



"SUSTAINABLE FORESTRY"

Timber Sale Appraisal Piggy Back

Sale FG-341-2016-46-

District: Forest Grove

Date: April 05, 2016

Cost Summary

| | Conifer | Hardwood | Total |
|-------------------------|----------------|-------------------|----------------|
| Gross Timber Sale Value | \$1,041,478.62 | \$0.00 | \$1,041,478.62 |
| | | Project Work: | (\$242,755.00) |
| | | Advertised Value: | \$798,723.62 |



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Sale FG-341-2016-46-

District: Forest Grove

Date: April 05, 2016

Timber Description

Location: Portions of Sections 11, 12, and 14, T3N, R6W, W.M., Tillamook County, Oregon.

Stand Stocking: 20%

| Specie Name | AvgDBH | Amortization (%) | Recovery (%) |
|---------------|--------|------------------|--------------|
| Douglas - Fir | 21 | 0 | 100 |

| Volume by Grade | 2S | 3S | 4S | Total |
|-----------------|-------|-----|----|-------|
| Douglas - Fir | 1,862 | 623 | 77 | 2,562 |
| Total | 1,862 | 623 | 77 | 2,562 |

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

Western Hemlock and Other Conifers Stumpage Price = Pond Value minus Logging Cost:
 $\$229.56/\text{MBF} = \$435/\text{MBF} - \$205.44/\text{MBF}$

Western redcedar and Other Cedars Stumpage Price = Pond Value minus Logging Cost:
 $\$979.56/\text{MBF} = \$1,185/\text{MBF} - \$205.44/\text{MBF}$

Red Alder and Other Hardwoods Stumpage Price = Pond Value minus Logging Cost:
 $\$399.56/\text{MBF} = \$605/\text{MBF} - \$205.44/\text{MBF}$

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):
Brand and Paint: $2,562 \text{ MBF} \times \$2/\text{MBF} = \$5,124$
TOTAL Other Costs (with Profit & Risk to be added) = \$5,124

Other Costs (No Profit & Risk added):
Block/Waterbar Roads/Skid Trails: $15 \text{ hrs} \times \$150/\text{hour} = \$2,250$
Pile Landing Slash/Sort Firewood: $20 \text{ hrs} \times \$150/\text{hour} = \$3,000$
Equipment Cleaning: $3 \times \$1,000/\text{Piece} = \$3,000$
TOTAL Other Costs (No Profit & Risk added) = \$8,250

ROAD MAINTENANCE
Move-in: \$4,000
General Road Maintenance: $9.0 \text{ miles} \times \$1,200/\text{mile} = \$10,800$
TOTAL Road Maintenance: $\$14,800/2,562 \text{ MBF} = \$5.78/\text{MBF}$



"STRENGTH IN FORESTRY"

Timber Sale Appraisal Piggy Back

Sale FG-341-2016-46-

District: Forest Grove

Date: April 05, 2016

Logging Conditions

| | | |
|--------------------------|---|---------------------------------|
| Combination#: 1 | Douglas - Fir | 13.78% |
| Logging System: | Cable: Small Tower <=40 | Process: Stroke Delimber |
| yarding distance: | Short (400 ft) | downhill yarding: No |
| tree size: | Mature / Partial Cut (900 Bft/tree), 3-5 logs/MBF | |
| loads / day: | 6 | bd. ft / load: 4100 |
| cost / mbf: | \$227.64 | |
| machines: | Log Loader (A) Stroke Delimber (A) Tower Yarder (Small) | |

| | | |
|--------------------------|---|---------------------------------|
| Combination#: 2 | Douglas - Fir | 86.22% |
| Logging System: | Shovel | Process: Stroke Delimber |
| yarding distance: | Medium (800 ft) | downhill yarding: No |
| tree size: | Mature / Partial Cut (900 Bft/tree), 3-5 logs/MBF | |
| loads / day: | 9 | bd. ft / load: 4100 |
| cost / mbf: | \$85.96 | |
| machines: | Stroke Delimber (B) | |



"STAND FOR A FORESTRY"

Timber Sale Appraisal Piggy Back

Sale FG-341-2016-46-

District: Forest Grove

Date: April 05, 2016

Logging Costs

| | |
|------------------------------------|--------------------------------------|
| Operating Seasons: 1.00 | Profit Risk: 15% |
| Project Costs: \$242,755.00 | Other Costs (P/R): \$5,124.00 |
| Slash Disposal: \$0.00 | Other Costs: \$8,250.00 |

Miles of Road

Road Maintenance: \$5.78

| 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 | 4.6 |



~~"STAND FOR A FOREST"~~

Timber Sale Appraisal Piggy Back

Sale FG-341-2016-46-

District: Forest Grove

Date: April 05, 2016

Logging Costs Breakdown

| Logging | Road Maint | Fire Protect | Hauling | Other P/R appl | Profit & Risk | Slash Disposal | Scaling | Other | Total |
|---------------|------------|--------------|---------|----------------|---------------|----------------|---------|--------|----------|
| Douglas - Fir | | | | | | | | | |
| \$105.49 | \$5.78 | \$1.71 | \$56.52 | \$2.00 | \$25.72 | \$0.00 | \$5.00 | \$3.22 | \$205.44 |

| Specie | Amortization | Pond Value | Stumpage | Amortized |
|---------------|--------------|------------|----------|-----------|
| Douglas - Fir | \$0.00 | \$611.95 | \$406.51 | \$0.00 |



"SUSTAINING FORESTRY"

Timber Sale Appraisal Piggy Back

Sale FG-341-2016-46-

District: Forest Grove

Date: April 05, 2016

Summary

Amortized

| Specie | MBF | Value | Total |
|---------------|-----|--------|--------|
| Douglas - Fir | 0 | \$0.00 | \$0.00 |

Unamortized

| Specie | MBF | Value | Total |
|---------------|-------|----------|----------------|
| Douglas - Fir | 2,562 | \$406.51 | \$1,041,478.62 |

Gross Timber Sale Value

Recovery: \$1,041,478.62

Prepared By: Eric Foucht

Phone: 503-359-7473

TIMBER SALE SUMMARY
Piggy Back
Contract No. 341-16-46

1. **Location:** Portions of Sections 11, 12, & 14, T3N, R6W, W.M., Tillamook County, Oregon.
2. **Type of Sale:** Piggy Back is a 130 acre Light Partial Cut, and a 1 acre new construction right-of-way. The timber will be sold on a recovery basis at a sealed bid auction.
3. **Revenue Distribution:** 100% BOF, Tillamook County, Tax Code 56-1
4. **Sale Acreage:** Acres are net of stream buffers and road prisms. Acreage was determined using ESRI ArcMap GIS software.
5. **Cruise:** The Timber Sale was cruised by ODF Cruisers in February of 2016. For more information see Cruise Report.
6. **Timber Description:** The Timber Sale Area consists of a medium to well stocked 75 year old stand of Douglas-fir. The estimated average "take" Douglas-fir DBH is 21 inches. The estimated average net Douglas-fir harvest volume is 19.8 MBF/acre on approximately 40 trees/acre.

7. **Volume Summary**

| AREA 1 (PC L) | | | | | |
|---------------|------------------|-------|-------|-------|-------|
| SPECIES | | 2 SAW | 3 SAW | 4 SAW | TOTAL |
| Douglas-fir | Cruise Volume | 1,870 | 626 | 78 | 2,574 |
| | Hidden D&B (2%) | (37) | (13) | (2) | (51) |
| | NET TOTAL | 1,833 | 613 | 76 | 2,522 |
| | % of Total | 73 | 24 | 3 | |
| AREA 2 (R/W) | | | | | |
| | Cruise Volume | 30 | 10 | 1 | 41 |
| | Hidden D&B (2%) | (1) | 0 | 0 | (1) |
| | NET TOTAL | 29 | 10 | 1 | 40 |
| | % of Total | 73 | 25 | 2 | |
| Sale Total | | 1,862 | 638 | 78 | 2,562 |

8. **Topography and Logging Method:** With the exception of a few short steep pitches, slopes are generally less than 35% and for the most part are of a southern aspect. The Sale Area is 86% ground-based yarding and 14% cable yarding. The average horizontal tractor yarding distance is approximately 450 feet. The average cable corridor length is 432 feet and the maximum is about 700 feet.
9. **Access:** From Forest Grove, travel north on Highway 47 through Banks then merge onto Highway 26 westbound and continue for approximately 11 ½ miles to the Timber Road. Turn left and proceed south on the Timber Road .7 miles to the Lousignont Road. Turn right and continue west on Lousignont Road for 2 miles to Swede Fiddle Road. Turn right and proceed on Swede Fiddle Road 1.5 miles to the north portion of the Timber Sale Area.

10. Projects:

| | |
|--|--------------|
| Project No. 1: Road Construction and Improvement | \$30,369.85 |
| Project No. 2: Surfacing | \$145,018.22 |
| Project No. 3: Grass Seed, Fertilize, and Mulch | \$1,609.50 |
| Project No. 4: Drill test holes at Dunbar Pit | \$3,004.57 |
| Project No. 5: Construct 5000cy Stockpile | \$57,130.00 |
| Move in and equipment cleaning | \$5,622.86 |
| <u>Total all Projects</u> | \$242,755.00 |

PROJECT COST SUMMARY SHEET

Timber Sale: Piggy Back
Sale Number: 341-16-46

PROJECT NO. 1: ROAD CONSTRUCTION AND IMPROVEMENT**CONSTRUCTION**

| Road Segment | Length | Cost |
|--------------|---------------|------------|
| C to D | 9+20 | \$2,633.12 |
| | 9+20 stations | |
| | 0.17 miles | |

SUBTOTAL CONSTRUCTION = \$2,633.12

IMPROVEMENTS

| Road Segment | Length | Cost |
|--------------|-----------------|------------|
| A to B | 15+50 | \$9,028.46 |
| E to A | 52+20 | \$9,742.55 |
| B to F | 30+40 | \$4,590.32 |
| G to H | 102+65 | \$4,375.40 |
| | 200+75 stations | |
| | 3.80 miles | |

SUBTOTAL IMPROVEMENTS = \$27,736.73

TOTAL PROJECT NO. 1 COST = \$30,369.85

PROJECT NO. 2: SURFACING

| Road Segment | Rock Amount | Rock Type | Cost |
|--------------|-------------|-----------------|-------------|
| A to B | 1104 cy | 3" - 0 | \$16,284.00 |
| A to B | 48 cy | 6" - 0 Shotrock | \$288.48 |
| A to B | 40 cy | 1 1/2" - 0 | \$512.00 |
| C to D | 908 cy | 3" - 0 | \$13,574.60 |
| E to A | 2956 cy | 3" - 0 | \$47,355.12 |
| E to A | 240 cy | 1 1/2" - 0 | \$3,376.80 |
| B to F | 1004 cy | 3" - 0 | \$13,102.20 |
| B to F | 80 cy | 1 1/2" - 0 | \$986.40 |
| B to F | 12 cy | 24" - 6" | \$75.84 |
| G to H | 3149 cy | 3" - 0 | \$49,061.42 |
| G to H | 20 cy | 1 1/2" - 0 | \$297.20 |
| G to H | 12 cy | 24" - 6" | \$104.16 |
| Total | 9121 cy | 3" - 0 | |
| | 380 cy | 1 1/2" - 0 | |
| | 48 cy | 6" - 0 Shotrock | |
| | 24 cy | 24" - 6" | |

TOTAL PROJECT NO. 2 COST = \$145,018.22

PROJECT NO. 3 GRASS SEED, FERTILIZE, & MULCH

TOTAL PROJECT NO. 3 COST = \$1,609.50

PROJECT NO. 4: DRILL TEST HOLES AT DUNBAR PIT

TOTAL PROJECT NO. 4 COST = \$3,004.57

PROJECT NO. 5: 5,000CY STOCKPILE

5,000cy 1 1/2" - 0 Stockpile (stockpile measurement) **TOTAL PROJECT NO. 5 COST = \$57,130.00**

MOVE-IN & EQUIPMENT CLEANING

| | |
|----------------------------------|------------|
| Grader | \$802.31 |
| Roller (smooth/grid) & Compactor | \$536.05 |
| Excavator - Equipment Cleaning | \$1,802.31 |
| Dozer - Equipment Cleaning | \$1,846.89 |
| Dump Trucks | \$635.30 |

TOTAL MOVE-IN & EQUIPMENT CLEANING COST = \$5,622.86

TOTAL CREDITS \$242,755.00

SUMMARY OF CONSTRUCTION COST

| | | | |
|---------------|-------------------|--------------|--|
| Timber Sale: | <u>Piggy Back</u> | Sale Number: | <u>341-16-46</u> |
| Road Segment: | <u>A to B</u> | Improvement: | <u>15+50</u> stations <u>0.29</u> miles |

PROJECT NO. 1

EXCAVATION

| | | | | | |
|-------------------------------|-------|-------|------------|------------|---------------------------------|
| Clearing & grubbing (scatter) | 1.07 | ac @ | \$1,078.00 | per acre = | \$1,153.46 |
| Road Improvement | 15.50 | sta @ | \$110.00 | per sta = | \$1,705.00 |
| Turnouts | 2 | ea @ | \$66.00 | per ea = | \$132.00 |
| Grade, ditch, & roll | 15.50 | sta @ | \$36.00 | per sta = | \$558.00 |
| | | | | | TOTAL EXCAVATION COSTS = |
| | | | | | \$3,548.46 |

CULVERTS - MATERIALS & INSTALLATION

Culverts

| | |
|---------------|------------|
| 120 LF of 18" | \$2,400.00 |
| 80 LF of 24" | \$2,320.00 |

Culvert Markers

| | |
|-----------|---------|
| 6 markers | \$60.00 |
|-----------|---------|

Additional Installation Cost

| | | | |
|---------|----------|----------|-----------------|
| 4 hrs @ | \$175.00 | per hr = | <u>\$700.00</u> |
|---------|----------|----------|-----------------|

TOTAL CULVERT COSTS = \$5,480.00

PROJECT NO. 1 TOTAL COST = \$9,028.46

PROJECT NO. 2:

SURFACING

12" deep = 65 cy/sta

| | | | | | | | |
|--------------------------|-------|-------|-----------------|---|---------|----------|-------------|
| A to B | 1008 | cy of | 3" - 0 | @ | \$14.75 | per cy = | \$14,868.00 |
| Turnouts (2) | 48 | cy of | 3" - 0 | @ | \$14.75 | per cy = | \$708.00 |
| Junction | 48 | cy of | 3" - 0 | @ | \$14.75 | per cy = | \$708.00 |
| Subgrade reinforcement | 48 | cy of | 6" - 0 | @ | \$6.01 | per cy = | \$288.48 |
| Culvert Bedding/Backfill | 40 | cy of | 1 1/2" - 0 | @ | \$12.80 | per cy = | \$512.00 |
| Rock Total = | 1,192 | | | | | | |
| | 1,104 | cy of | 3" - 0 | | \$14.75 | per cy = | \$16,284.00 |
| | 48 | cy of | 6" - 0 Shotrock | | \$6.01 | per cy = | \$288.48 |
| | 40 | cy of | 1 1/2" - 0 | | \$12.80 | per cy = | \$512.00 |

PROJECT NO. 2 TOTAL COST = \$17,084.48

PROJECT NO. 3:

| | | | | | | |
|-------------------------|------|-------|---|----------|------------|----------|
| Grass seed & fertilizer | 0.54 | acres | @ | \$425.00 | per acre = | \$229.50 |
| Mulch | 8 | bales | @ | \$8.00 | per bale = | \$64.00 |

PROJECT NO. 3 TOTAL COST = \$293.50

TOTAL COST = \$26,406.44

SUMMARY OF CONSTRUCTION COST

Timber Sale: Piggy Back
 Road Segment: C to D

Sale Number: 341-16-46
 Construction: 9+20 stations
0.17 miles

PROJECT NO. 1

EXCAVATION

| | | | | | |
|-------------------------------|------|-------|------------|------------|------------|
| Clearing & grubbing (scatter) | 0.64 | ac @ | \$1,078.00 | per acre = | \$689.92 |
| Balanced road construction | 9.20 | sta @ | \$110.00 | per sta = | \$1,012.00 |
| "Y" Junction | 1.25 | sta @ | \$110.00 | per sta = | \$137.50 |
| Turnouts | 1 | ea @ | \$66.00 | per ea = | \$66.00 |
| Turnarounds | 1 | ea @ | \$82.50 | per ea = | \$82.50 |
| Landing | 1 | ea @ | \$314.00 | per ea = | \$314.00 |
| Grade, ditch, & roll | 9.20 | sta @ | \$36.00 | per sta = | \$331.20 |

TOTAL EXCAVATION COSTS = \$2,633.12

PROJECT NO. 1 TOTAL COST = \$2,633.12

PROJECT NO. 2:

SURFACING

12 " deep = 65 cy/sta

| | | | | | | | |
|--------------|-----|-------|--------|---|---------|----------|-------------|
| C to D | 598 | cy of | 3" - 0 | @ | \$14.95 | per cy = | \$8,940.10 |
| Turnout | 24 | cy of | 3" - 0 | @ | \$14.95 | per cy = | \$358.80 |
| Turnaround | 24 | cy of | 3" - 0 | @ | \$14.95 | per cy = | \$358.80 |
| Junction | 82 | cy of | 3" - 0 | @ | \$14.95 | per cy = | \$1,225.90 |
| Landing | 180 | cy of | 3" - 0 | @ | \$14.95 | per cy = | \$2,691.00 |
| Rock Total = | 908 | | | | | | |
| | 908 | cy of | 3" - 0 | | \$14.95 | per cy = | \$13,574.60 |

PROJECT NO. 2 TOTAL COST = \$13,574.60

PROJECT NO. 3:

| | | | | | | |
|-------------------------|------|-------|---|----------|------------|----------|
| Grass seed & fertilizer | 0.32 | acres | @ | \$425.00 | per acre = | \$136.00 |
|-------------------------|------|-------|---|----------|------------|----------|

PROJECT NO. 3 TOTAL COST = \$136.00

TOTAL COST = \$16,343.72

SUMMARY OF CONSTRUCTION COST

Timber Sale: Piggy Back
Road Segment: E to A

Sale Number: 341-16-46
Improvement: 52+20 stations
0.99 miles

PROJECT NO. 1

EXCAVATION

| | | | | | |
|--------------------------------------|-------|-------|---------|-----------|--|
| Clean ditch & scatter waste material | 15.58 | sta @ | \$12.41 | per sta = | \$193.35 |
| Clean culvert inlet & outlet (0+00) | 1 | ea @ | \$25.00 | per ea = | \$25.00 |
| Grade & roll | 52.20 | sta @ | \$36.00 | per sta = | \$1,879.20 |
| | | | | | TOTAL EXCAVATION COSTS = \$2,097.55 |

CULVERTS - MATERIALS & INSTALLATION

Culverts

180 LF of 18" \$3,600.00

130 LF of 24" \$3,770.00

Culvert Markers

10 markers \$100.00

Additional Installation Cost

1 hrs @ \$175.00 per hr = \$175.00

TOTAL CULVERT COSTS = \$7,645.00

PROJECT NO. 1 TOTAL COST = \$9,742.55

PROJECT NO. 2:

SURFACING

10 " deep = 53 cy/sta

| | | | | | | | |
|--------------------------|-------|-------|------------|---|---------|----------|-------------|
| E to A | 2767 | cy of | 3" - 0 | @ | \$16.02 | per cy = | \$44,327.34 |
| Turnouts (4) | 72 | cy of | 3" - 0 | @ | \$16.02 | per cy = | \$1,153.44 |
| Y-Junction | 117 | cy of | 3" - 0 | @ | \$16.02 | per cy = | \$1,874.34 |
| Culvert bedding/Backfill | 240 | cy of | 1 1/2" - 0 | @ | \$14.07 | per cy = | \$3,376.80 |
| Rock Total = | 3,196 | | | | | | |
| | 240 | cy of | 1 1/2" - 0 | | \$14.07 | per cy = | \$3,376.80 |
| | 2,956 | cy of | 3" - 0 | | \$16.02 | per cy = | \$47,355.12 |

PROJECT NO. 2 TOTAL COST = \$50,731.92

PROJECT NO. 3:

| | | | | | | |
|-------------------------|------|-------|---|----------|------------|------------|
| Grass seed & fertilizer | 2.40 | acres | @ | \$425.00 | per acre = | \$1,020.00 |
| Mulch | 16 | bales | @ | \$8.00 | per bale = | \$128.00 |

PROJECT NO. 3 TOTAL COST = \$1,148.00

TOTAL COST = \$61,622.47

SUMMARY OF CONSTRUCTION COST

Timber Sale: Piggy Back Sale Number: 341-16-46
 Road Segment: B to F Improvement: 30+40 stations
0.58 miles

PROJECT NO. 1

EXCAVATION

| | | | | | |
|--------------------------------------|-------|-------|---------|-----------|---------------------------------|
| Clean ditch & scatter waste material | 3.70 | sta @ | \$12.41 | per sta = | \$45.92 |
| Grade & roll | 30.40 | sta @ | \$36.00 | per sta = | \$1,094.40 |
| | | | | | TOTAL EXCAVATION COSTS = |
| | | | | | \$1,140.32 |

CULVERTS - MATERIALS & INSTALLATION

| | |
|-----------------------------------|------------|
| Culverts | |
| 70 LF of 18" | \$1,400.00 |
| 40 LF of 36" | \$2,000.00 |
| Culvert Markers | |
| 5 markers | \$50.00 |
| TOTAL CULVERT COSTS = | |
| \$3,450.00 | |
| PROJECT NO. 1 TOTAL COST = | |
| \$4,590.32 | |

PROJECT NO. 2:

| | | | | | | |
|-----------------------------------|-------|----------|------------|---|---------|----------------------|
| SURFACING | 6 | " deep = | 31 cy/sta | | | |
| B to F | 942 | cy of | 3" - 0 | @ | \$13.05 | per cy = \$12,293.10 |
| Turnouts (4) | 44 | cy of | 3" - 0 | @ | \$13.05 | per cy = \$574.20 |
| Junction | 18 | cy of | 3" - 0 | @ | \$13.05 | per cy = \$234.90 |
| Culvert bedding | 80 | cy of | 1 1/2" - 0 | @ | \$12.33 | per cy = \$986.40 |
| Riprap | 12 | cy of | 24" - 6" | @ | \$6.32 | per cy = \$75.84 |
| Rock Total = | 1,096 | | | | | |
| | 80 | cy of | 1 1/2" - 0 | | \$12.33 | per cy = \$986.40 |
| | 1,004 | cy of | 3" - 0 | | \$13.05 | per cy = \$13,102.20 |
| | 12 | cy of | 24" - 6" | | \$6.32 | per cy = \$75.84 |
| PROJECT NO. 2 TOTAL COST = | | | | | | \$14,164.44 |

PROJECT NO. 3:

| | | | | | | |
|-----------------------------------|---|-------|---|--------|------------|--------------------|
| Mulch | 4 | bales | @ | \$8.00 | per bale = | \$32.00 |
| PROJECT NO. 3 TOTAL COST = | | | | | | \$32.00 |
| TOTAL COST = | | | | | | \$18,786.76 |

SUMMARY OF CONSTRUCTION COST

Timber Sale: Piggy Back
 Road Segment: G to H

Sale Number: 341-16-46
 Improvement: 102+65 stations
1.94 miles

PROJECT NO. 1

EXCAVATION

| | | | | | |
|----------------------|--------|-------|---------|-----------|---------------------------------|
| Grade, ditch, & roll | 102.65 | sta @ | \$36.00 | per sta = | \$3,695.40 |
| | | | | | TOTAL EXCAVATION COSTS = |
| | | | | | \$3,695.40 |

CULVERTS - MATERIALS & INSTALLATION

Culverts
 30 LF of 18" \$600.00
 Culvert Markers
 8 markers \$80.00

TOTAL CULVERT COSTS = \$680.00

PROJECT NO. 1 TOTAL COST = \$4,375.40

PROJECT NO. 2:

SURFACING

| | | | | | | |
|--------------------------|-------|----------|------------|---|---------|----------------------|
| | 8 | " deep = | 42 cy/sta | | | |
| | 6 | " deep = | 31 cy/sta | | | |
| G to H (29+88 to 40+00) | 314 | cy of | 3" - 0 | @ | \$15.58 | per cy = \$4,892.12 |
| G to H (40+00 to 102+65) | 2631 | cy of | 3" - 0 | @ | \$15.58 | per cy = \$40,990.98 |
| Turnouts (13) | 182 | cy of | 3" - 0 | @ | \$15.58 | per cy = \$2,835.56 |
| Junction | 22 | cy of | 3" - 0 | @ | \$15.58 | per cy = \$342.76 |
| Culvert bedding | 20 | cy of | 1 1/2" - 0 | @ | \$14.86 | per cy = \$297.20 |
| Riprap | 12 | cy of | 24" - 6" | @ | \$8.68 | per cy = \$104.16 |
| Rock Total = | 3,181 | | | | | |
| | 20 | cy of | 1 1/2" - 0 | | \$14.86 | per cy = \$297.20 |
| | 3,149 | cy of | 3" - 0 | | \$15.58 | per cy = \$49,061.42 |
| | 12 | cy of | 24" - 6" | | \$8.68 | per cy = \$104.16 |

PROJECT NO. 2 TOTAL COST = \$49,462.78

TOTAL COST = \$53,838.18

SUMMARY OF CONSTRUCTION COST

Timber Sale: Piggy Back
Project 4

Timber Sale No. : 341-16-46

PROJECT NO. 4

| | | | |
|-------------------------------|----|------------------------|------------|
| Access road construction | 5 | hr @ \$105.00 per hr = | \$525.00 |
| Drill test holes with report. | 10 | hr @ \$132.00 per hr = | \$1,320.00 |
| Move-in equipment | | | \$536.05 |
| Within area move (Drill) | | | \$623.52 |

PROJECT NO. 4 TOTAL COST = \$3,004.57

SUMMARY OF CONSTRUCTION COST

Timber Sale: Piggy Back
Project 5

Timber Sale No. : 341-16-46

PROJECT NO. 5

5,000cy 1 1/2"-0 Stockpile (stockpile measure) 5,800 cy @ \$9.85 per cy = \$57,130.00

PROJECT NO. 5 TOTAL COST = \$57,130.00

ROCK PIT DEVELOPMENT & CRUSHING COST SUMMARY

Timber Sale: Piggy Back
Sale Number: 341-16-46
Pit Name: Rock Creek Ridge Pit

1 1/2" - 0: 380 cy (truck measure)
3" - 0: 9,121 cy (truck measure)
1 1/2"-0 Stockpile: 5,800 cy (truck measure)
Total truck yardage: 15,301 cy
Total in place yardage: 11,770 cy

Swell: 130%
Shrinkage: 116%

Pit development, including clearing & grubbing of waste area, place overburden in waste area, spread & compact.

| | | | | | |
|--------------------|---------------|--------|---------------|------|---------------------|
| | | | | | \$3,666.26 |
| Drill & shoot | <u>\$2.80</u> | / cy x | <u>11,770</u> | cy = | \$32,956.00 |
| Load crusher | <u>\$0.80</u> | / cy x | <u>15,301</u> | cy = | \$12,240.80 |
| Crush (1 1/2" - 0) | <u>\$3.30</u> | / cy x | <u>380</u> | cy = | \$1,254.00 |
| Crush (3" - 0) | <u>\$3.30</u> | / cy x | <u>9,121</u> | cy = | \$30,099.30 |
| Crush (Stockpile) | <u>\$3.30</u> | / cy x | <u>5,800</u> | cy = | \$19,140.00 |
| Load dump truck | <u>\$0.80</u> | / cy x | <u>15,301</u> | cy = | \$12,240.80 |
| | | | Subtotal: | | <u>\$111,597.16</u> |

| | | | | | |
|--|--------------------|----------|-----------|--|--------------------|
| Move in & setup drill | | | | | \$455.28 |
| Equipment cleaning & move in excavator | | | | | \$1,817.66 |
| Equipment cleaning & move in dozer | | | | | \$1,806.02 |
| Move in loader | | | | | \$723.11 |
| Move in crusher | | | | | \$3,286.00 |
| Setup crusher | | | | | \$3,327.00 |
| Gradation tests | \$71.50 /2,000cy x | <u>8</u> | tests | | \$572.00 |
| Change gradation | | | | | \$300.00 |
| Clean up pit | | | | | \$875.00 |
| | | | Subtotal: | | <u>\$13,162.07</u> |

TOTAL PRODUCTION COST = \$124,759.23

ROCK DEVELOPMENT COST = \$8.15/cy

**CRUISE REPORT
PIGGY BACK
341-16-46**

1. LOCATION: Portions of Sections 11, 12, & 14, T3N, R6W, W.M., Tillamook County, Oregon

2. CRUISE DESIGN:

The cruise design assumed a Coefficient of Variation of 55%, an average stand diameter of 20 inches, and a desired sampling error of 10% at a 68% confidence level. A minimum sample size of 100 grade trees is required. Pre-cruise estimates indicated that approximately 15 trees per plot could be realized with a 20 BAF prism. Thinning to a target stand density index of 40% would yield approximately 5 'Take' trees per plot.

3. SAMPLING METHOD:

The Sale Area was cruised in February, 2016 with 32 variable radius plots using a combination of 20 and 25.1 BAF prisms. Plots were laid out on a 5 chain x 5 chain grid. Plots falling on or near existing roads or no-harvest areas were offset 1 chain. Cruisers 'thinned' plots from below to a target residual basal area of 200 ft².

4. CRUISE RESULTS

155 trees were measured and graded producing a sampling error of 9.6% on the Basal Area and 9.4% on the Board Foot Volume.

5. TREE MEASUREMENT AND GRADING:

All grade plot 'Take' trees were measured and graded following Columbia River Log Scale grade rules and favoring 40 foot segments.

a) **Height Standards:**

Total tree heights were measured to the nearest foot. Bole heights were calculated to a six inch top.

b) **Diameter Standards:** Diameters were measured outside bark at breast height to the nearest inch.

c) **Form Factors** were measured for each grade tree using a form point of 16 feet.

6. DATA PROCESSING

a) **Volumes and Statistics,** Volume estimates, and sampling statistics, were derived from Super Ace 2008 cruise software. The volume estimate for Area 2 was derived from the per acre cruise volume estimate.

b) **Deductions:** Two percent of the volume was subtracted from the computed volumes to account for hidden defect and breakage.

7. Cruisers: The sale was cruised by ODF cruisers Mark Savage and Kent Burns.

Prepared by: Mark Savage

Reviewed by: Eric Foucht

RESIDUAL STAND SPECIFICATIONS

SALE NAME: Piggy Back
SALE NUMBER: 341-16-46

Residual QMD assumption (from leave tree cruise information) =

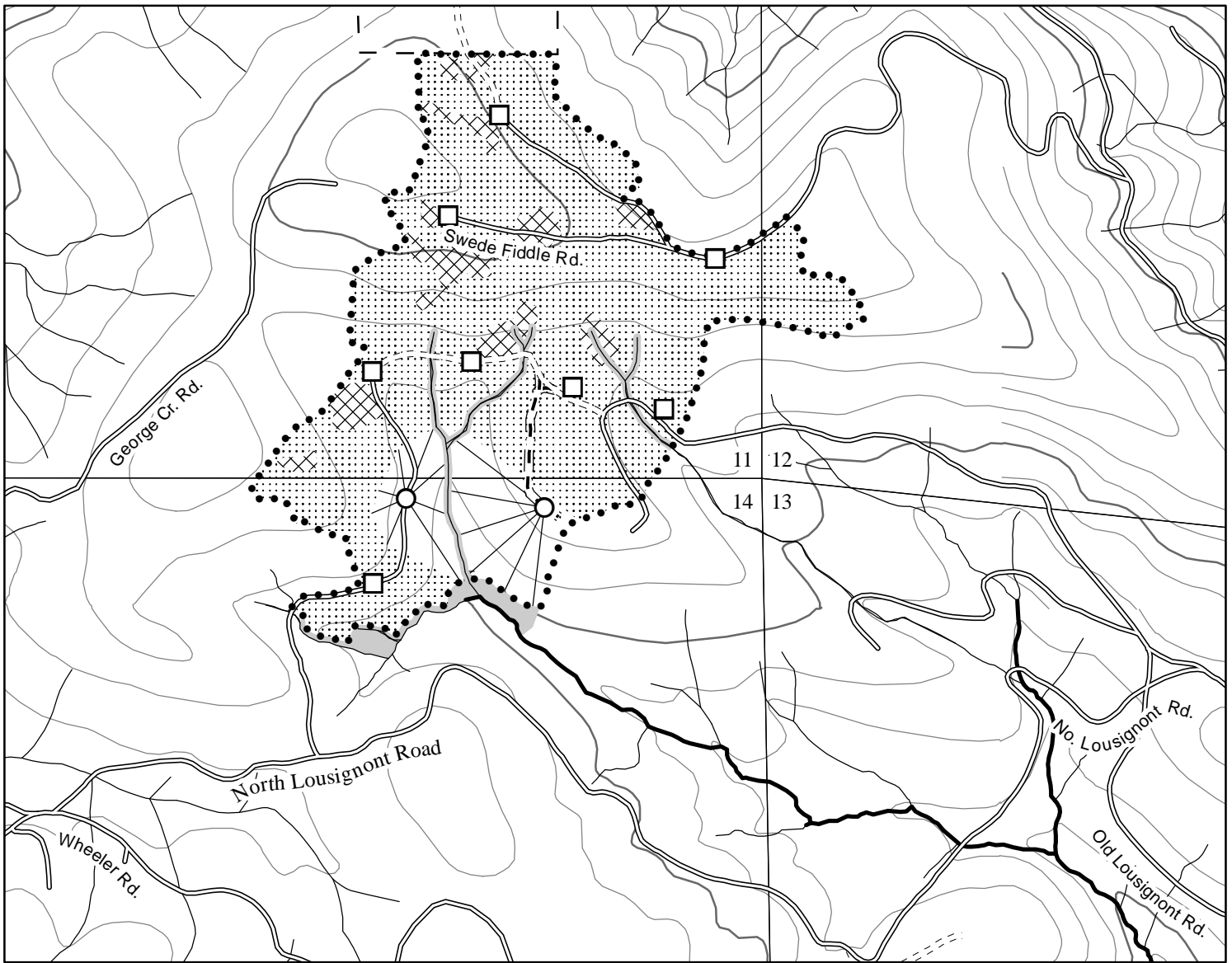
| |
|----|
| 25 |
|----|

Target Relative Density =

| |
|----|
| 40 |
|----|

| | Minimum | Target | Maximum |
|------------------|---------|--------|---------|
| Relative Density | 32 | 40 | 52 |
| Basal Area | 160 | 200 | 260 |
| Trees per Acre | 47 | 59 | 76 |

$RD = BA / \sqrt{DBH}$
 $BA = \sqrt{DBH} (RD)$
 $TPA = (BA/acre) / (BA/tree)$
 $BA / tree = (\pi r^2) / (144)$



Legend

- Timber Sale Boundary
- Surfed Road
- - - - - Unsurfaced Road
- - - New Road Construction
- - - Posted R/W Boundary
- Type F Stream
- Type N Stream
- Stream Buffer
- Partial Cut Non-Required
- Cable Yarding Area
- Tractor Yarding Area
- Cable Landing
- Tractor Landing
- ODF Property Boundary
- Section Line
- 400 Foot Contour Band
- 80 Foot Contour Band

LOGGING PLAN

FOR TIMBER SALE CONTRACT # 341-16-46
 PIGGY BACK
 PORTIONS OF SECTIONS 11, 12, & 14, T3N, R6W, W.M.,
 TILLAMOOK COUNTY, OREGON

Forest Grove District GIS
 February, 2016

This product is for informational use and may not be
 suitable for legal, engineering, or surveying purposes.



APPROXIMATE NET ACRES

| TRACTOR | CABLE |
|-----------|----------|
| 113 Acres | 18 Acres |

1:12,000

1 inch = 1,000 feet

