



Timber Sale Appraisal
Meier Mainline Combo
Sale AT-341-2016-42-

District: Astoria

Date: May 11, 2016

Cost Summary

	Conifer	Hardwood	Total
Gross Timber Sale Value	\$1,786,048.02	\$35,370.37	\$1,821,418.39
		Project Work:	(\$175,903.00)
		Advertised Value:	\$1,645,515.39



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Timber Description

Location: Portions of Sections 3 and 4, T5N, R6W, and portions of Section 33, T6N, R6W, W.M., Clatsop County, Oregon.

Stand Stocking: 60%

Specie Name	AvgDBH	Amortization (%)	Recovery (%)
Douglas - Fir	19	0	97
Western Hemlock / Fir	14	0	97
Alder (Red)	17	0	95

Volume by Grade	2S	3S	4S	Camprun	Total
Douglas - Fir	3,525	1,140	189	0	4,854
Western Hemlock / Fir	15	9	6	0	30
Alder (Red)	0	0	0	119	119
Total	3,540	1,149	195	119	5,003

Comments: Pond Values Used: 1st Quarter Calendar Year 2016.

Expected Log Markets: Mist, Clatskanie, Tillamook, Forest Grove, Longview, and Garibaldi.

Western redcedar and Other Cedars Stumpage Price = Pond Value minus Logging Cost:
\$901.66/MBF = \$1,185/MBF - \$283.34/MBF

SCALING COST ALLOWANCE = \$5.00/MBF

FUEL COST ALLOWANCE = \$3.00/Gallon

HAULING COST ALLOWANCE
Hauling costs equivalent to \$780 daily truck cost.

Other Costs (with Profit & Risk to be added):
100% Brand and Paint: \$1/MBF x 5,003/MBF = \$5,003
Machine Washing for Noxious Weed Compliance = \$4,000
Log Loader Slash & Landing Piling (includes Move-In and Pile Materials): (see attached appraisal) = \$3,437
TOTAL Other Costs (with Profit & Risk to be added) = \$12,440

Other Costs (No Profit & Risk added):
None.

ROAD MAINTENANCE
\$21,048/5,003 MBF = \$4.21/MBF (See Attached Appraisal)



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Logging Conditions

Combination#:	1	Douglas - Fir	65.00%
		Western Hemlock / Fir	65.00%
		Alder (Red)	65.00%
Logging System:	Cable: Medium Tower >40 - <70		
Process:	Manual Falling/Delimbing		
yarding distance:	Medium (800 ft)		
downhill yarding:	No		
tree size:	Mature / Regen Cut (900 Bft/tree), 3-5 logs/MBF		
loads / day:	10	bd. ft / load:	4700
cost / mbf:	\$140.43		
machines:	Log Loader (A) Tower Yarder (Medium)		
Combination#:	2	Douglas - Fir	18.00%
		Western Hemlock / Fir	18.00%
		Alder (Red)	18.00%
Logging System:	Shovel		
Process:	Manual Falling/Delimbing		
yarding distance:	Medium (800 ft)		
downhill yarding:	No		
tree size:	Mature / Regen Cut (900 Bft/tree), 3-5 logs/MBF		
loads / day:	18	bd. ft / load:	4700
cost / mbf:	\$46.54		
machines:	Shovel Logger		
Combination#:	3	Douglas - Fir	1.00%
		Western Hemlock / Fir	1.00%
		Alder (Red)	1.00%
Logging System:	Cable: Small Tower <=40		
Process:	Manual Falling/Delimbing		
yarding distance:	Short (400 ft)		
downhill yarding:	No		
tree size:	Small / Thinning 12in (130 Bft/tree), 12-17 logs/MBF		
loads / day:	5	bd. ft / load:	3700
cost / mbf:	\$335.14		
machines:	Log Loader (A) Tower Yarder (Small)		
Combination#:	4	Douglas - Fir	16.00%
		Western Hemlock / Fir	16.00%
		Alder (Red)	16.00%
Logging System:	Shovel		
Process:	Manual Falling/Delimbing		
yarding distance:	Long (1,500 ft)		
downhill yarding:	No		
tree size:	Small / Thinning 12in (130 Bft/tree), 12-17 logs/MBF		
loads / day:	8	bd. ft / load:	3700
cost / mbf:	\$133.02		
machines:	Shovel Logger		



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Logging Costs

Operating Seasons: 3.00	Profit Risk: 12%
Project Costs: \$175,903.00	Other Costs (P/R): \$12,440.00
Slash Disposal: \$0.00	Other Costs: \$0.00

Miles of Road

Road Maintenance: \$4.21

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	5.0
Western Hemlock / Fir	\$0.00	2.0	3.5
Alder (Red)	\$0.00	2.0	3.0



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Logging Costs Breakdown

Logging	Road Maint	Fire Protect	Hauling	Other P/R appl	Profit & Risk	Slash Disposal	Scaling	Other	Total
Douglas - Fir									
\$124.29	\$4.34	\$2.63	\$80.34	\$2.49	\$25.69	\$0.00	\$5.00	\$0.00	\$244.78
Western Hemlock / Fir									
\$124.29	\$4.34	\$2.63	\$114.77	\$2.49	\$29.82	\$0.00	\$5.00	\$0.00	\$283.34
Alder (Red)									
\$124.29	\$4.42	\$2.63	\$136.50	\$2.49	\$32.44	\$0.00	\$5.00	\$0.00	\$307.77

Specie	Amortization	Pond Value	Stumpage	Amortized
Douglas - Fir	\$0.00	\$611.71	\$366.93	\$0.00
Western Hemlock / Fir	\$0.00	\$449.00	\$165.66	\$0.00
Alder (Red)	\$0.00	\$605.00	\$297.23	\$0.00



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Amortized

Specie	MBF	Value	Total
Douglas - Fir	0	\$0.00	\$0.00
Western Hemlock / Fir	0	\$0.00	\$0.00
Alder (Red)	0	\$0.00	\$0.00

Unamortized

Specie	MBF	Value	Total
Douglas - Fir	4,854	\$366.93	\$1,781,078.22
Western Hemlock / Fir	30	\$165.66	\$4,969.80
Alder (Red)	119	\$297.23	\$35,370.37

Gross Timber Sale Value

Recovery: \$1,821,418.39

Prepared By: Derek Bangs

Phone: 503-325-5451

Road Maintenance Cost Summary

Sale:	Meier Mainline Combo	MBF:	5,003
Date:	02-Dec-15	\$/MBF:	\$4.21
By:	D. Bangs		

Type	Equipment/Rationale	Move In	Times	Hours	Rate	Cost
Progressive Operations 1st Entry	Grader 14G	\$778	1	24	\$100	\$3,178
Final Haul Maintenance Haul Route	Grader 14G	\$778	1	44	\$100	\$5,178
	Dump Truck 12CY	\$163	1	22	\$79	\$1,901
	Vibratory Roller	\$778	1	44	\$77	\$4,166
	Water Truck 2,500 gallon	\$190	1	22	\$89	\$2,148
	FE Loader C966	\$778	1	22	\$83	\$2,604
	Rubber Tire Backhoe	\$321	1	16	\$77	\$1,553
Total						\$21,048

Progressive Ops. 1st Entry	Production Rates	Miles/day	Distance(miles)	Days
	Grader	2.5	5.0	2.0
Final Road Maintenance	Production Rates	Miles/day	Distance(miles)	Days
	Grader	1.5	8.0	5.3
	Vibratory Roller	1.5	8.0	5.3

Site Prep Appraisal

Sale Number: 341-16-42
Sale Name: Meier Mainline Combo
Date: 12/02/2015

Vegetation Type/Zone	Vegetation Type/Zone Code	Production Rate (hr/ac)	Estimated Piles/Acre
Doug-fir	A	1.0	2.0
Hemlock/Fir	B	1.5	4.0
Hemlock/Spruce	C	2.0	6.0
Hemlock	D	2.0	6.0
Conifer/Hardwood	E	1.5	3.0

Sale Area	Harvest Type	Veg Type/Zone	Ground Based Yarding Acres	Estimated Piling Hours/Area	Cost/Hour	Total Cost/Area
4	MC	A	12	12	\$110.00	\$1,320.00

Sub Total = \$1,320.00

Sale Area	Number of Landings to be Piled	Cost/Landing Pile*	Total Cost/Area	Number of In-Unit Piles	Material Cost/Pile	Total Cost/Area
4	4	\$263.00	\$1,052.00	24	\$5.00	\$120.00

*Cost includes separating firewood

Sub Total = \$1,172.00

Move-In Allowance	Number of Move-In's	Total Move-In Allowance
\$945.00	1	\$945.00

Sub Total = \$945.00

Grand Total = \$3,437.00

SUMMARY OF ALL PROJECT COSTS

SALE NAME: Meier Mainline Combo

ROAD CONSTRUCTION:

	<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
Project No. 1			
	2A to 2B, 3A to 3B,	29.50	\$56,837
	4A to 4B, 4C to 4D,		
	4E and 4F		
	TOTALS		\$56,837

ROAD IMPROVEMENT:

	<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
Project No. 2			
	I1 to I2, I3 to I4,	359.60	\$102,431
	I5 to I6, I7 to I8		
	TOTALS	359.60	\$102,431

SPECIAL PROJECTS:

	<u>Description</u>	<u>Cost</u>
Project No. 3	Fill Vacating	\$2,614
	Project Road Maintence	\$4,514
	TOTAL	\$7,128

MOVE IN:

<u>Equipment</u>	<u>Cost</u>
Dozer (D8)	\$1,406.00
Dozer (D6)	\$778.00
Excavator (C330)	\$1,406.00
Excavator (C315)	\$805.00
Skidder (C518)	\$717.00
Dump Trucks (12cy x 6)	\$978.00
Dump Trucks (20cy x 3)	\$573.00
Front End Loader (C966)	\$778.00
Backhoe (C 580)	\$321.00
Grader (14G)	\$778.00
Vibratory Roller	\$778.00
Water Truck (2,500 gallon)	\$190.00
TOTAL	\$9,508.00

GRAND TOTAL **\$175,903**

Compiled By: W. Lawrence

Date: 03/08/2016

SALE NAME:	Meier Mainline Combo	NEW CONSTRUCTION:	29.50	STATIONS	0.56	MILES
ROAD:	2A-2B (8+00), 3A-3B (3+20), 4A-4B (3+00),	IMPROVEMENT:			0.00	MILES
POINTS:	4C-4D (1+00), 4E, 4F, A-B (14+30)					

EXCAVATION				x	Rate	=	Cost
2A-2B	Excavator time for opening old road	2		x	\$155.00	=	\$310.00
3A-3B	Excavator time for opening old road	1.00		x	\$122.00	=	\$122.00
4A-4B	Balanced Construction \$/sta	3.00		x	\$122.00	=	\$366.00
	Landing Construction \$/ldg	1		x	\$389.00	=	\$389.00
	Remove existing culvert and re-establish subgrade on West Sager Creek @ 0+00	1		x	\$155.00	=	\$155.00
4C-4D	Balanced Construction \$/sta	1.00		x	\$389.00	=	\$389.00
	Landing Construction \$/ldg	1		x	\$389.00	=	\$389.00
4E and 4F	Landing Construction \$/ldg	2		x	\$389.00	=	\$778.00
A - B	Common Drift \$/cy	3.103		x	\$1.80	=	\$5,585.40
	Embankment Compaction \$/CY	3.047		x	\$0.70	=	\$2,132.90
	Cutslope Rounding \$/sta.	8.00		x	\$43.00	=	\$344.00
	Fill Armor Placement w/C330, \$/Hr	5.0		x	\$155.00	=	\$775.00
	Free Draining Fill C330 \$/Hr	5.0		x	\$155.00	=	\$775.00
SUB TOTAL FOR EXCAVATION							\$12,510

CULVERT MATERIALS AND INSTALLATION									
Location	Dia/type	Lineal ft.	Rate	Cost	Location	Dia/type	Lineal ft.	Rate	Cost
2A to 2B					A to B				
0+00	18"CPP	30	\$19.53	\$585.90	3+40	18" CPP	30	\$19.53	\$585.90
3+00	18"CPP	30	\$19.53	\$585.90	4+60	18" CMP	70	\$24.68	\$1,727.60
3A to 3B					7+00				
0+00	18"CPP	30	\$19.53	\$585.90	10+00	18" CPP	30	\$19.53	\$585.90
4A to 4B									
0+00	18"CPP	40	\$19.53	\$781.20					
Other/miscellaneous:					Description	Quantity	Rate	Cost	
					Free draining fill fabric 10 oz. non-woven yd	1.00	\$500.00	\$500.00	
					Labor	4	\$40.00	\$160.00	
					Seeding and mulching			\$400.00	
Culvert stakes & markers:					Culvert markers	7	\$20.00	\$140.00	
SUB TOTAL FOR CULVERT MATERIALS & INSTALLATION									
\$7,224									

SURFACING		Subgrade prep:		Description		Stations/ amount		Rate/ sta/amt		Cost	
				Grade, Shape and Ditch 16'				x		\$732.49	
				Subgrade Compaction				x		\$595.61	
								x			
ROAD SEGMENT		2A to 2B		POINT TO POINT		Sta. to Sta.		TOTAL		Rate/	
Application		Rock Size and Type		Depth of Rock (inches)		Location		Volume (CY) per station		Sta./amt.	
Base Rock		4"-0" crushed		8		0+00 to 8+00		50		8.00	
Turnarounds		4"-0" crushed		8				TA		1	
Turnarounds		4"-0" crushed		8				TO		22	
Total Rock for Road Segment:				2A to 2B						499	
ROAD SEGMENT		3A to 3B		POINT TO POINT		Sta. to Sta.		TOTAL		Rate/	
Application		Rock Size and Type		Depth of Rock (inches)		Location		Volume (CY) per station		Sta./amt.	
Base Rock		4"-0" crushed		8		0+00 to 3+20		50		3.20	
Landings		6"-0" pit run		N/A		3B		Landing		50	
Total Rock for Road Segment:				3A to 3B						210	
ROAD SEGMENT		4A to 4B		POINT TO POINT		Sta. to Sta.		TOTAL		Rate/	
Application		Rock Size and Type		Depth of Rock (inches)		Location		Volume (CY) per station		Sta./amt.	
Base Rock		4"-0" crushed		8		0+00 to 3+00		50		3.00	
Junction Rock		1 1/2"-0" crushed		8		0+00		Junctions		22	
Subgrade Reconstruction		1 1/2"-0" crushed		N/A		0+00		load		11	
Culvert Bedding/Backfill		1 1/2"-0" crushed		N/A		0+00		load		11	
Landings		6"-0" pit run		N/A		4B		Landing		70	
Total Rock for Road Segment:				4A to 4B						308	
ROAD SEGMENT		4C to 4D		POINT TO POINT		Sta. to Sta.		TOTAL		Rate/	
Application		Rock Size and Type		Depth of Rock (inches)		Location		Volume (CY) per station		Sta./amt.	
Base Rock		4"-0" crushed		8		0+00 to 1+00		50		1.00	
Junction Rock		1 1/2"-0" crushed		8		0+00		Junctions		22	
Landings		6"-0" pit run		N/A		4D		Landing		70	
Total Rock for Road Segment:				4C to 4D						142	
ROAD SEGMENT		4E and 4F		POINT TO POINT		Sta. to Sta.		TOTAL		Rate/	
Application		Rock Size and Type		Depth of Rock (inches)		Location		Volume (CY) per station		Sta./amt.	
Base Rock		4"-0" crushed		8		N/A		4E and 4F		N/A	
Junction Rock		1 1/2"-0" crushed		8		0+00		Junctions		22	
Landings		6"-0" pit run		N/A		4F		Landing		70	
Total Rock for Road Segment:				4E and 4F						120	

\$3,443

\$1,555

\$2,288

\$1,131

\$1,081

ROAD SEGMENT			A to B		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per station	Number of junctions	0+00 to 14+30					
Base Rock	4"-0" crushed	0+00 to 14+30	10	station	14.30	stations	2	junctions	901	\$6.90	\$6,216
Junctions	4"-0" crushed	0+00, 14+30 3+70, 6+40,	10	junction	88	junctions	2	junctions	176	\$6.90	\$1,214
Turnouts	4"-0" crushed	9+20	10	TO	28	TO's	3	TO's	84	\$6.90	\$580
Curve Widening	4"-0" crushed	1+15 to 3+60, 4+15 to 5+25, 5+85 to 7+00, 7+60 to 9+70, 10+30 to	10	N/A	n/a	N/A	N/A	N/A	420	\$6.90	\$2,898
Surfacing Rock	3/4"-0" crushed	0+00 to 14+30	4	station	25	stations	14	junctions	358	\$6.90	\$2,467
Junctions	3/4"-0" crushed	0+00, 14+30	4	junction	22	junctions	2	junctions	44	\$6.90	\$304
Turnouts	3/4"-0" crushed	3+70, 6+40, 9+20	4	TO	11	TO's	3	TO's	33	\$6.90	\$228
Curve Widening	3/4"-0" crushed	1+15 to 3+60, 4+15 to 5+25, 5+85 to 7+00, 7+60 to 9+70, 10+30 to	4	N/A	N/A	N/A	N/A	N/A	166	\$6.90	\$1,145
Bedding and backfill	3/4"-0" crushed	4+60	N/A	N/A	N/A	N/A	N/A	N/A	55	\$6.90	\$380
Free Draining Fill	24"-6" riprap	4+60	N/A	N/A	N/A	N/A	N/A	N/A	110	\$9.01	\$991
Fill Armor	24"-6" riprap	4+60	N/A	N/A	N/A	N/A	N/A	N/A	110	\$9.01	\$991
Total Rock for Road Segment:									2,456		\$17,413
SUB TOTAL FOR SURFACING											
\$29,906											

SPECIAL PROJECTS			
	Description	Cost	
		6 1/2 oz. woven fabric - road fabric (A to B(0+00-14+30))	#####
		Develop riprap (220c.y. @ \$4.30/c.y.)	\$946.00
SUB TOTAL FOR SPECIAL PROJECTS			\$3,266
	Subtotal of Surfacing & Spec. Proj.		\$33,172
	Subtotal of Clearing, Exc., Culv.		\$23,665
	GRAND TOTAL		\$56,837

Compiled By: D.Bangs / W.Lawrence Date: 03/08/2016

Subtotal of Surfacing & Spec. Proj. \$33,172
Subtotal of Clearing, Exc., Culv. \$23,665

SUMMARY OF CONSTRUCTION COSTS

SALE NAME: Meier Mainline Combo

ROAD: 11-12(241.8 Sta.),13-14(87.6 Sta.),

POINTS: 15-16(11.8 Sta.), 17-18(8.4 Sta.), 19-10(10.0Sta.)

NEW CONSTRUCTION:

IMPROVEMENT:

STATIONS

STATIONS

0.00 MILES

6.81 MILES

CLEARING & GRUBBING							
Method		Acres/amount	x	Rate	=	Cost	
13 to 14							
0+00 - 87+60							
Daylighting, decking non-merch,							
and slash disposal		(C315)hrs.	x	\$101.00	=	\$3,030.00	
		(D.Truck)hrs.	x	\$79.00	=	\$2,370.00	
SUB TOTAL FOR CLEARING & GRUBBING							\$5,400

EXCAVATION							
Material		Cy/amount	x	Rate	=	Cost	
13 to 14							
0+00 Construct truck turnaround (\$/turnaround)		1.0	x	\$180.00	=	\$180.00	
9+60 Install three rock ditch filters (C315)hrs.		1.0	x	\$101.00	=	\$101.00	
11+10 Install dissipator (C315)hrs.		1.0	x	\$101.00	=	\$101.00	
13+70 Repair sinkholes / remove slumped material (C315)hrs.		3.0	x	\$101.00	=	\$303.00	
		(D.Truck)hrs.	x	\$79.00	=	\$237.00	
17+00 Install large dissipator (C330)hrs.		3.0	x	\$155.00	=	\$465.00	
		(D.Truck)hrs.	x	\$79.00	=	\$237.00	

SURFACING									
Subgrade prep:			Description			Stations/ amount	Rate/ sta/amt	Cost	
			Grade, Shape and Ditch 16' (11-12, 13-14, 15-16, 17-18, 19-110)				x	\$24.83	\$8,928.87
			Subgrade Compaction (13-14, 15-16, 17-18, 19-110)			359.60	x	\$20.19	\$2,378.38
			Sod Removal & Ditch Restoration: (13-14, 15-16, 17-18, 19-110)(extra Grader time \$(Sta.)			117.80	x	\$22.23	\$2,618.69
			Sod Removal & Ditch Restoration: (13-14, 15-16, 17-18, 19-110)(extra Backhoe time \$(Sta.)			117.80	x	\$16.90	\$1,990.82
			Sod Removal & Ditch Restoration: (13-14, 15-16, 17-18, 19-110)(extra D.Truck time \$(Sta.)			117.80	x	\$17.40	\$2,049.72
ROAD SEGMENT		11 to 12	POINT TO POINT		Sta. to Sta.	TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per load	Number of loads				
Surface Leveling Rock	3/4"-0" crushed	0+00 – 241+80	N/A	11	60	660	\$6.90	\$4,554	
Total Rock for Road Segment:						660			\$4,554
ROAD SEGMENT		13 to 14	POINT TO POINT		Sta. to Sta.	TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per load	Number of loads				
Subgrade Leveling Rock	4"-0" crushed	0+00 – 87+60	N/A	11	20	220	\$6.90	\$1,518	
Turnaround	4"-0" crushed	0+00	N/A	11	loads	22	\$6.90	\$152	
Surfacing	4"-0" crushed	17+20 – 87+60	4	station	70.4	1,760	\$6.90	\$12,144	
		35+70, 43+90, 51+25, 55+50, 67+30, 68+10, 81+11							
Turnouts	4"-0" crushed	81+11	4	turnout	turnouts	7	\$6.90	\$531	
Turnaround	4"-0" crushed	87+20	4	turnaround	11	turnaround	1	\$6.90	\$76
Junctions	4"-0" crushed	23+70, 59+95, 81+95	4	junction	11	junctions	3	\$6.90	\$228
		34+60-37+70, 49+70-52+60, 54+10-60+70, 64+60-66+45, 68+80-74+40, 76+80-82+40, 84+30-87+00							
Traction Rock	3/4"-0" crushed	84+30-87+00	3	station	19	stations	28.4	\$6.90	\$3,717
Subgrade Reinforcement	4"-0" crushed	13+70, 46+10	N/A	33	location	2	\$6.90	\$455	
		3+50, 11+10, 45+60, 49+85, 68+80, 71+60, 79+55							
Culvert Bedding and Backfill	1 1/2"-0" crushed	79+55	N/A	culvert	33	culverts	7	\$7.07	\$1,633
		11+10, 33+05, 37+30, 42+35, 45+60, 49+85, 54+30, 71+60, 75+70, 79+55							
Culvert Energy Dissipator	24"-6" riprap	75+70, 79+55	N/A	dissipator	11	dissipators	10	\$9.01	\$991
Additional Culvert Energy Dissipator	24"-6" riprap	75+70	N/A	dissipator	11	dissipators	1	\$9.01	\$99

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Compiled By: W.Lawrence

Date: 03/08/2016

Ditch Drain and Buttress ConstructionWill Lawrence
03/08/2016Location: 13-14 (44+70 to 45+30)

Materials	Quantity		\$	Total
12" double wall perforated drain pipe	60	ft	\$4.93	\$296
Perforated drain pipe coupler	3	ea	\$4.93	\$15
Drain pipe delivery	1	\$	\$300.00	\$300
24"-12" Riprap	66	cy		*see rock sheet
12"-6" Riprap	33	cy		*see rock sheet
2"-1" Drain Rock	33	cy		*see rock sheet
10 oz. Non-Woven Fabric, 8' wide	120	ft	\$2.75	\$330
4.5 oz. Woven Fabric, 16' wide	60	ft	\$1.80	\$108
Seeding and Mulching	0.2	ac	\$1,749.00	\$350

\$1,398.39

Equipment/Labor Costs	Quantity		\$/Hr.	Hours	Total
Excavator(C330)					
	Operating	1	\$155.00	6	\$930
	Stand-By	1	\$155.00	2	\$310
Dump Truck					
	Dump Truck	1	\$79.00	4	\$316
	Dump Truck	2	\$158.00	2	\$316
Laborer		2	\$80.00	1	\$80

\$1,952.00**Project Total \$3,350.39**

CRUSHED ROCK COST

SALE NAME: Meier Mainline
PROJECT:
QUARRY: Cow Creek Stockpiles

DATE: 03/08/2016
BY: W.Lawrence

[illegible]

ROCK HAUL:

Truck type:	<u>D20</u>	No. trucks:	<u>3</u>
Delay min.:	<u>8</u>	Efficiency:	<u>85%</u>

Ave haul:	\$5.64	/cy
Load:	\$0.48	/cy
Spread:	\$0.78	/cy

Truck type:	<u>D12</u>	No. trucks:	<u>6</u>
Delay min.:	<u>6</u>	Efficiency:	<u>85%</u>

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

Production: cy/day = 1,098

CRUSHED ROCK HAUL COSTS 8,033 cy @ \$6.90 /cy

PIT RUN ROCK COST

SALE NAME: Meier Mainline
PROJECT: _____
QUARRY: Northrup Quarry Stockpile

MATERIAL: 1 1/2"-0"

DATE: 03/08/2016
BY: W.Lawrence

[illegible]

ROCK HAUL:

Truck type:	<u>D20</u>	No. trucks:	<u>3</u>
Delay min.:	<u>8</u>	Efficiency:	<u>85%</u>

Ave haul:	\$5.80	/cy
Load:	\$0.48	/cy
Spread:	\$0.78	/cy

Truck type:	<u>D12</u>	No. trucks:	<u>6</u>
Delay min.:	<u>6</u>	Efficiency:	<u>85%</u>

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

Production: cy/day = 1,066

CRUSHED ROCK HAUL COSTS

501 cy @ \$7.07 /cy

RIP RAP ROCK COST

SALE NAME: Meier Mainline
PROJECT: _____
QUARRY: Northrup Quarry

MATERIAL: pit-run & riprap
2"-1" drainrock

DATE: 03/08/2016
BY: W.Lawrence

[illegible]

ROCK HAUL:

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

Ave haul:	\$6.61	/cy
Load:	\$0.84	/cy
Spread:	\$1.56	/cy

Truck type:	<u>D12</u>	No. trucks:	<u>6</u>
Delay min.:	<u>6</u>	Efficiency:	<u>85%</u>

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

Production: cy/day = 573

CRUSHED ROCK HAUL COSTS 1,031 cy @ \$9.01 /cy

Meier Mainline Combo Timber Sale Vacating Costs V1 and V2									
Work Description	Station	C330	C315	D24 trk	D10/12 trk	D-8	Labor	Straw-bales	Seed-lbs
Walk equipment to V1		2.00							
V1: Vacate Fill		5.50					0.50	4	2.5
Walk equipment from V1 to V2		1.00							
V2: Vacate Fill		5.50					0.50	4	2.5
Walk equipment out from V2		2.00							
Total Quantity (Hours)		16.00	0.00	0	0	0	1	8	5
Rates		\$155.00	\$101.00	\$127.00	\$99.00	\$158.00	\$40.00	\$10.73	\$1.60
Total Dollars		\$2,480	\$0	\$0	\$0	\$0	\$40	\$86	\$8

Total Cost

\$2,614

Projects Road Maintenance Cost Summary

Sale: Meier Mainline Combination
Date: 09-Mar-16
By: W. Lawrence

Type	Equipment/Rationale			Hours	Rate	Cost
Project Work	Grader 14G			14	\$100	\$1,367
Final Haul	Dump Truck 12CY			10	\$79	\$790
Road	FE Loader C966			5	\$83	\$415
Maintenance	Vibratory Roller			14	\$77	\$1,052
	Water Truck 2,500 gallon			10	\$89	\$890
Total						\$4,514

Production Rates

Grader

Vibratory Roller

Miles/day	Distance(miles)	Days
1.5	2.05	1.4
1.5	2.05	1.4

NOTE:

Northrup Creek Road (Foster to P/L) =	0.75	Miles
Cow Creek Road (3/4"-0" S.P. to Northrup) =	0.10	Miles
Foster Rd. & Northrup Quarry Rd. (Northrup Quarry to Northrup) =	0.90	Miles
A to B=	0.30	Miles
TOTAL=	2.05	Miles

**Meier Mainline Combo
TIMBER CRUISE REPORT
FY 2016**

1. Sale Area Location: Areas 1, 2, 3, 4, and 5 are located in portions of Sections 3 and 4, of T5N, R6W, and portions of Section 33 of T6N, R6W, W.M. Clatsop County, OR.
2. Fund Distribution: BOF 100%
Tax Code 8-01 (100%)
3. Sale Acreage by Area:

Area	Treatment	Gross Acres	Non-Thinnable	Existing R/W	New R/W	Stream Buffer	Net Acres	Survey Method
1	Partial Cut	91	0	2	0	17	72	GIS
2	Partial Cut	42	3	2	0	6	31	GIS
3	Partial Cut	35	0	1	0	8	26	GIS
4	Modified Clearcut	61	0	3	1	2	55	GIS
5 R/W	Right-of-way	3	0				3	LxW
TOTALS		232	3	8	1*	33	187	

* There are two acres of out of sale Right-of-Way associated with the tie-thru-road

4. Cruisers and Cruise Dates:

The sale areas were cruised by Ty Williams, Derek Bangs, Kevin Berry, Nick Haile, and Dave Rygell 11/06/15 through 11/08/15.

5. Cruise Method and Computation:

Areas 1, 2, and 3 are Partial Cut units and were variable plot cruised using a 33.61 BAF. These plots are located on a 4 chain by 9 chain grid, with every third plot measured and graded. A total of 37 plots were sampled, with 13 measured and graded plots, and 24 count plots.

Area 4 is a Modified Clearcut unit and was variable plot cruised using a 40 BAF. These plots are located on a 3 chain by 4 chain grid, with every third plot measured and graded. A total of 48 plots were sampled, with 16 measured and graded plots, and 32 count plots.

Area 5 is the in-sale right-of-way and the cruise for Areas 1, 2, and 3 was used to calculate volume.

All Areas: Data was collected on Allegro 2 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.

* Statistic report "cruise" and "count" plot totals for A14MC vary due to one count plots with a measured and graded Doug-fir Leave tree.

AREA	CRUISE	TRACT	TYPE	ACRES
1, 2, & 3	MEIER	AREA123	Take	129
4	MEIER	AREA4	Take	55
5 R/W	MEIER	RIGHT-OF-WAY	ROW	3

6. Timber Description:

Areas 1, 2, and 3 are "auto-mark" thinning units (SDI 37) of Douglas-fir with minor amounts of western hemlock and red alder approximately 40 years of age. The "biggest and best" trees were recorded as "leave" trees to meet a target residual basal area of 160 ft²/acre. The average Douglas-fir tree size to be harvested is 15.4 inches DBH, with an average height of 53 feet to a merchantable top (6 inch d.i.b.). The net volume per acre to be harvested is 6.6 MBF.

Area 4 is a Modified Clearcut unit, approximately 90 years old, consisting of primarily Douglas-fir with minor amounts of western hemlock, red alder, big leaf maple, Sitka spruce, and western red cedar. The average Douglas-fir tree size to be harvested is 22.1 inches DBH, with an average height of 91 feet to a merchantable top (6 inch d.i.b.) The average red alder tree size 18.4 inches DBH and 66 feet to a merchantable top (6 inch d.i.b.) The average big leaf maple is 17.0 inches DBH and 70 feet to a merchantable top (6 inch d.i.b.) The net volume per acre to be harvested is 74.1 MBF.

Area 5 R/W is similar to the timber description mentioned above for Areas 1, 2, and 3. The average volume (net) is approximately 24.7 MBF/acre.

7. Statistical Analysis and Stand Summary

Statistics for Stand B.F. volumes

Area	Estimated CV	Target SE%	Actual CV	Actual SE%
1, 2, and 3 (PC)	35%	7%	36.3%	6.0%
4 (PC)	50%	9%	40.8%	5.9%

8. Volumes by Species and Log Grade:

Volumes by Species and Grade for All Sale Areas: (MBF) Volumes do not include "in-growth."

Species	DBH	Net Vol.	2 Saw	3 Saw	4 Saw	Camp Run	% D & B	% Sale
Douglas-fir	18.6"	4,854	3,525	1,140	189	0	3%	97%
Hemlock/True-fir	14.7"	30	15	9	6	0	4%	<1%
Red Alder/Maple	17.6"	119	0	0	0	119	4%	2%
TOTALS		5,003	3,540	1,149	195	119		

9. Approvals:

Prepared by: D. Bangs Date: 03/22/2016

Unit Forester Approval: [Signature] Date: 3/22/16

10. Attachments:

Volume Reports - 4 pages
Statistics Reports - 5 pages
Log Stock Tables - 2 pages
Stand Table Summary - 2 pages
Cruise Designs and Maps - 6 pages

X:\STATE_FORESTS\UNIT_JEWELL\Timber Sales\2016\Meier Mainline Combo\Sale Prep\Meier_CruiseReport.docx

TC PSPCSTGR

Species, Sort Grade - Board Foot Volumes (Project)

T05N R06W S03 TyTAKE 129.00
 T05N R06W S03 TyTAKE 55.00
 T05N R06W S03 TyROW 3.00

Project: MEIER
 Acres 187.00

Page 1
 Date 3/22/2016
 Time 9:57:46AM

Spp	S T	So rt	Gr ad	% Net BdFt	Bd. Ft. per Acre			Total Net MBF	Percent of Net Board Foot Volume								Average Log				Logs Per /Acre	
					Def%	Gross	Net		Log Scale Dia.					Log Length				Ln Ft	Dia In	Bd Ft		CF/ Lf
									4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99						
D		DOCU			100.0	414											13	12		0.00	6.3	
D		DO2S		72	1.0	19,030	18,847	3,525		2	22	76	1	0	7	92	38	17	517	2.74	36.4	
D		DO3S		24	2.2	6,234	6,098	1,140			93	6	1	2	5	33	35	8	91	0.76	66.9	
D		DO4S		4		1,012	1,012	189		2	92	6		30	36	28	25	6	31	0.41	32.6	
D Totals				97	2.7	26,690	25,956	4,854		0	27	18	55	2	3	14	81	32	10	182	1.28	142.3
H		DO2S		49	7.3	85	78	15			100					100	40	12	194	1.36	.4	
H		DO3S		28		46	46	9		100						100	40	7	70	0.75	.7	
H		DO4S		23		35	35	6		100					100		23	6	30	0.56	1.2	
H Totals				1	3.7	166	160	30		51	49			22		78	31	7	71	0.82	2.2	
A		DOCU			100.0	24											6	15		0.00	.5	
A		DOCR		100	.7	279	277	52	4	60	37		3	11	16	70	33	9	110	1.03	2.5	
A Totals				1	8.6	303	277	52	4	60	37		3	11	16	70	28	10	93	1.00	3.0	
M		DOCR		100		359	359	67	14	86				14		86	34	8	105	0.90	3.4	
M Totals				1		359	359	67	14	86				14		86	34	8	105	0.90	3.4	
Totals					2.8	27,518	26,752	5,003	0	28	18	54	2	3	14	81	32	10	177	1.26	150.9	

T TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)								Page 1							
		Project: MEIER								Date 3/22/2016							
										Time 9:58:24AM							
T05N R06W S03 TTAKE										T05N R06W S03 TTAKE							
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt								
05N	06W	03	AREA123	TAKE	129.00	37	24	1	W								
S So Gr T rt ad Spp		% Net BdFt	Bd. Ft. per Acre Def% Gross Net		Total Net MBF	Percent Net Board Foot Volume								Average Log		Logs Per /Acre	
						Log Scale Dia.				Log Length				Ln Dia Bd CF/ Ft In Ft Lf			
						4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99				
D	DO	CU		00.0	499					13	12		0.00	8.2			
D	DO	2S	14	6.9	1,004	934	121	100	19	27	54	32	13	170	1.53	5.5	
D	DO	3S	78	3.0	5,341	5,181	668	95 5		1	38	60	35	8	92	0.77	56.0
D	DO	4S	8		491	491	63	100	51	34	15	21	6	25	0.46	19.9	
D Totals		100	9.9	7,335	6,607	852	82	18	6	3	35	55	30	8	74	0.74	89.6
Type Totals			9.9	7,335	6,607	852	82	18	6	3	35	55	30	8	74	0.74	89.6

T TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)										Page 1									
		Project: MEIER										Date 3/22/2016									
												Time 9:58:24AM									
T05N R06W S03 TTAKE										T05N R06W S03 TTAKE											
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt												
05N	06W	03	AREA4	TAKE	55.00	48	105	1	W												
S So Gr Spp T rt ad		%	Net	Bd. Ft. per Acre			Total	Percent Net Board Foot Volume								Average Log			Logs Per /Acre		
								Log Scale Dia.				Log Length				Ln	Dia	Bd		CF/	
			BdFt	Def%	Gross	Net	Net MBF	4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99	Ft	In	Ft	Lf		
D DO CU				00.0	197											6	22		0.00	1.2	
D DO 2S		85		.7	61,901	61,453	3,380		2	19	79		0	0	6	93	38	18	564	2.88	109.0
D DO 3S		11		.9	7,926	7,854	432		92	6	2		5	10	25	60	34	8	89	0.73	88.6
D DO 4S		4			2,210	2,210	122		4	87	9		19	36	36	10	27	6	36	0.37	61.1
D Totals			96		1.0	72,234	71,517	3,933	0	15	17	68	1	2	9	87	34	12	275	1.68	259.9
M DO CR		100			1,221	1,221	67		14	86				14		86	34	8	105	0.90	11.6
M Totals			2			1,221	1,221	67	14	86				14		86	34	8	105	0.90	11.6
A DO CU				00.0	82												6	15		0.00	1.6
A DO CR		100		.7	941	934	51		4	59	37		2	11	16	70	33	9	111	1.03	8.4
A Totals			1		8.7	1,023	934	51	4	59	37		2	11	16	70	29	10	94	1.00	10.0
H DO 2S		41		10.0	211	190	10			100							40	12	180	1.30	1.1
H DO 3S		34			158	158	9			100							40	7	70	0.75	2.3
H DO 4S		25			110	110	6			100				100			23	6	30	0.56	3.7
H Totals			1		4.4	479	458	25		58	42			24		76	31	7	66	0.78	7.0
Type Totals					1.1	74,957	74,130	4,077	0	17	17	66	1	3	9	87	34	12	257	1.61	288.5

T TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)										Page 1						
		Project: MEIER										Date 3/22/2016						
												Time 9:58:24AM						
T05N R06W S03 TROW										T05N R06W S03 TROW								
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt									
05N	06W	03	RIGHTOFWAY	ROW	3.00	37	82	1	W									
S So Gr Spp T rt ad		% Net BdFt	Bd. Ft. per Acre		Total Net MBF	Percent Net Board Foot Volume								Average Log		Logs Per /Acre		
		Def%	Gross	Net		Log Scale Dia.				Log Length				Ln	Dia		Bd	CF/ Lf
						4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99	Ft	In	Ft	Lf	
D	DO	CU		00.0	758									14	9		0.00	19.2
D	DO	2S	35	2.7	8,173	7,954	24		100	4	3	18	75	36	13	214	1.62	37.2
D	DO	3S	58	2.1	13,609	13,317	40	87	13	0	3	37	60	35	8	95	0.81	139.8
D	DO	4S	7		1,439	1,439	4	100		34	56	5	6	23	6	28	0.48	52.2
D	Totals		93	5.3	23,979	22,710	68	57	43	4	6	28	62	31	9	91	0.87	248.5
H	DO	2S	88		1,399	1,399	4		100				100	40	13	240	1.57	5.8
H	DO	4S	12		175	175	1	100			100			25	6	30	0.60	5.8
H	Totals		6		1,574	1,574	5	11	89		11		89	33	10	135	1.20	11.7
A	DO	CR	100		133	133	0	100		100				17	10	60	0.94	2.2
A	Totals		1		133	133	0	100		100				17	10	60	0.94	2.2
Type Totals				4.9	25,686	24,417	73	54	46	4	6	26	63	31	9	93	0.89	262.4

TC PSTATS			PROJECT STATISTICS					PAGE 1				
			PROJECT		MEIER		DATE 3/22/2016					
TWP	RGE	SC	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt			
05N	06	03	AREA123	TAKE	187.00	122	680	1	W			
05N	06W	03	AREA4	TAKE								
05N	06W	03	RIGHTOFWAY	ROW								
			PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES					
TOTAL			122	680	5.6							
CRUISE			37	211	5.7	13,831	1.5					
DBH COUNT												
REFOREST												
COUNT			75	469	6.3							
BLANKS			10									
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
DOUG FIR			199	69.0	18.6	70	30.3	130.6	26,690	25,956	5,967	5,879
WHEMLOCK			5	1.8	14.7	39	0.6	2.2	166	160	57	57
R ALDER			6	1.4	18.3	65	0.6	2.5	303	277	89	84
BL MAPLE			1	1.7	17.0	70	0.7	2.7	359	359	104	104
TOTAL			211	74.0	18.5	69	32.1	138.0	27,518	26,752	6,217	6,124
CONFIDENCE LIMITS OF THE SAMPLE												
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR												
CL	68.1	COEFF	SAMPLE TREES - BF				# OF TREES REQ.		INF. POP.			
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR			133.4	9.4	789	872	954					
WHEMLOCK			92.3	45.9	70	130	190					
R ALDER			46.1	20.5	147	185	223					
BL MAPLE												
TOTAL			137.3	9.4	753	832	910	752	188	84		
CL	68.1	COEFF	TREES/ACRE				# OF PLOTS REQ.		INF. POP.			
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR			118.8	10.7	62	69	76					
WHEMLOCK			367.0	33.2	1	2	2					
R ALDER			545.0	49.3	1	1	2					
BL MAPLE			713.0	64.5	1	2	3					
TOTAL			111.0	10.0	67	74	81	492	123	55		
CL	68.1	COEFF	BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.			
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR			96.0	8.7	119	131	142					
WHEMLOCK			345.2	31.2	1	2	3					
R ALDER			568.0	51.4	1	2	4					
BL MAPLE			713.0	64.5	1	3	4					
TOTAL			91.9	8.3	126	138	149	337	84	37		
CL	68.1	COEFF	NET BF/ACRE				# OF PLOTS REQ.		INF. POP.			
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR			109.4	9.9	23,387	25,956	28,526					
WHEMLOCK			373.5	33.8	106	160	214					
R ALDER			564.5	51.1	135	277	418					
BL MAPLE			713.0	64.5	128	359	591					
TOTAL			107.2	9.7	24,159	26,752	29,345	458	115	51		

TC TSTATS				STATISTICS				PAGE 1			
				PROJECT MEIER		DATE 3/22/2016					
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt		
05N	06W	03	AREA123	00PC	129.00	37	254	1	W		
				TREES	ESTIMATED	PERCENT					
				PER PLOT	TOTAL	SAMPLE					
					TREES	TREES					
		PLOTS	TREES								
TOTAL		37	254	6.9							
CRUISE		13	84	6.5	19,418	.4					
DBH COUNT											
REFOREST											
COUNT		24	170	7.1							
BLANKS											
100 %											
STAND SUMMARY											
		SAMPLE	TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS	NET
		TREES	/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC	CF/AC
DOUGLEAV		56	88.1	17.3	60	34.5	143.5	16,581	16,003	4,801	4,718
DOUG FIR		24	54.1	15.4	53	17.8	69.9	7,335	6,607	2,113	2,001
HEMLEAV		1	5.8	20.0	67	2.8	12.7	1,574	1,574	455	455
ALDRLEAV		1	2.2	15.0	18	0.7	2.7	133	133	36	36
SPRUCELV		2	.4	30.5	85	0.3	1.8	369	346	84	84
TOTAL		84	150.5	16.8	57	56.4	230.7	25,992	24,663	7,487	7,293
CONFIDENCE LIMITS OF THE SAMPLE											
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR											
CL: 68.1 %		COEFF		SAMPLE TREES - BF			# OF TREES REQ.		INF. POP.		
SD: 1.0		VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUGLEAV		44.8	6.0	207	220	234					
DOUG FIR		50.7	10.6	124	139	154					
HEMLEAV											
ALDRLEAV											
SPRUCELV		8.1	7.5	892	965	1,038					
TOTAL		71.7	7.8	197	214	230	205	51	23		
CL: 68.1 %		COEFF		TREES/ACRE			# OF PLOTS REQ.		INF. POP.		
SD: 1.0		VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUGLEAV		33.0	5.4	83	88	93					
DOUG FIR		90.2	14.8	46	54	62					
HEMLEAV		313.6	51.5	3	6	9					
ALDRLEAV		448.3	73.6	1	2	4					
SPRUCELV		608.3	99.9	0	0	1					
TOTAL		35.0	5.8	142	151	159	49	12	5		
CL: 68.1 %		COEFF		BASAL AREA/ACRE			# OF PLOTS REQ.		INF. POP.		
SD: 1.0		VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUGLEAV		31.5	5.2	136	144	151					
DOUG FIR		90.2	14.8	60	70	80					
HEMLEAV		313.6	51.5	6	13	19					
ALDRLEAV		448.3	73.6	1	3	5					
SPRUCELV		608.3	99.9	0	2	4					
TOTAL		34.2	5.6	218	231	244	47	12	5		
CL: 68.1 %		COEFF		NET BF/ACRE			# OF PLOTS REQ.		INF. POP.		
SD: 1.0		VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUGLEAV		35.1	5.8	15,081	16,003	16,925					
DOUG FIR		91.7	15.1	5,612	6,607	7,602					
HEMLEAV		313.6	51.5	763	1,574	2,385					
ALDRLEAV		448.3	73.6	35	133	231					
SPRUCELV		608.3	99.9	0	346	693					
TOTAL		36.3	6.0	23,192	24,663	26,134	53	13	6		

TC TSTATS				STATISTICS			PAGE 1					
				PROJECT	MEIER	DATE 3/22/2016						
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt			
05N	06W	03	AREA123	TAKE	129.00	37	77	1	W			
			PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES					
TOTAL			37	77	2.1							
CRUISE			8	24	3.0	6,973	.3					
DBH COUNT												
REFOREST												
COUNT			19	53	2.8							
BLANKS			10									
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	
DOUG FIR			24	54.1	15.4	53	17.8	69.9	7,335	6,607	2,113	2,001
TOTAL			24	54.1	15.4	53	17.8	69.9	7,335	6,607	2,113	2,001
CONFIDENCE LIMITS OF THE SAMPLE												
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR												
CL: 68.1 %		COEFF		SAMPLE TREES - BF				# OF TREES REQ.		INF. POP.		
SD: 1.0		VAR.%		S.E.%		LOW	AVG	HIGH	5	10	15	
DOUG FIR		50.7		10.6		124	139	154				
TOTAL		50.7		10.6		124	139	154	107	27	12	
CL: 68.1 %		COEFF		TREES/ACRE				# OF PLOTS REQ.		INF. POP.		
SD: 1.0		VAR.%		S.E.%		LOW	AVG	HIGH	5	10	15	
DOUG FIR		90.2		14.8		46	54	62				
TOTAL		90.2		14.8		46	54	62	325	81	36	
CL: 68.1 %		COEFF		BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.		
SD: 1.0		VAR.%		S.E.%		LOW	AVG	HIGH	5	10	15	
DOUG FIR		90.2		14.8		60	70	80				
TOTAL		90.2		14.8		60	70	80	325	81	36	
CL: 68.1 %		COEFF		NET BF/ACRE				# OF PLOTS REQ.		INF. POP.		
SD: 1.0		VAR.%		S.E.%		LOW	AVG	HIGH	5	10	15	
DOUG FIR		91.7		15.1		5,612	6,607	7,602				
TOTAL		91.7		15.1		5,612	6,607	7,602	336	84	37	

TC TSTATS				STATISTICS				PAGE	1		
				PROJECT	MEIER			DATE	3/22/2016		
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt		
05N	06W	03	AREA123	LEAV	129.00	37	177	1	W		
				TREES	ESTIMATED	PERCENT					
				PER PLOT	TOTAL	SAMPLE					
					TREES	TREES					
TOTAL				37	177	4.8					
CRUISE				13	60	4.6	12,445	.5			
DBH COUNT											
REFOREST											
COUNT				24	117	4.9					
BLANKS											
100 %											
STAND SUMMARY											
SAMPLE		TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS	NET	
TREES		/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC	CF/AC	
DOUGLEAV		56	88.1	17.3	60	34.5	143.5	16,581	16,003	4,801	
HEMLEAV		1	5.8	20.0	67	2.8	12.7	1,574	1,574	455	
ALDRLEAV		1	2.2	15.0	18	0.7	2.7	133	133	36	
SPRUCELV		2	.4	30.5	85	0.3	1.8	369	346	84	
TOTAL		60	96.5	17.5	60	38.5	160.8	18,657	18,057	5,375	
										5,292	
CONFIDENCE LIMITS OF THE SAMPLE											
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR											
CL: 68.1 %	COEFF		SAMPLE TREES - BF				# OF TREES REQ.		INF. POP.		
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15			
DOUGLEAV		44.8	6.0	207	220	234					
HEMLEAV											
ALDRLEAV											
SPRUCELV		8.1	7.5	892	965	1,038					
TOTAL		68.7	8.9	222	243	265	188	47	21		
CL: 68.1 %	COEFF		TREES/ACRE				# OF PLOTS REQ.		INF. POP.		
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15			
DOUGLEAV		33.0	5.4	83	88	93					
HEMLEAV		313.6	51.5	3	6	9					
ALDRLEAV		448.3	73.6	1	2	4					
SPRUCELV		608.3	99.9	0	0	1					
TOTAL		17.7	2.9	94	96	99	13	3	1		
CL: 68.1 %	COEFF		BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.		
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15			
DOUGLEAV		31.5	5.2	136	144	151					
HEMLEAV		313.6	51.5	6	13	19					
ALDRLEAV		448.3	73.6	1	3	5					
SPRUCELV		608.3	99.9	0	2	4					
TOTAL		17.9	2.9	156	161	165	13	3	1		
CL: 68.1 %	COEFF		NET BF/ACRE				# OF PLOTS REQ.		INF. POP.		
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15			
DOUGLEAV		35.1	5.8	15,081	16,003	16,925					
HEMLEAV		313.6	51.5	763	1,574	2,385					
ALDRLEAV		448.3	73.6	35	133	231					
SPRUCELV		608.3	99.9	0	346	693					
TOTAL		25.9	4.3	17,287	18,057	18,826	27	7	3		

TC TSTATS				STATISTICS			PAGE 1			
				PROJECT MEIER			DATE 3/22/2016			
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
05N	06W	03	AREA4	TAKE	55.00	48	351	1	W	
				TREES	ESTIMATED	PERCENT				
				PER PLOT	TOTAL	SAMPLE				
					TREES	TREES				
PLOTS		TREES								
TOTAL		48	351	7.3						
CRUISE		16	105	6.6	6,410	1.6				
DBH COUNT										
REFOREST										
COUNT		32	246	7.7						
BLANKS										
100 %										
STAND SUMMARY										
SAMPLE		TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS	NET
TREES		/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC	CF/AC
DOUG FIR		95	100.3	22.1	91	57.0	268.3	72,234	71,517	14,954
BL MAPLE		1	5.8	17.0	70	2.2	9.2	1,221	1,221	355
R ALDER		5	4.5	18.4	66	1.9	8.3	1,023	934	300
WHEMLOCK		4	5.9	14.4	38	1.8	6.7	479	458	169
TOTAL		105	116.5	21.5	87	63.2	292.5	74,957	74,130	15,778
CONFIDENCE LIMITS OF THE SAMPLE										
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR										
CL: 68.1 %	COEFF		SAMPLE TREES - BF				# OF TREES REQ.		INF. POP.	
SD: 1.0	VAR. %	S.E. %	LOW	AVG	HIGH	5 10		15		
DOUG FIR	81.1	8.3	1,491	1,626	1,761					
BL MAPLE										
R ALDER	31.6	15.7	177	210	243					
WHEMLOCK	110.6	63.2	35	95	155					
TOTAL	89.2	8.7	1,357	1,487	1,616	318	79	35		
CL: 68.1 %	COEFF		TREES/ACRE				# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR. %	S.E. %	LOW	AVG	HIGH	5 10		15		
DOUG FIR	67.9	9.8	90	100	110					
BL MAPLE	443.2	63.9	2	6	10					
R ALDER	344.4	49.7	2	5	7					
WHEMLOCK	231.1	33.3	4	6	8					
TOTAL	56.7	8.2	107	117	126	128	32	14		
CL: 68.1 %	COEFF		BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR. %	S.E. %	LOW	AVG	HIGH	5 10		15		
DOUG FIR	44.0	6.3	251	268	285					
BL MAPLE	443.2	63.9	3	9	15					
R ALDER	356.4	51.4	4	8	13					
WHEMLOCK	226.0	32.6	4	7	9					
TOTAL	35.8	5.2	277	293	308	51	13	6		
CL: 68.1 %	COEFF		NET BF/ACRE				# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR. %	S.E. %	LOW	AVG	HIGH	5 10		15		
DOUG FIR	45.2	6.5	66,860	71,517	76,174					
BL MAPLE	443.2	63.9	441	1,221	2,002					
R ALDER	350.5	50.5	462	934	1,406					
WHEMLOCK	262.5	37.9	285	458	632					
TOTAL	40.8	5.9	69,764	74,130	78,497	67	17	7		

Log Stock Table - MBF

T05N R06W S03 TyTAKE 129.00
T05N R06W S03 TyTAKE 55.00
T05N R06W S03 TyROW 3.00

Project: MEIER
Acres 187.00

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Date 3/22/2016
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S T Spp	So Gr rt de	Log Len	Gross MBF	Def %	Net MBF	% Sp	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 CU	6	15	100.0															
D	DO CU	8	3	100.0															
D	DO CU	10	14	100.0															
D	DO CU	12	21	100.0															
D	DO CU	18	0	100.0															
D	DO CU	20	18	100.0															
D	DO CU	21	6	100.0															
D	DO 2S	15	1		1	.0					1								
D	DO 2S	16	25	7.1	23	.5							23						
D	DO 2S	17	2		2	.0							2						
D	DO 2S	18	1		1	.0							1						
D	DO 2S	20	6		6	.1						4	2						
D	DO 2S	22	2		2	.0							2						
D	DO 2S	24	3		3	.1							3						
D	DO 2S	32	246		245	5.0				8	9	58	64	70	15	8	15		
D	DO 2S	35	3		3	.1			3										
D	DO 2S	37	4	21.4	3	.1					3								
D	DO 2S	38	4		4	.1						4							
D	DO 2S	40	3,261		3,231	66.6				9	40	229	163	739	842	908	272	28	
D	DO 3S	15	5		5	.1					1		2		2				
D	DO 3S	16	3		3	.1				1	2								
D	DO 3S	17	5		5	.1					5								
D	DO 3S	18	0		0	.0					0								
D	DO 3S	19	2		2	.0					2								
D	DO 3S	20	7		7	.1					7								
D	DO 3S	21	3		3	.1				1	2								
D	DO 3S	22	2		2	.0			2										
D	DO 3S	23	7		7	.1			0		5	2							
D	DO 3S	24	3		3	.1					3								
D	DO 3S	25	2		2	.0			2										
D	DO 3S	26	11		11	.2			8		2								
D	DO 3S	27	22		22	.5			2	5	11	5							
D	DO 3S	28	0		0	.0			0										
D	DO 3S	29	3		3	.1			3										
D	DO 3S	30	0		0	.0			0										
D	DO 3S	31	14		14	.3			11			3							
D	DO 3S	32	348	5.1	331	6.8			92	77	123	39							

Log Stock Table - MBF

T05N R06W S03 TyTAKE	129.00
T05N R06W S03 TyTAKE	55.00
T05N R06W S03 TyROW	3.00

Project: MEIER
Acres 187.00

Page 3
Date 3/22/2016
Time 9:58:11AM

S T	So Gr rt de	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	CR	17	0		0	.8					0							
A	DO	CR	20	1		1	2.0			1									
A	DO	CR	28	2		2	3.8		2										
A	DO	CR	29	4		4	7.4			4									
A	DO	CR	32	8		8	16.0						8						
A	DO	CR	40	37	1.0	36	69.9					26		11					
A	Totals			57	8.6	52	1.0		2	5		26	8	11					
M	DO	CR	28	10		10	14.3		10										
M	DO	CR	40	58		58	85.7					58							
M	Totals			67		67	1.3		10			58							
Total	All Species			5,146	2.8	5,003	100.0	5	12	486	258	672	387	275	819	859	916	287	28

TC		Stand Table Summary										Page		1	
PSTNDSUM												Date:		3/22/2016	
T05N R06W S03 TyTAKE129.00 T05N R06W S03 TyTAKE55.00 T05N R06W S03 TyROW3.00		Project		MEIER		Time:		9:58:11AM							
		Acres		187.00		Grown Year:									
S Spec T	DBH	Sample Trees	Tot		Trees/ Acre	BA/ Acre	Logs Acre	Average Log		Tons/ Acre	Net Cu.Ft. Acre	Net Bd.Ft. Acre	Totals		
			FF 16'	Av Ht				Net Cu.Ft.	Net Bd.Ft.				Tons	Cunits	MBF
D	10	4	87	98	6.811	3.71	9.86	12.0	50.0		118	493		221	92
D	11	5	90	108	3.906	2.58	6.36	14.2	52.1		90	331		169	62
D	12	7	86	97	4.898	3.84	7.01	18.8	63.5		132	445		246	83
D	13	10	86	82	9.863	9.09	16.60	16.7	52.5		276	871		517	163
D	14	6	86	42	2.081	2.22	2.16	10.2	24.6		22	53		41	10
D	15	10	86	73	7.404	9.09	11.46	22.7	77.1		261	884		488	165
D	16	14	86	86	8.040	11.23	13.73	26.7	92.1		366	1,264		685	236
D	17	15	87	95	6.400	10.09	13.85	27.9	96.7		386	1,339		722	250
D	18	8	85	90	1.307	2.31	2.61	31.0	105.9		81	277		152	52
D	19	17	86	94	3.169	6.24	6.14	33.7	103.8		207	637		387	119
D	20	15	86	91	3.361	7.33	6.16	35.4	124.9		218	770		408	144
D	21	6	88	125	.434	1.04	1.21	42.0	178.9		51	217		95	41
D	22	6	89	131	.694	1.83	2.00	47.7	204.6		95	410		178	77
D	23	3	87	145	.591	1.70	1.76	52.6	215.2		92	378		173	71
D	24	4	84	131	.556	1.75	1.38	61.8	248.1		85	342		159	64
D	25	4	87	145	.744	2.54	2.22	62.1	270.3		138	600		258	112
D	26	3	88	154	.676	2.49	2.03	71.0	326.7		144	662		269	124
D	27	3	87	157	.627	2.49	2.09	69.6	320.0		145	669		272	125
D	28	2	87	157	.389	1.66	1.36	70.7	330.0		96	449		180	84
D	29	2	87	173	.362	1.66	1.45	70.7	345.0		103	500		192	93
D	30	7	86	172	1.185	5.82	4.74	75.5	371.4		358	1,760		669	329
D	31	3	85	153	.475	2.49	1.43	99.4	466.7		142	666		265	124
D	32	7	88	161	1.041	5.82	3.57	97.0	486.7		346	1,737		648	325
D	33	7	87	165	.979	5.82	3.50	99.1	499.6		347	1,747		648	327
D	34	4	88	171	.527	3.32	2.11	98.9	535.0		209	1,128		390	211
D	35	3	87	153	.373	2.49	1.24	112.7	563.0		140	700		262	131
D	36	3	86	175	.353	2.49	1.29	122.6	657.3		159	850		296	159
D	37	2	86	180	.223	1.66	.89	119.0	640.0		106	570		198	107
D	38	2	86	180	.211	1.66	.84	126.0	676.3		106	571		199	107
D	39	4	86	167	.401	3.32	1.30	152.2	791.5		198	1,030		371	193
D	40	2	86	183	.190	1.66	.76	141.6	760.0		108	579		202	108
D	41	1	86	177	.091	.83	.36	143.5	775.0		52	281		97	53
D	42	2	86	168	.173	1.66	.60	166.3	882.9		101	534		188	100
D	44	2	86	174	.157	1.66	.55	186.6	1020.0		103	562		192	105
D	46	1	89	166	.072	.83	.29	178.0	982.5		51	283		96	53
D	47	1	85	169	.069	.83	.28	185.2	1020.0		51	281		96	53
D	48	1	85	173	.066	.83	.26	193.2	1062.5		51	281		96	53
D	52	2	86	166	.113	1.66	.34	276.7	1521.7		94	514		175	96
D	65	1	88	166	.036	.83	.14	350.0	2027.5		50	292		94	55
D	Totals	199	86	100	69.047	130.60	135.95	43.2	190.9		5,879	25,956		10,993	4,854
M	17	1	87	84	1.710	2.70	3.42	30.5	105.0		104	359		195	67
M	Totals	1	87	84	1.710	2.70	3.42	30.5	105.0		104	359		195	67
A	15	1	86	20	.036	.04	.04	16.0	60.0		1	2		1	0
A	16	1	86	84	.351	.49	.70	27.0	90.0		19	63		35	12
A	17	1	87	91	.311	.49	.62	31.5	110.0		20	68		37	13
A	18	1	87	74	.277	.49	.55	27.5	90.0		15	50		29	9
A	21	1	87	84	.204	.49	.41	47.5	160.0		19	65		36	12
A	22	1	87	64	.186	.49	.19	57.0	150.0		11	28		20	5
A	Totals	6	87	79	1.365	2.49	2.51	33.6	110.4		84	277		158	52
H	12	1	88	26	.624	.49	.62	11.0	30.0		7	19		13	4
H	14	1	85	30	.459	.49	.46	15.0	30.0		7	14		13	3

TC PSTNDSUM		Stand Table Summary								Page 2						
										Date: 3/22/2016						
T05N R06W S03 TyTAKE 129.00					Project MEIER					Time: 9:58:11AM						
T05N R06W S03 TyTAKE 55.00					Acres 187.00					Grown Year:						
T05N R06W S03 TyROW 3.00																
S Spec T	Sample		Tot		Trees/ Acre	BA/ Acre	Logs Acre	Average Log		Tons/ Acre	Net Cu.Ft. Acre	Net Bd.Ft. Acre	Totals			
	DBH	Trees	FF 16'	Av Ht				Net Cu.Ft.	Net Bd.Ft.				Tons	Cunits	MBF	
H	16	1	86	55	.351	.49	.35	35.0	70.0		12	25		23	5	
H	17	1	89	109	.311	.49	.62	38.0	125.0		24	78		44	15	
H	20	1	88	80	.094	.20	.19	39.0	135.0		7	25		14	5	
H	Totals		5	87	49	1.838	2.16	2.24	25.4	71.4		57	160		107	30
Totals			211	86	98	73.960	137.95	144.12	42.5	185.6		6,124	26,752		11,452	5,003

Revised August, 2002

**CRUISE DESIGN
ASTORIA DISTRICT**

Sale Name: Meier Mainline Combo Areas 1, 2, and 3

Harvest Type: (PC) "Partial Cut"

Approx. Cruise Acres: 129 Estimated CV% 35% Net BF **SE% Objective** 7 Net BF

Planned Sale Volume: 892 MBF Estimated Sale Area Value/Acre: \$2,625/Ac
(7.5 MBF/Ac.) (\$350/MBF)

- A. **Cruise Goals:** (a) Grade minimum 50 conifer
(b) Sample 29 cruise plots (13 grade/ 24 count); (c) Other goals (X Determine "automark" thinning standards; X Determine log grades for sale value; X Determine snag and leave tree species and sizes.

B. Cruise Design:

1. **Plot Cruises:** BAF 33.61 (Full point; Half point) (circle one)
Cruise Line Direction(s): AZ= Area 1: 180° (n/s) Area 2: 300° Area 3: 90° (e/w)
Cruise Line Spacing 9 (chains)
Cruise Plot Spacing 4 (chains)
Grade/Count Ratio 1/2

The BA target is 160 sqft. Leave 5 trees every plot. Alder does not count towards the Basal Area. Record all hardwood as camp run. Record all cedar and hardwoods as leave trees. Record all snags as SN and estimate total height and diameter on grade plots. If plot lands in buffer then offset at least 1/2 chain outside the buffer.

C. Tree Measurements:

1. **Diameter:** Minimum DBH to cruise is 8" for conifers and 10" for hardwoods.
Record dbh to nearest 1/2" 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" for conifers and 7" for hardwoods 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 = Camprun; 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. Cruise lines shall begin half the distance between plots from the sale boundary. 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, Yellow Paint.
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.

Cruise Design by: Derek Bangs

Approved by: [Signature] 11/6/15

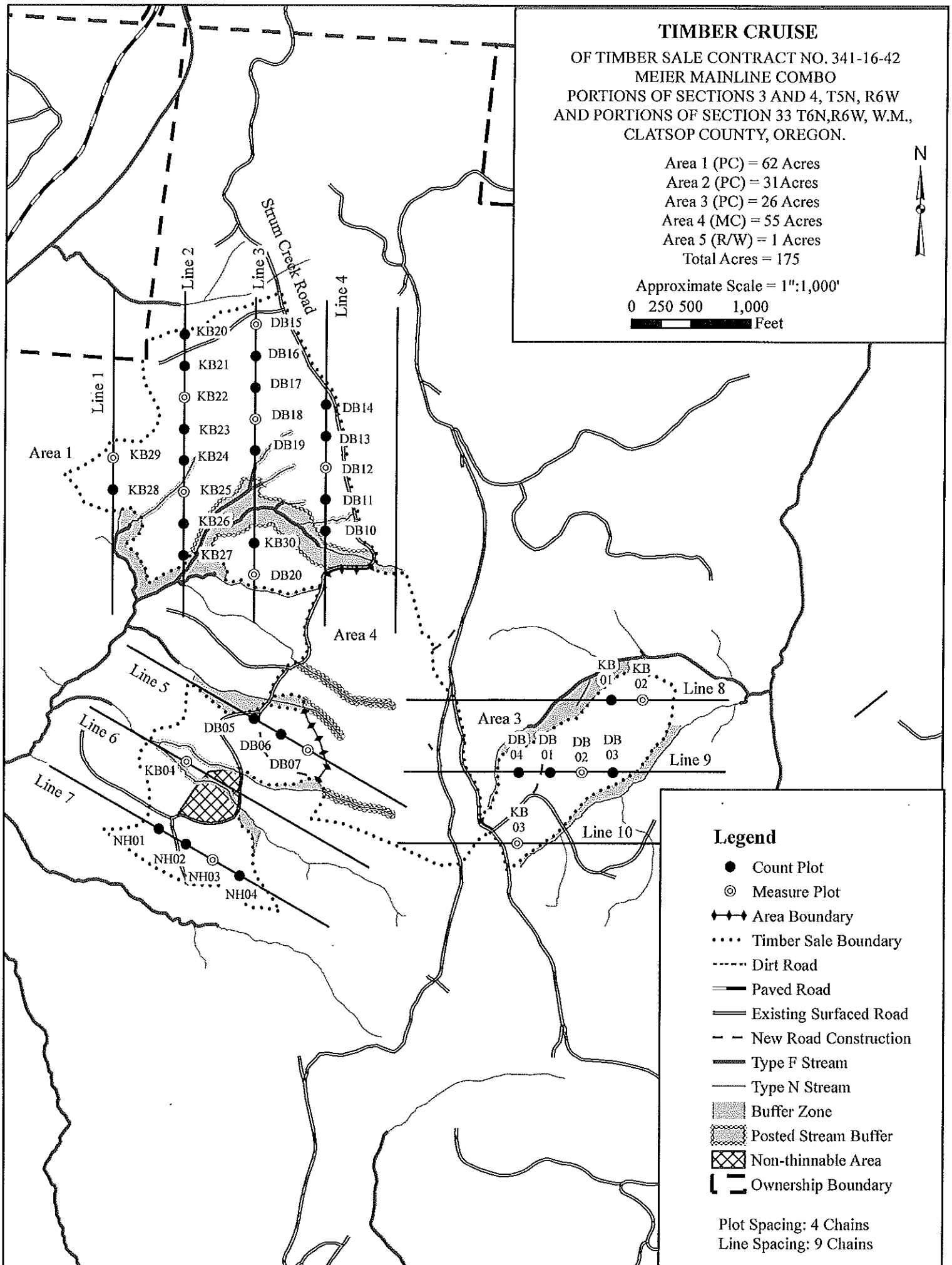
Date: 11/06/2015

TIMBER CRUISE

OF TIMBER SALE CONTRACT NO. 341-16-42
MEIER MAINLINE COMBO
PORTIONS OF SECTIONS 3 AND 4, T5N, R6W
AND PORTIONS OF SECTION 33 T6N, R6W, W.M.,
CLATSOP COUNTY, OREGON.

Area 1 (PC) = 62 Acres
Area 2 (PC) = 31 Acres
Area 3 (PC) = 26 Acres
Area 4 (MC) = 55 Acres
Area 5 (R/W) = 1 Acres
Total Acres = 175

Approximate Scale = 1"=1,000'
0 250 500 1,000
Feet



**CRUISE DESIGN
ASTORIA DISTRICT**

Sale Name: Meier Mainline Combo Area 4

Harvest Type: Modified Clearcut

Approx. Cruise Acres: 55 Estimated CV% 50 Net BF or BA/Acre SE% Objective 9

Planned Sale Volume: 3,000 MBF Estimated Sale Area Value/Acre: \$ 21,000
(80 MBF/Acre) (\$350/acre)

A. **Cruise Goals:** (a) Grade minimum 70 trees:

Determine log grades for sale value; Determine snag and leave tree species and sizes;
Determine "diameter limit" harvest parameters;

B. **Cruise Design:**

1. **Plot Cruises:** BAF 40 Full point
Cruise Line Direction(s) NW/SE
Cruise Line Spacing 4 chains
Cruise Plot Spacing 3 chains
Grade/Count Ratio 1:2

Record all hardwood as camp run. Record all cedar as leave. Record all snags as SN and record diameter & total height. If plot lands in buffer then offset at least 1/2 chain outside the buffer.

C. **Tree Measurements:**

1. **Diameter:** Minimum DBH to cruise is 8" for conifers and 10" for hardwoods.
Record dbh to nearest 1" for trees 8"-24", and to nearest 2" for trees > 24".

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 less than 18" dbh and 40% of dob @ FP for trees greater than 18" dbh.

4. **Form Factors:** (1) Measure or estimate a 16' form factor for every conifer tree measured/graded; Hardwood form factors are a Standard 87.

5. **Tree Segments:** Record log segments in "standard" 32" and 40' log lengths whenever possible. Do not record odd segments just to maximize grade. The maximum segment length is 40'. The minimum segment length is 12' for conifer and 8' for hardwoods. Minimum merchantable diameter for conifer is 8" dbh and 10" dbh for hardwoods. One foot of trim is assumed for each merchantable segment.

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); DL(Douglas-fir over 30"dbh); HL(Western hemlock over 30" dbh); SL(Sitka spruce over 30" dbh); CL (Western red cedar over 30" dbh); NFL (Noble fir over 30" dbh); SFL (Silver fir over 30" dbh)

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.

8. **Standard Field Procedures: Plot Type Cruises**: Mark cruise line beginning and end points with blue/yellow flagging. Cruise lines shall begin half the distance between plots from the sale boundary. 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.

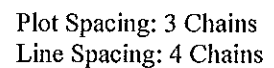
9. **Cruising Equipment**: Relaskop, Rangefinder, Biltmore Stick, Compass, Data Recorder, Cruise Design, Cruise Map, Yellow Flagging, Blue Flagging.

10. **Attachments**: A. Cruise Map (showing cruise unit boundaries, cruise lines and plot locations, BAF or plot size, measure/count plot ratio, north arrow, and scale bar.

Cruise Design by: Derek Bangs
Approved by: [Signature]
Date: 11/09/15

OF TIMBER SALE CONTRACT NO. 341-16-42
MEIER MAINLINE COMBO
PORTIONS OF SECTIONS 3 AND 4, T5N, R6W
AND PORTIONS OF SECTION 33 T6N, R6W, W.M.,
CLATSOP COUNTY, OREGON.

0 250 500 1,000 Feet



LOGGING PLAN

OF TIMBER SALE CONTRACT NO. 341-16-42
MEIER MAINLINE COMBO
PORTIONS OF SECTIONS 3 AND 4, T5N, R6W
AND PORTIONS OF SECTION 33 T6N, R6W, W.M.,
CLATSOP COUNTY, OREGON.

Area 1 (PC) = 72 Acres

Area 2 (PC) = 31 Acres

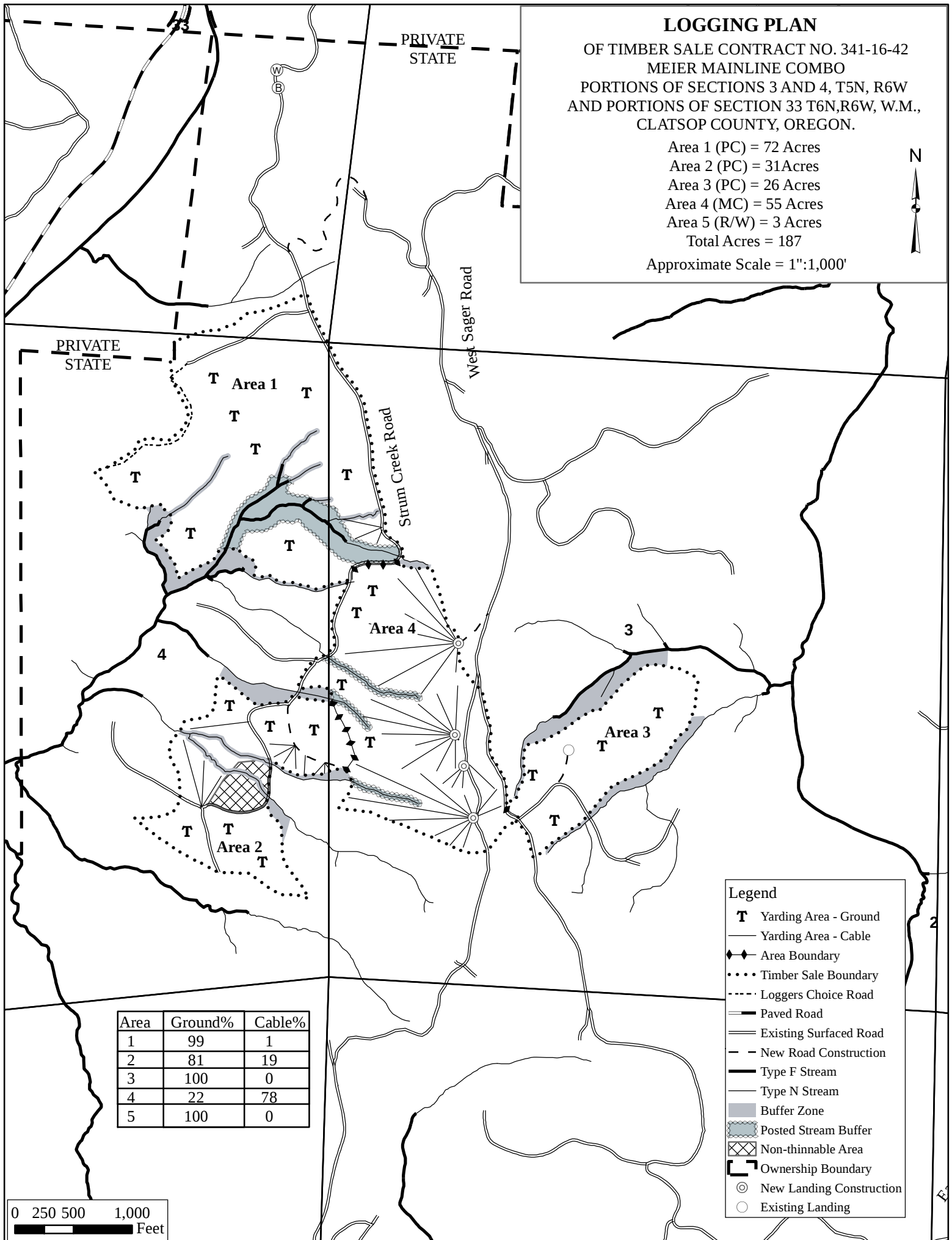
Area 3 (PC) = 26 Acres

Area 4 (MC) = 55 Acres

Area 5 (R/W) = 3 Acres

Total Acres = 187

Approximate Scale = 1":1,000'



Area	Ground%	Cable%
1	99	1
2	81	19
3	100	0
4	22	78
5	100	0

Legend

- T** Yarding Area - Ground
- Yarding Area - Cable
- ◆◆ Area Boundary
- Timber Sale Boundary
- Loggers Choice Road
- Paved Road
- Existing Surfaced Road
- - New Road Construction
- Type F Stream
- Type N Stream
- Buffer Zone
- Posted Stream Buffer
- Non-thinnable Area
- Ownership Boundary
- ⊙ New Landing Construction
- Existing Landing

0 250 500 1,000
Feet