TIMBER SALE REPORT & APPRAISAL

Stewie Spruce Salvage Re-Offer

Grand Mesa, Uncompahgre, and Gunnison National Forests
Gunnison Ranger District
August 2016

Prepared by: _____ **Date:** 8/9/2016
Drew Stroberg - TMA

Approved by: _____ **Date:** 8-9-2016
John Murphy - District Ranger

SUMMARY OF RECOMMENDATIONS

Net Volume (Appraised and Contract)

Recent Dead Engelmann	4612 CCF
Older Dead Engelmann Spruce Sawtimber	153 CCF
Total: Live and Dead ES and Other Conifer	**4765 CCF**

Quadratic Mean DBH (all sawtimber): 11.8 inches

Treatment acres: 238 acres

Advertised Rates
ES&O Sawtimber: $12.57/CCF

Specified Road Reconstruction: $21,052.71
Road Completion Date: 10/31/2017

Required Slash Deposit is $2.31/CCF
Required Surface Rock Replacement Deposit is $0.87/CCF

Total cost of KV work: $192,937
Total KV Collections at advertised rates: $45,856.95
Essential KV: $0.00

Contract period:
Termination Date: October 31, 2019
Normal Operating Season: June 1 to October 31
2nd Normal Operating Season: December 15 to February 28

DESCRIPTION

A. Location

The sale area is located along NFSR 790.0 and 865.0 in the Cebolla Creek east of Los Pinos Pass in the Gunnison National Forest. The sale area is approximately 40 air miles southeast of Montrose, Colorado, in Sections 14-15, T44N, R1W; Section 18, T44N, R1E; New Mexico P.M.; Saguache County, Colorado. The sale area is approximately 427 acres, of which 238 acres are within cutting units. Principal access to the sale would be from Colorado State Highway 114 and NFSR 790.0.

B. Land Status

All harvested units are on National Forest Service lands. There are no known encumbrances.

C. Basis for Selecting Area

This area was considered for placement in the five-year Timber-Sale Action Plan. The timber sale area is part of the larger La Garita Beetle Response analysis area, which was deemed in need of treatment due to spruce bark beetle infestation and tree mortality. The harvest meets current direction in the Grand Mesa, Uncompahgre and Gunnison National Forest Land Management Plan, as well as the Environmental Analysis (EA). The La Garita Beetle Response Environmental Assessment was signed in December 2013.

D. Transportation Routes and Appraisal Points

Sawtimber will be appraised using Montrose, Colorado as the most advantageous appraisal point.

E. Silvicultural Prescription

The silvicultural prescription for all cutting units is the harvest of merchantable dead or dying Engelmann spruce trees over 8.0 inches DBH. This will be accomplished with a Designation by Species and Diameter per C2.3521#. Live trees will not be removed except incidental amounts to accommodate logging operations. Provision C2.3521 is used to indicate the retention of 225 wildlife snags per 100 acres, and pink tracer painted trees will be left uncut and have been used to buffer several wet areas (see Sale Area Map).

F. Unique Circumstances

Cutting units 9, 10, 11, 7 & 6 have portions of boundaries that follow NFSRs 865, 865.1A, and 790.0. These portions of boundary that border the roads are not painted; the edge of the road closest to the cutting unit serves as cutting unit boundaries in these areas as per the Forest Service Handbook, Section 2409.12, Chapter 70, subsection 71.22 and C.2301#.

Specified reconstruction of portions of NFSRs 788.0, 790.0, 865.0, and 865.1D will be required (5.9 miles). Total cost of specified road work is estimated at $21,052.71. Reconstruction deposits in the amount of $6,302.00 are included with road maintenance deposits. See road package for more information. C5.13#

Winter operations will be required to accommodate the Use Restriction on FR 693.0 per C5.12# and in units 6 and 16 per C6.312#. This restriction requires that operations be restricted to periods when the soil is sufficiently frozen to support equipment and prevent resource damage. Any and all road maintenance and road closure activities must be conducted so as not to disrupt

surface flows or cause other resource damage. Two Normal Operating Seasons have been assigned to the sale, one in winter, and snowplowing appraisals have been made. See Roadwork Appraisal spreadsheet for details.

Fences run through cutting unit 11 and are protected improvements shown on Sale Area Map (B6.22, C6.223).

Any raptor nest (including Northern Goshawk), Post Fledgling Area, or heritage site discovered within the sale area during the course of operations shall be reported immediately to the appropriate specialist and subject to the protective measures identified in the La Garita Beetle Response Environmental Assessment as per provision B6.24.

CONDITIONS OF SALE

A. Planned Cutting Methods

All timber has been indicated by Designation by Species and Diameter per C2.3521# with wildlife retention requirements indicated by the same provision. In addition, wet areas in all units were protected by leave trees which were marked with a pink band at a height of 4 to 7 feet on the main bole of each tree, in addition to a pink painted stump mark. Boundaries have been delineated with three orange painted vertical strips (one strip facing the next boundary tree and the middle strip facing into the cutting unit). Cutting unit numbers were painted with orange, facing into the unit, on approximately every third boundary tree and on all corner trees. Trees with three horizontal orange bands are boundary trees that designate a sharp turn in the boundary (C2.301).

B. Sale Area Improvement Needs (SAI)

See the KV Plan Narrative for information.

C. Slash Treatment

Slash must be lopped and scattered (C6.7). A deposit will be collected to cover the cost of post sale landing slash pile burning conducted by U.S. Forest Service personnel. See the Brush Disposal Treatment Plan FS-2400-62 and Excel spreadsheet for slash disposal details.

D. Utilization Specs

Standard Utilization Specifications are used in this sale (A2). Minimum top diameter is 6.0".

E. Water Quality Protection and Erosion Control

Landings, skid trails, and temporary roads will be re-seeded to stabilize soils; seed that is used will be certified noxious weed-free seed mixture. (C6.601). Skid trails are to be laid out to reduce erosion and will require agreement by the timber sale administrator (B6.422). Skid trails must be at least 100 feet from all live streams except in areas previously identified by U.S. Forest Service personnel (C6.6). Drainage structures will be required where erosion potential is high. Temporary roads will be closed by installing or cleaning waterbars, ripping, seeding, and placing logs, rocks, stumps and slash in the roadway (C5.35).

F. Relevant Mitigation Measures & Design Criteria

Mitigation measures are additional requirements, developed on a site specific basis, along with project design criteria to avoid, minimize, reduce or eliminate adverse effects as a result of implementing the proposed treatments. The mitigation measures and design criteria listed below are found in the La Garita Beetle Response Environmental Assessment in Appendix B.

Water Quality/Soil Productivity

All operations will conform to the direction provided in Chapter 10 of the Water Conservation Practices Handbook (WCPH), FSH 2509.25 Chapter 10. The various measures may be achieved through avoidance, on-the-ground marking, appropriate contract provisions, identification on the sale area map, or during sale administration.

- responsibility: U.S. Forest Service & timber purchaser
- notes: Areas within the WIZ, as defined in the WCPH, were excluded from cutting units as much as possible during layout. B6.5, B6.6, B6.61, B6.62, C2.301#

Limit ground skidding to slopes of 35% or less reduce potential soil erosion.

- responsibility: U.S. Forest Service & timber purchaser
- notes: Unit layout avoided areas with slopes greater than 35%. C2.301#

Operate heavy equipment for land treatments only when soil moisture is below the plastic limit *(a rolled thread of soil 1/8" in diameter crumbles or cracks when the soil moisture content is below the plastic limit)*, or protected by at least 1 foot of packed snow or 2 inches of frozen soil.

- responsibility: U.S. Forest Service & timber purchaser
- notes: Sale administration and/or field visits from Forest Soil Scientist/Hydrologist will be used to determine if soil moisture is at operational levels. C6.411#, C6.42#

Minimize the use of post-harvest slash piling and site preparation in order to maintain 10-20 tons per acre of coarse woody debris within harvest units and to protect nutrient rich litter layers and surface A horizons. Limbs and tops (fine fuels) should be lopped and scattered to retain nutrients concentrated in crown materials on site.

- responsibility: U.S. Forest Service & timber purchaser
- notes: Provision C6.71 was added to allow for redistribution of slash in cutting units if whole-tree yarding is utilized. C6.7#, C6.71

Reclaim roads, landings and other disturbed sites when use ends, as needed, to prevent resource damage. Remove road ditches & ditch relief culverts, site-prepare, drain (install water bars, out-slope, or re-contour), de-compact (80% or more of the road bed to a depth of 8 to 12 inches), re-vegetate by seeding and mulching with weed free straw or logging slash, and close system roads to be decommissioned, temporary, and intermittent use roads and other disturbed sites within one year after use ends. Provide stable drainage that disperses runoff into filter strips and maintains stable fills. Use certified local native plants as practicable; avoid persistent or invasive exotic plants. Remove all temporary stream crossings (including culverts and all fill material in the active channel), restore the channel geometry, and restore the original shape & re-vegetate the channel banks using certified local native plants as practicable; avoid persistent or invasive exotic plants. Restore cuts and fills to the original slope contours along road segments with ≥ 4 foot vertical cut slopes and as opportunities arise to re-establish subsurface pathways. Use certified local native plants as practicable; avoid persistent or invasive exotic plants.
Establish effective ground cover on disturbed sites to prevent accelerated on-site soil loss and sediment delivery to streams. Restore ground cover using certified native plants as practicable to meet re-vegetation objectives.

- responsibility: Timber purchaser, U.S. Forest Service representative will assure compliance.
- notes: C5.35#, C6.602#

Except at designated skid trail or temporary road crossings, no timber removal or equipment operation will be allowed within the 100 feet of perennial streams, springs, seeps and wetlands, or within 50 feet of intermittent streams. This restricted zone is defined for various water features as follows:

- responsibility: U.S. Forest Service & timber purchaser

- notes: These areas were identified during unit layout and were excluded from harvest. C2.301#, C6.6#, B6.5

Feature	Treatment Restriction Zone
Perennial Stream	100 ft minimum from Stream Bank
Intermittent Stream	50 ft minimum from Stream Bank
Wetlands >1/4 acre	100 ft minimum from Edge of Wetland
Springs/Seeps	100 ft from the source or edge of associated wetland, whichever is greater
Ditch	Edge of Right of Way

Keep heavy equipment out of ephemeral streams and swales except to cross at designated points, build crossings, or do restoration work, or if protected by at least 1 foot of packed snow or 2 inches of frozen soil. Approval by the timber sale administrator of temporary road location and construction would be subject to requirements concerning drainage crossings, period of use, and road rehabilitation and be consistent with the Watershed Conservation Practices Handbook.

- responsibility: U.S. Forest Service & timber purchaser
- notes: All temporary road locations subject to approval by Forest Service representatives and will consider these factors during evaluation and approval. B6.5, C6.42#

Do not locate skid trails, temporary roads, or landings in the bottom of swales or ephemeral streams. Do not excavate earth material from, or store excavated earth material in, any stream, swale, lake, wetland, or WIZ. Design and construct all stream crossings (including Temporary roads) and other in-stream structures to provide for passage of flow and sediment, withstand expected flood flows (or be removed prior to the termination of seasonal operations), and to allow free movement of resident aquatic life. All fill associated with temporary crossings must be removed. Install stream crossings to meet Corps of Engineers and State permits, pass normal flows and be armored to withstand design flows. Install stream crossings on straight and resilient stream reaches, as perpendicular to flow as practicable, and to provide passage of fish and other aquatic life. Install stream crossings to sustain bankfull dimensions of width, depth, and slope and keep streambeds and banks resilient. Favor bridges, bottomless arches or buried pipe-arches for those streams with identifiable floodplains and elevated road prisms, instead of pipe culverts. Favor armored fords for those streams where vehicle traffic is either seasonal or temporary, or the ford design maintains the channel pattern, profile and dimension. Limit roads and other disturbed sites to the minimum feasible number, width, and total length.

- responsibility: U.S. Forest Service & timber purchaser
- notes: All temporary road locations are subject to approval by Forest Service representatives and will consider these factors during evaluation and approval. B6.5, B6.422, C5.35#, C6.42#, C6.6#

Design all roads, trails, and other soil disturbances to the minimum standard for their use and to "roll" with the terrain as feasible *in order to limit the use of cuts and fills.* Use filter strips, and sediment traps if needed, to keep all sand-sized sediment on the land and disconnect disturbed soil from streams, lakes, and wetlands. Disperse runoff into filter strips. Design road ditches and cross drains to limit flow to ditch capacity and prevent ditch erosion and failure. Road

alignments should avoid wet slopes and seeps that would contribute perennial ditch flow and reduce road bed strength.

- responsibility: U.S. Forest Service & timber purchaser
- notes: All temporary road locations are subject to approval by Forest Service representatives and will consider these factors during evaluation and approval. B6.422, B6.63, C5.31#

Skid trail locations will be agreed to by the Forest Service in advance of construction, and will be located to minimize impacts to advanced regeneration; spacing will be approximately 100 feet apart, allowing for topographic variation and skid trail convergence. Skid trails will be waterbarred at least every 100 feet on slopes greater than 20% or as needed depending on slope and ground conditions and slash placed on main trails as needed to control erosion.

- responsibility: U.S. Forest Service & timber purchaser
- notes: Stipulations were added to C6.42# to address these concerns. C6.42#, C6.6#

Space water bars and rolling dips according to road grade and soil type as indicated below:

- responsibility: U.S. Forest Service & timber purchaser
- notes: B6.63, C5.31#

Unified Soil Classification - ASTM D 2487[1]				
Slope (%)	ML, SM Extr. Erodible Silts-sands with little or no binder (d.g.)	MH, SC, CL Highly Erodible Silts-sands with moderate binder	SW, SP, GM, GC Mod. Erodible Gravels + fines & sands with little or no fines	GW, GP Low Erodible Gravels with little or no fines
1-3	200	300	400	500
4-6	125	200	300	400
7-9	100	150	200	250
10-12	70	100	150	200
13-25	50	50	75	100
25+	30-50	30-50	60-75	80-100

[1] American Society for Testing Materials, standard classification of soil for engineering purposes.

Place new sources of chemical and pathogenic pollutants where such pollutants will not reach surface or ground water.

- responsibility: U.S. Forest Service & timber purchaser
- notes: B6.34

Insure that all designed road drainage features are fully functional and effective throughout the operational periods.

- responsibility: U.S. Forest Service & timber purchaser
- notes: B5.3, C5.31#

Range

All fences and cattleguards will be identified in the timber sale or service contract as protected improvements.

- responsibility: U.S. Forest Service & timber purchaser

Timber sale contract provision for the control of noxious weed proliferation will be included in the timber sale contract where needed.

- responsibility: U.S. Forest Service & timber purchaser
- notes: B6.35, C6.602#

Retain native vegetation to the extent possible to prevent weed germination and establishment, in and around sale area activity and keep soil disturbance to a minimum.

- responsibility: timber purchaser
- notes: B6.422, B6.6, B6.63

Timber purchasers and contractors will re-seed disturbed areas (as designated by the Forest Service) with certified weed free source using San Luis slender wheatgrass or another acceptable seed mix (as determined by the Forest Service) to avoid introduction of exotics and promote re-vegetation of native species. Species of seed and mixtures ratios for re-seeding activities will be determined on a site specific basis.

- responsibility: U.S. Forest Service & timber purchaser
- notes: Sale administrator will identify areas in need of re-seeding. C6.601#, C6.602#

Wildlife

Maintain 10-20 tons per acre of coarse woody debris within harvest units. Where possible in regeneration units, create piles of logs, stumps, or other woody debris to minimize the effects of larger openings. Maintain large diameter downed logs in various stages of decomposition within harvest units (50 linear feet/acre of 10 inches diameter or larger at the large end of lodgepole pine and aspen logs and/or 12 inches diameter or larger for Engelmann spruce, subalpine fir and Douglas fir logs).

- responsibility: U.S. Forest Service & timber purchaser
- notes: C6.42#, C6.7#, C6.71

Northern goshawk - no activities will be allowed within ½ mile of active nests from March 1 to July 31 or until fledging has occurred. The timing restriction buffer could be reduced to ¼ mile if topographic features and/or adequate screening cover are present that would protect the nest site from disturbance. No harvest activities will be allowed within a 30-acre buffer of nest sites. Outside of a 30-acre area around goshawk nest sites, timing restrictions are not needed for project layout, marking, and any other activities that are non-disturbing (i.e., activities not involving the use of heavy equipment or chainsaws). Timing restrictions will only apply to active nests, as confirmed by the district wildlife biologist. This restriction will apply to the known Sage Park and Killdeer goshawk nest sites, and any new nests that are discovered.

- responsibility: U.S. Forest Service & timber purchaser

Retain all live trees in salvage units, except for trees that need to be removed for operational/safety or silvicultural purposes. Operational/safety or silvicultural purposes include the need to remove live trees if necessary to access dead trees for salvage or to address safety concerns. Damage to understory vegetation and dense horizontal cover will be minimized to

benefit snowshoe hare and lynx by identifying skid trail locations away from dense understory and spacing skid trails at least 100 feet apart. Place landings in areas without advanced tree regeneration if available, to protect understory.

- responsibility: U.S. Forest Service & timber purchaser

Surveys for threatened, endangered, and sensitive (TES) species have already occurred in the project area. However, since it will take several years to fully implement the project, some level of TES re-survey will occur on an annual basis. If TES species are confirmed present the appropriate standards for the Forest Plan and Gunnison Field Office RMP will be applied (timing restrictions, distance from nest sites, etc.).

- responsibility: U.S. Forest Service
- notes: B6.24

Transportation System

New temporary roads built and utilized during logging activities and following logging will remain closed to the general public to minimize wildlife disturbance, and will be effectively closed to all motorized use after harvesting activities are completed.

- responsibility: U.S. Forest Service & timber purchaser
- notes: C5.35#

Surface rock replacement deposits will be collected to maintain currently surfaced roads that are used for timber hauling. Deposits will be collected commensurate with the use.

- responsibility: U.S. Forest Service & timber purchaser
- notes: C5.32#

Timber hauling operations will be restricted during wet or thawed conditions, when needed to protect the road surface.

- responsibility: U.S. Forest Service & timber purchaser
- notes: B5.12, C5.36#

Safety signing will be used to alert the public that logging operations are in progress and would meet the requirements of the Manual of Uniform Traffic Control Devices (MUTCD).

- responsibility: timber purchaser
- notes: B6.33#

Cultural Resources

Cultural resource surveys will occur prior to project implementation. Locations of all known cultural resource sites needing protection would be shown on internal working maps not subject to disclosure and/or identified on the ground so that these areas are avoided and protected during all phases of project implementation.

- responsibility: U.S. Forest Service & timber purchaser
- notes: No cultural sites were discovered prior to contract preparation. B6.24

If any new cultural resource sites are discovered during implementation, project activities would stop and the agency archeologist would be contacted immediately. The operator shall take any additional measures requested by the BLM or USFS to protect discoveries until they can be

adequately evaluated by the permitted archaeologist. Within 48 hours of the discovery, the SHPO and consulting parties will be notified of the discovery and consultation will begin to determine an appropriate mitigation measure. Agency officials in cooperation with the operator will ensure that the discovery is protected from further disturbance until mitigation is completed. Operations may resume at the discovery site upon receipt of written instructions and authorization by agency officials.

- responsibility: U.S. Forest Service & timber purchaser
- notes: B6.24

Native American human remains: Pursuant to 43 CFR 10.4(g), the holder must notify the authorized officer, by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony on federal land. Further, pursuant to 43 CFR 10.4 (c) and (d), the holder must stop activities in the vicinity of the discovery that could adversely affect the discovery. The holder shall make a reasonable effort to protect the human remains, funerary items, sacred objects, or objects of cultural patrimony for a period of thirty days after written notice is provided to the authorized officer, or until the authorized officer has issued a written notice to proceed, whichever occurs first.

- responsibility: U.S. Forest Service & timber purchaser
- notes: B6.24

CRUISE VOLUMES

This sale was laid out, marked, and cruised in the summer of 2015. The sale was sampled using one strata using the Point Count Measure method. Collected field data was entered and processed using the U.S. Forest Service software FSCruiser, version 12.12.2014.

Unseen defect and breakage was included in volume totals (5% for ES recent dead and 10% for ES older dead). This is a scaled sale estimated to have a value of around $100,000; therefore, the maximum sampling error for the sale as a whole must be ± 20%. This information can be found in Chapter 40 of the Timber Cruising Handbook (2409.12). The combined sampling error for this cruise is 13.15% (report DS1, error for net volume).

A. Volume Summary:

Volume Reported by Individual Tree Species

Live and Dead Sawtimber	Gross CCF	%	Net CCF	%
Engelmann Spruce recent dead	6048.72	96	4611.48	97
Engelmann Spruce older dead	229.04	4	153.18	3
Total	**6277.76**	**100**	**4764.66**	**100**

Volume estimates may be slightly different from other report groupings due to the characteristics of number rounding. See appraisal spreadsheet, "Volume&SkidDist" tab for volume and percent determination to account for rounding.

B. Contract Volume

The volume components of recent dead and older dead Engelmann spruce sawtimber and live true fir were combined into one contract species group.

Cruise Volume Reported by Contract Species Groupings

Contract Species Grouping	Cruise Gross CCF	% of Total Cruise Volume	Cruise Net CCF	% of Total Cruise Volume	Net CCF Rounded (contract volume)	% of Total Volume
ES & O	6277.76	100%	4764.66	100%	**4765**	**100%**

Contract volumes may be slightly different than other reported volumes due to the characteristics of rounding contained in the TIM project management software. (TIM rounds the sum of raw cutting unit volumes contained within each payment unit.) Contract volume is used to determine payments and is the official volume estimate used in the appraisal and the contract.

C. Area Determination

Area determination for this sale was conducted using a Global Positioning System (GPS). Procedures used for determining the acreages of harvest units in the timber sale area are in accordance with the standards set forth in Forest Service Handbook Section 2409.12, Chapter 50. GPS data was collected during the 2015 field season.

Acres by cutting unit

Cutting Unit	Acres
6	34
16	4
7	11
8	8
9	38
10	85
11	58
Total	**238**

D. Volume Breakdown

Cutting Unit Acres and Net Harvest Volume

Unit	Cutting Prescription	Acres	Recent Dead ES ST CCF	Older Dead ES ST CCF	Total CCF	Net Harvest Volume per Acre CCF
6	DxES 8"	34	658.78	21.88	680.67	20.0
16	DxES 8"	4	77.5	2.57	80.08	20.0
7	DxES 8"	11	213.14	7.08	220.22	20.0
8	DxES 8"	8	155.01	5.15	160.16	20.0
9	DxES 8"	38	736.29	24.46	760.74	20.0
10	DxES 8"	85	1646.96	54.71	1701.66	20.0
11	DxES 8"	58	1123.81	37.33	1161.14	20.0
Total		**238**	**4611.48**	**153.18**	**4764.66**	

461148 CF / 38975 trees = 11.83 CF/tree (ES Recent Dead ST)
15318 CF / 2084 trees = 7.4 CF/tree (ES Older Dead ST)

4611.48 CCF / 238 acres = 19.4 CCF Average Net Volume/Acre (ES Recent Dead ST)
153.18 CCF / 238 acres = 0.6 CCF Average Net Volume/Acre (ES Older Dead ST)

Quadratic Mean Diameter: 11.9 (ES Recent Dead ST)
10.6 (ES Older Dead ST)
11.8 (Combined)

Net Board Foot/Cubic Foot Ratio: 4.626 (Combined)

APPRAISAL

A. Appraisal Data

Bulletin No. BU230716 for Region 2, Zone 3 (SW Intermountain Zone) effective August 8, 2016 until superseded was used for this timber sale appraisal.

B. Skid/Yard (Refer to 2400-17)

The skid/yard cost adjustment (formerly called the logging cost adjustment) is now calculated using the TEA234 MS Access-based Appraisal System. It is based on the difference between the appraised sale and Regional average sale diameter and sale volume per acre. (Reference FSH 2409.22, 51.3 and 51.61).

Base Skid/Yard Cost = $104.44
Sale Skid/Yard Cost = $104.45
Skid/Yard Cost Adjustment = -$0.01 (line 12, 2400-17)

C. Haul Cost Calculation (Refer to appraisal spreadsheet, Haul tab)

Sawtimber: Haul to Montrose, Colorado

Log Truck Haul Time Estimations

Road Number	Class	% Grade	% Volume	Mileage	Weighted Haul Miles	Round Trip Mins/Mile	Time (min)
NFSR 790	4B3	0	24	3.60	0.8640	5.1	4.41
NFSR 693	5D3	2	10	0.34	0.0340	8.5	0.29
U7035	5D3	-3	4	0.51	0.0204	8.5	0.17
U7031	5D3	-4	11	0.41	0.0451	8.5	0.38
NFSR 865.1C	5C3	1	10	0.61	0.0610	6.5	0.40
NFSR 865.1A	5C3	4	3	0.18	0.0054	6.5	0.04
NFSR 865.1D	5C3	-3	10	1.17	0.1170	6.5	0.76
NFSR 865	5B3	-7	19	1.29	0.2451	5.5	1.35
NFSR 790	4B3	-5	100	3.52	3.5200	5.1	17.95
NFSR 788	4B3	-3	100	1.70	1.7000	5.1	8.67
NFSR 788	4B3	1	100	1.00	1.0000	5.1	5.10
NFSR 788	4C3	-2	100	2.50	2.5000	6.2	15.50
NFSR 788	4B3	3	100	2.30	2.3000	5.2	11.96
NFSR 788	4B3	-2	100	3.30	3.3000	4.9	16.17
SAGCO-KK-14	2A2	-4	100	0.20	0.2000	3.3	0.66
SAGCO-KK-14	2A2	-1	100	0.90	0.9000	3.2	2.88
SAGCO-KK-14	2A2	1	100	5.50	5.5000	3.3	18.15
SAGCO-NN-14	2A2	-1	100	0.30	0.3000	3.2	0.96
SAGCO-NN-14	2A2	5	100	0.20	0.2000	5.5	1.10
SAGCO-NN-14	2A2	1	100	2.10	2.1000	3.3	6.93
Colo Hwy 114	2C1	-2	100	18.70	18.7000	4.2	78.54
US Hwy 50	1A1	2	100	62.20	62.2000	3.5	217.70
Load & Unload Delay Time	2B1	-3	100	10.80	10.8000	3.6	38.88
Total					**119.21**		**457.27**

*Round Trip Minutes Per Mile are from FSH 2409.22 Sec. 44.1 Exhibit 1

540 Minutes Round Trip Time x $0.1130/CCF/Minute (FSH 2409.22 Sec. 44.0) =
$61.05/CCF Haul Cost for Sawtimber

D. Road Maintenance (Refer to "15708_RoadworkAppraisal.xlsx")
All costs and figures are from the *USDA Forest Service Regions 2, 3, 4 March 2013 Cost Estimating Guide for Road Construction.*

1) Pre-haul Maintenance – Purchaser responsibility
Assumptions:

Blade, surface repair and ditch cleaning at 1 mile per 3 hours
Clean 1 culvert/gate/cattleguard in 0.5 hours
Clearing, slide/slump repair and dip repair at 1 mile per hour
Roads to be maintained per B5.3 and C5.31#
Blading, surface repair and ditch cleaning require motor grader and operator and one laborer per day
Culvert, cattleguard and gate cleaning and repair require one laborer per day
Repairing slides/slumps, repairing dips, and clearing require one dozer and operator and one laborer per day
Move in costs assumed for 1 move, 5 hrs roundtrip time

Pickup use 3 hours per day, required for all days
10 hour days for laborers and all operators, equipment time 7 hours per day

- 1.87 miles of miscellaneous repair work and clearing per T-801, T-805, and T-807, on portions of NFSRs 865.1D, 865.1C, 865.1A,and 865.0.
- 1.87 miles of blading, surfacing, and ditch cleaning per T-802, T-803, and T-804, on portions of NFSRs 865.1D, 865.1C, 865.1A, and 865.0.
- Maintenance of 157 culverts and cattleguards along NFSRs 790.0 and 788.0 per T-805 and T-808.

Total Pre-haul maintenance (with inflation)= $8,764.55

2) Normal Road Maintenance – Purchaser responsibility
Assumptions:

Blade, surface repair and ditch cleaning at 1 mile per 3 hours
Clean 1 culvert/gate/cattleguard in 0.5 hours
Clearing, slide/slump repair and dip repair at 1 mile per hour
Roads to be maintained per B5.3 and C5.31#
Blading, surface repair and ditch cleaning require motor grader and operator and one laborer per day
Culvert, cattleguard and gate cleaning and repair require one laborer per day
Repairing slides/slumps, repairing dips, and clearing require one dozer and operator and one laborer per day
Move in costs assumed for 1 move, 5 hrs roundtrip time

Pickup use 3 hours per day, required for all days
10 hour days for laborers and all operators, equipment time 7 hours per day

- 18.84 miles of miscellaneous repair work and clearing per T-801, T-805, and T-807, on portions of NFSRs 788.0 AND 790.0.
- 22.09 miles of blading, surfacing, and ditch cleaning per T-802, T-803, and T-804, on portions of NFSRs 788.0, 790.0, 865.1D, 865.1C, 865.1A and 865.0

Total during-haul road maintenance (with inflation): $17,246.50

3) Post-haul Maintenance – Purchaser responsibility
Assumptions:

Blade, surface repair and ditch cleaning at 1 mile per 3 hours
Clean 1 culvert/gate/cattleguard in 0.5 hours
Clearing, slide/slump repair and dip repair at 1 mile per 4 hours
Roads to be maintained per B5.3 and C5.31#
Blading, surface repair and ditch cleaning require motor grader and operator and one laborer per day
Culvert, cattleguard and gate cleaning and repair require one laborer per day
Repairing slides/slumps, repairing dips, and clearing require one dozer and operator and one laborer per day
Move in costs assumed for 1 move, 5 hrs roundtrip time

Pickup use 3 hours per day, required for all days
10 hour days for laborers and all operators, equipment time 7 hours per day

- 19.34 miles of miscellaneous repair work and clearing per T-801, T-805, and T-807, on portions of NFSRs 788.0, 790.0, and 865.0.
- 22.09 miles of blading, surfacing, and ditch cleaning per T-802, T-803, and T-804, on portions of NFSRs 865.1D, 865.1C, 865.1A, and 865.0.
- Maintenance of 157 culverts and cattleguards along NFSRs 790.0 and 788.0 per T-805 and T-808.

Total post-haul road maintenance (with inflation): $19,708.17

4) Surface Rock Replacement
A total of 2.3 miles of the appraised haul route (2 miles of NFSR 788.0 and 0.3 miles of NFSR 790.0) have an aggregate surface that is eligible for Surface Rock Replacement deposit. Current direction from engineering is to collect $0.38/ccf/mile (see "SRR_Direction.pdf").

$0.38 x 4765 ccf x 2.3 = $4,164.61

Total Surface Rock Replacement Cost = $4,164.61
Cost/CCF = $0.87/CCF

5) Dust Abatement
Based on the Environmental Assessment dust abatement during road maintenance is not needed, thus a cost adjustment is not necessary for this timber sale.

6) Snow Removal
A total of 19.18 miles of the haul route (11.72 miles of NFSR 788.0, 7.12 miles of NFSR 790.0, and 0.34 miles of NFSR 693.0) are included in snowplowing cost calculations. A snowplowing cost appraisal is necessary as this contract will include a winter Normal Operating

Season to allow for Purcahser's Operations on a restricted road and in restricted units (see C5.12# and C6.312#).

Assumptions:
Snow removal production rate same as blading a single-lane, native surface road (FSM 2443.23 Snow Removal): 1 mile/3 hrs
Snow removal requires one motor grader with wing and operator
No move in/ move out costs
Equipment and operator work 10 hr days
Snow removal will be required for all snow events in excess of 6" accumaulation after initial 1' snow event has occurred
Snow removal will be required times 4** for Normal Operating Season between 12/15 and 02/28
All snow removal must be inaccordance with C5.351# Snowplowing

Road	Total Seg Length Requiring Snow Removal (miles)	Number Snow Events PER YEAR**	Snow Removal MILES	Snow Removal Hours
788.0	11.72	4	46.9	140.64
790.0	7.12	4	28.5	85.44
865.1D	0	0	0.0	0
865.1C	0	0	0.0	0
865.1A	0	0	0.0	0
865.0	0	0	0.0	0
693.0	0.34	4	1.4	4.08
Total	**19.18**		**76.7**	**231**

** Average snow events per year within Normal Operating Season exceeding 6" accumulation, after initial accumulation of 1' was determining by historical SNOTEL data from Slumgullion

Snowplowing will require motor grader and operator for 231 hours at a cost of $25,383.67 or $5.33 per CCF.

7) Road Maintenance Summary

Pre-Haul Maintenance	$8,764.55
During-Haul Maintenance	$17,246.50
Post-Haul Maintenance	$19,708.17
Dust Abatement	$0.00
Snow Removal (NOS)	$25,383.67
Total	**$71,102.89**
	$14.92/CCF
Reconstruction Engineering Deposits	$6,302.00

Surface Rock Replacement (deposit) $4,164.61
$2.20/CCF Deposit

Total Road Maintenance Cost/CCF: $81,569.50
$17.12/CCF

E. Sale Slash Disposal (Refer to Brush Disposal Treatment Plan FS-2400-62)

Required deposits: $1109.44 / 4765 CCF
$2.31/CCF

YUM cost = $0.00/CCF (YUM will not be required for this sale)

Total Slash Cost = $2.31 + $0.00 = **$2.31/CCF**

F. Temporary Roads (Refer to "15708 RoadworkAppraisal.xlsx", temp road tab)

1.25 miles of temporary road will be needed to complete this sale. No new temporary road building will be needed for this sale; existing logging roads will need re-opening. All temporary roads will be closed using the standards in C5.35#. See Logging Plan Map for approximate locations. All costs and figures are from the *USDA Forest Service Regions 2, 3, 4 Cost Estimating Guide for Road Construction dated March 2013*.

Total temporary road cost = $7,748.90
Total temporary road cost per CCF = $1.63

G. Unusual & Quality Adjustments (Refer to appraisal spreadsheet, TS Cost Worksheet tab)

Quality Adjustment: Timber Quality

A quality adjustment of 40% of the Adjusted Base Period Price is included with this appraisal.

ES database avg. (BU230716)	0.47718
ES cruise avg.	0.4627
r-R (if > 0.010 it qualifies)	0.01448
Random Length difference (from appraisal bulletin)	117
Calculated Sale Adjustment	-$20.21
ES Adjusted BPP	$15.66
Maximum Adjustment (40% of Adjusted BPP)	-$6.26
Timber Quality Adjustment	**-$6.26**

Quality Adjustment: Performance Ratio (FSH R2 Supplement 2409.22 Chapter 50, Section 51.7)

Sales from the previous two quarters:

Sale Name	Advertised Rate	Bid Rate	Performance Ratio
Extra Salvage	$26.62	$26.63	0.9996
Still Beetle Salvage	$13.94	$14.95	0.9324
Average	**$20.28**	**$20.79**	**0.9660**

ES Adjusted BPP (From current apprasal bulletin)	$15.66
Desired Perf Ratio (FSH 2409.22 Chapter 50, Section 51.7)	0.85
Performance Ratio Difference	0.1160
Adjustment	***-$1.82***

Quality Adjustment: Short Haul Cap
The haul adjustment is capped at +$25.00 per CCF.

Base Haul Cost Per CCF	$	87.54
Sale Haul Cost Per CCF		$61.05
Sale Haul Adjustment per CCF	$	26.49
Short Haul Adjustment		**-$1.49**

Total quality adjustment: -$9.57

Unusual Adjustment: Risk
Operations restricted to 2 months as per C6.312
Percent reduction of Base Period Price: 16%
Restricted Volume: 761 CCF
Cost/CCF: -$0.40

Total unusual adjustment: -$0.40

H. Competition Factor (Bulletin No. BU230416)
The competition factor for the GMUG, Rio Grande, and San Juan will be set at 10%.

COMPETITION FACTOR by Forest and VALUES based on all species live ADJ BPP.

	Bid/Ad	LIVE CCF:			
		LP&DF	ES	PP	TF
GMUG	1.12	0.77	1.60	0.30	0.30

I. Specified Roads
Specified reconstruction on portions of NFSRs 790.0, 788.0, 865.0, and 865.1D will be required (5.9 miles). Total cost of specified road work is estimated at $21,052.71. The Deposit for Reconstruction Engineering Services is $6,302.00. See road package for more information.

J. Base Rates (2400-17)

ES&O	$5.00/CCF

K. Fire Precautionary Period (AT9)

June 30 to October 31

L. Purchaser's Obligation for Fire (Refer to appraisal spreadsheet, TS Cost Worksheet tab)

2 people x 12 hours x 3 days ($18.00/hour [AD-C])	$1,267.20
Rounded to the next $100	**$1,300.00**

M. Termination Date (AT12)

R2 Supplement No. 2409.18-2006-2, Sec. 53.41 states that sales of this size without specified roads should be 3 to 4 operating seasons. Termination date for this sale will be **October 31, 2019**.

N. Bid Guarantee (Refer to appraisal spreadsheet, TSCost Worksheet tab)

Bid Guarantee: **$6,000.00**

O. Performance Bond Calculation (Refer to appraisal spreadsheet, TSCost Worksheet tab)

Bond Based on 10% of Advertised Stumpage Value: **6,000.00**

P. Distribution of Funds

Live & Dead ES and Other Conifer	$12.57/CCF x 4,765 CCF =	$59,896.05

Total Sale Value:	$59,896.05
Less Essential KV:	($0.00)
Remainder available for NFF, KV or SSF:	**$59,896.05**
Contribution to NFF ($0.25/CCF):	($1,191.25)
Remainder available for KV:	**$58,704.80**