	1	80	$3.53	$282	
Total Rock for Road Segment:			4F to 4G					179			$632
ROAD SEGMENT	4H to 4I			POINT TO POINT		Sta. to Sta.					
				4H to 4I		0+00 to 1+20					
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per		Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Base Rock	6"-0" Pit-run		8	station	50	stations	1.20	60	$3.53	$212	
Junctions	6"-0" Pit-run		8	junction	24	junctions	1	24	$3.53	$85	
Landings	6"-0" Pit-run	4I	N/A	landing	80	landings	1	80	$3.53	$282	
Total Rock for Road Segment:			4H to 4I					164			$579
								14,905			

Processing:

Description	No.sta	Rate/sta	Cost
Water, Process & Compact Crushed Rock:	361.50	$37.00	$13,376
Compact Pit-Run rock with vibratory Grid	38.85	$38.75	$1,505
Develop Pit- Run (pr) rock (3,235 cyds @ $1.85/cyd = $5,984.75)			$5,985
Develop Rip Rap (rr) rock (380 cyds @ $2.60/cyd = $988.00)			$988

	24"-6" rr	6"-2" pr	6"-0" pr	4"-0"	1 1/2"-0"	3/4"-0"	Total		
Rock Totals	380	456	2,945	9,819	333	1,745	15,677		$70,157

Fill construction and other miscelaneous costs for Road 3A to 3B

Description	Costs
* Free Draining Fill Const. Sta. 16+90	$2,306
* Type F Fill Const. Sta. 125+75	$9,284
* Type N Fill Const. Sta. 149+10	$3,238
Energy Dissipator Palcement on 3A to 3B ($2/cy @ $120cy)	$240
Geotextile Fabric ($1.25 X 6,350 ft.)	$7,938
Grass seeding/fertilizing Sta. 0+00 to 24+85 1.6 acres x $400/ac	$640

* Costs for the culverts and bands are included on the culvert list on page 1.

Subtotal for Special Projects on Road 3A to 3B **$23,646**

GRAND TOTAL Cost per Mile $40,690 **$164,611**

Compiled By: J. Long Date: 6/20/2003

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Sale Name: Rotorwash
Project: 3A to 3B, Station 16+90
Project Type: Free Draining Fill

Prepared by: Cullen Bangs
Date: 5/22/03

Phase I: Fill Removal

Qty.	Equipment	Vol. (cyd)	Loads	Time (hr)	Rate ($/hr)	Cost ($)
1	Excavator w/ 1-1/2 cyd bucket			3	$115.00	$345.00
1	12-yard Dump Truck			3	$57.00	$171.00
						$516.00

Phase II: Development of Culvert Bed

Qty.	Equipment	Vol. (cyd)	Loads	Time (hr)	Rate ($/hr)	Cost ($)
1	Excavator w/ 1-1/2 cyd bucket			3	$115.00	$345.00
1	Handheld Tamper			2	$6.00	$12.00
1	Laborer			3	$25.00	$75.00
20*	1 1/2"-0" Crushed Bedding Rock ($/cy)					
						$432.00

Phase III: Pipe Installation and Fill Construction

Qty.	Equipment	Vol. (cyd)	Loads	Time (hr)	Rate ($/hr)	Cost ($)
1	Excavator w/ 1-1/2 cyd bucket			10	$115.00	$1,150.00
1	Handheld Tamper			3	$6.00	$18.00
1	Laborer			3	$25.00	$75.00
50	Culvert, 36" round, 12 gage, aluminized steel				$33.00	$1,650.00
1	36", 12 gage, aluminized steel, tee				$240.00	$240.00
1	36" aluminized steel band				$24.00	$24.00
2	Screens for inlet, and tee				$150.00	$300.00
456*	6"-2" Pit Run Free Draining Rock					
100*	1 1/2"-0" Crushed Backfill Rock ($/cy)					
10*	Rip-Rap Rock ($/cy)					
1	Place Rip-Rap w/ Excavator			1	$115.00	$115.00
						$3,572.00

Phase IV: Surfacing and Mulching

Qty.	Equipment	Vol. (cyd)	Loads	Time (hr)	Rate ($/hr)	Cost ($)
						$0.00
						$0.00
						$0.00
						$0.00

Materials Cost	$2,214.00
Installation, Fill Construction, Other Costs	$2,306.00
Total Free Draining Fill Cost	**$4,520.00**

* Rock haul is included with the Summary of Construction for road segment 3A to 3B

Sale Name: Rotorwash
Project: 3A to 3B, Station 125+76
Project Type: Type F Crossing

Prepared by: Cullen Bangs
Date: 5/8/03

Phase I: Fill Removal

Qty.	Equipment	Vol. (cyd)	Loads	Time (hr)	Rate ($/hr)	Cost ($)
1	Excavator w/ 1-1/2 cyd bucket			5	$115.00	$575.00
1	12-yard Dump Truck			5	$57.00	$285.00
						$860.00

Phase II: Development of Culvert Bed & De-watering

Qty.	Equipment	Vol. (cyd)	Loads	Time (hr)	Rate ($/hr)	Cost ($)
1	Excavator w/ 1-1/2 cyd bucket			12	$115.00	$1,380.00
1	Handheld Tamper			4	$6.00	$24.00
1	Hydraulic Rock Hammer			4	$85.00	$340.00
1	Sand Bags (40 bags, $25; sand 10cy $110)				$135.00	$135.00
1	Plastic (10'x50' roll) ($/roll)				$13.50	$13.50
2	Laborer			8	$25.00	$400.00
50	15" CPP w/band for dewatering ($/ft)				$6.45	$322.50
40*	1 1/2"-0" Crushed Bedding Rock ($/cy)					
						$2,615.00

Phase III: Pipe Installation and Fill Construction

Qty.	Equipment	Vol. (cyd)	Loads	Time (hr)	Rate ($/hr)	Cost ($)
1	Excavator w/ 1-1/2 cyd bucket			12	$115.00	$1,380.00
1	Handheld Tamper			8	$6.00	$48.00
2	Laborer			8	$25.00	$400.00
48	Pipe Arch, 117"x79", 10ga., Aluminized, 3x1 ($/ft)				$172.55	$8,282.40
1	117"x79" (24" band)				$258.85	$258.85
2	Beveling Inlet/Outlet ($/per side)				$50.00	$100.00
48	Seeding of culvert with native material (Laborer hrs.)				$25.00	$1,200.00
1	Rubber Tired Skidder w/operator			4	$60.00	$240.00
1	D-7 w/operator			4	$90.00	$360.00
415	Import Fill Material ($/cy)	415			$2.75	$1,141.25
80*	1 1/2"-0" Crushed Backfill Rock ($/cy)					
180*	Rip-Rap Rock ($/cy)					
1	Place Rip-Rap w/ Excavator			8	$115.00	$920.00
						$14,330.50

Phase IV: Surfacing and Mulching

Qty.	Equipment	Vol. (cyd)	Loads	Time (hr)	Rate ($/hr)	Cost ($)
0.1	Straw Mulch w/Seed Application EC mix ($/ac.)				$1,195.00	$119.50
						$0.00
						$0.00
						$119.50

Materials Cost	$8,641.25
Installation, Fill Construction, Other Costs	$9,283.75
Total Type F Crossing Cost	**$17,925.00**

Sale Name: Rotorwash
Project: 3A to 3B, Station 149+10
Project Type: Type N Crossing

Prepared by: Jon Long
Date: 6/4/2003

Phase I: Fill Removal

Qty.	Equipment	Vol. (cyd)	Loads	Time (hr)	Rate ($/hr)	Cost ($)
	Excavator w/ 1-1/2 cyd bucket				$115.00	$0.00
	12-yard Dump Truck				$57.00	$0.00
						$0.00

Phase II: Development of Culvert Bed & De-watering

Qty.	Equipment	Vol. (cyd)	Loads	Time (hr)	Rate ($/hr)	Cost ($)
1	Excavator w/ 1-1/2 cyd bucket			2	$115.00	$230.00
1	Handheld Tamper			4	$6.00	$24.00
2	Laborer			8	$25.00	$400.00
	1 1/2"-0" Crushed Bedding/Backfill Rock ($/cy)	65			$2.44	$158.60
						$812.60

Phase III: Pipe Installation and Backfill

Qty.	Equipment	Vol. (cyd)	Loads	Time (hr)	Rate ($/hr)	Cost ($)
1	Excavator w/ 1-1/2 cyd bucket			8	$115.00	$920.00
1	D-7 W/operator			8	$90.00	$720.00
1	Rubber Tire skidder W/operator			6	$60.00	$360.00
1	Handheld Tamper			4	$6.00	$24.00
1	Laborer			4	$25.00	$100.00
56	Round Pipe , 48" 14ga., Aluminized ($/ft)				$32.75	$1,834.00
1	Beveling Culvert Inlet				$25.00	$25.00
	Rip-Rap Rock ($/cy)	80			$5.25	$420.00
1	Place Rip-Rap w/ Excavator			4	$115.00	$460.00
						$4,863.00

Phase IV: Surfacing and Mulching

Qty.	Equipment	Vol. (cyd)	Loads	Time (hr)	Rate ($/hr)	Cost ($)
0	Straw Mulch w/Seed Application EC mix ($/ac.)				$1,195.00	$0.00
						$0.00
						$0.00
						$0.00

Materials Cost	$1,834.00
Installation and Fill Construction	$3,238.00
Total Project Cost =	**$5,072.00**

CRUSHED ROCK COST

SALE NAME: Rotowash
PROJECT: No. 1 - New Roads
QUARRY: Quartz Creek Stockpile
ROCK TYPE: Crushed
DATE: 6/4/03
BY: J.Long

Road Segment	Stations	Cubic Yards	ONE WAY HAUL IN MILES 50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH	Total Haul
1A - 1B	6.50	148				2.00	0.50	0.30	0.05	2.85
3A - 3B	135.00	11,749				1.60	0.50	0.20	0.10	2.40
TOTAL	141.50	11,897								AVERAGE HAUL
	STA./NO.	CU. YD.								
CUBIC YARD WEIGHTED HAUL						1.60	0.50	0.20	0.10	2.41
						Average Round Trip Distance (miles)			4.81	

ROCK HAUL:

Truck type: D20 No. trucks: 4
Delay min.: 8 Efficiency: 85%

Truck type: D12 No. trucks: 2
Delay min.: 6 Efficiency: 85%

Truck type: D10 No. trucks:
Delay min.: 5 Efficiency: 85%

Ave haul: $1.79 /cy
Load: $0.25 /cy
Spread: $0.40 /cy

Production: cy/day = 1,709

CRUSHED ROCK HAUL COSTS 11,897 cy @ **$2.44 /cy**

PIT RUN ROCK COST

SALE NAME: Rotowash
PROJECT: Project No. 1 - New roads
QUARRY: Spruce Run
ROCK TYPE: Pit Run
DATE: 6/4/03
BY: J. Long

Road Segment	Stations	Cubic Yards	ONE WAY HAUL IN MILES 50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH	Total Haul
1A-1B	7.00	609				0.20	0.10	0.10	0.10	0.50
3A-3B	16.00	866				3.00	1.30	0.40	0.10	4.80
4A-4B	9.60	712				3.00	0.40	0.10	0.10	3.60
4C		80				3.00	0.40	0.10	0.10	3.60
4D-4E	2.90	249				3.00	0.80	0.10	0.10	4.00
4F-4G	1.50	179				3.00	1.00	0.10	0.10	4.20
4H-4I	1.20	164				3.00	1.20	0.10	0.10	4.40
TOTAL	38.20	2,859								AVERAGE HAUL
	STA./NO.	CU. YD.								
CUBIC YARD WEIGHTED HAUL						2.40	0.73	0.19	0.10	3.42
						Average Round Trip Distance (miles)			6.84	

ROCK HAUL:

Truck type: D20 No. trucks: 2
Delay min.: 8 Efficiency: 85%

Truck type: D12 No. trucks: 4
Delay min.: 6 Efficiency: 85%

Truck type: D10 No. trucks:
Delay min.: 5 Efficiency: 85%

Ave haul: $2.48 /cy
Load: $0.40 /cy
Spread: $0.65 /cy

Production: cy/day = 1,166

PIT RUN ROCK HAUL COSTS 2,859 cy @ **$3.53 /cy**

RIP RAP ROCK COST

SALE NAME: Rotowash
PROJECT: Project No. 1 - New roads
QUARRY: Sterling
ROCK TYPE: Rip Rap
DATE: 6/4/03
BY: J. Long

Road Segment	Stations	Cubic Yards	ONE WAY HAUL IN MILES 50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH	Total Haul
3A - 3B		380			2	3.00	0.50	0.10	0.10	5.70
TOTAL		380								AVERAGE HAUL
STA./NO.		CU. YD.								
CUBIC YARD WEIGHTED HAUL					**2.00**	**3.00**	**0.50**	**0.10**	**0.10**	**5.70**
									Average Round Trip Distance (miles)	11.40

ROCK HAUL:

Truck type: D12 No. trucks: 3
Delay min.: 6 Efficiency: 85%

Truck type: D10 No. trucks:
Delay min.: 5 Efficiency: 85%

Ave haul: $3.75 /cy
Load: $1.50 /cy
Develop: /cy

Production: cy/day = 364

RIP RAP ROCK HAUL COSTS 380 cy @ **$5.25 /cy**

PIT RUN ROCK COST

SALE NAME: Rotowash
PROJECT: Free drain fill
QUARRY: Sterling
ROCK TYPE: Pit Run
DATE: 6/4/03
BY: J. Long

Road Segment	Stations	Cubic Yards	ONE WAY HAUL IN MILES 50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH	Total Haul
3A - 3B		456			1	1.50	0.50	0.10	0.10	3.20
TOTAL		456								AVERAGE HAUL
	STA./NO.	CU. YD.								
CUBIC YARD WEIGHTED HAUL					**1.00**	**1.50**	**0.50**	**0.10**	**0.10**	**3.20**

Average Round Trip Distance (miles) 6.40

ROCK HAUL:

Truck type:	D20	No. trucks:	2
Delay min.:	8	Efficiency:	85%
Truck type:	D12	No. trucks:	2
Delay min.:	6	Efficiency:	85%
Truck type:	D10	No. trucks:	
Delay min.:	5	Efficiency:	85%

Ave haul:	$2.09	/cy
Load:	$0.40	/cy
Spread:	$0.70	/cy

Production: cy/day = 948

PIT RUN ROCK HAUL COSTS 456 cy @ **$3.19 /cy**

SUMMARY OF CONSTRUCTION COSTS

SALE NAME: Rotorwash - Project No. 1 Road Improvement
ROAD: I1-I2(38.3),I2-I3(17.0), I3-I4(78.6)

NEW CONSTRUCTION: _____ **STATIONS** _____ **MILES**
IMPROVEMENT: 133.90 **STATIONS** 2.54 **MILES**

CLEARING & GRUBBING

Method	Acres/amount	x	Rate	=	Cost
Scatter Outside of R/W	2.20	x	$840.00	=	$1,848.00
		x		=	
		x		=	

SUB TOTAL FOR CLEARING & GRUBBING $1,848

EXCAVATION

Material	Cy or Sta.	x	Rate	=	Cost
Common Excavation $$/cy	1,757.00	x	$1.35	=	$2,371.95
Embankment $$/cy	1,625.00	x	$0.40	=	$650.00
Endhaul $$/cy	3,665.00	x	$2.75	=	$10,078.75
Cutslope Rounding $$/sta.	17.29	x	$27.00	=	$466.83
		x		=	
		x		=	

SUB TOTAL FOR EXCAVATION $13,568

CULVERT MATERIALS AND INSTALLATION

	Location	Dia/type	Lineal ft.	Rate	Cost	No. bands	Rate	Cost
I2-I3	4+17	18"CPP	44	$11.00	$484.00			
I2-I3	9+86	18"CPP	34	$11.00	$374.00			
I2-I3	11+68	18"CPP	34	$11.00	$374.00			
I2-I3	14+07	18"CPP	42	$11.00	$462.00			
I2-I3	15+44	18"CPP	32	$11.00	$352.00			
I3-I4	13+00	18"CPP	32	$11.00	$352.00			

	Description	Quantity	Rate	Cost
Other/miscellaneous:	6' Fiberglass markers existing culverts	18	$14.10	$253.80
Culvert stakes & markers:	6' Fiberglass markers for new and replaced culverts	6	$14.10	$84.60

SUB TOTAL FOR CULVERT MATERIALS & INSTALLATION $2,736

Subtotal **$18,152**

SURFACING

Subgrade prep:

Description	Stations/ amount	x	Rate/ sta/amt	Cost
Grade, Shape and Ditch 16'	133.90	x	$15.20	$2,035
Subgrade Compaction	133.90	x	$12.50	$1,674

ROAD SEGMENT	I1 to I2			POINT TO POINT		Sta. to Sta.				
Application	Rock Size and Type	Location	Depth of Rock (inches)	I1 to I2 Volume (CY) per		0+00 to 38+30 Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Subgrade Leveling	1 1/2"-0" Crushed		N/A					550	$2.82	$1,551
Total Rock for Road Segment:			I1 to I2					550		
ROAD SEGMENT	I2 to I3			POINT TO POINT		Sta. to Sta.				
Application	Rock Size and Type	Location	Depth of Rock (inches)	I2 to I3 Volume (CY) per		0+00 to 17+00 Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Base Rock	4"-0" Crushed		10	station	63	stations	17.00	1,071	$2.82	$3,020
Surface Rock	3/4"-0" Crushed		3	station	19	stations	17.00	323	$2.82	$911
Turn Outs	4"-0" Crushed		10	turnout	28	turnouts	3.00	84	$2.82	$237
Turn Outs	3/4"-0" Crushed		3	turnout	10	turnouts	3.00	30	$2.82	$85
Curve Widening	4"-0" Crushed		10					172	$2.82	$485
Curve Widening	3/4"-0" Crushed		3					36	$2.82	$102
Energy Dissipator	24"-6" Riprap	4+17	N/A					10	$6.80	$68
Fill Armor	24"-6" Riprap	4+17	N/A					10	$6.80	$68
Fill Material	6"-0" Pit Run	9+40 to 10+13	N/A					132	$4.19	$553
Ditch Armor	6"-0" Pit Run	8+79 to 11+68	N/A					60	$4.19	$251
Culvert Bedding	3/4"-0" Crushed	9+86	N/A					10	$2.82	$28
Energy Dissipator	24"-6" Riprap	9+86	N/A					10	$6.80	$68
Culvert Bedding	3/4"-0" Crushed	11+68	N/A					10	$2.82	$28
Energy Dissipator	24"-6" Riprap	11+68	N/A					10	$6.80	$68
Culvert Bedding	3/4"-0" Crushed	14+07	N/A					10	$2.82	$28
Energy Dissipator	24"-6" Riprap	14+07	N/A					10	$6.80	$68
Culvert Bedding	3/4"-0" Crushed	15+44	N/A					10	$2.82	$28
Energy Dissipator	24"-6" Riprap	15+44	N/A					10	$6.80	$68
Total Rock for Road Segment:			I2 to I3					2,008		
ROAD SEGMENT	I3 to I4			POINT TO POINT		Sta. to Sta.				
Application	Rock Size and Type	Location	Depth of Rock (inches)	I3 to I4 Volume (CY) per		0+00 to 78+60 Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Subgrade Leveling	1 1/2"-0" Crushed		N/A					350	$2.82	$987
Culvert Bedding	3/4"-0" Crushed	13+00	N/A					10	$2.82	$28
Energy Dissipator	24"-6" Riprap	13+00	N/A					10	$6.80	$68
Total Rock for Road Segment:			I3 to I4					370		$8,799

Processing:

Description	No. sta	Rate/sta	
Water, Process & Compact Crushed Rock:	17.00	$37.00	$629

	24"-6" rip	6"-0" pit	4"-0"	1 1/2"-0"	3/4"-0"	Total	
SUB TOTAL FOR SURFACING	70	192	1,327	900	439	2,928	$13,137

SPECIAL PROJECTS

Description	Cost
Disposal 4 old culverts with those from vacated road(1hr excavator)	$115.00
Energy Disp. & Fill Armor Placement @$2.00/cy x 220	$440.00
Shape waste area (8hrs w/D7@$90/hr)	$720.00
Seed & mulch cut slopes (0.88ac. @ $1,195/ac.)	$1,049.00
Geotextile Fabric (12' wide, 1,700' @ $1.25/LF)	$2,125.00
Energy Dissipator, Fill & Ditch Armor Placement ($2.00/cy x 130cy)	$260.00

SUB TOTAL FOR SPECIAL PROJECTS **$4,709**

GRAND TOTAL Cost per Mile $14,195 **$35,998**

Compiled By: Ty Williams Date: 6/3/2003

CRUSHED ROCK COST

SALE NAME: Rotorwash
PROJECT: No. 1, August Fire Road Imp.
QUARRY: Quartz Ck. Stockpile

ROCK TYPE: 3/4"-0", 11/2"-0",4"-0" Crushed

DATE: 6/3/2003
BY: Mellison/Williams

		Cubic Yards							
Segment	Stations	Base	Running	Turnout	Leveling	Junction	Curves	Misc	Total
I1 - I2	38.30				150				150
I2 - I3	17.00	1,054	323	108			208	40	1,733
I3 - I4	78.60				350			10	360
Grand Total	133.90	1,054	323	108	500		208	50	2,243

Road Segment	Stations	Cubic Yards	ONE WAY HAUL IN MILES							Total Haul
			50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH	
I1 - I2	38.30	150			1.05	1.56	0.05	0.05	0.05	2.76
I2 - I3	17.00	1,733			1.05	1.20	0.05	0.05	0.05	2.40
I3 - I4	78.60	360			1.05	0.46	0.05	0.05	0.05	1.66
TOTAL	133.90	2,243								
	STA./NO.	CU. YD.								AVERAGE HAUL
CUBIC YARD WEIGHTED HAUL					**1.05**	**1.11**	**0.05**	**0.05**	**0.05**	**2.31**
								Average Round Trip Distance (miles)		4.61

ROCK HAUL:

Truck type: D20 No. trucks: _____
Delay min.: 15 Efficiency: 75%

Truck type: D12 No. trucks: 4
Delay min.: 6 Efficiency: 85%

Truck type: D10 No. trucks: _____
Delay min.: 10 Efficiency: 75%

Ave haul: $1.77 /cy
Load: $0.40 /cy
Spread: $0.65 /cy

Production: cy/day = 1,032

CRUSHED ROCK HAUL COSTS 2,243 cy @ **$2.82 /cy**

PIT RUN ROCK COST

SALE NAME: Rotorwash
PROJECT: No. 1, August Fire Road Imp.
QUARRY: Spruce Run
ROCK TYPE: Pit Run
DATE: 5/21/2003
BY: d.mellison

		Cubic Yards							
Segment	Stations	Base	Landing	Turnout	Turnaround	Junction	Fill Material	Ditch line	Total
I2-I3	9+40 - 10+13						132		132
I2-I3	8+79 - 11+68							60	60
Grand Total							132	60	192

Road Segment	Stations	Cubic Yards	ONE WAY HAUL IN MILES							Total Haul
			50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH	
I2-I3	9+40 - 10+13	132				0.80	0.05	0.05	0.05	0.95
I2-I3	8+79 - 11+68	60				0.85	0.05	0.05	0.05	1.00
TOTAL		192								AVERAGE HAUL
STA./NO.		CU. YD.								
CUBIC YARD WEIGHTED HAUL						**0.82**	**0.05**	**0.05**	**0.05**	**0.97**
								Average Round Trip Distance (miles)		1.93

ROCK HAUL:

Truck type: D20 No. trucks:
Delay min.: 15 Efficiency: 75%

Truck type: D12 No. trucks: 2
Delay min.: 6 Efficiency: 85%

Truck type: D10 No. trucks:
Delay min.: 10 Efficiency: 75%

Ave haul:	$1.14	/cy
Load:	$0.45	/cy
Spread:	$0.80	/cy
Develop:	$1.80	

Production: cy/day = 803

PIT RUN ROCK HAUL COSTS 192 cy @ **$4.19 /cy**

RIP RAP ROCK COST

SALE NAME: Rotorwash
PROJECT: No. 1, August Fire Road Imp.
QUARRY: Spruce Run
ROCK TYPE: Sterling Quarry
DATE: 6/3/2003
BY: Mellison/Williams

		Cubic Yards							
Segment	Stations	Dissapator	Armor	Fill Mat.				Misc	Total
I2-I3 - 4+17		10	10						20
I2-I3 - 9+86		10							10
I2-I3 - 11+68		10							10
I2-I3 - 14+07		10							10
I2-I3 - 15+44		10							10
I3-I4 - 4+17		10							10
Grand Total		60	10						70

Road Segment	Stations	Cubic Yards	ONE WAY HAUL IN MILES						Total Haul
			50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH	
I2-I3 - 4+17		20			2.00	2.60	0.05	0.05	0.05	4.75
I2-I3 - 9+86		10			2.00	2.49	0.05	0.05	0.05	4.64
I2-I3 - 11+68		10			2.00	2.46	0.05	0.05	0.05	4.61
I2-I3 - 14+07		10			2.00	2.44	0.05	0.05	0.05	4.59
I2-I3 - 15+44		10			2.00	2.41	0.05	0.05	0.05	4.56
I3-I4 - 4+17		10			2.00	2.41	0.05	0.30	0.05	4.81
TOTAL		70								AVERAGE HAUL
STA./NO.		CU. YD.								
CUBIC YARD WEIGHTED HAUL					**2.00**	**2.49**	**0.05**	**0.09**	**0.05**	**4.67**
								Average Round Trip Distance (miles)		9.35

ROCK HAUL:

Truck type: D12 No. trucks: 2
Delay min.: 6 Efficiency: 85%

Truck type: D10 No. trucks:
Delay min.: 10 Efficiency: 75%

Ave haul: $3.00 /cy
Load: $1.50 /cy
Develop: $2.30 /cy

Production: cy/day = 303

RIP RAP ROCK HAUL COSTS 70 cy @ **$6.80 /cy**

Project No. 2 - Road Vacating

Sale Name: Rotorwash

Road Name: August Fire Road

Segment: V1 to V2 (11.16 stations)

Construction Phase	Equipment (Hrs.)			Labor Hrs.	Fees
	CAT 235	D-7 CAT	Dump Truck		
Crushed rock recovery	9		27		
Shape stockpile		4			
Remove old culverts	3			3	
Remove old fabric	3			3	
Disposal of culvert/fabric	1		5	1	$25
Scarification of road	5				
Total Hours/Fees	21	4	32	7	$25
Equipment/labor rates	x $115	x $90	x $57	x $25	
Total of hourly rates & fees:	$2,415	$360	$1,824	$175	$25

TOTAL VACATING COST **$4,799**

CRUSHED ROCK COST

SALE NAME: Rotorwash
PROJECT: Project No. 2 August Fire road
QUARRY: Waste Stockpile site
ROCK TYPE: Crushed
DATE: 5/15/2003
BY: d.mellison

		Cubic Yards							
Segment	Stations	Base	Running	Turnout	Turnaround	Junction		Misc	Total
V1 - V2	13.34	1,080	454	138					1,672
Grand Total	13.34	1,080	454	138					1,672

Road Segment	Stations	Cubic Yards	ONE WAY HAUL IN MILES							Total Haul
			50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH	
V1 - V2	13.34	1,672				0.43	0.05	0.05	0.05	0.58
TOTAL	13.34	1,672								
	STA./NO.	CU. YD.								AVERAGE HAUL
CUBIC YARD WEIGHTED HAUL						0.43	0.05	0.05	0.05	0.58
						Average Round Trip Distance (miles)			1.16	

ROCK HAUL:

Truck type: D20 No. trucks:
Delay min.: 15 Efficiency: 75%

Truck type: D12 No. trucks: 3
Delay min.: 6 Efficiency: 85%

Truck type: D10 No. trucks:
Delay min.: 10 Efficiency: 75%

Ave haul: $0.92 /cy
Load: $0.40 /cy
Spread: $0.65 /cy

Production: cy/day = 1,486

CRUSHED ROCK HAUL COSTS 1,672 cy @ **$1.97 /cy**

Rotowash

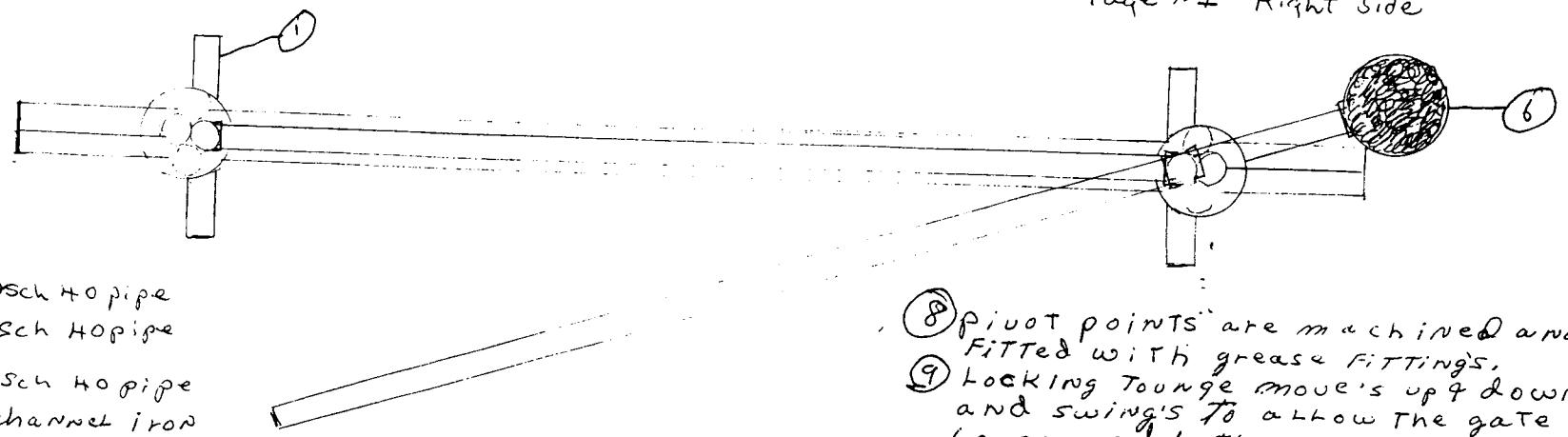
Project No. 3 - Gate Installation

Multi System Steel Gate Design		$200.00
Multi System Steel Gate[1]	$	2,500.00
Installation	$	600.00
Total Cost		$3,300.00

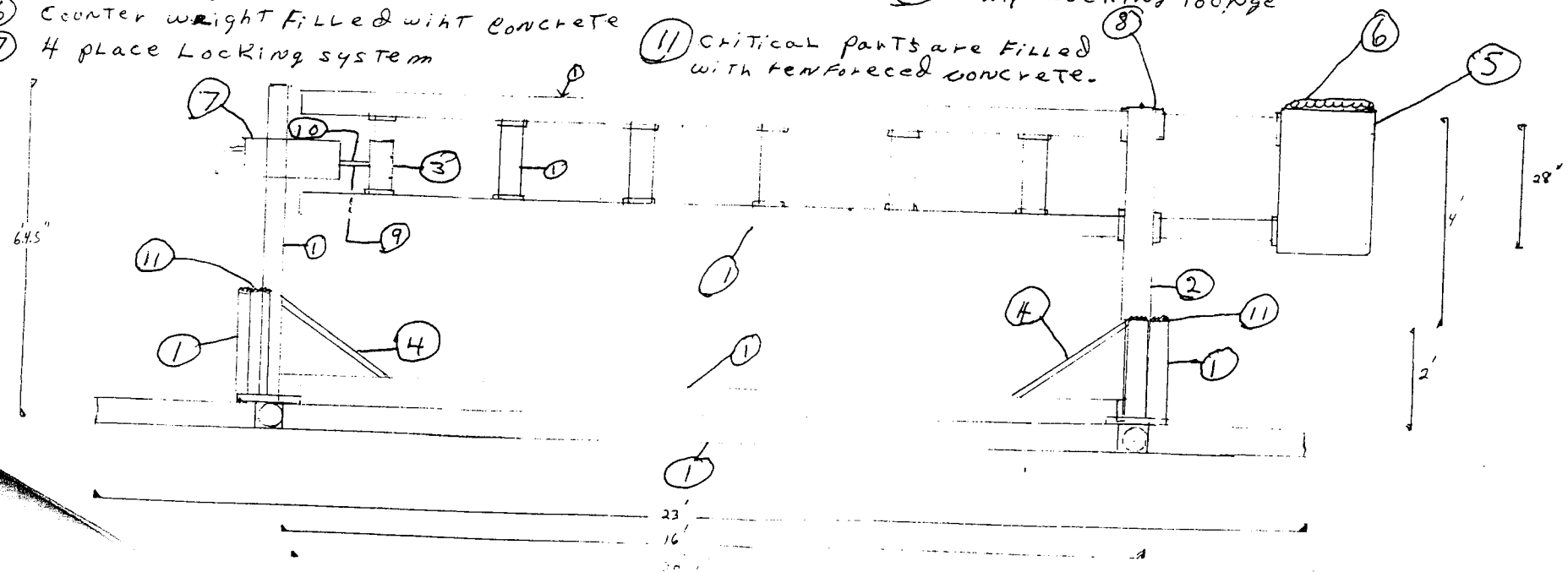
[1] Two piece gate with post anchored with cement. See attached specifications.

PAGE #1 Left Side

Page #1 Right Side



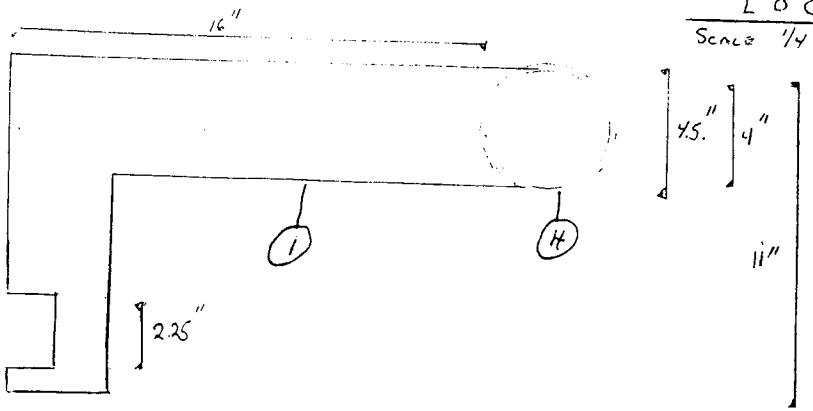
(1) 4" Sch 40 pipe
(2) 5" Sch 40 pipe
(3) 3½" Sch 40 pipe
(4) 4" channel iron
(5) 20" Sch 40 pipe
(6) Counter weight Filled with concrete
(7) 4 place Locking system
(8) pivot points are machined and fitted with grease fittings.
(9) Locking Tounge moves up & down and swings to allow the gate to be opened both ways.
(10) 1"x4" Locking Tounge
(11) Critical parts are Filled with reinforced concrete.

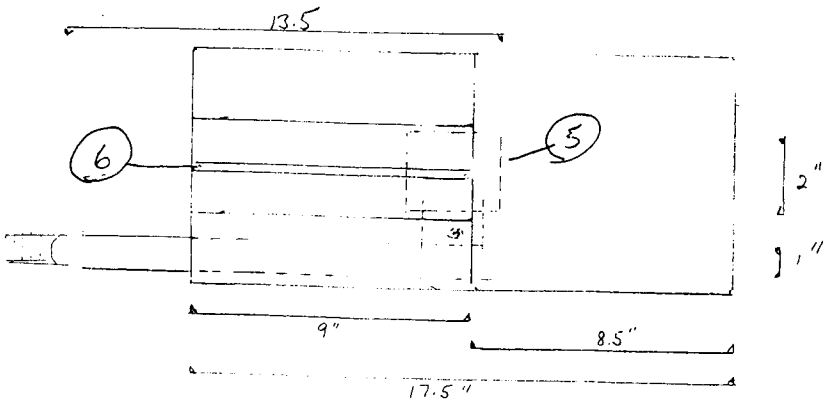


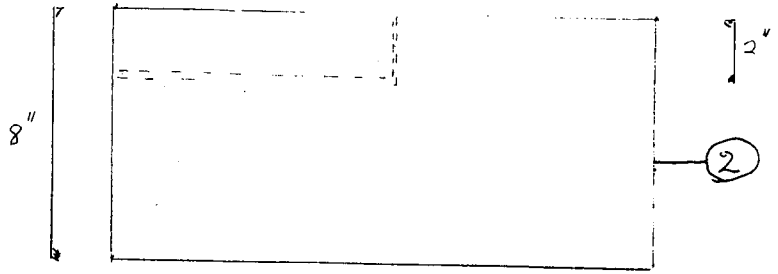
Page #1 Left Side

LOCK BOX

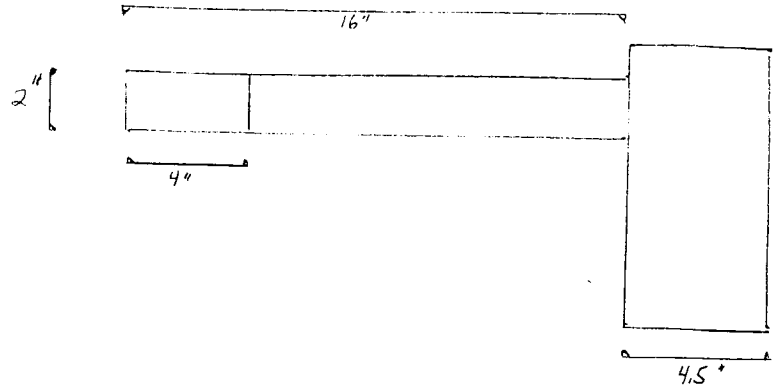
Scale 1/4 = 1"

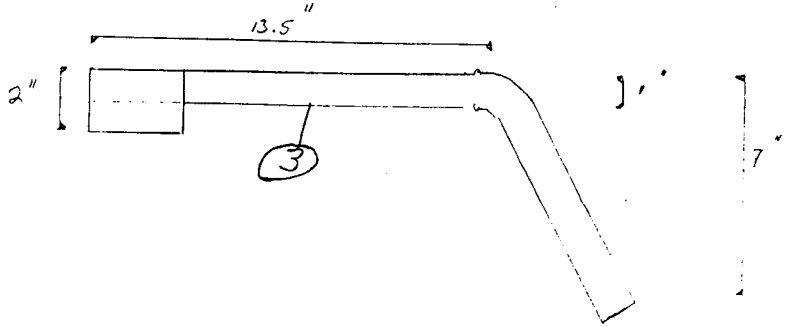






Page #2 Right Side





1. 1"x4" Locking Tounge
2. 1/4" x 8" x 17 1/2" Steel plate
3. 15/16" Steel round stock Locking Handle. 5 1/2" swivel Tube
4. 1" x 2" x 3" Locking pin w/ 1/2" hole for Lock
5. Slot For Locking spacers.
6. Side view of #1 & 4

Road Maintenance after completion of Project Nos. 1 and 2.

Sale: Rotowash
Date: 3-Jun-03
By: J. Long

Type	Equipment/Rationale			Hours	Rate	Cost	
	Grader 14G			15	$80	$1,200	
Final Haul	Dump Truck 12CY x 3			10	$57	$570	
Road	FE Loader C966			10	$75	$750	
Maintenance	Vibratory Roller			15	$75	$1,125	
Haul Route	Water Truck 1,500 gallon			10	$67	$670	
	Labor			10	$25	$250	
Total							$4,565

Production Rates	Miles/day	Distance(miles)	Days
Grader	1.5	2.0	1.3
Vibratory Roller	1.5	2.0	1.3

x:\Jewell Unit\timber sales\2003sales\foster divide\projectcosts\road maintenance after project work.xls

Timber Cruise Report
Rotorwash
FY 2003

1. **Sale Area Location:** Areas 1, 2, 3, 4, & 5 are located in portions of Sections 9, 10, 11, 15, & 16, T4N, R7W, W.M.,Clatsop County, Oregon.

2. **Fund Distribution:** BOF 100%
   Tax Code 8-01 (100%)
   LCR in Section 10 (Deed No. 576) = $2,982.98

3. **Sale Acreage by Area:**

Area	Treatment	Gross Acres	New R/W	Stream Buffer	Net Acres	Survey Method
1	Clearcut	42.1	0.4	1.7	40.0	GIS
2	Clearcut	9	0	0	9.0	GIS
3	Clearcut	89.3	5.3	7.0	77.0	GIS
4	Clearcut	107.5	6.8	3.7	97.0	GIS
5	Right-of-Way	23	0	0	23.0	L X W
TOTALS		**270.9**		**12.4**	**246**	

4. **Cruisers and Cruise Dates:** Areas 1, 2, 3, and 4 were cruised by Lanny Freeman, Alan Kelso, Jenny Laughman, Jon Long, Ty Williams, Dave Wolfgram, and Diana Ison in February, 2003. The private property portion of Area 5 (Right-of-Way) was cruised in May, 2002 by Lanny Freeman and Jon Long.

5. **Cruise Method and Computation:** AREAS 1, 2, 3, and 4 were variable plot cruised with a 33.61 BAF. A total of 67 plots were cruised, with 35 measured and graded, and 32 count. These plots are located on a 9 chain by 4 chain grid, with every other plot measured and graded. All western red cedar species are reserve trees.

   AREA 5 R/W, includes approximately one acre of private property and 22 acres of ODF owned property. The privately owned portion of Area 5 was ITS cruised to determine an accurate volume for payment to the landowner. All conifer were graded and every third alder was graded. The volumes for this portion of the sale area are listed in Section 8 below. These volumes are included in the Area 5 totals. Volume for 20 acres of the ODF owned portion of Area 5 was calculated by multiplying R/W acreage and the average volume per acre from the plots in Areas 1– 4. Two acres of the ODF owned portion of Area 5 was calculated by multiplying the acreage by the average volume per acre from the plots in Area 1 which is of similar timber type.

   All cruises used Corvallis MicroTechnology (CMT) data collectors, and were downloaded to the Atterbury Super A.C.E. program in District for computing. See the attached Cruise Design for more details on the cruise method. The cruise calculations were processed in the Astoria district office. See the attached Cruise Design for more details on the cruise method. The cruise calculations were processed in the Astoria district office.

AREA	CRUISE	CRUISE TYPE
1-4	ROTOR	4N 7W SEC 9 TRACT: CC TYPE:A1-4
5a	ROTOR	4N 7W SEC 9 TRACT: CC TYPE:A1-4
5b	ROTOR	4N 7W SEC 15 TRACT: CC TYPE:A1
Private R/W	ROTOR	4N 7W SEC 9 TRACT: PRIVATE TYPE:0R/W

6. **Timber Description:** Areas 1, 2, 3, and 4 are clearcut units, the majority of the stand is 45 to 61 years old, consisting of alder stands with some areas of mixed Douglas-fir patches. All trees will be harvested except for Leave Trees and marked Wildlife Trees. The average tree size for all species to be harvested is 15 inches DBH and 47 feet to a merchantable top. The average harvest volume (net) is 23.3 MBF/acre.

   Area 5 R/W is similar to the timber description mentioned above. This stand averages 15 inches DBH, with an average merchantable height of 46 feet to a merchantable top. The average volume (net) is 23.1 MBF/acre. A small portion (1 acre) of Area 5 is privately owned.

7. **Statistical Summary:** (See "Statistics" - Type Reports, attached)

Statistics for total stand B.F. volumes

Areas	Estimated CV	Target SE%	Actual CV	Actual SE%
1, 2, 3, & 4	65%	10%	54.7%	6.7%

8. **Volumes by Species and Log Grade:** (See "Species, Sort, Grade - Type and Project Reports, attached, of individual sale areas and combined areas). Volumes by Species and Grade for All Sale Areas: (MBF) Volumes do not include "in-growth."

Volumes for Private R/W Timber Only

Species	DBH	Net Vol.	2 Saw	3Saw	4 Saw	D & B
Hardwood	15"	19	0	15	4	<1
Douglas-fir	18"	3	2	1	<1	<1
Cedar	17"	1	0	<1	<1	<1
TOTALS		**23**				

Total Sale Volume(Includes Private R/W)

Species	DBH	Net Vol.	2 Saw	3Saw	4 Saw	D & B	% Sale
Hardwood	15"	3,505	0	3,482	23	19	61
Douglas-fir	19"	1,973	1,229	669	75	7	34
Hemlock	12"	238	125	61	52	<1	4
Spruce	15"	12	0	12	0	<1	<1
Cedar	21"	6	0	5	1	<1	<1
TOTALS		**5,734**					

9. **Approvals:**

Prepared by: Ty Williams **Date:** June 2, 2003

Reviewed by: Dan Goody **Date:** 6/11/03

10. Attachments:

Cruise Designs (2)
Cruise Maps (2)
Volume Reports - 6 pages
Statistics Reports - 3 pages
Stand Tables - 2 pages
Log Stock Tables – 4 pages

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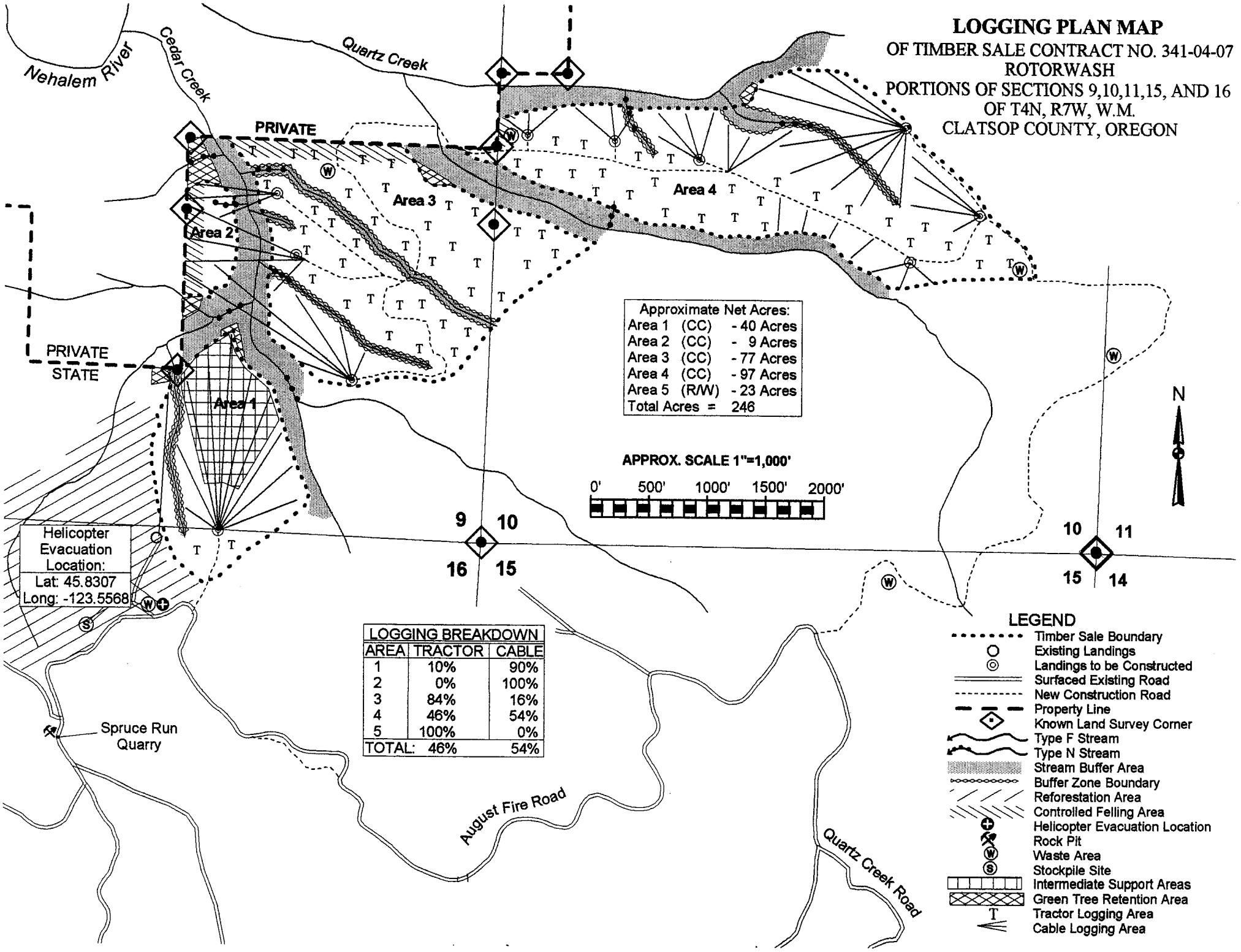

LOGGING PLAN MAP
OF TIMBER SALE CONTRACT NO. 341-04-07
ROTORWASH
PORTIONS OF SECTIONS 9,10,11,15, AND 16
OF T4N, R7W, W.M.
CLATSOP COUNTY, OREGON
Nehalem River
Cedar Creek
Quartz Creek
PRIVATE
PRIVATE
STATE
Area 1
Area 2
Area 3
Area 4
Approximate Net Acres:
Area 1 (CC) - 40 Acres
Area 2 (CC) - 9 Acres
Area 3 (CC) - 77 Acres
Area 4 (CC) - 97 Acres
Area 5 (R/W) - 23 Acres
Total Acres = 246
APPROX. SCALE 1"=1,000'
0' 500' 1000' 1500' 2000'
N
9 10
16 15
10 11
15 14
Helicopter Evacuation Location:
Lat: 45.8307
Long: -123.5568
LOGGING BREAKDOWN
AREA TRACTOR CABLE
1 10% 90%
2 0% 100%
3 84% 16%
4 46% 54%
5 100% 0%
TOTAL: 46% 54%
Spruce Run Quarry
August Fire Road
Quartz Creek Road
LEGEND
Timber Sale Boundary
Existing Landings
Landings to be Constructed
Surfaced Existing Road
New Construction Road
Property Line
Known Land Survey Corner
Type F Stream
Type N Stream
Stream Buffer Area
Buffer Zone Boundary
Reforestation Area
Controlled Felling Area
Helicopter Evacuation Location
Rock Pit
Waste Area
Stockpile Site
Intermediate Support Areas
Green Tree Retention Area
Tractor Logging Area
Cable Logging Area

Revised August, 2002

CRUISE DESIGN
ASTORIA DISTRICT

Sale Name: ROTOR WASH **Area(s)** 1, 2, 3, &4

Harvest Type: CC

Approx. Cruise Acres: 225 **Estimated CV%** 65 Net BF **SE% Objective** 10 Net BF

Planned Sale Volume: 5.5 MMBF **Estimated Sale Area Value/Acre:** $10,000

A. **Cruise Goals**: (a) Grade minimum **30** conifer and **125** hardwood trees: Sample **34** grade plots, **32** count plots. Grade all hardwoods as **3** saw. Determine **snag** and **leave tree** species and sizes; **X**

B. **Cruise Design**:

1. **Plot Cruises:** BAF **40** **(Full point; Half point)**

Cruise Line Direction(s) **Areas 2, & 3 North and South, Area 1 Az. 335', Area 4 Az. 278'**
Cruise Line Spacing **Areas 1, 2, 3, & 4 9 (chains)**
Cruise Plot Spacing **Areas 1, 2, 3, & 4 4 (chains)**
Grade/Count Ratio **All Areas 1:1**

C. **Tree Measurements**:

1. **Diameter:** Minimum DBH to cruise is **8"** for conifers and **10"** for hardwoods. Record dbh to nearest ½" for trees < 16", to nearest 1" for trees 16-24", and to nearest 2" for trees > 24". If tree diameters are estimated (only estimate on variable plot cruises), then record to closest estimate.

2. **Bole Length:** Record bole length to nearest foot at TCD.

3. **Top Cruise Diameter (TCD):** Minimum top outside bark is **7 "** or **40%** of dob at 16' form point for conifers. Generally, use 7" outside bark for trees < 18" dbh and 40% of dob @ FP for trees > 18" dbh. Minimum top outside bark is **8"** for hardwoods. Allow for mossy TCD on hardwoods.

4. **Form Factors:** (1) Measure or estimate a 16' form factor for every conifer tree measured/graded; OR (2) Measure a minimum of 20 form factors for each major conifer species on the cruise area, and use these to calculate average FF for the species on the cruise. Hardwood form factors are a Standard 87.
5. **Tree Segments:** Record log segments in "standard" log lengths in general use, such as 32' and 40' lengths, whenever possible. Do not record odd segments just to maximize grade. Cull segments can be any length. For conifers, minimum merchantable segment length is 12'; for hardwoods, it's 8'. Maximum segment length is 40'. One foot of trim is assumed for each merch. segment. Do not use "double dash" (--) feature on the data recorder except for the top segment of the tree.

6. **Species, Sort, and Grade Codes:** A. Species: Record as D (Douglas-fir); H (Western hemlock); S (Sitka Spruce); C (Western red cedar); NF (Noble fir); SF (Silver fir); A (Red alder); M (Bigleaf maple). For "leave trees" in partial cuts, or for marked "wildlife trees," add an "L" to the species code (such as DL, HL, CL, etc.)
B. Sort: Use code "1" (Domestic).
C. Grade: A = 1 Peeler; B = 2 Peeler; C = 3 Peeler; D = Special Mill; 2 = 2 Sawmill; 3 = 3 Sawmill; 4 = 4 Sawmill; R = Camp Run; 0 = Cull

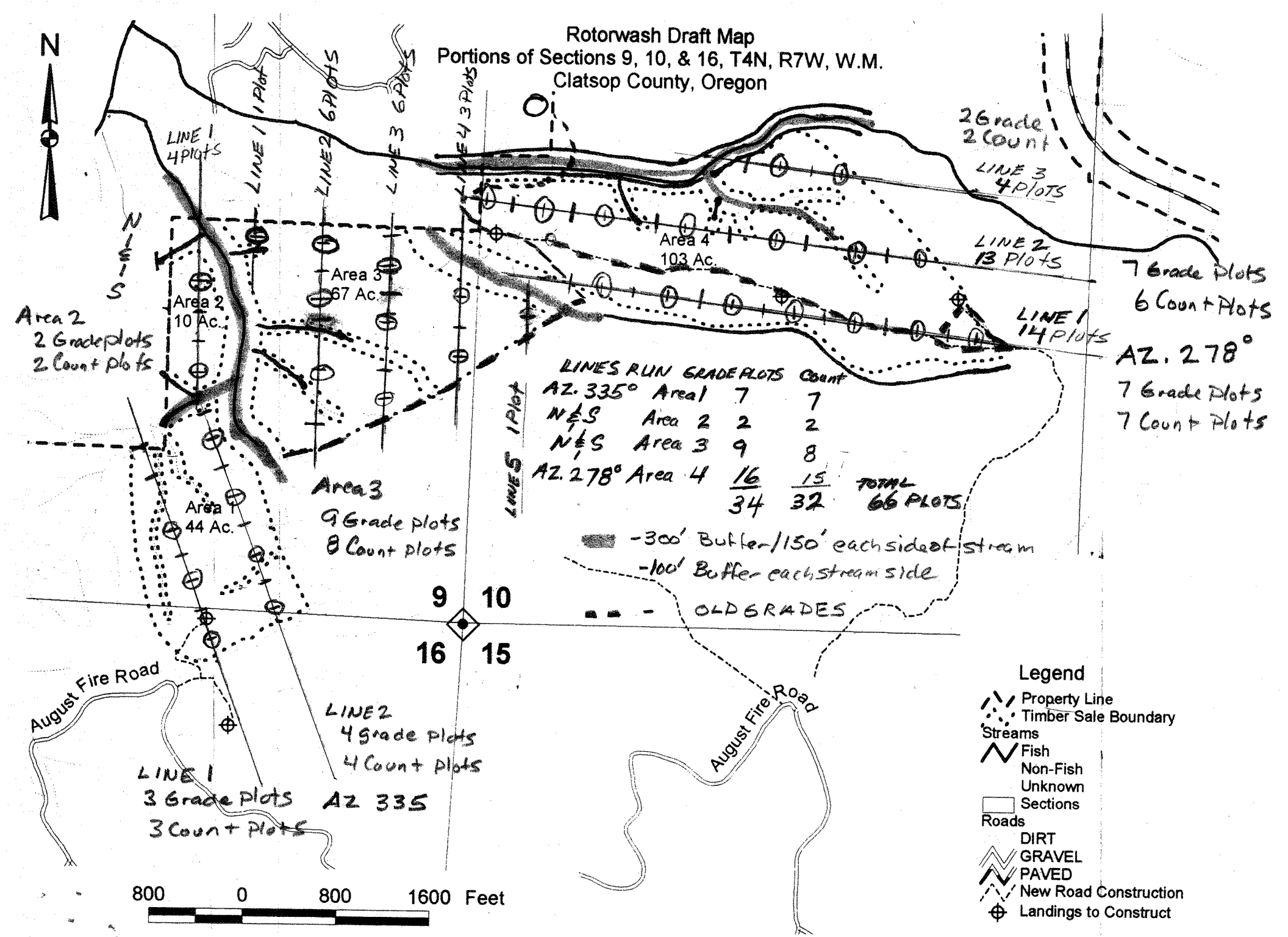
7. **Deductions:** Estimate visible defect or damage as a "length deduction" (most often), or as a "diameter deduction," as applicable. Estimate hidden defect and breakage (usually some breakage is encountered in trees > 100 feet in height) on a "per tree" basis. Steep and broken topography generally results in higher breakage percentages than gentler topography, and hemlock generally breaks more than D-fir and spruce.

8. **Standard Field Procedures:** Plot Type Cruises: Mark cruise line beginning and end points with blue/yellow flagging. Write plot identification numbers and line direction on the ribbon. At each plot, tie yellow flagging above eye level near plot center and another yellow flagging around a sturdy wooden stake marking plot center. On each yellow flagging, write the plot identification number. Between plots, along the cruise line, tie blue flagging at intervisible points, not to exceed 100' apart. On "measure/grade" plots write the tree number and/or tree diameter on at least the first measured tree (clockwise from the line direction) in yellow paint. All trees on the plot may be marked this way, if the cruiser chooses.
ITS and 100% Cruises: Mark cruise "strips" with various colored flagging (not pink). Mark trees measured and graded with yellow paint.

9. **Cruising Equipment:** Relaskop Rangefinder Logger's Tape Biltmore Stick Compass Cruise Cards in Tatum OR Data Recorder Cruise Design Cruise Map Yellow Flagging Blue Flagging Machete and Gloves ✓

10. **Attachments:** A. Cruise Map (showing cruise unit boundaries, roads, streams, approx. acres/unit, cruise lines and plot locations, legal description and section lines, BAF or plot size, measure/count plot ratio, north arrow, and scale.
B. Data Recorder Instructions
C. Other

Cruise Design by: L. Freeman
Approved by: Dan Goody
Date: 3/12/03


Rotorwash Draft Map
Portions of Sections 9, 10, & 16, T4N, R7W, W.M.
Clatsop County, Oregon
N
LINE 1 4 PLOTS
LINE 1 1 PLOT
LINE 2 6 PLOTS
LINE 3 6 PLOTS
LINE 4 3 PLOTS
Area 1 44 Ac.
Area 2 10 Ac.
Area 3 67 Ac.
Area 4 103 Ac.
Area 2
2 Grade plots
2 Count plots
Area 3
9 Grade plots
8 Count plots
LINE 5 1 Plot
LINES RUN GRADE PLOTS Count
AZ. 335° Area 1 7 7
N & S Area 2 2 2
N & S Area 3 9 8
AZ. 278° Area 4 16 15
34 32
TOTAL 66 PLOTS
-300' Buffer-150' each side of stream
-100' Buffer each stream side
OLD GRADES
9 10
16 15
August Fire Road
LINE 2
4 Grade plots
4 Count plots
LINE 1
3 Grade plots
3 Count plots
AZ 335
800 0 800 1600 Feet
2 Grade
2 Count
LINE 3
4 PLOTS
LINE 2
13 PLOTS
7 Grade Plots
6 Count Plots
LINE 1
14 PLOTS
AZ. 278°
7 Grade Plots
7 Count Plots
Legend
Property Line
Timber Sale Boundary
Streams
Fish
Non-Fish
Unknown
Sections
Roads
DIRT
GRAVEL
PAVED
New Road Construction
Landings to Construct

Revised August, 2002

CRUISE DESIGN
ASTORIA DISTRICT

Sale Name: Rotorwash **Area** Private R/W

Harvest Type: (CC) PC CT "Automark Thinning" (circle one)

Approx. Cruise Acres: 1.4 **Estimated CV%** N/A Net BF or BA/Acre **SE% Objective** N/A Net BF or BA/Acre

Planned Sale Volume: _____ MMBF **Estimated Sale Area Value/Acre:** $_____

A. Cruise Goals: (a) Grade minimum 30 conifer and 50 hardwood trees: (b) Sample ____ cruise plots; (c) Other goals (____ Determine "automark" thinning standards; ✓ Determine log grades for sale value; ____ Determine snag and leave tree species and sizes; ____ Determine LWD (down wood) cubic feet and decay classes; Determine "diameter limit" harvest parameters; To determine value of private R/W timber so that sale purchaser will know how much to pay landowner.)

B. Cruise Design:

1. **Plot Cruises:** BAF ____ (Full point; Half point) (circle one)
   Fixed Plot Size ____ Plot Radius ____ feet
   Cruise Line Direction(s) _____
   Cruise Line Spacing _____ (chains) (feet)
   Cruise Plot Spacing _____ (chains) (feet)
   Grade/Count Ratio _____

✓ 2. **ITS (Sample Tree) Cruises:** Measure-grade ratios: D-fir All Hemlock All Spruce All True Fir All Cedar All Hardwood 1:3

C. Tree Measurements:

1. **Diameter:** Minimum DBH to cruise is 8 " for conifers and 8" for hardwoods. Record dbh to nearest ½" for trees < 16", to nearest 1" for trees 16-24", and to nearest 2" for trees > 24". If tree diameters are estimated (only estimate on variable plot cruises), then record to closest estimate.

2. **Bole Length:** Record bole length to nearest foot at TCD. For trees greater than 100 feet in merchantable height, estimating to the nearest 5 feet is acceptable.

3. **Top Cruise Diameter (TCD):** Minimum top outside bark is 7" or 40% of dob at 16' form point. Generally, use 7" outside bark for trees < 18" dbh and 40% of dob @ FP for trees > 18" dbh.

4. **Form Factors:** (1) Measure or estimate a 16' form factor for every conifer tree measured/graded; OR (2) Measure a minimum of 20 form factors for each major conifer species on the cruise area, and use these to calculate average FF for the species on the cruise. Hardwood form factors are a Standard 87.

5. **Tree Segments:** Record log segments in "standard" log lengths in general use, such as 32' and 40' lengths, whenever possible. Do not record odd segments just to maximize grade. Cull segments can be any length. For conifers, minimum merchantable segment length is 12'; for hardwoods, it's 8'. Maximum segment length is 40'. One foot of trim is assumed for each merch. segment. Do not use "double dash" (--) feature on the data recorder except for the top segment of the tree.

6. **Species, Sort, and Grade Codes:** A. Species: Record as D (Douglas-fir); H (Western hemlock); S (Sitka Spruce); C (Western red cedar); NF (Noble fir); SF (Silver fir); A (Red alder); M (Bigleaf maple). For "leave trees" in partial cuts, or for marked "wildlife trees," add an "L" to the species code (such as DL, HL, CL, etc.)
B. Sort: Use code "1" (Domestic).
C. Grade: A = 1 Peeler; B = 2 Peeler; C = 3 Peeler; D = Special Mill; 2 = 2 Sawmill; 3 = 3 Sawmill; 4 = 4 Sawmill; R = Camp Run; 0 = Cull

7. **Deductions:** Estimate visible defect or damage as a "length deduction" (most often), or as a "diameter deduction," as applicable. Estimate hidden defect and breakage (usually some breakage is encountered in trees > 100 feet in height) on a "per tree" basis. Steep and broken topography generally results in higher breakage percentages than gentler topography, and hemlock generally breaks more than D-fir and spruce.

8. **Standard Field Procedures:** Plot Type Cruises: Mark cruise line beginning and end points with blue/yellow flagging. Write plot identification numbers and line direction on the ribbon. At each plot, tie yellow flagging above eye level near plot center and another yellow flagging around a sturdy wooden stake marking plot center. On each yellow flagging, write the plot identification number. Between plots, along the cruise line, tie blue flagging at intervisible points, not to exceed 100' apart. On "measure/grade" plots write the tree number and/or tree diameter on at least the first measured tree (clockwise from the line direction) in yellow paint. All trees on the plot may be marked this way, if the cruiser chooses.
ITS and 100% Cruises: Mark cruise "strips" with various colored flagging (not pink). Mark trees measured and graded with yellow paint.

9. **Cruising Equipment:** Relaskop Rangefinder Logger's Tape (with dbh on back) Biltmore Stick Compass Cruise Cards in Tatum OR Data Recorder Cruise Design Cruise Map Yellow Flagging Blue Flagging

10. **Attachments:** A. Cruise Map (showing cruise unit boundaries, roads, streams, approx. acres/unit, cruise lines and plot locations, legal description and section lines, BAF or plot size, measure/count plot ratio, north arrow, and scale.
B. Data Recorder Instructions
C. Other

Cruise Design by: Lanny Freeman
Approved by: Dan Goody
Date: 5-27-03

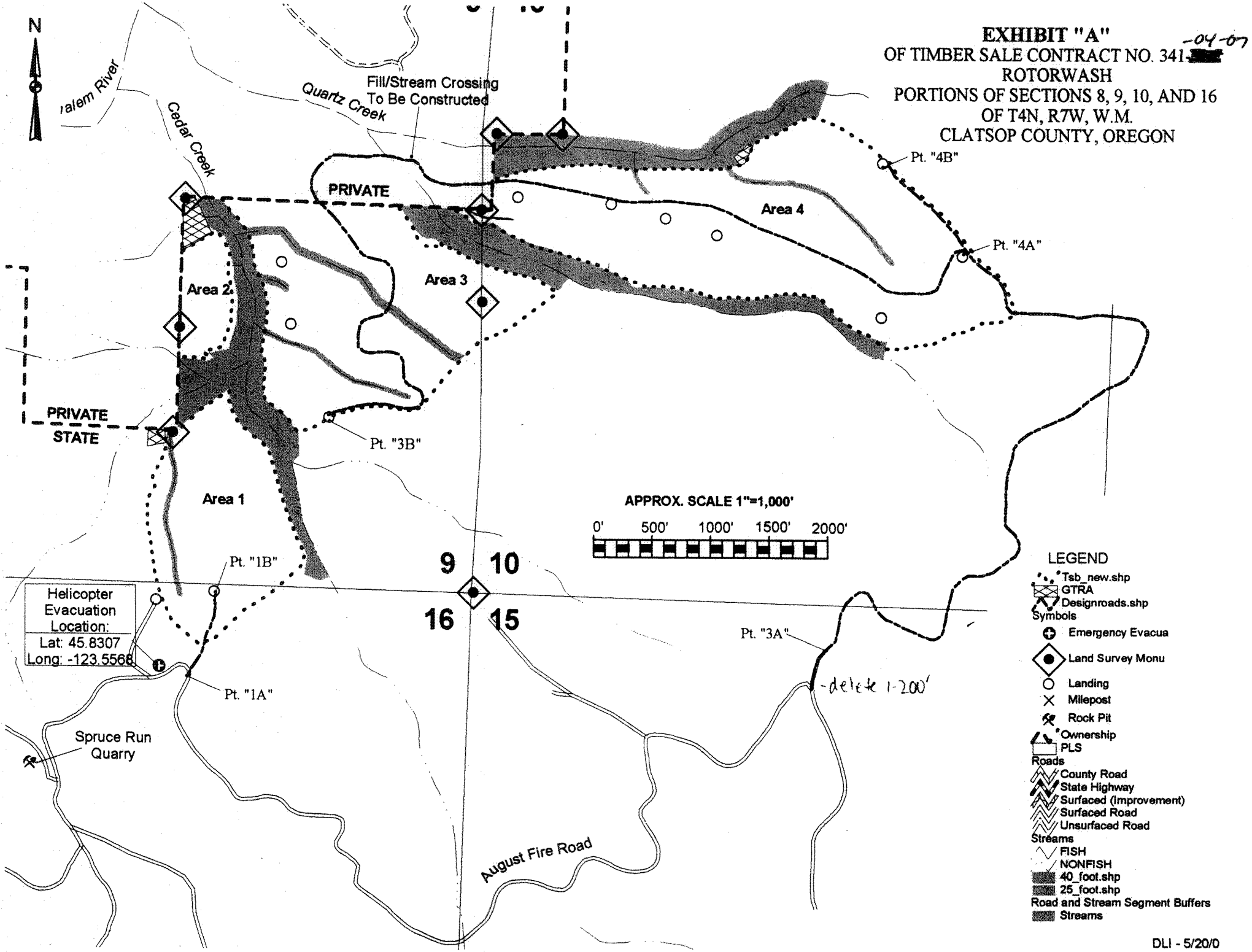


EXHIBIT "A"
-04-07
OF TIMBER SALE CONTRACT NO. 341-[redacted]
ROTORWASH
PORTIONS OF SECTIONS 8, 9, 10, AND 16
OF T4N, R7W, W.M.
CLATSOP COUNTY, OREGON
N
Salem River
Cedar Creek
Quartz Creek
Fill/Stream Crossing
To Be Constructed
PRIVATE
Area 4
Area 3
Area 2
Area 1
PRIVATE
STATE
Pt. "4B"
Pt. "4A"
Pt. "3B"
Pt. "3A"
Pt. "1B"
Pt. "1A"
APPROX. SCALE 1"=1,000'
0' 500' 1000' 1500' 2000'
9 10
16 15
Helicopter
Evacuation
Location:
Lat: 45.8307
Long: -123.5568
Spruce Run
Quarry
August Fire Road
-delete 1-200'
LEGEND
Tsb_new.shp
GTRA
Designroads.shp
Symbols
Emergency Evacua
Land Survey Monu
Landing
Milepost
Rock Pit
Ownership
PLS
Roads
County Road
State Highway
Surfaced (Improvement)
Surfaced Road
Unsurfaced Road
Streams
FISH
NONFISH
40_foot.shp
25_foot.shp
Road and Stream Segment Buffers
Streams
DLI - 5/20/0

TC PSPCSTGR

Species, Sort Grade - Board Foot Volumes (Project)

T04N R07W S09 TyA1-4
THRU
T04N R07W S15 TyRW5B

Project: ROTOR
Acres 246.00

Date 6/11/2003
Time 7:52:34AM

Spp	S T	So rt	Gr ad	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent of Net Board Foot Volume: Log Scale Dia. 4-5	6-11	12-16	17+	Log Length 12-20	21-30	31-35	36-99	Average Log Ln Ft	Bd Ft	CF/ Lf	Logs Per /Acre
A			CU																0.00	.0
A	?		CU														4		0.00	11.8
A	?		3S	60	.6	14,128	14,047	3,456	62	34	4		14	16	64	7	27	83	0.84	170.0
A	?		4S	0	.4	92	92	23	100				89	7	2	2	13	22	0.47	4.3
A Totals				61	.6	14,220	14,139	3,478	62	34	4		14	16	63	7	25	76	0.82	186.2
D	?		CU														10		0.00	5.0
D	?		2S	21	.4	5,013	4,995	1,229	2	49	50		4	5	49	43	35	397	2.31	12.6
D	?		3S	12	.3	2,729	2,720	669	76	20	4		8	14	51	27	30	94	0.89	29.0
D	?		4S	1		304	304	75	75	25			42	17	40		20	40	0.57	7.7
D Totals				34	.3	8,047	8,019	1,973	30	38	33		7	8	49	36	28	148	1.25	54.3
H		DO	CU														32		0.00	.0
H		DO	2S	2		509	509	125		36	64				100		32	435	2.56	1.2
H	?		3S	1	.0	249	249	61	100						20	80	38	132	1.06	1.9
H	?		4S	1		211	211	52	100				100				15	20	0.40	10.5
H Totals				4		969	969	238	47	19	34		22		58	21	20	71	0.87	13.6
M	?		3S	0		110	110	27	100					100			26	50	0.73	2.2
M	?		4S	0	16.7	1	1	0	50	50				75	25		25	50	0.79	.0
M Totals				0	.1	111	111	27	100	0				100	0		26	50	0.73	2.2
S		DO	3S	0		48	48	12	100						100		33	50	0.76	1.0
S Totals				0		48	48	12	100						100		33	50	0.76	1.0
C		DO	3S	0		20	20	5	27	5	68				85	15	36	182	1.87	.1
C	?		4S	0		3	3	1	100				13	87			23	30	0.96	.1
C Totals				0		23	23	6	36	4	59		2	11	75	13	30	112	1.55	.2
Totals					0.5	23,417	23,309	5,734	50	34	15		12	13	58	17	25	91	0.92	257.4

TC TSPCSTGR

Species, Sort Grade - Board Foot Volumes (Type)

Project: ROTOR

Date 6/2/2003

Time 11:18:52AM

T04N R07W S09 TA1-4

Twp	Rge	Sec	Tract	Type	Acre	Plots	Sample Trees	CuFt	BdFt
04N	07W	09	CC	A1-4	223.00	67	162	1	W

T04N R07W S09 TA1-4

Spp	S T	So rt	Gr ad	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent Net Board Foot Volume: Log Scale Dia. 4-5	6-11	12-16	17+	Log Length 12-20	21-30	31-35	36-99	Average Log Ln Ft	Bd Ft	CF/ Lf	Logs Per /Acre
A		DO	CU														4		0.00	11.8
A		DO	3S	99	.6	14,190	14,111	3,147		62	34	4	13	16	64	7	27	83	0.84	170.8
A		DO	4S	1		77	77	17		100			100				12	20	0.46	3.8
A	**Totals**			61	.6	14,267	14,188	3,164		62	34	4	14	15	64	7	25	76	0.82	186.4
D		DO	CU														10		0.00	5.0
D		DO	2S	62	.4	5,022	5,004	1,116		2	48	50	4	5	49	42	35	398	2.31	12.6
D		DO	3S	34	.3	2,737	2,728	608		76	20	4	8	14	51	27	30	94	0.89	29.1
D		DO	4S	4		301	301	67		76	24		43	18	40		20	39	0.56	7.7
D	**Totals**			34	.3	8,060	8,033	1,791		30	38	33	7	8	49	35	28	148	1.25	54.3
H		DO	2S	52		499	499	111			36	64			100		32	440	2.58	1.1
H		DO	3S	26		250	250	56		100					20	80	38	132	1.06	1.9
H		DO	4S	22		209	209	47		100			100				15	20	0.40	10.5
H	**Totals**			4		958	958	214		48	19	33	22		57	21	20	71	0.87	13.5
M		DO	3S	100		107	107	24		100				100			26	50	0.73	2.1
M	**Totals**			0		107	107	24		100				100			26	50	0.73	2.1
S		DO	3S	100		49	49	11		100					100		33	50	0.76	1.0
S	**Totals**			0		49	49	11		100					100		33	50	0.76	1.0
Type Totals					.5	23,441	23,334	5,203		50	35	15	12	13	58	17	26	91	0.92	257.3

TC PSPCSTGR

Species, Sort Grade - Board Foot Volumes (Project)

T04N R07W S09 TyRW5A	19.80
T04N R07W S09 Ty0R/W	1.00
T04N R07W S15 TyRW5B	2.20

Project: ROTOR

Acres 23.00

Page 1
Date 6/11/2003
Time 8:33:09AM

Spp	S T	So rt	Gr ad	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent of Net Board Foot Volume: Log Scale Dia. 4-5	6-11	12-16	17+	Log Length 12-20	21-30	31-35	36-99	Average Log Ln Ft	Bd Ft	CF/ Lf	Logs Per /Acre
A			CU																0.00	.3
A	?		CU														3		0.00	12.1
A	?		3S	58	.7	13,521	13,432	309	61	35	4		14	17	61	8	27	83	0.85	162.3
A	?		4S	1	1.6	240	236	5	100				55	30	9	7	19	26	0.50	9.1
A Totals				59	.7	13,761	13,667	314	62	34	4		15	17	60	8	25	74	0.83	183.7
D	?		CU														8		0.00	5.1
D	?		2S	21	.4	4,928	4,910	113	2	50	49		5	4	47	44	35	387	2.29	12.7
D	?		3S	11	.5	2,654	2,641	61	77	18	5		9	13	51	27	30	92	0.88	28.8
D	?		4S	1		334	334	8	68	32			39	15	47		20	42	0.59	8.0
D Totals				34	.4	7,917	7,885	181	30	38	32		8	8	49	36	28	145	1.24	54.6
M	?		3S	1		139	139	3	100					100			26	50	0.73	2.8
M	?		4S	0	16.7	10	9	0	50	50				75	25		25	50	0.79	.2
M Totals				1	1.2	149	147	3	97	3				99	1		26	50	0.73	2.9
H		DO	CU														32		0.00	.3
H		DO	2S	3		607	607	14		35	65				100		32	402	2.40	1.5
H	?		3S	1		240	240	6	100						16	84	38	136	1.06	1.8
H	?		4S	1		233	233	5	100				100				15	21	0.42	11.0
H Totals				5		1,079	1,079	25	44	20	37		22		60	19	20	74	0.87	14.6
C		DO	3S	1		211	211	5	27	5	68				85	15	36	182	1.87	1.2
C	?		4S	0		30	30	1	100				13	87			23	30	0.96	1.0
C Totals				1		241	241	6	36	4	59		2	11	75	13	30	112	1.55	2.2
S		DO	3S	0		42	42	1	100						100		33	50	0.76	.8
S Totals				0		42	42	1	100						100		33	50	0.76	.8
Totals					0.5	23,189	23,062	530	50	34	15		12	13	56	18	25	89	0.93	258.8

TC TSPCSTGR

Species, Sort Grade - Board Foot Volumes (Type)

Project: ROTOR

Date 6/11/2003

Time 7:50:58AM

T04N R07W S09 TRW5A

Twp	Rge	Sec	Tract	Type	Acre	Plots	Sample Trees	CuFt	BdFt
04N	07W	09	CC	RW5A	19.80	67	167	1	W

T04N R07W S09 TRW5A

Spp	ST	Sort	Grad	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent Net Board Foot Volume: Log Scale Dia. 4-5	6-11	12-16	17+	Log Length 12-20	21-30	31-35	36-99	Average Log Ln Ft	Bd Ft	CF/ Lf	Logs Per /Acre
A		DO	CU														4		0.00	11.8
A		DO	3S	99	.6	14,190	14,111	279		62	34	4	13	16	64	7	27	83	0.84	170.8
A		DO	4S	1		77	77	2		100			100				12	20	0.46	3.8
A	**Totals**			59	.6	14,267	14,188	281		62	34	4	14	15	64	7	25	76	0.82	186.4
D		DO	CU														9		0.00	5.2
D		DO	2S	63	.3	5,143	5,125	101		1	49	50	5	5	49	41	35	393	2.30	13.0
D		DO	3S	34	.3	2,757	2,748	54		76	20	4	8	14	51	26	30	94	0.90	29.1
D		DO	4S	4		305	305	6		76	24		44	17	39		19	39	0.56	7.9
D	**Totals**			34	.3	8,204	8,178	162		29	38	33	8	8	50	35	28	148	1.25	55.3
H		DO	CU														32		0.00	.4
H		DO	2S	63		705	705	14			35	65			100		32	402	2.40	1.8
H		DO	3S	19		214	214	4		100					20	80	38	132	1.06	1.6
H		DO	4S	18		203	203	4		100			100				16	22	0.43	9.4
H	**Totals**			5		1,122	1,122	22		37	22	41	18		67	15	21	85	0.95	13.1
C		DO	3S	90		234	234	5		29		71			85	15	36	180	1.86	1.3
C		DO	4S	10		27	27	1		100				100			24	30	1.00	.9
C	**Totals**			1		261	261	5		36		64		10	76	14	31	119	1.59	2.2
M		DO	3S	100		107	107	2		100				100			26	50	0.73	2.1
M	**Totals**			0		107	107	2		100				100			26	50	0.73	2.1
S		DO	3S	100		49	49	1		100					100		33	50	0.76	1.0
S	**Totals**			0		49	49	1		100					100		33	50	0.76	1.0
Type Totals					.4	24,010	23,903	473		50	34	16	12	13	59	17	26	92	0.93	260.1

TC TSPCSTGR

Species, Sort Grade - Board Foot Volumes (Type)

Project: ROTOR

Date 6/11/2003

Time 7:50:58AM

T04N R07W S15 TRW5B

Twp	Rge	Sec	Tract	Type	Acre	Plots	Sample Trees	CuFt	BdFt
04N	07W	15	CC	RW5B	2.20	11	24	1	W

T04N R07W S15 TRW5B

Spp	ST	Sort	Grad	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent Net Board Foot Volume: Log Scale Dia. 4-5	6-11	12-16	17+	Log Length 12-20	21-30	31-35	36-99	Average Log Ln Ft	Bd Ft	CF/ Lf	Logs Per /Acre
A		DO	CU																0.00	11.8
A		DO	3S	100	.9	6,761	6,702	15		65	35		32	33	35		23	63	0.80	107.2
A	**Totals**			43	.9	6,761	6,702	15		65	35		32	33	35		21	56	0.80	119.0
D		DO	CU																0.00	5.7
D		DO	2S	57	.5	4,109	4,088	9			57	43			23	77	37	386	2.33	10.6
D		DO	3S	33	2.3	2,441	2,384	5		83		17	24		49	28	30	74	0.81	32.3
D		DO	4S	9		658	658	1		30	70		15		85		24	75	0.84	8.8
D	**Totals**			46	1.1	7,208	7,130	16		30	39	30	9		37	53	28	124	1.19	57.3
H		DO	3S	49		577	577	1		100						100	40	150	1.08	3.8
H		DO	4S	51		607	607	1		100			100				15	20	0.40	30.3
H	**Totals**			8		1,183	1,183	3		100			51			49	18	35	0.57	34.2
M		DO	3S	100		488	488	1		100				100			26	50	0.73	9.8
M	**Totals**			3		488	488	1		100				100			26	50	0.73	9.8
Type Totals					.9	15,640	15,504	34		53	33	14	22	17	32	28	22	70	0.89	220.3

TC TSPCSTGR

Species, Sort Grade - Board Foot Volumes (Type)

Project: ROTOR

Date 6/2/2003

Time 10:41:56AM

T04N R07W S09 T0R/W

Twp	Rge	Sec	Tract	Type	Acre	Plots	Sample Trees	CuFt	BdFt
04N	07W	09	PRIVATE	0R/W	1.00	1	73	1	W

T04N R07W S09 T0R/W

Spp	Stat	Sort	Grad	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent Net Board Foot Volume: Log Scale Dia. 4-5	6-11	12-16	17+	Log Length 12-20	21-30	31-35	36-99	Average Log Ln Ft	Bd Ft	CF/ Lf	Logs Per /Acre
A			CU																0.00	6.0
A		?	CU														4		0.00	18.0
A		?	3S	79	2.4	15,150	14,790	15		51	49		10	26	33	32	30	130	1.19	114.0
A		?	4S	21	2.3	3,990	3,900	4		100			37	42	12	9	22	29	0.51	135.0
A	**Totals**			81	2.4	19,140	18,690	19		61	39		15	29	28	27	24	68	0.87	273.0
D		?	CU														2		0.00	2.0
D		?	2S	65	1.2	2,490	2,460	2		13	70	17	7	9	50	34	33	246	1.77	10.0
D		?	3S	29		1,090	1,090	1		100				12	49	39	34	78	0.75	14.0
D		?	4S	6		210	210	0		100			52	48			19	26	0.46	8.0
D	**Totals**			16	.8	3,790	3,760	4		43	46	11	8	12	47	34	28	111	1.05	34.0
C		DO	3S	61		230	230	0			100				100		32	230	2.34	1.0
C		?	4S	39		150	150	0		100			60	40			19	30	0.77	5.0
C	**Totals**			2		380	380	0		39	61		24	16	61		22	63	1.16	6.0
M		?	4S	100	16.7	240	200	0		50	50			75	25		25	50	0.79	4.0
M	**Totals**			1	16.7	240	200	0		50	50			75	25		25	50	0.79	4.0
Type Totals					2.2	23,550	23,030	23		58	40	2	14	27	32	28	24	73	0.89	317.0

TC TSTATS

STATISTICS

PROJECT ROTOR

DATE 5/29/2003

TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
04N	07W	09	CC	A1-4	223.00	67	312	1	W

	PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES
TOTAL	67	312	4.7		
CRUISE	35	161	4.6	32,669	.5
DBH COUNT					
REFOREST					
COUNT	31	150	4.8		
BLANKS	1				
100 %					

STAND SUMMARY

	SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
R ALDER	101	106.8	14.5	46		123.0	14,267	14,188	3,869	3,869
DOUG FIR	52	25.6	19.0	61		50.1	8,060	8,033	1,895	1,887
WHEMLOCK	4	11.0	11.8	25		8.4	958	958	234	234
BL MAPLE	3	2.1	14.3	27		2.4	107	107	41	41
S SPRUCE	1	1.0	15.0	34		1.2	49	49	24	24
TOTAL	*161*	*146.5*	*15.2*	*47*		*185.1*	*23,441*	*23,334*	*6,063*	*6,055*

SAMPLE TREES - BF

SD: 1	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF TREES REQ. 5	7	INF. POP. 12
R ALDER	127.9	10.1	97	108	119			
DOUG FIR	198.9	15.7	146	173	200			
WHEMLOCK	1057.9	83.4	1	7	13			
BL MAPLE	737.8	58.1	0	1	1			
S SPRUCE	1268.9	100.0		0	1			
TOTAL	*109.7*	*8.6*	*264*	*289*	*314*	*482*	*246*	*84*

TREES/ACRE

SD: 1	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	7	INF. POP. 12
R ALDER	70.0	8.6	98	107	116			
DOUG FIR	140.1	17.1	21	26	30			
WHEMLOCK	496.3	60.6	4	11	18			
BL MAPLE	644.2	78.7	0	2	4			
S SPRUCE	574.4	70.2	0	1	2			
TOTAL	*58.0*	*7.1*	*136*	*146*	*157*	*135*	*69*	*23*

BASAL AREA/ACRE

SD: 1	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	7	INF. POP. 12
R ALDER	67.3	8.2	113	123	133			
DOUG FIR	135.6	16.6	42	50	58			
WHEMLOCK	489.6	59.8	3	8	13			
BL MAPLE	644.2	78.7	1	2	4			
S SPRUCE	574.4	70.2	0	1	2			
TOTAL	*48.7*	*6.0*	*174*	*185*	*196*	*95*	*48*	*16*

NET BF/ACRE

SD: 1	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	7	INF. POP. 12
R ALDER	76.7	9.4	12,858	14,188	15,517			
DOUG FIR	137.6	16.8	6,682	8,033	9,384			
WHEMLOCK	498.2	60.9	375	958	1,541			
BL MAPLE	644.2	78.7	23	107	191			
S SPRUCE	574.4	70.2	15	49	83			
TOTAL	*54.7*	*6.7*	*21,774*	*23,334*	*24,894*	*120*	*61*	*21*

TC PSTATS

PROJECT STATISTICS

PROJECT ROTOR

DATE 6/11/2003

TWP	RGE	SC	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
04N	07W	09	CC	RW5A	22.00	78	366	1	W
04N	07W	15	CC	RW5B					

	PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES
TOTAL	78	366	4.7		
CRUISE	41	190	4.6	3,239	5.9
DBH COUNT					
REFOREST					
COUNT	36	175	4.9		
BLANKS	1				
100 %					

STAND SUMMARY

	SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
R ALDER	110	104.1	14.5	45		119.1	13,517	13,439	3,678	3,678
DOUG FIR	62	25.8	19.1	61		51.1	8,105	8,073	1,920	1,913
WHEMLOCK	8	11.9	12.3	27		9.9	1,128	1,128	270	270
BL MAPLE	6	2.9	14.3	27		3.2	145	145	55	55
WR CEDAR	3	1.7	21.8	38		4.3	235	235	97	97
S SPRUCE	1	.9	15.0	34		1.1	44	44	22	22
TOTAL	*190*	*147.2*	*15.3*	*46*		*188.7*	*23,173*	*23,063*	*6,041*	*6,034*

SAMPLE TREES - BF

SD: 1	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF TREES REQ. 5	7	INF. POP. 12
R ALDER	138.0	10.0	87	97	107			
DOUG FIR	196.8	14.3	144	168	193			
WHEMLOCK	801.4	58.1	5	11	18			
BL MAPLE	562.8	40.8	1	2	2			
WR CEDAR	1197.6	86.9	0	3	6			
S SPRUCE	1378.4	100.0		0	1			
TOTAL	*109.9*	*8.0*	*260*	*282*	*305*	*483*	*246*	*84*

TREES/ACRE

SD: 1	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	7	INF. POP. 12
R ALDER	74.4	8.4	95	104	113			
DOUG FIR	137.7	15.6	22	26	30			
WHEMLOCK	393.7	44.6	7	12	17			
BL MAPLE	544.7	61.7	1	3	5			
WR CEDAR	378.2	42.8	1	2	2			
S SPRUCE	620.4	70.3	0	1	1			
TOTAL	*56.0*	*6.3*	*138*	*147*	*157*	*125*	*64*	*22*

BASAL AREA/ACRE

SD: 1	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	7	INF. POP. 12
R ALDER	72.3	8.2	109	119	129			
DOUG FIR	131.7	14.9	44	51	59			
WHEMLOCK	415.6	47.1	5	10	15			
BL MAPLE	544.7	61.7	1	3	5			
WR CEDAR	371.5	42.1	2	4	6			
S SPRUCE	620.4	70.3	0	1	2			
TOTAL	*48.7*	*5.5*	*178*	*189*	*199*	*95*	*48*	*16*

NET BF/ACRE

SD: 1	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	7	INF. POP. 12
R ALDER	83.6	9.5	12,166	13,439	14,712			
DOUG FIR	134.9	15.3	6,839	8,073	9,306			
WHEMLOCK	469.0	53.1	529	1,128	1,727			
BL MAPLE	544.7	61.7	56	145	234			
WR CEDAR	410.0	46.4	126	235	344			
S SPRUCE	620.4	70.3	13	44	75			
TOTAL	*58.0*	*6.6*	*21,550*	*23,063*	*24,577*	*134*	*69*	*23*

TC TSTATS

STATISTICS

PROJECT ROTOR

DATE 6/2/2003

TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
04N	07W	09	PRIVATE	0R/W	1.00	1	73	1	W

	PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES
TOTAL	1	73	73.0		
CRUISE	1	73	73.0	169	43.2
DBH COUNT					
REFOREST					
COUNT					
BLANKS					
100 %					

STAND SUMMARY

	SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
R ALDER	48	144.0	15.4	47		186.1	19,140	18,690	5,586	5.586
DOUG FIR	17	17.0	17.9	58		29.8	3,790	3,760	1,010	1,010
WR CEDAR	5	5.0	17.0	27		7.9	380	380	150	150
BL MAPLE	3	3.0	14.8	35		3.6	240	200	80	80
TOTAL	*73*	*169.0*	*15.7*	*47*		*227.4*	*23,550*	*23,030*	*6,826*	*6,826*

SD: 1	COEFF VAR.%	S.E.%	SAMPLE TREES - BF LOW	AVG	HIGH	# OF TREES REQ. 5	7	INF. POP. 12
R ALDER	109.1	12.8	74	85	96			
DOUG FIR	245.8	28.8	37	52	66			
WR CEDAR	595.7	69.7	2	5	9			
BL MAPLE	596.8	69.9	1	3	5			
TOTAL	*84.0*	*9.8*	*131*	*145*	*159*	*282*	*144*	*49*

TC PSTNDSUM

Stand Table Summary

Page 1
Date: 6/11/2003

T04N R07W S09 TyA1-4
THRU
T04N R07W S15 TyRW5B

Project ROTOR
Acres 246.00

Time: 8:44:02AM
Grown Year:

Spc	S T	DBH	Sample Trees	FF 16'	Tot Av Ht	Trees/ Acre	BA/ Acre	Logs Acre	Average Log Net Cu.Ft.	Average Log Net Bd.Ft.	Tons/ Acre	Net Cu.Ft. Acre	Net Bd.Ft. Acre	Totals Tons	Totals Cunits	Totals MBF
A		9	2	87	17	2.720	1.20	2.72	6.0	20.0		16	54		40	13
A		10	5	87	45	4.419	2.41	4.42	11.0	44.9		49	199		119	49
A		11	19	86	77	11.126	7.34	16.59	12.7	45.6		211	757		518	186
A		12	34	86	63	21.829	17.03	29.50	14.5	50.2		427	1,482		1,050	365
A		13	18	87	72	9.389	8.46	13.42	18.2	62.9		244	844		600	208
A		14	25	86	66	9.501	9.87	14.49	18.5	65.1		268	943		659	232
A		15	34	88	78	13.027	15.81	24.93	21.3	78.9		530	1,968		1,303	484
A		16	34	87	75	12.960	18.10	24.20	24.5	87.1		594	2,108		1,460	519
A		17	18	87	76	5.473	8.55	9.31	29.6	106.0		275	987		677	243
A		18	22	87	74	5.553	9.74	10.43	30.9	109.0		322	1,137		793	280
A		19	12	87	75	3.142	6.12	6.28	33.6	120.4		211	757		520	186
A		20	15	88	92	3.342	7.29	8.34	36.0	141.9		300	1,183		737	291
A		21	7	89	89	1.511	3.63	3.53	40.7	165.3		144	584		353	144
A		22	9	87	79	1.874	4.89	3.75	44.4	171.5		166	643		409	158
A		23	3	86	64	.429	1.24	.86	44.1	165.0		38	141		93	35
A		24	2	94	120	.383	1.20	1.53	42.8	230.0		65	352		161	87
A		Totals	259	87	70	106.678	122.89	174.30	22.1	81.1		3,859	14,139		9,494	3,478
D		9	2	74	17	2.252	.95									
D		10	3	89	18	1.748	.95	1.75	7.0	30.0		12	52		30	13
D		11	3	89	53	1.446	.95	1.45	14.0	49.9		20	72		50	18
D		12	3	93	76	1.215	.95	2.43	12.0	45.0		29	109		72	27
D		13	1	86	52	.004	.00	.00	19.0	50.0		0	0		0	0
D		14	3	86	61	.941	1.01	.94	26.0	70.0		24	66		60	16
D		15	10	86	70	2.480	2.97	4.95	17.2	59.8		85	296		209	73
D		16	7	87	94	1.375	1.92	2.75	25.2	92.4		69	254		171	62
D		17	10	86	88	3.055	4.76	6.75	23.9	86.9		161	587		396	144
D		18	6	86	75	1.085	1.92	2.17	25.5	87.6		55	190		136	47
D		19	2	85	101	.510	.95	1.53	25.3	100.0		39	153		95	38
D		20	7	86	113	1.335	2.86	3.09	40.0	172.7		123	533		303	131
D		21	2	87	92	.008	.02	.02	43.8	155.0		1	3		2	1
D		22	10	86	104	1.466	3.87	4.01	37.5	150.3		151	603		370	148
D		23	7	87	106	1.008	2.91	2.35	48.1	217.0		113	509		278	125
D		24	6	85	93	.640	2.01	1.60	43.8	176.0		70	282		172	69
D		25	8	86	106	.864	2.94	2.33	45.5	193.3		106	451		261	111
D		26	9	84	114	1.036	3.82	2.59	65.7	279.8		170	725		419	178
D		27	8	87	122	.966	3.81	3.14	55.6	261.4		175	820		429	202
D		28	10	89	113	.915	3.91	2.29	77.2	354.8		177	812		434	200
D		29	4	87	133	.415	1.90	1.04	96.4	444.0		100	460		246	113
D		31	2	88	103	.181	.95	.54	62.7	303.3		34	165		84	41
D		32	2	86	135	.176	.95	.53	89.3	483.3		47	255		116	63
D		33	2	89	95	.160	.95	.32	101.0	460.0		32	147		80	36
D		34	4	87	123	.302	1.90	.75	121.2	628.0		91	474		225	117
D		Totals	131	86	80	25.582	50.15	49.32	38.2	162.6		1,886	8,019		4,639	1,973
H		9	3	82	17	5.310	2.09	5.31	5.0	20.0		27	106		65	26
H		10	3	79	24	3.837	2.09	3.84	8.0	20.0		31	77		76	19
H		17	3	88	68	1.328	2.09	2.66	24.5	85.0		65	226		160	56
H		26	2	89	121	.553	2.04	1.66	65.7	323.3		109	536		268	132
H		29	1	88	143	.031	.14	.09	51.3	256.7		5	24		12	6
H		Totals	12	82	31	11.059	8.46	13.55	17.4	71.5		236	969		581	238
M		12	1	87	32	.004	.00	.00	12.0	20.0		0	0		0	0
M		14	6	87	37	1.531	1.64	1.53	18.5	50.0		28	77		70	19

TC PSTNDSUM

Stand Table Summary

Page 2
Date: 6/11/2003

T04N R07W S09 TyA1-4
THRU
T04N R07W S15 TyRW5B

Project ROTOR
Acres 246.00

Time: 8:44:02AM
Grown Year:

Spc	S T	DBH	Sample Trees	FF 16'	Tot Av Ht	Trees/ Acre	BA/ Acre	Logs Acre	Average Log Net Cu.Ft.	Average Log Net Bd.Ft.	Tons/ Acre	Net Cu.Ft. Acre	Net Bd.Ft. Acre	Totals Tons	Totals Cunits	Totals MBF
M		15	4	86	35	.671	.82	.67	20.0	50.0		13	34		33	8
M		17	1	87	55	.004	.01	.01	22.5	65.0		0	1		0	0
M		Totals	12	87	36	2.210	2.47	2.21	19.0	50.0		42	111		103	27
S		15	2	85	42	.960	1.18	.96	25.0	50.0		24	48		59	12
S		Totals	2	85	42	.960	1.18	.96	25.0	50.0		24	48		59	12
C		14	2	80	21	.008	.01	.01	13.5	30.0		0	0		0	0
C		15	1	80	31	.004	.00	.00	17.0	30.0		0	0		0	0
C		16	1	78	17	.004	.01	.00	15.0	30.0		0	0		0	0
C		18	1	75	31	.073	.13	.07	24.0	30.0		2	2		4	1
C		22	1	78	52	.049	.13	.05	53.0	60.0		3	3		6	1
C		24	1	78	73	.004	.01	.01	45.5	130.0		0	1		1	0
C		29	1	83	88	.028	.13	.06	78.0	285.0		4	16		11	4
C		Totals	8	78	47	.169	.42	.20	46.1	112.0		9	23		23	6
Totals			424	86	68	146.658	185.57	240.55	25.2	96.9		6,056	23,309		14,899	5,734

TC PLOGSTVB

Log Stock Table - MBF

T04N R07W S09 TyA1-4
THRU
T04N R07W S15 TyRW5B

Project: ROTOR
Acres 246.00

Date 6/11/2003
Time 7:52:33AM

Spp	ST	Sort	Grade	Log Len	Gross MBF	Def %	Net MBF	% Spc	Net Volume by Scaling Diameter in Inches 2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-19	20-23	24-29	30-39	40+
A		DO	3S	10	5		5	.1			5									
A		DO	3S	12	13		13	.4					13							
A		DO	3S	13	36	24.7	27	.8			4		23							
A		DO	3S	14	5		5	.1			5									
A		?	3S	15	37		37	1.1			13	23								
A		?	3S	16	246		246	7.1			62	33	58	93						
A		?	3S	17	37		37	1.1			23	13								
A		DO	3S	18	15		15	.4			15									
A		?	3S	19	23		23	.7			5	5	13							
A		?	3S	20	59		59	1.7			6	16	1				36			
A		DO	3S	21	44		44	1.3			15	4			25					
A		?	3S	22	34		34	1.0			21		0	12						
A		?	3S	23	51		51	1.5			51									
A		?	3S	24	141	2.7	137	3.9			8	23	1	51		55				
A		?	3S	25	41		41	1.2			11	8	21							
A		?	3S	26	27		27	.8			4		22	0						
A		?	3S	27	28		28	.8			28	0								
A		?	3S	28	104		104	3.0			5	24	45	29						
A		?	3S	30	75		75	2.2			8	31	1		1	34				
A		DO	3S	31	23		23	.7			23									
A		?	3S	32	2,034		2,027	58.3			331	277	483	531	200	206				
A		?	3S	33	93		93	2.7			93									
A		DO	3S	34	39		39	1.1			24	15								
A		?	3S	35	17		17	.5			17									
A		?	3S	36	19		19	.6			19									
A		DO	3S	38	17		17	.5			17									
A		DO	3S	39	67		67	1.9			67									
A		?	3S	40	145		145	4.2			60	25	2	57	1					
A		DO	4S	8	2		2	.1			2									
A		DO	4S	11	9		9	.3			9									
A		?	4S	12	0		0	.0					0							
A		?	4S	14	0		0	.0			0									
A		?	4S	15	0		0	.0			0	0								
A		?	4S	16	4		4	.1			4									
A		?	4S	17	0	14.3	0	.0			0									
A		?	4S	18	0		0	.0			0									
A		?	4S	19	0		0	.0			0									
A		?	4S	20	4		4	.1			4	0								

TC PLOGSTVB

Log Stock Table - MBF

T04N R07W S09 TyA1-4
THRU
T04N R07W S15 TyRW5B

Project: ROTOR
Acres 246.00

Date 6/11/2003
Time 7:52:33AM

Spp	ST	Sort	Grade	Log Len	Gross MBF	Def %	Net MBF	% Spc	Net Volume by Scaling Diameter in Inches									
									2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-19	20-23	24-29	30-39	40+
A		?	4S	21	0	11.1	0	.0			0									
A		?	4S	22	0		0	.0			0									
A		?	4S	23	0		0	.0			0									
A		?	4S	24	0		0	.0			0									
A		?	4S	25	0		0	.0			0									
A		?	4S	26	0		0	.0			0									
A		?	4S	27	0		0	.0			0									
A		?	4S	29	0		0	.0			0									
A		?	4S	31	0		0	.0			0									
A		?	4S	32	0	20.0	0	.0			0									
A		?	4S	36	0		0	.0			0									
A		?	4S	39	0		0	.0			0									
A		Totals			3,498		3,478	60.7			966	499	684	772	227	294	36			
D		DO	2S	16	14		14	.7						13		1				
D		DO	2S	17	15		15	.8						15						
D		DO	2S	18	20		20	1.0										20		
D		?	2S	20	0		0	.0							0					
D		DO	2S	26	26		26	1.3									26			
D		?	2S	30	30		30	1.5							0			30		
D		?	2S	32	604		601	30.5					19	37	150	269	96	30		
D		?	2S	38	0		0	.0					0							
D		?	2S	40	213		212	10.7						26	76	31	79			
D		DO	2S	42	45		45	2.3									45			
D		DO	2S	57	45		45	2.3						45						
D		DO	2S	78	49		49	2.5						49						
D		DO	2S	80	172		172	8.7						106		66				
D		?	3S	16	23		23	1.2			6					17				
D		DO	3S	17	2		2	.1			2									
D		?	3S	18	7		7	.3			4	2								
D		?	3S	20	26	2.2	25	1.3			5	2				18				
D		DO	3S	21	8		8	.4			4		4							
D		?	3S	22	23		23	1.2			5		19							
D		DO	3S	23	3		3	.2				3								
D		DO	3S	24	23		23	1.2				5	18							
D		?	3S	25	14		14	.7			2	0				12				
D		DO	3S	26	10		10	.5			10									
D		DO	3S	28	9		9	.5			5	4								

TC PLOGSTVB

Log Stock Table - MBF

T04N R07W S09 TyA1-4
THRU
T04N R07W S15 TyRW5B

Project: ROTOR
Acres 246.00

Date 6/11/2003
Time 7:52:33AM

Spp	ST	Sort	Grade	Log Len	Gross MBF	Def %	Net MBF	% Spc	Net Volume by Scaling Diameter in Inches 2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-19	20-23	24-29	30-39	40+
D		DO	3S	30	4		4	.2				4								
D		DO	3S	31	7		7	.4			7									
D		?	3S	32	322		322	16.3			29	62	118	82	18	14				
D		?	3S	33	11	15.2	10	.5			6	4								
D		?	3S	35	0		0	.0			0									
D		?	3S	36	16		16	.8			10		6							
D		DO	3S	37	10		10	.5				10								
D		?	3S	38	16		16	.8			16									
D		?	3S	40	94		94	4.7			16	0	77							
D		DO	3S	60	43		43	2.2					43							
D		DO	4S	9	2		2	.1					2							
D		DO	4S	14	0		0	.0				0								
D		?	4S	15	3		3	.1			3									
D		?	4S	16	27		27	1.4			25	2								
D		?	4S	18	0		0	.0			0									
D		?	4S	21	3		3	.1			0	3								
D		DO	4S	22	7		7	.3			7									
D		?	4S	23	0		0	.0			0									
D		DO	4S	25	3		3	.2				3								
D		?	4S	30	0		0	.0			0									
D		?	4S	33	11		11	.6			11									
D		?	4S	34	19		19	1.0							19					
D		Totals			1,979		1,973	34.4			173	106	305	372	263	428	246	80		
H		DO	2S	32	125		125	52.5							2	47	76			
H		DO	3S	32	12		12	5.1				12								
H		?	3S	40	49		49	20.5					49							
H		?	4S	13	7		7	2.7			7									
H		?	4S	15	26		26	11.0			26									
H		DO	4S	16	0		0	.2					0							
H		?	4S	17	19		19	7.9			19									
H		Totals			238		238	4.2			52	12	49		2	47	76			
M		?	3S	23	8		8	27.7			8									
M		?	3S	25	8		8	30.1				8								
M		?	3S	30	11		11	41.5				11								
M		?	4S	21	0		0	.1			0									

TC PLOGSTVB

Log Stock Table - MBF

T04N R07W S09 TyA1-4
THRU
T04N R07W S15 TyRW5B

Project: ROTOR
Acres 246.00

Date 6/11/2003
Time 7:52:33AM

Spp	ST	Sort	Grade	Log Len	Gross MBF	Def %	Net MBF	% Spc	Net Volume by Scaling Diameter in Inches 2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-19	20-23	24-29	30-39	40+
M		?	4S	22	0	23.1	0	.4						0						
M		?	4S	24	0	33.3	0	.1			0									
M		?	4S	34	0		0	.2			0									
M		Totals			27		27	.5			8	19		0						
S		DO	3S	33	12		12	100.0			12									
S		Totals			12		12	.2			12									
C		DO	3S	32	4		4	74.7				1			0	3				
C		DO	3S	40	1		1	12.9			1									
C		?	4S	16	0		0	1.1				0								
C		?	4S	19	0		0	.5			0									
C		?	4S	23	0		0	1.1			0									
C		DO	4S	24	1		1	9.6			1									
C		Totals			6		6	.1			1	1			0	3				
Total		All Species			5,761		5,734	100.0			1211	637	1038	1144	492	773	358	80		

FPA "WRITTEN PLAN" for Harvest
Rotorwash Timber Sale Number 341-04-07

Landowner: Oregon Department of Forestry
92219 Hwy 202
Astoria, OR 97103
(503) 325-5451

Planned Operation: Type 3 Harvest (clearcut)

Protected Resources:
Type F Streams: Cedar Creek, is a medium Type F stream located within 100 feet of operations in Area 1, 2, and 3. It flows adjacent to Area 1 for 1,700 feet, the eastern boundary of Area 2 for 1,500 feet, and the western boundary of Area 3 for 2,300 feet. Additionally, an unnamed small Type F tributary of Cedar Creek is located between the northern boundary of Area 1 and the southern boundary of Area 2 for 700 feet. An unnamed medium Type F tributary of Quartz Creek is located within 100 feet of operations of Areas 3 and 4. It flows along the northeast boundary of Area 3 for 1,600 feet and the southern boundary of Area 4 for 4,200 feet. Quartz Creek, which is designated as a large Type F stream, is located along the northern boundary of Area 4 for approximately 3,000 feet, and is also located within 100 feet of operations of Area 4.

Description of Area:
- Four Type 3 harvest units totaling 223 acre in the Coast Range Geographic Region
- Upland vegetation: red alder with scattered Douglas-fir and other conifer species 45-60 years old
- RMA vegetation: red alder, similar age with scattered conifer
- Streamside slopes range from 15% to 70% and the streambed ranges from 10-40 feet wide

Planned Resource Protection Measures:
The timber sale boundaries adjacent to all Type F streams are posted an average of 110 feet.

Along the above mentioned streams, the following practices are required, under the timber sale contract, to protect the streams and streamside areas:
- No trees will be felled within stream buffers (RMA's).
- Trees adjacent to the stream buffers (RMA's) will be felled away from or parallel to the streams to prevent trees from entering the aquatic areas.
- No ground based equipment will be permitted within the posted RMA's nor within 100 feet of any live Type F stream.
- When cable logging is conducted nearby the RMA's, logging lines may cross, but will not be lowered into the RMA's during yarding, except during rigging. During rigging the lines must be pulled out of the RMA's when changing corridors.

Submitted: _____ Date: _____
Purchaser/Operator Contract Representative

Approved: _____ Date: _____
State Lands Forester

Approved: _____ Date: _____
Forest Practices Forester

Attachments: Logging Plan Map

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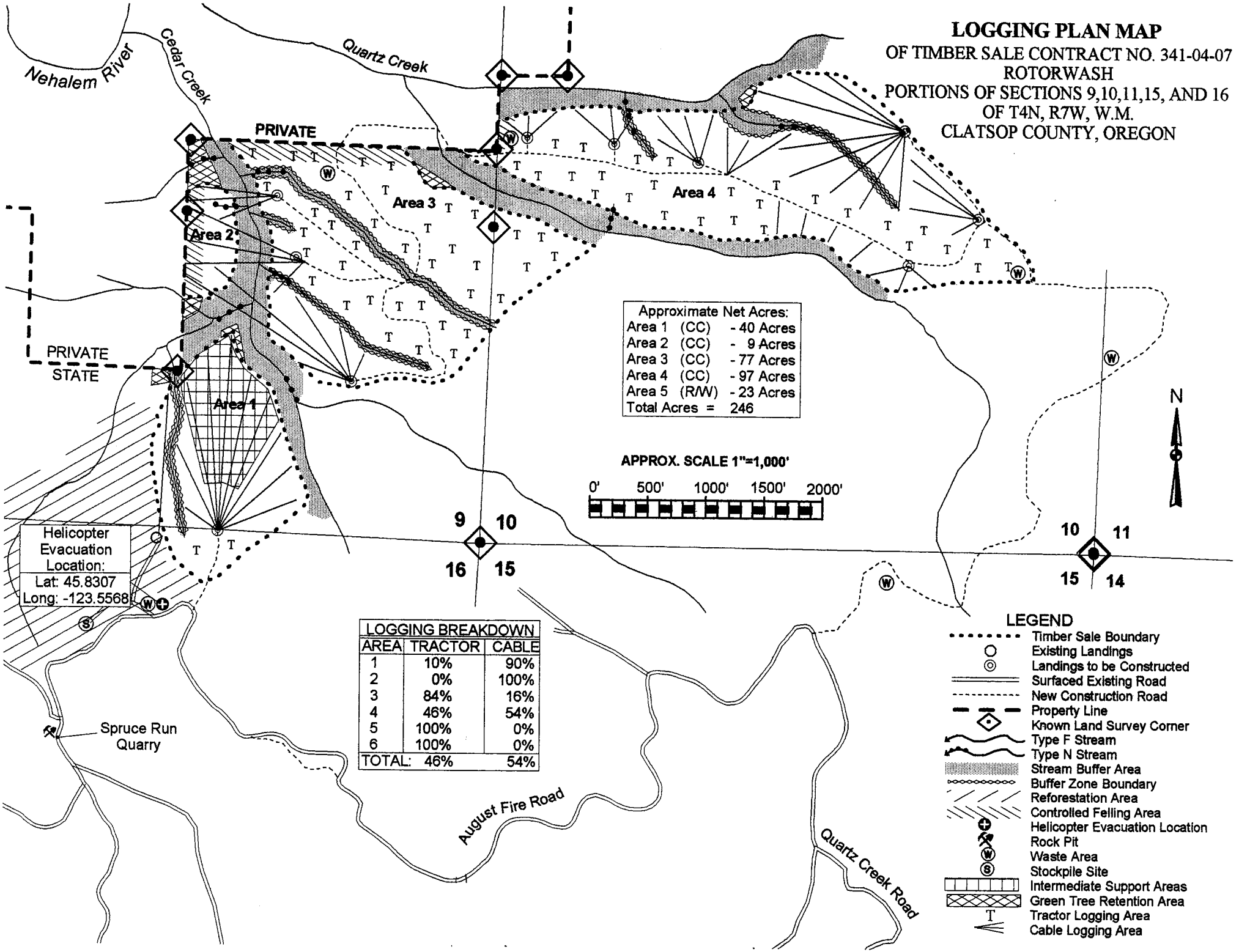

LOGGING PLAN MAP
OF TIMBER SALE CONTRACT NO. 341-04-07
ROTORWASH
PORTIONS OF SECTIONS 9,10,11,15, AND 16
OF T4N, R7W, W.M.
CLATSOP COUNTY, OREGON
Nehalem River
Cedar Creek
Quartz Creek
PRIVATE
PRIVATE
STATE
Area 1
Area 2
Area 3
Area 4
Approximate Net Acres:
Area 1 (CC) - 40 Acres
Area 2 (CC) - 9 Acres
Area 3 (CC) - 77 Acres
Area 4 (CC) - 97 Acres
Area 5 (R/W) - 23 Acres
Total Acres = 246
APPROX. SCALE 1"=1,000'
0' 500' 1000' 1500' 2000'
N
9 10
16 15
10 11
15 14
Helicopter Evacuation Location:
Lat: 45.8307
Long: -123.5568
LOGGING BREAKDOWN
AREA TRACTOR CABLE
1 10% 90%
2 0% 100%
3 84% 16%
4 46% 54%
5 100% 0%
6 100% 0%
TOTAL: 46% 54%
Spruce Run Quarry
August Fire Road
Quartz Creek Road
LEGEND
Timber Sale Boundary
Existing Landings
Landings to be Constructed
Surfaced Existing Road
New Construction Road
Property Line
Known Land Survey Corner
Type F Stream
Type N Stream
Stream Buffer Area
Buffer Zone Boundary
Reforestation Area
Controlled Felling Area
Helicopter Evacuation Location
Rock Pit
Waste Area
Stockpile Site
Intermediate Support Areas
Green Tree Retention Area
Tractor Logging Area
Cable Logging Area

FPA "WRITTEN PLAN"
Rotorwash Timber Sale Number 341-04-07
Project No. 1 Road Construction – Stream Crossing

Landowner: Alice Gronnel c/o Nick Nicholson **Address:** 80857 Gronnel Road
Phone: (503) 755-2384 Seaside, Or. 97138

Planned Operation: Permanent stream crossing construction across a Type F stream.

Protected Resources: A medium Type F tributary of Quartz Creek, located in the NE ¼, Sec. 9, T4N, R7W, W.M., Clatsop County, Oregon.

Description of Area:

- Operation is located in the Coast Range Geographic Region
- Upland vegetation: red alder 45-60 years old with minor components of conifer
- RMA Vegetation: red alder of similar age
- Streamside slopes range from gentile flood plains of less than 5 percent to 15 percent, streambed width ranges from 8 to 9 feet and stream gradient is 3%

Drainage Area and Stream Crossing Design:

Drainage Area: Using GIS, the watershed basin area was calculated and found to be approximately 378 acres. The 50-year peak flow for the basin was determined using current FPA guidance and a 50-year recurrence interval of 275 cfs per mile^2. The 50-year peak flow for this Medium Type F stream crossing was determined to be 162 cfs.

Stream Crossing Design: An embedded 117" x 79", 10 gage, aluminized steel pipe arch culvert will be installed using a streambed simulation strategy (for the purpose of preserving hydrologic functions and fish passage).

- Stream sediments are composed of intermixed cobbles, gravels and sedimentary rock fines. The depth of stream sediments and substrates is unknown.
- Active channel width ranges from 7 to 9 feet and stream gradient is 3%.
- The pipe arch invert will be sunk 18 inches at both the inlet and outlet and installed at a 3% gradient.
- Native (excavated) stream sediments will be placed in the culvert barrel to a depth of 18 inches. Excavated boulders or riprap rock will be placed (embedded) at the outlet to enhance settlement of additional stream sediments in the culvert.
- The net flow capacity for the embedded structure is 277 cfs
- Sufficient time is required to achieve the predicted stream channel development for this stream reach.

Planned Resource Protection Measures:

- Machine activity in stream channels will be minimized.
- In-stream work shall be conducted during period of low water flows and between July 1 and September 15, annually.
- Minimum 1 ½ cubic yard, track mounted excavator type equipment shall be used for embankment excavation, stream channel development and riprap placement.
- Excavated embankment materials will be hauled to approved waste areas, sloped for drainage and left in a stable condition.
- Erosion control measures shall be applied to all exposed bare soils and waste materials.
- Riprap rock will be used to armor road embankments and stream banks.
- Excavated boulders or riprap rock shall be placed and embedded at the outlet of the new culvert to allow additional stream sediment materials to settle in the barrel of the culvert.
- The de-watering of the installation area during development of the culvert bed and stream channel will be accomplished by use of cofferdams, temporary diversion ditches, and/or drainage structures.

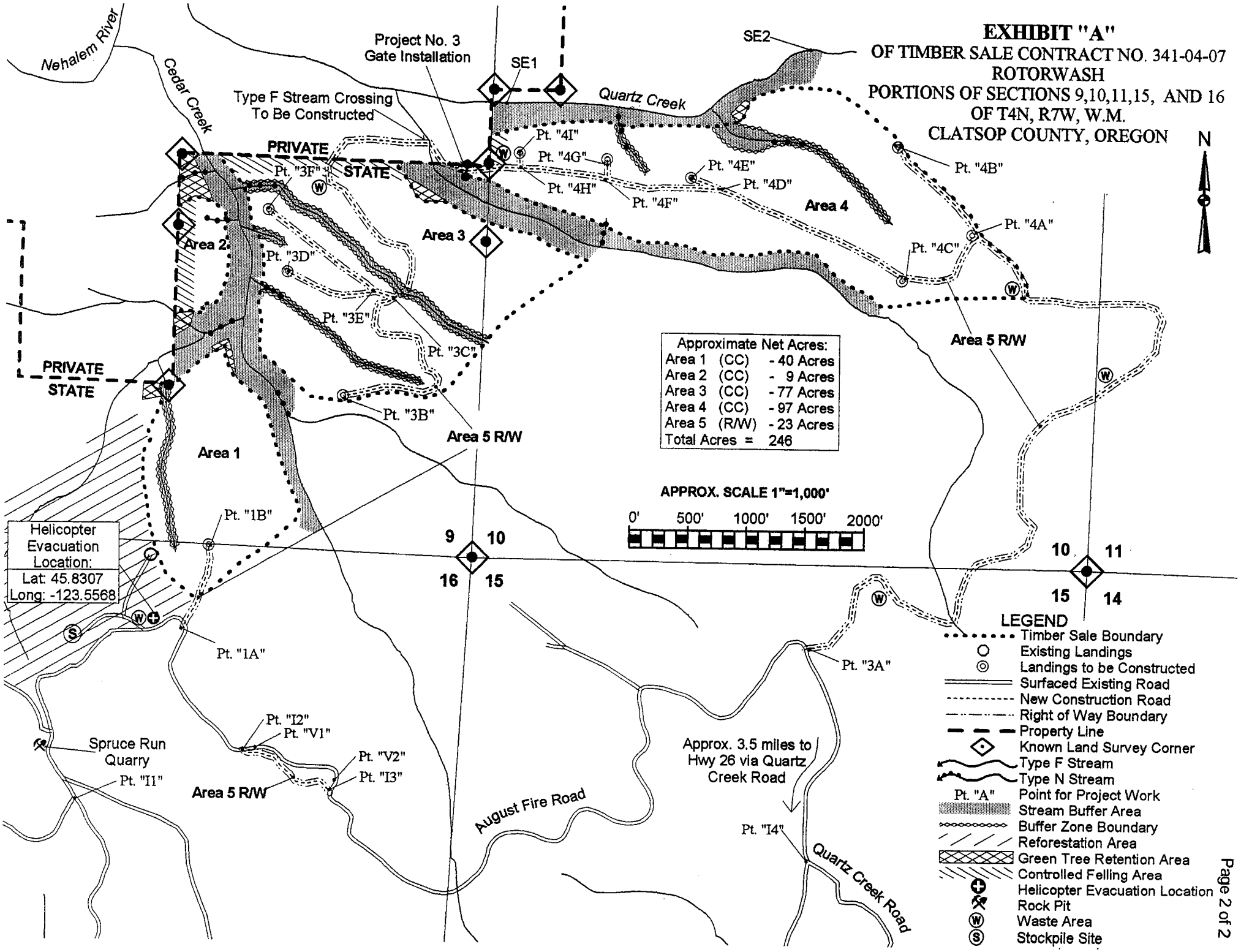
I, the undersigned, submit this written plan in compliance with the requirements in the Forest Practices Act regarding the operations conducted within 100 feet of Type F streams. I agree to the protection measures listed on this plan:

Submitted by: _____ Date: _____
Operator/PURCHASER

Approved by: _____ Date: _____
State Lands Forester

_____ Date: _____
Forest Practice Forester

Attachments: Exhibit "A" Map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ROTORWASH
PORTIONS OF SECTIONS 9,10,11,15, AND 16
OF T4N, R7W, W.M.
CLATSOP COUNTY, OREGON
N
Nehalem River
Cedar Creek
Project No. 3
Gate Installation
SE1
SE2
Quartz Creek
Type F Stream Crossing
To Be Constructed
PRIVATE
STATE
Pt. "4I"
Pt. "4G"
Pt. "4E"
Pt. "4D"
Pt. "4H"
Pt. "4F"
Pt. "4B"
Pt. "3F"
Area 4
Area 3
Area 2
Pt. "4A"
Pt. "4C"
Pt. "3D"
Pt. "3E"
Pt. "3C"
Area 5 R/W
PRIVATE
STATE
Pt. "3B"
Area 5 R/W
Area 1
Approximate Net Acres:
Area 1 (CC) - 40 Acres
Area 2 (CC) - 9 Acres
Area 3 (CC) - 77 Acres
Area 4 (CC) - 97 Acres
Area 5 (R/W) - 23 Acres
Total Acres = 246
APPROX. SCALE 1"=1,000'
0' 500' 1000' 1500' 2000'
Pt. "1B"
9
10
16
15
10
11
15
14
Helicopter
Evacuation
Location:
Lat: 45.8307
Long: -123.5568
Pt. "1A"
Pt. "3A"
Pt. "I2"
Pt. "V1"
Spruce Run
Quarry
Pt. "V2"
Pt. "I1"
Pt. "I3"
Area 5 R/W
August Fire Road
Approx. 3.5 miles to
Hwy 26 via Quartz
Creek Road
Pt. "I4"
Quartz Creek Road
LEGEND
Timber Sale Boundary
Existing Landings
Landings to be Constructed
Surfaced Existing Road
New Construction Road
Right of Way Boundary
Property Line
Known Land Survey Corner
Type F Stream
Type N Stream
Pt. "A" Point for Project Work
Stream Buffer Area
Buffer Zone Boundary
Reforestation Area
Green Tree Retention Area
Controlled Felling Area
Helicopter Evacuation Location
Rock Pit
Waste Area
Stockpile Site

FOREST PRACTICES ACT "WRITTEN PLAN"
For Rotorwash – Stream Enhancement

Landowner: Oregon Department of Forestry
92219 Hwy 202
Astoria, OR 97103
(503) 325-5451

Planned Operation:
Stream enhancement project recommended by ODFW fisheries biologist to be performed in conjunction with adjacent commercial logging. Five structures will be created for stream enhancement. Each structure will be created by placing 3-5 logs in Quartz Creek. This work will be accomplished using a cable yarding system to place logs into Quartz Creek (Nehalem River tributary) as part of the Rotorwash Timber Sale. At locations to be selected by Dave Plawman, ODFW fisheries biologist, and as cable corridors permit.

Protected Resources:
Quartz Creek, which is designated as a large Type F stream between SE1 to SE2 (approximately 2,500 feet of stream).

Description of Area:
- Operation is located in the Coast Range Geographic Region
- Upland vegetation: predominately red alder 45-61 years old with a minor component of Douglas-fir and hemlock
- RMA vegetation: red alder and salmon berry
- Streamside slopes range from 30% to 70% and the streambed ranges from 20 to 25 feet wide

Planned Resource Protection Measures:
Logs will be lowered with a cable logging system while the cable lines are suspended above the RMA. All trees will be utilized from inside the timber sale area and not from within the RMA. The work will take place during the in-water work period between July 1 – September 15. If the work cannot be done during the designated instream work period an ODFW fisheries biologist will be consulted to field verify any fish habitat concerns and approve any work to be conducted outside the designated period.

Attachments: Exhibit A

Submitted: _____ Date: _____
Purchaser/Operator Contract Representative

Approved: _____ Date: _____
State Lands Forester

Approved: _____ Date: _____
Forest Practices Forester

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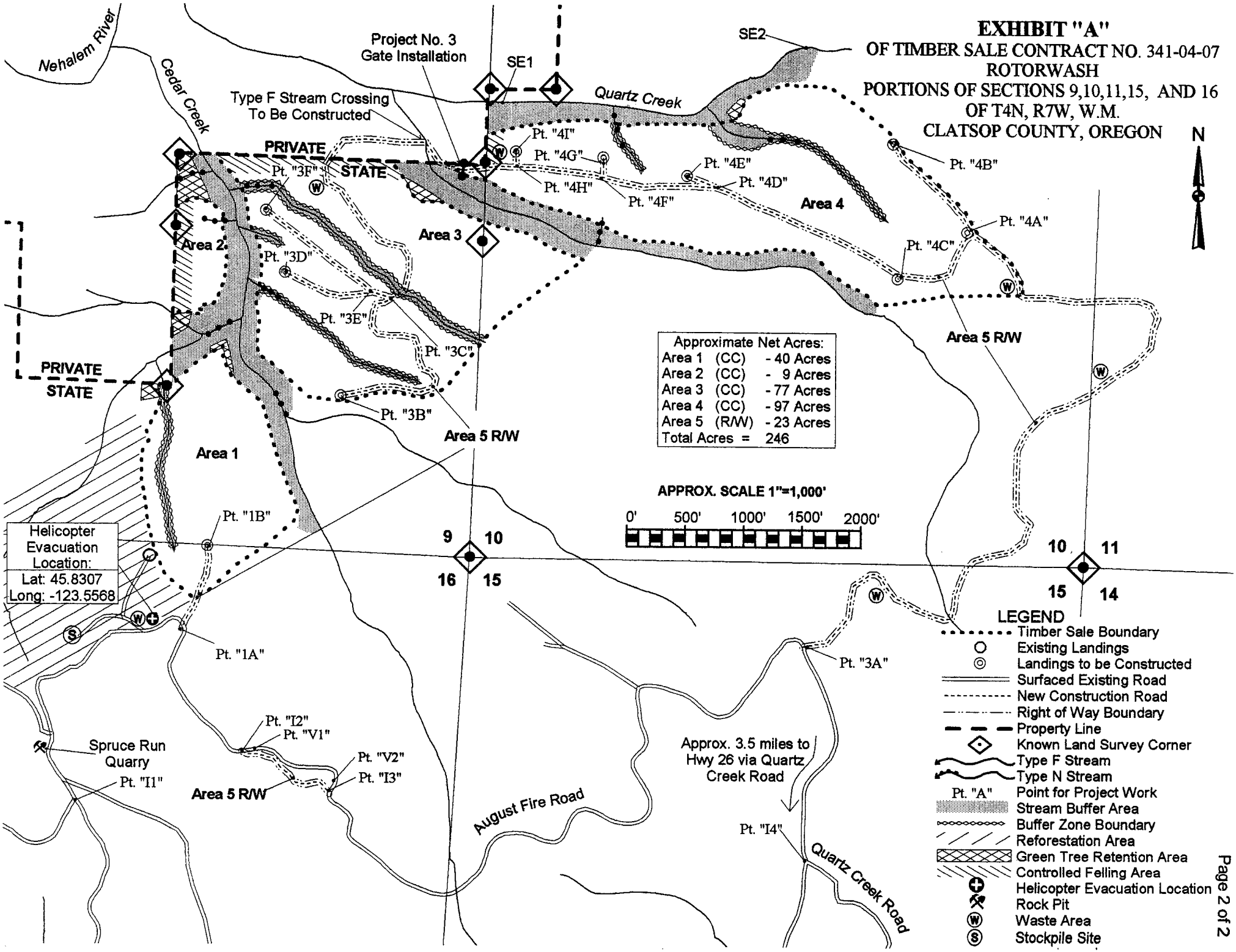
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Pt. "3A"
Pt. "I2"
Pt. "V1"
Spruce Run
Quarry
Pt. "I1"
Pt. "V2"
Pt. "I3"
Area 5 R/W
August Fire Road
Approx. 3.5 miles to
Hwy 26 via Quartz
Creek Road
Pt. "I4"
Quartz Creek Road
LEGEND
Timber Sale Boundary
Existing Landings
Landings to be Constructed
Surfaced Existing Road
New Construction Road
Right of Way Boundary
Property Line
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Type F Stream
Type N Stream
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