



Timber Sale Appraisal
Imperial Walker
Sale at-341-2020-w00829-01

District: Astoria

Date: December 04, 2019

Cost Summary

	Conifer	Hardwood	Total
Gross Timber Sale Value	\$5,492,653.68	\$4,166.96	\$5,496,820.64
		Project Work:	(\$583,474.00)
		Advertised Value:	\$4,913,346.64



"STEWARDSHIP IN FORESTRY"

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Imperial Walker
Sale at-341-2020-w00829-01

District: Astoria

Date: December 04, 2019

Timber Description

Location: Portions of Sections 9, 10, 15, and 16, T5N, R6W, W.M., Clatsop County Oregon.

Stand Stocking: 80%

Specie Name	AvgDBH	Amortization (%)	Recovery (%)
Douglas - Fir	24	0	98
Western Hemlock / Fir	28	0	97
Alder (Red)	12	0	96

Volume by Grade	2S	3S & 4S 6"-11"	4S	Total
Douglas - Fir	10,035	1,828	0	11,863
Western Hemlock / Fir	293	16	0	309
Alder (Red)	0	0	28	28
Total	10,328	1,844	28	12,200

Comments: Pond Values Used: Local Pond Values, November 2019.

Expected Log Markets: Mist, Willamina, Banks, North Plains, Clatskanie, Tillamook, Garibaldi, Forest Grove, Warrenton, Elma, WA, Longview, WA, Vancouver, WA and Chehalis, WA

Western Red Cedar and other Cedars stumpage = pond value - logging cost.
\$790/MBF = \$1,000/mbf - \$210/MBF

Spruce stumpage = pond value - logging cost.
\$238/MBF = \$448/mbf - \$210/MBF

Other Costs (with Profit & Risk to be added):

Slash and Landing Piling (Includes move-in and pile materials) = \$11,320

Machine Washing for Invasive Weed Compliance = \$3,000

Ditch Filters:

20 bales of straw @ \$10.00/bale = \$200

8 hours of labor @ \$40/hr = \$320

TOTAL Other Costs (with Profit & Risk to be added): \$14,840

Other Costs (No Profit & Risk added):

None.

ROAD MAINTENANCE

(See attached Road Maintenance Cost Summary Sheet)

TOTAL Road Maintenance: \$34,065/12,200 MBF = \$2.79/MBF



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Logging Conditions

Combination#: 1	Douglas - Fir	64.00%
	Western Hemlock / Fir	64.00%
	Alder (Red)	64.00%
Logging System:	Shovel	Process: Stroke Delimber
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: 4400
cost / mbf:	\$72.09	
machines:	Stroke Delimber (B)	

Combination#: 2	Douglas - Fir	36.00%
	Western Hemlock / Fir	36.00%
	Alder (Red)	36.00%
Logging System:	Cable: Large Tower >=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: 4600
cost / mbf:	\$147.83	
machines:	Log Loader (A) Tower Yarder (Large)	



"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal Imperial Walker Sale at-341-2020-w00829-01

District: Astoria

Date: December 04, 2019

Logging Costs

Operating Seasons: 3.00	Profit Risk: 12%
Project Costs: \$583,474.00	Other Costs (P/R): \$14,840.00
Slash Disposal: \$0.00	Other Costs: \$0.00

Miles of Road

Road Maintenance: \$2.79

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	3.0	4.0
Western Hemlock / Fir	\$0.00	3.0	4.2
Alder (Red)	\$0.00	2.0	3.5



"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal Imperial Walker Sale at-341-2020-w00829-01

District: Astoria

Date: December 04, 2019

Logging Costs Breakdown

Logging	Road Maint	Fire Protect	Hauling	Other P/R appl	Profit & Risk	Slash Disposal	Brand & Paint	Other	Total
Douglas - Fir									
\$99.36	\$2.85	\$1.08	\$80.75	\$1.22	\$22.23	\$0.00	\$2.00	\$0.00	\$209.49
Western Hemlock / Fir									
\$99.36	\$2.87	\$1.08	\$77.66	\$1.22	\$21.86	\$0.00	\$2.00	\$0.00	\$206.05
Alder (Red)									
\$99.36	\$2.90	\$1.08	\$141.14	\$1.22	\$29.48	\$0.00	\$2.00	\$0.00	\$277.18

Specie	Amortization	Pond Value	Stumpage	Amortized
Douglas - Fir	\$0.00	\$663.69	\$454.20	\$0.00
Western Hemlock / Fir	\$0.00	\$544.17	\$338.12	\$0.00
Alder (Red)	\$0.00	\$426.00	\$148.82	\$0.00



"STEWARDSHIP IN FORESTRY"

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Summary

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	11,863	\$454.20	\$5,388,174.60
Western Hemlock / Fir	309	\$338.12	\$104,479.08
Alder (Red)	28	\$148.82	\$4,166.96

Gross Timber Sale Value

Recovery: \$5,496,820.64

Prepared By: Kevin Berry

Phone: 503-325-5451

SUMMARY OF ALL PROJECT COSTS

SALE NAME: Imperial Walker

Project No. 1: ROAD CONSTRUCTION:

<u>Road segment</u>	<u>Length (Sta)</u>	<u>Length (Mile)</u>	<u>Cost</u>	
1A to 1B, 1C to 1D, 1E to 1F, 2A to 2B, 2C to 2D, 2E to 2F, 3A to 3B	99.25	1.88	\$117,898	
Road Maint.			\$4,820	
Move-In			\$5,481	
TOTALS	99.25	1.88		\$128,199

Project No. 2: ROAD IMPROVEMENT:

<u>Road segment</u>	<u>Length (Sta)</u>	<u>Length (Mile)</u>	<u>Cost</u>	
I1 to I2, I3 to I4	263.5	4.99	\$93,258	
Road Maint.			\$3,813	
Move-In			\$4,336	
TOTALS	263.50	4.99		\$101,406

SPECIAL PROJECTS (Move-In and Road Maint. are included separately as needed, for each Special Project):

<u>Description</u>	<u>Length/Vol.</u>	<u>Cost</u>	
Proj. 3 Rock Crushing		\$262,255	
Proj. 4 Stream Enhancement		\$1,000	
Proj. 5 Install Fish Passage Culvert		\$90,614	
TOTAL			\$353,869

GRAND TOTAL \$583,474

Compiled By: Kevin Berry FL

Date: 12/03/2019

Site Prep/Machine Piling Appraisal

Sale Number: AT-341-2020-W00829-01
Sale Name: Imperial Walker
Date: 08/23/2019

Vegetation Type/Zone	Vegetation Type/Zone Code	Production Rate (hr/ac)	Estimated Piles/Acre	Landing Production Rate (hrs/30 acres)
Doug-fir	A	0.5	0.5	6
Hemlock/Fir	B	1.3	4.5	8
Hemlock/Spruce	C	1.8	6.0	10
Hemlock	D	1.8	6.0	8
Conifer/Hardwood	E	1.0	2.0	8
Whole Tree Yarding	F	0.5	0.5	12

Sale Area	Harvest Type	Veg Type/Zone	Ground Based Yarding Acres	Estimated Piling Hours/Area	Cost/Hour	Total Cost/Area	
1	MC	F	78	39	\$145	\$5,655	
2	MC	F	12	6	\$145	\$870	
3	MC	F	62	31	\$145	\$4,495	
					In-unit Piling	Sub Total =	\$6,525
Sale Area	Number of Landings to be Piled	# cable acres per area	Total Cost/Area	Number of In-Unit Piles	Material Cost/Pile	Total Cost/Area	
1	11	30	\$1,740	50	\$5	\$250	
2	7	25	\$1,450	13	\$5	\$65	
3	7	21	\$1,218	38	\$5	\$190	
*Cost includes separating firewood					Materials	Sub Total =	\$315
					Landing Piling	Sub Total =	\$3,190
Move-In Allowance	Additional Move-In Number of Move-In's	Move-in allowance Total Move-In Allowance					
\$1,290.00	1	\$1,290					
					Move-In	Sub Total =	\$1,290
Slash Endhaul Dump Truck hrs	Cost/Hour	Total	Loader hrs	Cost/Hour	Total		
	\$89.00	\$0		\$145	\$0	Sub Total =	\$0
						Grand Total =	\$11,320.00

Road Maintenance Cost Summary (Interim and Post Harvest)

Sale: Imperial Walker
Date: 11/22/2019
By: John Tillotson *FL*

MBF: 12,200
\$/MBF: \$2.79

Type	Equipment/Rationale	Move In	Times	Hours	Rate	Cost
Interim Operations	Grader 14G	\$875	1	16	\$113	\$2,683
	Dump Truck 12CY	\$184	1	4	\$89	\$540
	FE Loader C966	\$875	1	2	\$94	\$1,063
	Vibratory Roller	\$875	1	16	\$87	\$2,267
Interim Operations	Grader 14G	\$875	1	16	\$113	\$2,683
	Dump Truck 12CY	\$184	1	4	\$89	\$540
	FE Loader C966	\$875	1	2	\$94	\$1,063
Final Haul Route Maintenance	Grader 14G	\$875	1	60	\$113	\$7,655
	Dump Truck 12CY	\$184	2	16	\$89	\$3,216
	Vibratory Roller	\$875	1	60	\$87	\$6,095
	Water Truck 2,500 gallon	\$214	1	30	\$101	\$3,244
	FE Loader C966	\$875	1	4	\$94	\$1,251
	Rubber Tire Backhoe	\$361	1	12	\$87	\$1,405
	Laborer	\$0	1	8	\$45	\$360
Total						\$0 \$34,065

Interim Operations Road Maintenance

Production Rates	Miles/day	Distance(miles)	Days	Hours
Grader	2.5	4.0	1.6	16.0
Vibratory Roller	2.5	1.0	0.4	4.0

Final Road Maintenance

Production Rates	Miles/day	Distance(miles)	Days	Hours
Grader	1.5	8.8	5.9	58.7
Vibratory Roller	1.5	8.8	5.9	58.7

Process and compact: All crushed rock roads

Wage Road 1.8 miles

Walker Ridge Road 4.5 miles

Unnamed Spurs 0.6 miles

New Construction 1.9 miles

Grade & Process Total = 8.8

Move In and Maintenance Calculator for Construction and ImprovementSALE NAME: Imperial Walker**Project No. 1: ROAD CONSTRUCTION:**

<u>Road segment</u>	<u>Length/Sta</u>	<u>Length/Mile</u>	<u>Cost</u>
1A to 1B, 1C	99.25	1.88	\$117,898
to 1D, 1E to			
1F, 2A to 2B,			
2C to 2D, 2E			
to 2F, 3A to			
3B			
TOTALS	99.25	1.88	\$117,898

Project No. 2: ROAD IMPROVEMENT:

<u>Road segment</u>	<u>Length/Sta</u>	<u>Length/Mile</u>	<u>Cost</u>
I1 to I2, I3	263.50	4.99	\$93,258
to I4			
TOTALS	263.50	4.99	\$93,258

MOVE IN (Construction & Improvement Only)

<u>Equipment</u>	<u>Move In</u>	<u>Cost</u>
Dozer (D8)	\$1,581.00	\$1,581.00
Excavator C330	\$1,581.00	\$1,581.00
Excavator C315	\$905.00	\$905.00
Dump Truck 20CY (X3)	\$215.00	\$645.00
Dump Truck 12CY (X6)	\$184.00	\$1,104.00
Off Highway Dumptruck (24cy)	\$870.00	\$870.00
Rubber tired backhoe	\$361.00	\$361.00
Skidder (C518)	\$806.00	\$806.00
Grader (14G)	\$875.00	\$875.00
Vibratory Roller	\$875.00	\$875.00
Water Truck (2500 ga)	\$214.00	\$214.00

TOTAL \$9,817**ROAD MAINTENANCE (Construction & Improvement Only)**

	<u>Length/Mile</u>	<u>Cost</u>
Buster Creek Road, Grand	4.82	\$8,633.00
Rapids Road, Wage Road		
TOTAL		\$8,633

SUMMARY OF CONSTRUCTION COSTS

SALE NAME: Imperial Walker
ROAD: 1A to 1B(14+50), 1C to 1D(8+00), 1E to 1F(1+00),
POINTS: 2A to 2B(40+25), 2C to 2D(11+50), 2E to 2F(1+00), 3A to 3B(23+00)

NEW CONSTRUCTION: 99.25 STATIONS
IMPROVEMENT: 0.00 STATIONS

1.88 MILES
0.00 MILES

CLEARING & GRUBBING			
Method	Acres/amount	x	Rate
1A to 1B	Scatter outside right of way	x	\$ 1,503
1C to 1D	Scatter outside right of way	x	\$ 1,503
1E to 1F	Scatter outside right of way	x	\$ 1,503
2A to 2B	Scatter outside right of way	x	\$ 1,503
2C to 2D	Scatter outside right of way	x	\$ 1,503
2E to 2F	Scatter outside right of way	x	\$ 1,503
3A to 3B	Scatter outside right of way	x	\$ 1,503
SUB TOTAL FOR CLEARING & GRUBBING			\$16,683

EXCAVATION			
Material	Cy/amount	x	Rate
1A to 1B	Balanced construction (\$/Sta)	x	\$138.00
	Drift earth up to 200' (\$/Sta)	x	\$214.00
1C to 1D	Landing Construction (\$/Sta)	x	\$389.00
	Balanced construction (\$/Sta)	x	\$138.00
1E to 1F	Landing Construction (\$/Sta)	x	\$389.00
	Balanced construction (\$/Sta)	x	\$138.00
2A to 2B	Landing Construction (\$/Sta)	x	\$389.00
	Balanced construction (\$/Sta)	x	\$138.00
	Drift earth up to 200' (\$/Sta)	x	\$214.00
	End-haul excavation	x	\$4.50
	Embankment compaction (\$/Cy)	x	\$0.79
	Cutslop rounding (\$/Sta)	x	\$49.00
2C to 2D	Drift earth up to 200' (\$/Sta)	x	\$214.00
	Embankment compaction (\$/Cy)	x	\$0.79
	Cutslop rounding (\$/Sta)	x	\$49.00
2E to 2F	Balanced construction (\$/Sta)	x	\$138.00
	Landing Construction (\$/Sta)	x	\$389.00
3A to 3B	Balanced construction (\$/Sta)	x	\$138.00
	Drift earth up to 200' (\$/Sta)	x	\$214.00
	Landing Construction (\$/Sta)	x	\$389.00
SUB TOTAL FOR EXCAVATION			\$26,012

SURFACING

Subgrade prep:

Description

Grade, Shape and Ditch 16'

Subgrade Compaction

Stations/ amount	Rate/ sta/amt	Cost
x	\$27.91	\$2,770.07
x	\$22.69	\$2,251.98

ROAD SEGMENT		1A to 1B		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	1A to 1B	Sta. to Sta.					
				Volume (CY) per	Number of					
Junction Rock	5"-0" crushed	0+00	n/a	junction	33	junctions	1.00	33	\$5.34	\$176
Base Rock	5"-0" crushed	0+00 to 13+50	10	station	63	stations	14.50	914	\$5.34	\$4,878
Traction Rock	1 1/2"-0" crushed	5+50 to 12+00	2	station	13	stations	6.50	85	\$5.34	\$451
Turnouts	5"-0" crushed	1+00, 4+00, 11+00	n/a	turnout	22	turnouts	3	66	\$5.34	\$352
Culvert Bedding/Backfill	1 1/2"-0" crushed	10+50	n/a	culvert	11	culverts	1	11	\$5.34	\$59
Landings	12"-0" pit-run	8+50, 13+50	n/a	landing	77	landings	2	154	\$8.16	\$1,257
Total Rock for Road Segment:				1A to 1B				1,262		

ROAD SEGMENT		1C to 1D		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	1C to 1D Volume (CY) per	Number of	0+00 to 8+00				
Junction Rock	5"-0" crushed	0+00	n/a	junction	11	junctions	1	11	\$5.34	\$59
Base Rock	5"-0" crushed	0+00 to 13+50	10	station	63	stations	8.00	504	\$5.34	\$2,691
Turnouts	5"-0" crushed	4+20	n/a	turnout	22	turnouts	1	22	\$5.34	\$117
Landing	12"-0" pit-run	2+50, 8+00	n/a	landing	77	landings	2	154	\$8.16	\$1,257
Total Rock for Road Segment:		1C to 1D						691		

ROAD SEGMENT		1E to 1F		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	Number of	0+00 to 1+00				
Junction Rock	5"-0" crushed	2+20, 26+70, 31+10	n/a	junction	11	junctions	1	11	\$5.34	\$59
Base Rock	5"-0" crushed	0+00 to 1+00	10	station	63	stations	1.00	63	\$5.34	\$336
Landings	12"-0" pit-run	1+00	n/a	landing	77	landings	1	77	\$8.16	\$628
Total Rock for Road Segment:		1E to 1F						151		

ROAD SEGMENT										TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
2A to 2B				POINT TO POINT		Sta. to Sta.						
Application	Rock Size and Type	Location	Depth of Rock (inches)	2A to 2B Volume (CY) per	0+00 to 40+25 Number of							
Base Rock	5"-0" crushed	0+00 to 40+42	10	station	63	stations	40.25	\$5.34	\$13,541			
Turnouts	5"-0" crushed	3+65, 8+80, 14+55, 21+20, 29+15, 33+25, 39+30	10	turnout	28	turnouts	7	\$5.34	\$1,047			
		2+20, 26+70, 31+10	n/a	junction	11	junctions	3	\$5.34	\$176			
Junction Rock	5"-0" crushed		n/a	load	11	loads	32	\$5.34	\$1,880			
Curve Widening	5"-0" crushed		n/a	station	25	stations	40.25	\$5.34	\$5,373			
Surface Rock	1 1/2"-0" crushed	0+00 to 40+20	4									

[illegible]

SALE NAME:	Imperial Walker	NEW CONSTRUCTION:	STATIONS	0.00	MILES
ROAD:	11 to 12(244+00), 13 to 14(19+50)	IMPROVEMENT:	263.50	STATIONS	4.99
					MILES

[illegible]

EXCAVATION						
Material		Cy/amount	x	Rate	=	Cost
11 to 12 Install rock ditch filters (5X)	C315 hrs	7.00	x	\$114.00	=	\$798.00
2+40, 3+05, 43+10, 45+00, 69+8, 70+20, 74+10						
Ditchline re-establishment	\$\$/sta	11.3	x	\$17.07	=	\$192.89
0+00 to 1+00, 153+40 to 157+35, 188+50					=	
to 189+70, 191+80 to 193+70, 198+75 to					=	
Clean-out culvert catch basin	C315 hrs	17.0	x	\$114.00	=	\$1,938.00
77+70(1hr, 96+00(1hr), 99+80(1hr),					=	
119+45(1hr), 125+85(1hr), 131+60(1hr),					=	
145+90(1hr), 188+00(1hr), 204+00(1hr),					=	
207+10(1hr), 239(hrs)					=	
Walk Excavator	C315 hrs	4.00	x	\$114.00	=	\$456.00
13 to 14 Widen Junction 0+00	C330 hrs	2.00	x	\$175.00	=	\$349.13
					=	
SUB TOTAL FOR EXCAVATION						\$3,734

CULVERT MATERIALS AND INSTALLATION									
Location	Dia/type	Lineal ft.	Rate	Cost	Location	Dia/type	Lineal ft.	Rate	Cost
11 to 12									
1+00	18	30	\$21.95	\$658.50					\$0.00
43+70	72	95	See Type F Cost Sheet						\$0.00
62+00	18	30	\$21.95	\$658.50					\$0.00
									\$0.00
									\$0.00
									\$0.00

Other/miscellaneous:				
Description	Quantity	Rate	Cost	
Culvert Repair	2.00	\$45.00	\$90.00	
Culvert stakes & markers:				
Culvert Markers (6' x 2 1/2" white fiberglass)				
1+00, 91+60, 119+45, 153+10, 239+00	5	\$23.00	\$115.00	
SUB TOTAL FOR CULVERT MATERIALS & INSTALLATION				\$1,522
Subtotal of Clearing, Exc., Culv.				\$5,256

ROAD SEGMENT		I3 to I4		POINT TO POINT		Sta. to Sta.		VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	I3 to I4		0+00 to 19+50				
				Volume (CY) per	Number of					
Subgrade Leveling Rock	5'-0" crushed	n/a	n/a	11	load	12	loads	132	\$5.34	\$705
Traction Rock	1 1/2"-0" crushed	9+00 to 19+50	n/a	11	load	8	loads	88	\$5.34	\$470
Turnouts	5'-0" crushed	n/a	n/a	33	turnout	2	turnouts	66	\$5.34	\$352
Junction	5'-0" crushed	n/a	n/a	44	junction	1	Junctions	44	\$5.34	\$235
Total Rock for Road Segment:									330	\$1,762
		Processing:		Description		No.sta		Rate/sta		Cost
				Water, Process & Compact:				217.20		\$63.48
				Water, Process & Compact:				12" lift @ 2 lifts		\$13,788
				Traction Rock Water, Process & Compact				26.80		\$126.96
				Leveling and Traction Rock Water, Process and Compact.				7.05		\$63.48
								9.75		\$63.48
										\$619
				12"-6" pr		5'-0" crushed		1 1/2"-0" crushed		Total
				77		8,672		224		8,973
										8,973
SUB TOTAL FOR SURFACING \$88,002										
SPECIAL PROJECTS										
SUB TOTAL FOR SPECIAL PROJECTS \$0										
Subtotal of Surfacing & Spec. Proj. \$88,002										
Subtotal of Cleaning, Exc., Culv. \$5,256										
GRAND TOTAL \$93,258										

**Imperial Walker
Project No 4. Stream Enhancement**

Location	Number of trees			Placement method		\$ /tree	Cost per Site
	Site						
SE1-SE2	N/A	25		Felling		\$40.00	\$1,000.00

Project Total **\$1,000**

**Imperial Walker Timber Sale
Project No. 5
Install Fish Passage Culvert and Fill Replacement (I1 to I2, 43+70)**

Sale Name: Imperial Walker			Date: 10/15/19		Compiled By: W. Lawrence										
Construction Phase	QTY	Cost	Total Cost	Equipment Hours					Labor	Culvert		Erosion Control		Total	
				C330	C330	C315	C315 Rock Hammer	24CY off Highway Dump		Pump	Tamper	Ft	\$/ft.		Acres
Walk equipment to site					1	1									
Unload and move cmp to site				4											
Existing Culvert removal/disposal				1		1									
De-watering (w/pump)															
Excavate New Culvert Trench (CY)	2,900														
Haul Waste Material Offsite(CY)	2,175	\$6.53	\$14,202.75		24	24	10								
Place Reuseable Fill Material Onsite (CY)	725														
				2	2	2		2							
Build culvert bed compact w/pit-run and crushed rock bedding surface (33 CY PR, 22 CY 1 1/2"-0 CR)	55	\$6.53	\$359.15	2	5	5			5	5					
Place culvert & compact flanks w/ 1 1/2"-0" crushed rock (CY)	187	\$6.53	\$1,221.11	10	10	5				20					
Remaining Backfill Placement from Buster Stockpile Site (CY)	1,834	\$6.53	\$11,972.76	10	20										
Fill Compaction (CY)	2,559	\$0.79	\$2,021.22												
Develop Waste Area					2										
Compact/Shape Waste Area (CY)	2,175	\$0.45	\$978.75		2										
Develop Stream bed upstream and downstream from pipe				4	4	4									
Place Stream and Streambed Retention (CY)	33	\$6.53	\$215.49	2	2	2									
Place Inside Pipe Seeding (CY)	33	\$6.53	\$215.49	3	3	3				20					
Armor (CY)	66	\$6.53	\$430.98	3	3	3									
Place Riprap/Fill Armor (CY)	605	\$6.53	\$3,950.65		6	6									
Road subgrade prep. (Station)	1.50	\$31.12	\$46.68												
Road Base Rock Processing (Station)	1.50	\$63.48	\$95.22												
Road Surface Rock Processing (Station)	1.50	\$63.48	\$95.22												
Road base reconstruction (1.5 sta.)															
stockpile rock (8" lift, 50 cy per station)	75	\$6.53	\$489.75												
Pit-run development (CY)	66	\$2.92	\$192.72												
Riprap development (CY)	704	\$4.83	\$3,400.32												
Seeding and Mulching:															
Total Hours				57	89	56	10	2	100	5	45		0.50	\$2,010	\$1,005
Equipment Rates:				\$175	\$175	\$114	\$50	\$143	\$12	\$12	\$45				
Sub total :			\$39,888.25	\$9,975	\$15,575	\$6,384	\$500	\$286	\$1,200	\$60	\$2,025				\$75,893

CRUSHED ROCK COST

SALE NAME: Imperial Walker
 PROJECT: No. 1
 QUARRY: Buster

MATERIAL: Crushed

DATE: 09/24/2019
 BY: Kevin Berry

		Cubic Yards							
Segment	Stations	Base	Surface	T/O	T/A	Junction	Traction	misc	Total
1A to 1B	14.50	914		66		11	85	11	1,087
1C to 1D	8.00	504		22		11			537
1E to 1F	1.00	63				11			74
2A to 2B	40.25	2,536	1,006	273	22	66		495	4,398
2C to 2D	11.50	725		67	17			176	985
2E to 2F	1.00	63							63
3A to 3B	23.00	1,449		66	22		143	22	1,702
11 to 12	244.00		7,400	319	11	308	72	396	8,506
13 to 14	19.50			66		44	88	132	330
Grand Total	362.75	6,254	8,406	879	72	451	388	1,232	17,682

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	
1A to 1B	14.50	1,087		2.0	1.0	1.5	0.5	1.0	0.1	6.10
1C to 1D	8.00	537		2.0	1.0	1.5	0.5	1.0	0.1	6.10
1E to 1F	1.00	151		2.0	1.0	1.5	0.5	1.0	0.1	6.10
2A to 2B	40.25	4,398		2.5	2.5	1.9	0.5	1.0	0.2	8.60
2C to 2D	11.50	985		2.5	2.5	1.9	0.6	1.0	0.3	8.80
2E to 2F	1.00	63		2.5	2.5	1.9	0.6	1.0	0.3	8.80
3A to 3B	23.00	1,702		2.0	1.2	1.9	0.5	1.0	0.1	6.70
11 to 12	244.00	8,506		2.0	1.2	0.3	0.1	0.1		3.70
13 to 14	19.50	330		2.0	1.2	1.9	0.5	0.5	0.1	6.20
TOTAL 362.75		17,759								AVERAGE HAUL 5.74
STA./NO.		CU. YD.								
CUBIC YARD WEIGHTED HAUL				2.14	1.57	1.08	0.31	0.55	0.09	

Average Round Trip Distance (miles) 11.47

ROCK HAUL:

Truck type: D20 No. trucks: 3
 Delay min.: 8 Efficiency: 85%

Ave haul: \$4.56 /cy
 Load: /cy
 Spread: \$0.78 /cy

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

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

Production: cy/day = 1,359

CRUSHED ROCK HAUL COSTS 17,682 cy @ \$5.34 /cy

PIT RUN ROCK COST

SALE NAME: Imperial Walker
 PROJECT: _____
 QUARRY: Buster Creek Quarry

MATERIAL: Pit Run 12"-0"

DATE: 10/25/2019
 BY: _____

		Cubic Yards							
Segment	Stations	Landing	Base Rock			Ditch Filter	Armor	Misc	Total
1A to 1B	14.50	154							154
1C to 1D	8.00	154							154
1E to 1F	1.00	77							77
2A to 2B	40.25	77							77
2C to 2D	11.50	77							77
2E to 2F	1.00	77							77
3A to 3B	23.00	77	100						177
11 to 12	244.00					77			77
13 to 14	19.50								
Grand Total	362.75	693	100			77			870

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	
1A to 1B	14.50	154		2.0	1.0	1.5	0.5	1.0	0.1	6.10
1C to 1D	8.00	154		2.0	1.0	1.5	0.5	1.0	0.1	6.10
1E to 1F	1.00	77		2.0	1.0	1.5	0.5	1.0	0.1	6.10
2A to 2B	40.25	77		2.0	1.0	1.5	0.5	1.0	0.1	6.10
2C to 2D	11.50	77		2.5	2.5	1.9	0.6	1.0	0.3	8.80
2E to 2F	1.00	77		2.5	2.5	1.9	0.6	1.0	0.3	8.80
3A to 3B	23.00	177		2.0	1.2	1.9	0.5	1.0	0.1	6.70
11 to 12	244.00	77		2.0	1.2	0.3	0.1	0.1		3.70
13 to 14	19.50									
TOTAL 362.75		870								AVERAGE HAUL 5.41
STA./NO.		CU. YD.								
CUBIC YARD WEIGHTED HAUL				1.73	1.15	1.28	0.39	0.74	0.11	

Average Round Trip Distance (miles) 10.82

Average Round Trip Distance (miles) 10.82

ROCK HAUL:

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

Ave haul: \$5.15 /cy
 Load: \$1.08 /cy
 Spread: \$1.92 /cy

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

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

Production: cy/day = 490

PIT RUN ROCK HAUL COSTS

870 cy @ \$8.16 /cy

Projects Road Maintenance Cost Summary

Sale: Imperial Walker
Date: 25-Nov-19
By: John Tillotson

Type	Equipment/Rationale			Hours	Rate	Cost
Project Work	Grader 14G			30	\$114	\$3,420
Final Haul	Dump Truck 12CY			8	\$89	\$712
Road	FE Loader C966			4	\$94	\$376
Maintenance	Vibratory Roller			30	\$87	\$2,610
	Water Truck 2,500 gallon			15	\$101	\$1,515
Total						\$8,633

Production Rates
 Grader
 Vibratory Roller

Miles/day	Distance(miles)	Days
1.5	4.82	3.2
1.5	4.82	3.2

NOTE:	Buster Creek Road	0.68	Miles
	Grand Rapids Road	3.19	Miles
	Wage Road	0.18	Miles
	Buster Quarry Road	0.77	Miles
	TOTAL=	4.82	Miles

SUMMARY OF ROCK DEVELOPMENT AND CRUSHING COSTS

PROJECT NO.	3	Contract Name:	Imperial Walker
Quarry:	Buster Creek	Swell:	
Location:	NW 1/4, Section 25, T5N, R7W, W.M.	Shrink:	16%
County:	Clatsop		
By:	C.Bangs	Loading Hopper:	Yes
Date:	10/23/19		

ROCK SIZE	REJECT	GRADATION	STOCKPILE CU. YDS.	TRUCK MEAS CU. YDS.	TOTAL CU. YDS.
3/4"-0"		CR			
1-1/2"-0"		CR			
5"-0"	40%	CR		15,942	15,942
6"-0"		PR			
12"-0"		PR		870	870
TOTAL CUBIC YARDS OF ROCK:				16,812	16,812

1) MOBILIZATION & SET UP:

EQUIPMENT	QUANTITY	RATE	COST	EQUIPMENT	QUANTITY	RATE	COST
Loading Hopper	1	\$622	\$622	Powder	1	\$395	\$395
Screening Plants	1	\$622	\$622				
2 Stage Crusher	1	\$2,445	\$2,445				
Drill & Compressor	1	\$1,581	\$1,581				
Off Highway Dump Truck	2	\$622	\$1,244				
Excavator	1	\$1,581	\$1,581				
Front End Loader	1	\$1,581	\$1,581				
D6 Cat	1	\$875	\$875				

SUB TOTAL FOR MOBILIZATION \$10,946

EQUIPMENT SET UP	TIMES	RATE	COST
2 Stage Crusher	1	\$2,445	\$2,445
Screening Plants	1	\$330	\$330
Loading Hopper	1	\$330	\$330
Original Calibration	1	\$612	\$612

SUB TOTAL FOR SET UP COSTS \$3,717

TOTAL MOBILIZATION & SET UP COSTS \$14,663

2) CLEARING & GRUBBING

DESCRIPTION	QUANTITY	UNIT	RATE	COST

TOTAL CLEARING & GRUBBING COSTS

3) EXCAVATION

MATERIAL DESCRIPTION		QUANTITY	UNIT	RATE	COST
Overburden Removal (excavate, load	Excavator	40	hrs	\$175.00	\$7,000
haul, spread), Bench Construction	OR Truck	40	hrs	\$143.00	\$5,720

TOTAL EXCAVATION COSTS \$12,720

4) DEVELOP ROCK

ROCK SUMMARY			METHOD	%	QUANTITY	RATE	COST
Type	Cu. yd. Vol.	Weight	Ripping	10%	1,594	\$3.40	\$5,420
crushed	15,942	100%	Drill & shoot	80%	17,855	\$3.50	\$62,493
pit run	0	0	Oversize red	10%	1,594	\$5.80	\$9,246
rip rap	0	0	Other				
Total	15,942						
reject	6,377	40.0%					
TOTAL ROCK DEVELOPMENT COSTS							\$77,159

5) CALIBRATION & TESTING

DESCRIPTION	NO.	\$/TEST	COST
Calibrate			
Calibrate			
Test	8	\$57.30	\$458
Test			

TOTAL CALIBRATION & TESTING COSTS \$458

6) FEEDING & LOADING

DESCRIPTION		CU. YD. QUANTITY		COST CU. YD.		TOTAL COST
Dig & Feed Rock		22,319		\$0.78		\$17,377
Shot Rock (landing/haulin)hrs	Excavator	160		\$175.00		\$28,000
	ORx2	320		\$143.00		\$45,760

TOTAL FEEDING & LOADING COSTS \$91,137

7) ROCK CRUSHING

ROCK SIZE	ROCK TYPE	CU. YD. QUANTITY	CRUSHER TYPE	HOURLY PRODUCTION	RATE CU. YD.	TOTAL COST
3/4"-0"	crushed		3 stage w/s	110		
1-1/2"-0"	crushed		3 stage w/s	120		
5"-0"	crushed	15,942	2 stage w/s	140	\$2.48	\$39,513

TOTAL ROCK CRUSHING COSTS \$39,513

8) STOCKPILING

STOCKPILE SITE PREPARATION

Equipment	Hours	Rate	Total
Dozer			
Compactor			
Grader			
Excavator			

SUB TOTAL

Rock for Floor (CY)	\$/CY Haul	Total

HAUL & STOCKPILE

STOCKPILE LOCATION	SIZE	# of TRUCKS	CU. YDS.	RATE	COST
--------------------	------	-------------	----------	------	------

1.
2.
3.
4.
5.
6.

SUB TOTAL

TOTAL STOCKPILING COSTS

9) MISCELLANEOUS COSTS

DESCRIPTION	COST
Load, Haul, and Spread the reject material at the waste area.	\$24,104
\$3.78 /CY 6,377 CY	
Final Quarry Dev., Access Road Const., Waterbarring, Drainage, Block Quarry Access	\$2,000
Seeding and mulching	\$500

TOTAL MISCELLANEOUS COSTS \$26,604

10) GRAND TOTAL: \$262,255

\$/Cubic Yard \$16.45

Footnotes:

Imperial Walker Timber Sale
FY 2019
TIMBER CRUISE REPORT

1. **Sale Unit Location:** Units 1, 2, and 3 are located in portions of Sections 9, 10, 15, and 16, T5N, R6W, W.M., Clatsop County, Oregon.

2. **Fund Distribution:** Fund: BOF 100% CSL 0%
Tax Code: 8-01 100%

3. **Sale Acreage by Unit:**

Unit	Harvest Type	Gross Acres	Stream Buffer Acres	New R/W Acres	Existing R/W Acres	Net Acreage	Survey Method
1	MC	129	13	2	6	108	GIS
2	MC	48	7	3	<1	37	GIS
3	MC	99	13	3	<1	83	GIS
4	R/W (In-unit)	8	N/A	N/A	N/A	8	Length x Width
4	R/W (Out-of-unit)	2	N/A	N/A	N/A	2	Length x Width
TOTALS		286	33	8	7	238	

4. **Cruisers and Cruise Dates:** Units 1, 2, and 3 were cruised on 7/18/2019 and 7/22/2019, by Ella Salkeld, John Choate, Bryce Rodgers and Kevin Berry.

5. **Cruise Method and Computation:** Units 1, 2, and 3 are modified clearcut units. A variable plot cruise with a 40.0 BAF was used in these Units. These plots were located on a 5 chain by 9 chain grid, with a count/cruise plot ratio of 2:1. A total of 60 plots were sampled, with 25 measured plots and 35 count plots.

Unit 4 R/W Right-of-way volume was calculated by multiplying the R/W acreage and the average volume per acre from the cruise.

Cruisers used Allegro 2 data collectors, and were downloaded to the Atterbury Super A.C.E. program at the Astoria 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.

<u>UNIT</u>	<u>PROJECT</u>	<u>TRACT</u>	<u>CRUISE TYPE</u>
1, 2, 3	IMPERIAL	A123	OOMC and TAKE
4/RW	IMPERIAL	RW	OOMC

6. **Timber Description:** Units 1, 2, and 3 are approximately 70 year old stands of Douglas-fir, with some western hemlock and red alder. The average take Douglas-fir tree size for harvest is approximately 24 inches DBH, with an average merchantable tree height of 80 feet. The average take hemlock tree size is approximately 28 inches DBH, with an average merchantable tree height of 96 feet. The average take red alder tree size is approximately 12 inches DBH, with an average merchantable tree height of 42 feet. The average volume per acre to be harvested (net) is approximately 51 MBF. All trees were cruised to a merchantable top of 6 inch DIB or 40% fp.

Unit 4 R/W is similar to the timber description mentioned in Units 1, 2, and 3.

7. **Statistical Analysis: (See also "Statistics Reports," attached.)**

Units	Target CV	Target SE%	Actual CV	Actual SE%
1, 2, 3	50	8	38.0	4.9

The statistics are for all Units and Take and Leave trees combined based on Net BF/Acre.

8. **Take Volumes by Species and Log Grades for All Sale Units by MBF:** (See "Species, Sort Grade-Board Feet Volumes (Project)", "Statistics (Project)", and the "Stand Table Summary" attached). Volumes do not include "in-growth." The majority of defect and breakage was taken out during the cruise.

Conifer

Species	DBH	Net Vol. MBF	2 Saw	3Saw	4 Saw	% D&B	% Sale
Douglas-fir	24	11,863	10,035	1,624	204	2	97
W. Hemlock	28	309	293	12	4	1	3

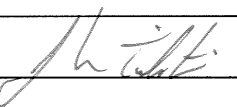
Hardwoods

Species	DBH	Net Vol. MBF	12"+	10-12"	8-10"	6-8"	% D&B	% Sale
Red Alder	12	28	--	--	--	28	2	<1

TOTAL NET VOLUME	12,200
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9. **Prepared by:** Ella Salkeld

Date: 07/24/2019

10. **Approved by:** Kevin Berry 

Date: 08/26/2019

11. **Attachments:** Cruise Plans & Maps (3)
Species, Sort, Grade Report (3)
Statistics Reports (5)
Stand Table Report (1)
Log Stock Table Report MBF (2)

**CRUISE DESIGN
ASTORIA DISTRICT**

Sale Name: Imperial Walker

Area 1, 2, 3

Harvest Type: (MC) Modified Clearcut

Approx. Cruise Acres: 228 **Estimated CV%** 50 Net BF/Acre **SE% Objective** 8 Net BF/Acre

Planned Sale Volume : 7,945 MBF **Estimated Sale Area Value/Acre:** \$14,875/Acre
(35 MBF/Ac. @ \$425/MBF)

A. Cruise Goals: (a) Grade minimum 150 conifer and 10 hardwood trees
(b) Sample 60 cruise plots (25 grade/ 35 count); (c) Other goals (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 40 (Full point)

Cruise Line Directions: A1:116°/296° A2:143°/323°, A3:119°/299°

Cruise Plot Spacing 5 (chains) 330 (Feet)

Cruise Line Spacing 9 (chains) 594 (Feet)

Grade/Count Ratio 1:2

Take plots as marked on cruise map. All cedar will be reserved. Record all snags as SN.

DO NOT RECORD 12', 22' and 32' (for Hardwoods).

DO NOT RECORD 22' LENGTHS.

All hardwood will be measured to a G, or as appropriate.

C. Tree Measurements:

1. Diameter: Minimum DBH to cruise is 8" for conifers and 8" for hardwoods.

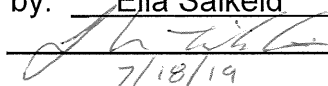
Record dbh to nearest 1/2" for trees < 16", to nearest 1" for trees 16-24", and to nearest 2" for trees > 24". If tree diameters are estimated (only estimate on variable plot cruises), then record to closest estimate.

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 conifer trees > 18" dbh.

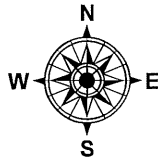
4. Form Factors: (1) Measure or estimate a 16' form factor for every conifer tree measured/graded; OR (2) Measure a minimum of 20 form factors for each major conifer species on the cruise area, and use these to calculate average FF for the species on the cruise. Hardwood form factors are a Standard 87.

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. Hardwoods shall be recorded in 8' and 10' multiples.
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
Hardwoods: Alder Grades: 12" + = 1 Sawmill; 10"-12" = 2 Sawmill; 10"-8" = 3 Sawmill; and 8"-6" 4 Sawmill, or R = Camp Run; 0 = Cull.
All Maple Camp Run = R
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 inter-visible 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.
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: Ella Salkeld
Approved by: 
Date: 7/18/19

Legend

- ⊙ Grade Plot
- Count Plot
- ⋯ TSB



0 1,000 2,000
Feet

Imperial Walker
Area 1, 2, 3 (MC)

Page 1 of 1

Plots Total:60

Grade Plots:25

Count Plots:35

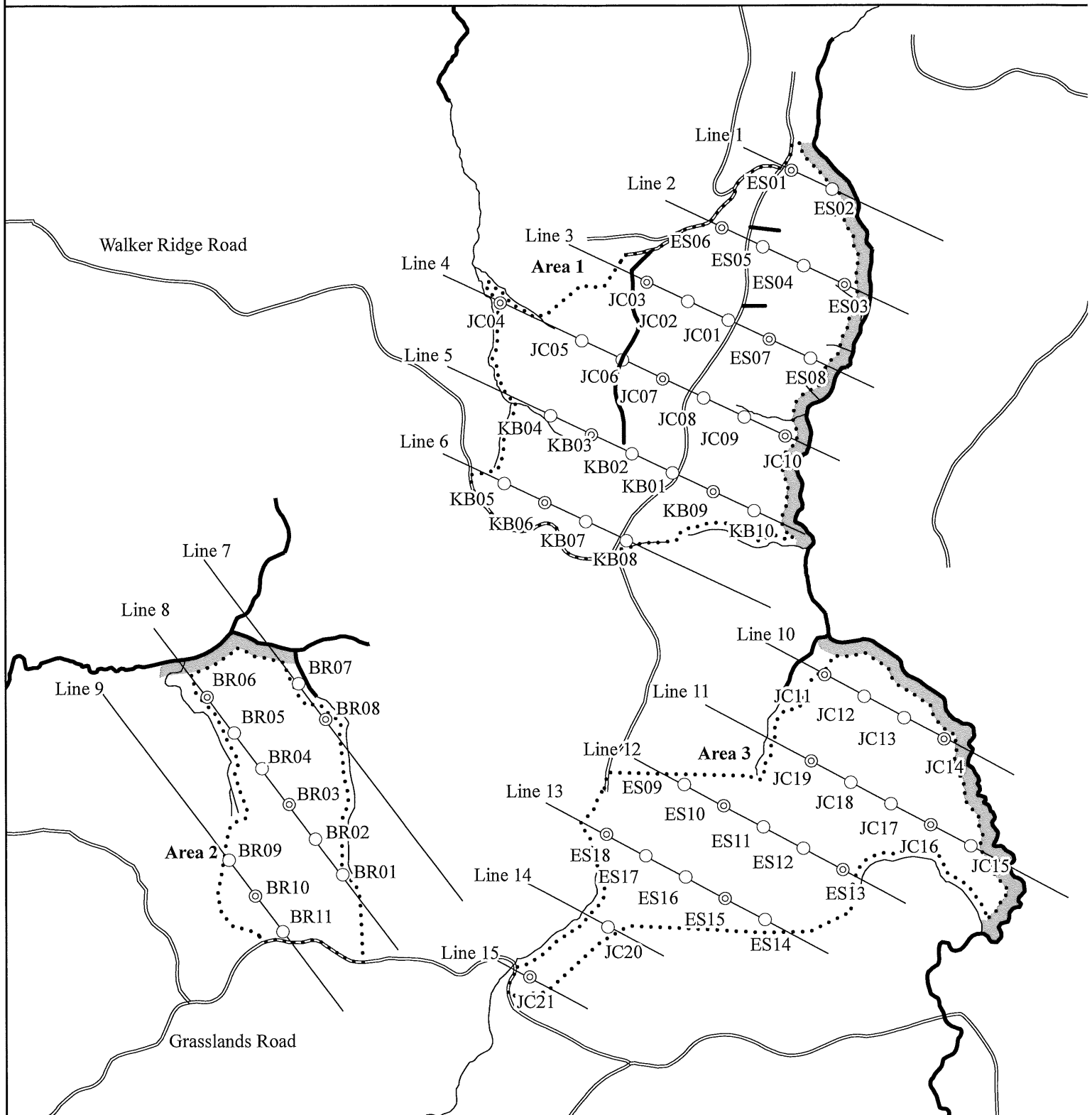
AZ: 1:116/296, 2: 143/323, 3:119/299

BAF: 40

Plot Spacing: 5 (330 Ft)

Line Spacing: 9 (594 Ft)

Map Scale 1:12,000



TC		PSPCSTGR		Species, Sort Grade - Board Foot Volumes (Project)																	
T05N R06W S15 TyRW10.00 T05N R06W S15 TyTAKE228.00				Project: IMPERIAL														Page 1			
				Acres 238.00														Date 8/26/2019			
																		Time 1:57:47PM			
S Spp	So T	Gr rt	ad	% Net BdFt	Bd. Ft. per Acre Def%GrossNet			Total Net MBF	Percent of Net Board Foot Volume								Average Log				Logs Per /Acre
									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	567											8	21		0.00	3.6
D		DO2S		84	1.2	42,681	42,163	10,035			21	79	2	3	1	94	38	18	567	3.05	74.3
D		DO3S		14	.9	6,882	6,822	1,624		86	9	6	4	6	37	54	35	9	100	0.83	68.0
D		DO4S		2		858	858	204		96	4		74	26			19	6	25	0.44	33.9
D Totals				97	2.2	50,988	49,842	11,863		13	19	67	3	4	6	87	33	12	277	1.85	179.8
H		DO2S		94	1.1	1,246	1,233	293			28	72			16	84	37	18	503	2.78	2.5
H		DO3S		4		51	51	12		100			100				19	10	65	1.05	.8
H		DO4S		2		18	18	4		100			100				16	9	40	0.81	.4
H Totals				3	1.0	1,315	1,301	309 310		5	27	68	5		15	79	31	15	354	2.43	3.7
A		DOCU			100.0	34											13	10		0.00	.8
A		DO4S		100		119	119	28		100			35	51		14	24	6	33	0.49	3.6
A Totals				0	22.2	153	119	28		100			35	51		14	22	7	27	0.44	4.4
Totals					2.3	52,456	51,263	12,201 12,204		13	19	67	4	4	6	87	32	12	273	1.84	187.9

12,200

T		TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)												Page		1		
				Project: IMPERIAL												Date		8/26/2019		
																Time		1:57:47PM		
T05N R06W S15 TTAKE																T05N R06W S15 TTAKE				
Twp		Rge		Sec		Tract		Type		Acres		Plots		Sample Trees		CuFt		BdFt		
05N		06W		15		A123		TAKE		228.00		60		146		1		W		
S So Gr T rt ad Spp				%	Bd. Ft. per Acre Def% Gross Net			Total Net MBF	Percent Net Board Foot Volume								Average Log			Logs Per /Acre
				Net BdFt					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		
D DO CU					00.0 567				21 79				2 3 1 94				8 21		0.00	3.6
D DO 2S				84	1.2 42,681 42,163			9,613	21 79				2 3 1 94				38 18	567	3.05	74.3
D DO 3S				14	.9 6,882 6,822			1,555	86 9 6				4 6 37 54				35 9	100	0.83	68.0
D DO 4S				2	858 858			196	96 4				74 26				19 6	25	0.44	33.9
D Totals				97	2.2 50,988 49,842			11,364	13 19 67				3 4 6 87				33 12	277	1.85	179.8
H DO 2S				94	1.1 1,246 1,233			281	28 72				16 84				37 18	503	2.78	2.5
H DO 3S				4	51 51			12	100				100				19 10	65	1.05	.8
H DO 4S				2	18 18			4	100				100				16 9	40	0.81	.4
H Totals				3	1.0 1,315 1,301			297	5 27 68				5 15 79				31 15	354	2.43	3.7
A DO CU					00.0 34												13 10		0.00	.8
A DO 4S				100	119 119			27	100				35 51 14				24 6	33	0.49	3.6
A Totals				0	22.2 153 119			27	100				35 51 14				22 7	27	0.44	4.4
Type Totals					2.3 52,456 51,263			11,688	13 19 67				4 4 6 87				32 12	273	1.84	187.9

T		TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)										Page		1				
				Project: IMPERIAL										Date		8/26/2019				
														Time		1:57:47PM				
T05N R06W S15 TRW										T05N R06W S15 TRW										
Twp		Rge		Sec		Tract		Type		Acres		Plots		Sample Trees		CuFt		BdFt		
05N		06W		15		A123		RW		10.00		60		146		1		W		
S So Gr T rt ad Spp			%	Bd. Ft. per Acre			Total	Percent Net Board Foot Volume								Average Log			Logs Per /Acre	
								Log Scale Dia.				Log Length				Ln Dia Bd CF/				
			Net	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	84	100.0	567	422			21	79	2	3	1	94	38	18	567	3.05
D			DO	2S	14	1.2	42,681	42,163	68	86	9	6	4	6	37	54	35	9	100	0.83
D			DO	3S	2	.9	6,882	6,822	9	96	4		74	26			19	6	25	0.44
D			DO	4S		858	858													
D			DO	4S		858	858													
D			DO	4S		858	858													
D			DO	4S		858	858													
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D			DO	4S		858	858													
D			DO	4S		858	858													

TC PSTATS			PROJECT STATISTICS							PAGE	1	
			PROJECT IMPERIAL							DATE	10/24/2019	
TWP	RGE	SC	TRACT	TYPE			ACRES	PLOTS	TREES	CuFt	BdFt	
05N 05N	06 06W	15 15	A123 A123	RW TAKE			238.00	120	710	1	W	
				TREES		ESTIMATED		PERCENT				
				PER PLOT		TOTAL		SAMPLE				
				TREES		TREES		TREES				
TOTAL			120	710	5.9							
CRUISE			50	290	5.8		18,806		1.5			
DBH COUNT												
REFOREST												
COUNT			70	410	5.9							
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
DOUG FIR			278	75.4	23.6	80	47.2	229.3	50,988	49,842	10,944	10,855
WHEMLOCK			6	1.2	28.3	96	1.0	5.3	1,315	1,301	275	275
R ALDER			6	2.3	12.5	42	0.6	2.0	153	119	50	42
TOTAL			290	79.0	23.4	79	48.9	236.7	52,456	51,263	11,269	11,172
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			69.2	4.1	1,213	1,266	1,318					
WHEMLOCK			24.9	11.1	963	1,083	1,203					
R ALDER			47.3	21.1	39	50	61					
TOTAL			70.8	4.2	1,186	1,237	1,288	200		50	22	
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			119.4	10.9	67	75	84					
WHEMLOCK			359.7	32.8	1	1	2					
R ALDER			739.7	67.5	1	2	4					
TOTAL			115.7	10.6	71	79	87	535		134	59	
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			105.3	9.6	207	229	251					
WHEMLOCK			359.2	32.8	4	5	7					
R ALDER			779.8	71.1	1	2	3					
TOTAL			103.7	9.5	214	237	259	430		107	48	
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			105.9	9.7	45,029	49,842	54,656					
WHEMLOCK			360.6	32.9	873	1,301	1,729					
R ALDER			807.5	73.6	31	119	207					
TOTAL			105.3	9.6	46,339	51,263	56,187	443		111	49	

TC TSTATS				STATISTICS				PAGE 1			
				PROJECT		IMPERIAL		DATE 12/4/2019			
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt		
05N	06W	15	A123	00MC	228.00	60	360	1	W		
				TREES	ESTIMATED	PERCENT					
				PER PLOT	TOTAL	SAMPLE					
					TREES	TREES					
TOTAL		60	360	6.0							
CRUISE		25	146	5.8	18,538	.8					
DBH COUNT											
REFOREST											
COUNT		35	208	5.9							
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	
DOUG FIR		138	75.4	23.6	80	47.2	229.3	51,023	49,870	10,946	10,856
WHEMLOCK		3	1.2	28.3	96	1.0	5.3	1,315	1,301	275	275
SNAG		2	2.3	16.2	36	0.8	3.3				
R ALDER		3	2.3	12.5	42	0.6	2.0	153	119	50	42
TOTAL		146	81.3	23.3	78	49.8	240.0	52,491	51,290	11,270	11,173
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		69.1	5.9	1,196	1,271	1,346					
WHEMLOCK		27.8	19.2	875	1,083	1,292					
SNAG											
R ALDER		52.9	36.6	32	50	68					
TOTAL		72.2	6.0	1,151	1,224	1,298	208	52	23		
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		55.6	7.2	70	75	81					
WHEMLOCK		257.5	33.2	1	1	2					
SNAG		400.8	51.7	1	2	4					
R ALDER		543.5	70.1	1	2	4					
TOTAL		48.2	6.2	76	81	86	93	23	10		
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		36.9	4.8	218	229	240					
WHEMLOCK		257.1	33.2	4	5	7					
SNAG		400.8	51.7	2	3	5					
R ALDER		573.4	74.0	1	2	3					
TOTAL		32.8	4.2	230	240	250	43	11	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		
DOUG FIR		38.1	4.9	47,416	49,870	52,323					
WHEMLOCK		258.2	33.3	868	1,301	1,735					
SNAG											
R ALDER		594.1	76.6	28	119	210					
TOTAL		37.3	4.8	48,822	51,290	53,758	56	14	6		
CL: 68.1 %		COEFF	TONS/ACRE				# OF PLOTS REQ.		INF. POP.		
SD: 1.0		VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR											
WHEMLOCK											
SNAG											
R ALDER											
TOTAL											

TC TSTATS				STATISTICS				PAGE	2
				PROJECT	IMPERIAL			DATE	12/4/2019
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
05N	06W	15	A123	00MC	228.00	60	360	1	W
CL:	68.1 %	COEFF		TONS/ACRE			# OF PLOTS REQ.		INF. POP.
SD:	1.0	VAR.	S.E. %	LOW	AVG	HIGH	5	10	15

TC TSTATS				STATISTICS				PAGE	1
				PROJECT IMPERIAL				DATE	10/24/2019
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
05N	06W	15	A123	TAKE	228.00	60	355	1	W

			TREES	ESTIMATED	PERCENT
			PER PLOT	TOTAL	SAMPLE
	PLOTS	TREES		TREES	TREES
TOTAL	60	355	5.9		
CRUISE	25	145	5.8	18,015	.8
DBH COUNT					
REFOREST					
COUNT	35	205	5.9		
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
DOUG FIR	139	75.4	23.6	80	47.2	229.3	50,988	49,842	10,944	10,855
WHEMLOCK	3	1.2	28.3	96	1.0	5.3	1,315	1,301	275	275
R ALDER	3	2.3	12.5	42	0.6	2.0	153	119	50	42
TOTAL	145	79.0	23.4	79	48.9	236.7	52,456	51,263	11,269	11,172

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	69.3	5.9	1,191	1,266	1,340					
WHEMLOCK	27.8	19.2	875	1,083	1,292					
R ALDER	52.9	36.6	32	50	68					
TOTAL	70.9	5.9	1,164	1,237	1,310		201	50	22	

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	56.4	7.3	70	75	81					
WHEMLOCK	257.5	33.2	1	1	2					
R ALDER	543.5	70.1	1	2	4					
TOTAL	52.0	6.7	74	79	84		108	27	12	

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	38.0	4.9	218	229	241					
WHEMLOCK	257.1	33.2	4	5	7					
R ALDER	573.4	74.0	1	2	3					
TOTAL	35.5	4.6	226	237	248		50	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	38.8	5.0	47,346	49,842	52,339					
WHEMLOCK	258.2	33.3	868	1,301	1,735					
R ALDER	594.1	76.6	28	119	210					
TOTAL	38.0	4.9	48,751	51,263	53,774		58	14	6	

TC TSTATS				STATISTICS				PAGE	1	
				PROJECT IMPERIAL				DATE	10/24/2019	
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
05N	06W	15	A123	RW	10.00	60	355	1	W	
				TREES	ESTIMATED	PERCENT				
				PER PLOT	TOTAL	SAMPLE				
					TREES	TREES				
TOTAL		60	355	5.9						
CRUISE		25	145	5.8	790		18.4			
DBH COUNT										
REFOREST										
COUNT		35	205	5.9						
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
DOUG FIR		139	75.4	23.6	80	47.2	229.3	50,988	49,842	10,944
WHEMLOCK		3	1.2	28.3	96	1.0	5.3	1,315	1,301	275
R ALDER		3	2.3	12.5	42	0.6	2.0	153	119	50
TOTAL		145	79.0	23.4	79	48.9	236.7	52,456	51,263	11,269
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		69.3	5.9	1,191	1,266	1,340				
WHEMLOCK		27.8	19.2	875	1,083	1,292				
R ALDER		52.9	36.6	32	50	68				
TOTAL		70.9	5.9	1,164	1,237	1,310	201	50	22	
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		56.4	7.3	70	75	81				
WHEMLOCK		257.5	33.2	1	1	2				
R ALDER		543.5	70.1	1	2	4				
TOTAL		52.0	6.7	74	79	84	108	27	12	
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		38.0	4.9	218	229	241				
WHEMLOCK		257.1	33.2	4	5	7				
R ALDER		573.4	74.0	1	2	3				
TOTAL		35.5	4.6	226	237	248	50	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		38.8	5.0	47,346	49,842	52,339				
WHEMLOCK		258.2	33.3	868	1,301	1,735				
R ALDER		594.1	76.6	28	119	210				
TOTAL		38.0	4.9	48,751	51,263	53,774	58	14	6	

TC		PSTNDSUM		Stand Table Summary								Page		1		
												Date:		10/24/2019		
T05N R06W S15 TyRW10.00 T05N R06W S15 TyTAKE228.00				Project		IMPERIAL		Time:		2:10:28PM						
				Acres		238.00		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	T o t a l s		
				FF 16'	Av Ht				Net Cu.Ft.	Net Bd.Ft.				Tons	Cunits	MBF
D		10	2	85	31	3.025	1.65	3.02	8.0	20.0		24	60	58	14	
D		11	4	86	100	5.000	3.30	7.50	14.7	50.0		110	375	262	89	
D		12	6	87	84	6.302	4.95	10.50	14.2	50.0		149	525	355	125	
D		13	8	89	88	7.160	6.60	14.32	15.9	58.8		227	841	541	200	
D		14	4	85	72	3.087	3.30	4.63	19.3	56.7		90	262	213	62	
D		15	10	87	98	6.722	8.25	13.44	22.9	84.0		308	1,129	733	269	
D		16	2	86	96	1.182	1.65	2.36	25.5	90.0		60	213	143	51	
D		18	2	88	95	.934	1.65	1.87	34.5	125.0		64	233	153	56	
D		19	4	87	127	1.676	3.30	5.03	32.7	116.7		164	587	391	140	
D		20	8	88	106	3.025	6.60	6.81	40.1	144.4		273	983	650	234	
D		21	8	88	107	2.744	6.60	6.86	40.8	157.0		280	1,077	666	256	
D		22	6	88	93	1.875	4.95	3.75	45.5	173.3		171	650	406	155	
D		23	12	88	123	3.431	9.90	9.72	47.9	199.4		466	1,939	1,109	461	
D		24	8	89	126	2.101	6.60	6.30	50.7	222.5		319	1,402	760	334	
D		25	18	88	133	4.356	14.85	13.07	58.4	254.8		763	3,330	1,815	793	
D		26	8	87	117	1.790	6.60	4.92	60.7	251.8		299	1,240	711	295	
D		27	12	89	138	2.490	9.90	7.47	69.9	321.7		522	2,403	1,242	572	
D		28	10	88	110	1.929	8.25	4.63	75.9	327.5		352	1,516	837	361	
D		29	2	88	146	.360	1.65	1.08	86.0	416.7		93	450	221	107	
D		30	8	87	137	1.344	6.60	4.03	83.1	400.8		335	1,617	798	385	
D		31	4	88	144	.630	3.30	2.20	79.9	402.9		176	888	419	211	
D		32	4	87	146	.591	3.30	1.77	101.3	490.0		180	869	427	207	
D		33	10	87	115	1.389	8.25	3.89	87.4	410.0		340	1,594	809	379	
D		34	14	88	141	1.832	11.55	5.50	109.2	551.4		600	3,030	1,428	721	
D		35	8	88	148	.988	6.60	2.96	123.5	633.3		366	1,877	871	447	
D		36	26	87	144	3.034	21.45	9.34	123.3	623.0		1,151	5,817	2,739	1,384	
D		37	14	87	141	1.547	11.55	4.64	132.0	671.9		613	3,118	1,458	742	
D		38	8	87	143	.838	6.60	2.51	140.7	718.3		354	1,806	842	430	
D		39	2	83	146	.199	1.65	.60	142.3	683.3		85	408	202	97	
D		40	10	87	152	.945	8.25	3.02	149.8	790.0		453	2,390	1,079	569	
D		41	8	86	137	.720	6.60	2.16	153.4	715.8		331	1,546	788	368	
D		42	8	86	138	.686	6.60	2.06	165.9	810.0		341	1,667	813	397	
D		43	6	89	146	.491	4.95	1.47	184.3	964.4		271	1,420	646	338	
D		44	2	89	144	.156	1.65	.47	193.7	973.3		91	456	216	109	
D		45	6	85	134	.448	4.95	1.20	202.9	992.5		242	1,186	577	282	
D		46	4	87	127	.286	3.30	.86	185.3	961.7		159	825	378	196	
D		48	2	77	74	.131	1.65	.26	125.0	440.0		33	116	78	27	
D		Totals	278	87	109	75.442	229.33	176.23	61.6	282.8		10,855	49,842	25,835	11,863	
H		27	2	86	111	.447	1.78	1.34	63.7	266.7		85	358	203	85	
H		28	2	89	118	.416	1.78	1.25	72.7	350.0		91	437	216	104	
H		30	2	92	124	.362	1.78	1.09	90.7	466.7		99	507	234	121	
H		Totals	6	89	117	1.225	5.33	3.68	74.7	354.1		275	1,301	653	310	
A		10	2	87	100	1.222	.67	2.44	9.5	35.0		23	86	55	20	
A		12	2	86	47	.849	.67	.85	9.0	20.0		8	17	18	4	
A		21	2	87	41	.277	.67	.28	41.0	60.0		11	17	27	4	
A		Totals	6	87	74	2.348	2.00	3.57	11.8	33.4		42	119	101	28	
Totals			290	87	108	79.015	236.67	183.48	60.9	279.4		11,172	51,263	26,589	12,201	

TC PLOGSTVB			Log Stock Table - MBF																
T05N R06W S15 TyRW10.00 T05N R06W S15 TyTAKE228.00				Project: IMPERIAL Acres238.00										Page 2 Date 10/24/2019 Time 2:10:28PM					
S T Spp	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+	
D	DO 4S	16	67		67	.6			35	33									
D	DO 4S	18	23		23	.2			23										
D	DO 4S	20	43		43	.4			43										
D	DO 4S	24	10		10	.1				10									
D	DO 4S	28	26		26	.2			18			8							
D	DO 4S	30	17		17	.1			17										
D	Totals		12,135	2.2	11,863	97.2			472	526	587	812	873	2630	1929	3171	863		
H	DO 2S	32	48		48	15.5					20	28							
H	DO 2S	40	249	1.3	245	79.2							95	150					
H	DO 3S	18	5		5	1.7					5								
H	DO 3S	20	7		7	2.2					7								
H	DO 4S	16	4		4	1.4				4									
H	Totals		313	1.0	310	2.5				4	12	20	28	95	150				
A	DO CU	13	8	100.0															
A	DO 4S	18	6		6	20.5			6										
A	DO 4S	20	4		4	14.2			4										
A	DO 4S	30	15		15	51.3			15										
A	DO 4S	36	4		4	14.0			4										
A	Totals		36	22.2	28	.2			28										
Total	All Species		12,484	2.3	12,201	100.0			501	530	599	833	900	2725	2080	3171	863		

Legend

- Survey Monument
- Timber Sale Boundary
- Yarding Area - Cable
- Existing Landing
- New Construction Landing
- Yarding Area - Ground Based
- New Road Construction
- Designated Haul Route
- Reforestation Area
- Green Tree Retention Area
- Surfaced Road
- Type F Stream
- Type N Stream

LOGGING PLAN MAP

OF TIMBER SALE CONTRACT NO.
AT-341-2020-W00829-01 IMPERIAL WALKER
PORTIONS OF SECTIONS 9, 10, 15, AND 16,
T5N, R6W, W.M., CLATSOP COUNTY, OREGON

Approximate Scale 1 inch = 1,000 feet



Logging Breakdown	Tractor	Cable
Unit 1	72%	28%
Unit 2	32%	68%
Unit 3	63%	37%
Unit 4	100%	0%
Total	64%	36%

Approximate Net Acreage	MC Acres
Unit 1 (MC) =	108 Acres
Unit 2 (MC) =	37 Acres
Unit 3 (MC) =	83 Acres
Unit 4 (R/W) =	10 Acres
Total =	238 Acres

