

TIMBER SALE REPORT & APPRAISAL

GRAND MESA RESORT SALVAGE SALE

Grand Mesa National Forest

Grand Valley Ranger District

December 2015

Prepared by:  Date: 7/29/16
Forester

Recommended By: Caru Johnson Date: 7-29-16
TMA

Approved By: Carrie Seuba Date: 7-29-16
District Ranger
acting

SUMMARY OF RECOMMENDATIONS

The following lists the major recommendations and results of the appraisal.

Net Volume (Cruise report):

Product	CCF	% Volume
ES Sawtimber	4130.14	56%
ESR Sawtimber	1400.25	19%
ESD Sawtimber	1697.78	23%
TF Sawtimber	130.56	2%
Total Volume	7358.73	100.00%

Net Volume (Appraisal):

Product	CCF
Live and Dead ES & Other Sawtimber	7358.73

Quadratic Mean (Cruise Report)

Quadratic Mean DBH (ES Sawtimber)	13.4
Quadratic Mean DBH (ESR Sawtimber)	15.2
Quadratic Mean DBH (ESD Sawtimber)	16.8
Quadratic Mean DBH (TF Sawtimber)	13.3
Quadratic Mean DBH (sale as a whole)	14.5

Net Acres	466 acres Group Selection/Individual Tree Selection (ITM)
Gross Acres within Sale Area Boundary	1326 acres

Advertised Rates:

Live & Dead ES & Other Conifer Sawtimber	\$10.78
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Specified Road Construct & Reconstruction \$0.00 N/A

Required Deposits:

Slash Deposits	\$13,864
Surface Rock Replacement Deposit	\$26,474.45
Road Maintenance Deposit (schedule A)	\$6,295.91

KV Collections:

Essential KV	\$0.00
Non – Essential KV	\$304,000.00

Contract Period 3 years.
 Termination Date October 31, 2019
 Normal Operating Season July 15 – October 31

DESCRIPTION

A. Location

The Grand Mesa Resort Salvage Sale is located approximately 21 air miles northeast of Delta, Colorado. The legal location is; T. 11 S., R. 95 W., Sections 34-36, T. 11 S., R. 94 W., Sections 31 & 32, T. 12 S., R. 94 W., Section 6, and T. 12 S., R. 95 W., Sections 1-3, 6th Principle Meridian Delta County, Colorado. The sum acreage of the cutting units is approximately 466 acres in a gross sale area of 1326 acres.

B. Land Status

All harvest units are on National Forest System lands.

C. Basis for Selecting Area

The Grand Mesa Resort Salvage Sale has been identified as a stand with a high population of spruce beetle infestation. The Grand Mesa Resort Salvage Sale was analyzed in the Grand Mesa Resort Salvage Farm Bill CE. A Decision Notice was signed by the District Ranger on 09/24/2015.

D. Transportation Routes and Appraisal Points

Sawtimber and POL will be appraised to Montrose, Colorado.

CONDITIONS OF SALE

A. Planned Cutting Method

Units 1, 4, 5 and 6 are to receive group selection with salvage and sanitation harvest to remove spruce beetle infested and wind thrown trees to decrease the potential for the rapid increase in Engelmann spruce beetle population. Salvage harvest will be conducted in conjunction with group selection. Units 2 and 3 will receive an overstory remove by designation by species and diameter which will remove all larger spruce trees and reserve ≤ 8 " trees. POL material will be subject to agreement.

B. Sale Area Improvement Needs (SAI)

See the SAI Plan on Form FS-2400-50 and KV Plan Narrative for information.

C. Slash Treatment

See the Brush Disposal Treatment Plan FS-2400-62 and the mitigation section below for slash deposal details.

Design Criteria

The following mitigation measures or design features are included in my decision and they provide for consistency with the Forest Plan and other guidance, and/or they minimize potential impacts to the applicable resources.

Forest Vegetation

1. Silvicultural prescriptions to be used will depend on the intensity of beetle activity; these include a combination of group selection and individual tree selection (ITS) and/or designation by species and diameter (DxDsp). Below are the highlights for each treatment is listed.

Group Selection and ITS highlights

- Harvest approximately 15% of the stand with small openings (groups) not to exceed two acres in size, group shape shall be rounded to decrease wind throw, reserve all healthy spruce ≤ 8 " within group, these areas will have higher beetle activity
- ITS will be conducted to remove beetle affected, stressed and deformed trees between the group selection openings over the remainder of the stand

Response: 207 acres are designated as group selection cuts. There is approximately 44 total acres of groups ranging from .5 acres to 2 acres in size with majority of groups at 1 acre in size.

Designation by Species and Diameter (DxDsp)

- In stands where beetle activity exceeds the 2 acre group openings DxDsp will be used. All spruce ≥ 8 " diameter will be designated for harvest. This is again due to wind throw susceptibility, if $>30\%$ is removed the stand becomes susceptible to wind damage.

Response: Units 2 and 3 with a total acreage of 259 are designated as DxDsp.

- Reserve areas will be located where advance regeneration of spruce and fir are heavy and will range in size from $\frac{1}{2}$ to 2 acres.

Response: This was implemented during layout. An exclusion area is within unit 2 and other areas were excluded outside cutting unit boundaries.

- Protect all seedling spruce and non-spruce within the harvest units as much as possible.

Response: Advanced regeneration is protected under B6.32 – Protection of Residual Trees, B6.42 – Skidding and Yarding and C6.411# meets these requirements.

- Reserve desired wildlife trees or snags that are 20 inches or greater in diameter. Reserve trees will also be marked around the snag from $\frac{1}{10}$ th to a $\frac{1}{4}$ acer in size to help decrease wind throw.

Response: Wildlife tree requirement were met through reserve areas and large un-merchantable snags.

2. Season of operation will be summer or winter.
3. Ground based mechanical harvesting will be used with full tree skidding/yarding.

Response: All harvest units are designated as ground based harvest method.

4. 10-20 tons/acre or more of logs and other woody material will be maintained where feasible.

Response: C6.7# - Slash Treatment, provides a table of Purchaser responsibilities.

5. Construction of temporary roads where needed. All temp roads will be decommissioned when operations are complete. Refer to project area map for temp road locations.

Response: C5.34# - Obliteration of Temporary Roads, Skid Trail and Landings meets this requirement.

Heritage

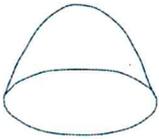
A literature review and cultural resource survey of the areas affected by the proposed action has been conducted in compliance with the National Historic Preservation Act of 1966 (NHPA), the Colorado State Historic Preservation Officer's Protocol Agreement, National Environmental Policy Act (NEPA) of 1969 and other Federal law, regulation, policy and guidelines regarding cultural resources. These laws are concerned with the identification, evaluation and protection of fragile, non-renewable evidence of human activity, occupation and endeavor reflected in districts, sites, structures, artifacts, objects, ruins, works of art, architecture and natural features that were of importance in human events. Such resources tend to be localized and highly sensitive to disturbance.

All sites located within or directly outside of the area of potential effect considered eligible for listing on the National Register of Historic Places will be flagged for avoidance by project activities prior to project implementation. In the event of inadvertent discovery of cultural resources, the site location will be placed on a map or recorded with a GPS unit, a qualified archaeologist will be notified, and the property will be protected as stated above.

Response: Adequate cultural resource surveys have been performed in accordance with the National Historical Preservation Act. There were no eligible sites within the sale. B6.24 – Protection Measures Needed for Plants, Animals, Cultural Resources, and Cave Resources and B8.33 – Contract Suspension and Modifications meet this requirement.

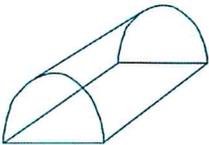
Fire/Fuels

All slash will be cleared within 30’ of GMRC property boundary to create a fire break. Treatment units that directly boarder the Grand Mesa Resort Company will have slash piled and burned within 1 chain (66’) of the private land boundary. Piles will resemble a “round mound” to facilitate burning while covered by snow and will be constructed in a manner that excludes dirt/other non-burnable material. Pile locations will be constructed at least 20’ from property boundaries, be spaced at least 20’ from each other and will not exceed a size of 13’long x 13’wide x7’high (round mound).



Example of a horizontal round mound shape

Treatment areas that are outside of the identified one chain will meet forest standards for slash as identified in the GMUG land and resource management plan. Large piles may be constructed where trees have been skidded for processing. These piles will be constructed free of dirt and in a way that will facilitate burning while covered by snow. Size will not be limited for these piles provided that they are free of dirt and do not exceed 200,000 ft³ (155’long x 80’wide x20’high in a horizontal half-cylinder shape). Piles will need to be spaced at least 40’ from each other to prevent unwanted ignition of surrounding piles. If slash piles contain dirt or are constructed with a straight blade, size will be limited to 60’long x 20’wide x15’high in a horizontal half-cylinder shape.



Example of a horizontal half cylinder shape

This reduced fuel loading will directly influence fire behavior, initiation of crown fire, fireline intensities and flame lengths that dictate strategy and tactics of wildfire operations. When complete, this project will create a defensible space adjacent to private property and will help increase safety margins for firefighters while engaged in desired and undesired wildfire events.

Response: C6.7# - Slash Treatment, provides requirements for slash piles and landings. The Brush Disposal plan includes burning of the piles by the Forest Service.

Recreation/Trails

To the fullest extent possible, temp roads and skid routes will be located in a manner that will result in the least amount of impact to the Crag Crest and Lower Crag Crest Trails.

- Design and construct a minimal amount of trail crossings and when needed, crossings will occur at a perpendicular angle.

Response: C6.42# - Skidding and Yarding (Special Objectives) is included in the contract. The location of skid trails and landings shall be agreed upon prior to construction through B6.422 –Landings and Skid Trails.

- Avoid locating roads that parallel and are within the sight distance of the trail and/or use the same alignment as the existing trail.

Response: Temporary roads were laid out by the Forest Engineers using these requirements.

- Logging Decks and slash piles will also be located outside of the trail viewing area.

Response: C6.7# - Slash Treatment, provides requirements for slash piles and landings.

- Trail sections that are impacted will be restored to meet pre-existing design specifications.

Response: C5.34# - Obliteration of Temporary Roads, Skid Trails and Landings includes a table that specifies closure methods and type of facilities. Designated trails and water user routes will be shown on the Sale Area Map. B6.22 – Protection of Improvements also meet this requirement.

- Extra consideration will be made involving treatment areas within view of the trail to minimize disturbance and restore the area (contour, seed, etc) to appear as natural as possible.

Response: C5.34# - Obliteration of Temporary Roads, Skid Trails and Landings includes a table that specifies closure methods and type of facilities. C6.601# - Erosion Control Seeding and C6.602# - Protection of Disturbed areas from Establishment of Noxious Weeds also meets this requirement.

- Within 10 ft of the center of the trail cut stumps flush to the ground and another 30 ft of that cut stumps ≤ 4 inches.

Response: KV funds will be used to cut stumps. Due to the nature of how cutting units were marked, this requirement was unable to be put into the contract.

- Either a temporary reroute or closure of the Crag Crest trail will be implemented while logging operations are active.

Response: A closure order will be put in place where the trail is within an active harvest unit. C5.41# - Closure to Use by Others is also included in the contract.

Hydrology & Soils

The following management measures and design criteria are based on, and structured according to the Regional Watershed Conservation Practices Handbook (R2-FSH-2509.25_10). They should be included as Best Management Practices (BMPs) and monitored during sale administration to protect soil and watershed resources. They address conditions or circumstances known to occur in the project area, or those that may occur during the course of project implementation. 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. Narrative text excerpted directly from the handbook appears in normal font, while project specific detail or supplemental design criteria are *provided in italicized font*.

12.1 - Management Measure (3)

In the water influence zone next to perennial, intermittent and ephemeral* streams, lakes, wetlands, and depressional recharge areas** allow only those actions that maintain or improve long-term stream health and riparian ecosystem condition.

Ground disturbing activities will be avoided within the WIZ. Those activities that may minimally disturb the ground and are necessary to achieve management area objectives may occur. The definition of the WIZ for various water related features is as follows:

Feature	Outside Edge of WIZ	No Harvest or Mech. Travel Zone
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<i>Fens and their associated wetlands</i>	<i>100 ft minimum from edge of fen</i>	<i>100 ft from edge of fen</i>
<i>Perennial Stream</i>	<i>100 ft minimum from Stream Bank</i>	<i>50 ft from stream bank</i>
<i>Wetlands > ¼ acre</i>	<i>100 ft minimum from Edge of Wetland</i>	<i>50 ft from edge of wetland</i>
<i>Intermittent streams, Reservoirs and Ponds</i>	<i>50 ft from bank or High Water Line</i>	<i>25 ft from bank or high water line</i>
<i>Springs/Seeps and wetlands and depressional recharge area**s < ¼ acre</i>	<i>50 ft from the source or edge of associated wetland, whichever is greater</i>	<i>25 ft from the source or edge of associated wetland, whichever is greater</i>
<i>Ephemeral Streams and Swales*</i>	<i>25 ft from the channel or topographic low.</i>	
<i>Ditches</i>	<i>Edge of Right of Way</i>	

* For the purpose of implementing protection measures, the term swale and ephemeral stream are considered to be synonymous. The measures are intended to avoid or minimize surface disturbance, not the nature of silvicultural treatments.

Ephemeral Stream -A stream that flows only in direct response to precipitation in the immediate locality (watershed or catchment basin), and whose channel is at all times above the zone of saturation.(Briggs, 1996).

Swale - A landform feature lower in elevation than adjacent hillslopes and subject to surface soil saturation in response to snowmelt or rainfall, usually present in headwater areas of limited areal extent, and generally without display of a defined channel that may or may not actually flow water.

***Depressional Recharge Areas – topographic depressions that are periodically saturated and show evidence of standing water as a result of snow melt and/or rain events. Periodic saturation may be evidenced by staining of rocks or visible highwater marks on vegetation or soils (“bathtub ring”). These land features act as ephemeral drainages on the Grand Mesa providing areas of groundwater recharge that support groundwater dependent ecosystems such as Fens and springs.*

- Keep heavy equipment out of 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.*

Response: B6.5 – Streamcourse Protection, B6.6 – Erosion Control, C6.6# - Erosion Prevention and Control, C6.42# - Skidding and Yarding, and B6.422 – Landings and Skid Trails, are incorporated in these contract to meet these requirements.

- Ensure at least one-end log suspension in the WIZ. Fell trees in a way that protects vegetation in the WIZ from damage. Keep log landings and skid trails out of the WIZ.

Response: B6.5 – Streamcourse Protection, B6.6 – Erosion Control, C6.6# - Erosion Prevention and Control, C6.42# - Skidding and Yarding, and B6.422 – Landings and Skid Trails, are incorporated in these contract to meet these requirements.

- *Leave a no harvest and no mechanized travel buffer equal to half of the width of the WIZ for all features except ephemeral streams and swales (e.g. perennial stream WIZ is 100ft from each bank therefore the no mechanized harvest buffer is 50 ft from the top of each bank).*

Response: WIZ buffers were put in place during Layout of the harvest units.

- Do not excavate earth material from, or store excavated earth material in, any stream, swale, lake, wetland, or WIZ.

Response: B6.5 – Streamcourse Protection meets these requirements.

- *Harvest of material adjacent to drainages would be done in a manner to minimize accumulations of logging residue. In the event significant accumulations of residue occurs, as determined by a forest hydrologist, or their designate, and timber sale administrator, the contractor would be required to remove material prior to acceptance of the harvest unit.*

Response: B6.5 – Streamcourse Protection and C6.7# - Slash treatment meets these requirements.

12.2 – Management Measure (4)

Design and construct all stream crossings and other instream structures to provide for passage of flow and sediment, withstand expected flood flows, and allow free movement of resident aquatic life.

- 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.
- *Temporary roads will not be constructed across perennial streams. Non-perennial temporary crossings will be designed to prevent the restriction of the expected flood flows or be removed prior to the termination of seasonal operations. All fill associated with temporary crossings below the ordinary high water line must be removed after harvest is complete.*
- *Where access across the WIZ must be provided by newly-constructed temporary roads, they will be completely obliterated after harvest is complete. Obliteration includes the removal of culverts, the recountouring of the road surface and stream banks to the original landform shape, and the reestablishment of vegetation on disturbed surfaces.*

Response: B6.63 – Temporary Roads requires the purchaser to place water bars, rolling dips, or ditch relief pipes as directed by the Forest Service. C6.6# - Erosion Prevention and Control requires the Purchaser to construct cross ditches for road runoff and take other reasonable measures needed to prevent soil erosion and silt runoff into streams. B6.5 – Streamcourse Protection, B6.6 – Erosion Control and C5.31# - Road Maintenance Requirements, are also incorporated in these contract to meet these requirements.

12.4 - Management Measure (6)

Maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function.

- Keep roads and trails out of wetlands unless there is no other practicable alternative. If roads or trails must enter wetlands, use bridges or raised prisms with diffuse drainage to sustain flow patterns. Set crossing bottoms at natural levels of channel beds and wet meadow surfaces. Avoid actions that may dewater or reduce water budgets in wetlands.
- Avoid long-term reduction in organic ground cover and organic soil layers in any wetland (including peat in fens).
- Avoid any loss of rare wetlands such as fens and springs. *No harvest or mechanized travel in fen WIZ (100 ft from edge of fen and associated wetland).*

Response: B6.63 – Temporary Roads requires the purchaser to place water bars, rolling dips, or ditch relief pipes as directed by the Forest Service. C6.6# - Erosion Prevention and Control requires the Purchaser to construct cross ditches for road runoff and take other reasonable measures needed to prevent soil erosion and silt runoff into streams. C5.1-Designed Temporary Roads, includes an engineering plan to install about 2 harden fords that cross wet areas. A temporary bridge will be installed crossing below a reservoir dam on NFSR 121.1N. B1.1 –Sale Area Map, all wetlands will be shown on the sale area map. B6.62 Wetland Protection is included in the contract and meets this requirement.

13.1 - Management Measure (9)

Limit roads and other disturbed sites to the minimum feasible number, width, and total length.

- Avoid soil-disturbing actions during periods of heavy rain or wet soils. Apply travel restrictions to protect soil and water.

Response: B6.6 – Erosion Prevention and Control prohibits operation of equipment “when ground conditions are such that excessive damage will result.”

- Install cross drains to disperse runoff into filter strips and minimize connected disturbed areas *and direct linkage of disturbed areas to the stream network.*

Response: B6.63 – Temporary Roads requires the purchaser to place water bars, rolling dips, or ditch relief pipes as directed by the Forest Service. C6.6# - Erosion Prevention and Control requires the Purchaser to construct cross ditches for road runoff and take other reasonable measures needed to prevent soil erosion and silt runoff into streams. . C5.1-Designed Temporary Roads, includes an engineering plan to install about 2 harden fords that cross wet areas. A temporary bridge will be installed crossing below a reservoir dam on NFSR 121.1N.

- Construct roads where practicable, with outslope and rolling grades instead of ditches and culverts.

Response: B6.63 – Temporary Roads requires the purchaser to place water bars, rolling dips, or ditch relief pipes as directed by the Forest Service. . C5.1-Designed Temporary Roads, includes an engineering plan to install about 2 harden fords that cross wet areas. A temporary bridge will be installed crossing below a reservoir dam on NFSR 121.1N.

- Use existing *skid trail and landings* unless other options will produce less long-term sediment. Reconstruct as needed for long-term soil and drainage stability.

Response: B6.422 – Landings and Skid Trails requires the location of skid trails and landings to be agreed upon by the sale administrator. B5.1 – Authorization and C6.6# - Erosion Prevention and Control are also included in the contract.

- Avoid ground skidding on sustained slopes greater than 40%.

Response: Slopes greater than 40% were excluded from harvest units during sale layout.

- Locate and construct log landings in such a way to minimize the amount of excavation needed and to reduce the potential for soil erosion. Design landings to have proper drainage. After use, treat landings to disperse runoff and prevent surface erosion and encourage re-vegetation.

Response: B6.422 – Landings and Skid Trails requires the location of skid trails and landings to be agreed upon by the sale administrator. B5.1 – Authorization and C6.6# - Erosion Prevention and Control are also included in the contract.

13.2 - Management Measure (10)

Construct roads and other disturbed sites to minimize sediment discharge into streams, lakes, and wetlands.

- 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.*
- *Road alignments should avoid wet slopes and seeps.*
- 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.

Response: B6.63 – Temporary Roads requires the purchaser to place water bars, rolling dips, or ditch relief pipes as directed

by the Forest Service. C6.6# - Erosion Prevention and Control requires the Purchaser to construct cross ditches for road runoff and take other reasonable measures needed to prevent soil erosion and silt runoff into streams.

13.3 - Management Measure (11)

Stabilize and maintain roads and other disturbed sites during and after construction to control erosion.

- Do not encroach fills or introduce soil into streams, swales, lakes, or wetlands.
- Properly compact fills and keep woody debris out of them. Revegetate cuts and fills upon final shaping to restore ground cover, using certified local native plants as practicable; avoid persistent or invasive exotic plants. Provide sediment control until erosion control is permanent. *Road cuts of ≤ 4 vertical feet will be laid back to slopes no steeper than 1.5 H:1V to facilitate the establishment of stabilizing vegetation.*
- Do not disturb ditches during maintenance unless needed to restore drainage capacity or repair damage. Do not undercut the cut slope.
- Space cross drains according to road grade and soil type as indicated below: (ex. 01). Do not divert water from one stream to another

13.3 - Exhibit 01

Maximum Cross-Drain Spacing in Feet Based on Soil Types ¹				
Unified Soil Classification - ASTM D 2487				
Road Grade (%)	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	600	1000	1000	1000
4-6	300	540	680	1000
7-9	200	360	450	670
10-12	150	270	340	510
13-15	120	220	270	410

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

Response: B6.63 – Temporary Roads requires the purchaser to place water bars, rolling dips, or ditch relief pipes as directed by the Forest Service. C6.6# - Erosion Prevention and Control requires the Purchaser to construct cross ditches for road runoff and take other reasonable measures needed to prevent soil erosion and silt runoff into streams. B6.67 – Erosion Control Structure Maintenance and C5.31# - Road Maintenance ensures maintenance of erosion control.

- Empty cross drains onto stable slopes that disperse runoff into filter strips. On soils that may gully, armor outlets to disperse runoff. Tighten cross-drain spacing so gullies are not created.
- *Space water bars and rolling dips according to road grade and soil type as indicated below:*

Unified Soil Classification - ASTM D 24871				
Slope (%)	ML, SM Extr. Erodible Silts-sands with little or no binder (d.g.)	MH, SC, CL Highly Erodible Silts-sands with	SW, SP, GM, GC Mod. Erodible Gravels + fines & sands with little or	GM, GC Low Erodible Gravels with little
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.

Response: B6.63 – Temporary Roads requires the purchaser to place water bars, rolling dips, or ditch relief pipes as directed by the Forest Service. C6.6# - Erosion Prevention and Control requires the Purchaser to construct cross ditches for road runoff and take other reasonable measures needed to prevent soil erosion and silt runoff into streams.

- Armor rolling dips as needed to prevent rutting damage to the function of the rolling dips. Ensure that road maintenance provides stable surfaces and drainage.
- During winter operations, maintain roads as needed to keep the road surface drained during thaws and break-ups. Perform snow removal in such a manner that protects the road and other adjacent resources. Do not use riparian areas, wetlands or streams for snow storage or disposal. Remove snow berms where they result in accumulation or concentration of snowmelt runoff on the road or erodible fill slopes. Install snow berms where such placement will preclude concentration of snowmelt runoff and will serve to rapidly dissipate melt water.
- *Insure that all designed road drainage features are fully functional and effective throughout the operational periods.*

Response: B6.63 – Temporary Roads requires the purchaser to place water bars, rolling dips, or ditch relief pipes as directed by the Forest Service. C6.6# - Erosion Prevention and Control requires the Purchaser to construct cross ditches for road runoff and take other reasonable measures needed to prevent soil erosion and silt runoff into streams. C5.36# -Snow Remove, B6.67 – Erosion Control Structure Maintenance and B5.3 – Road Maintenance are included in the contract and meet these requirements.

13.4 - Management Measure (12)

Reclaim roads 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 (seed and mulch), and close all non-system routes, 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 all fill material in the active channel), restore the channel geometry, and

- revegetate 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 where practicable 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 revegetation objectives.

Response: B6.63 – Temporary Roads requires the purchaser to place water bars, rolling dips, or ditch relief pipes as directed by the Forest Service. C6.6# - Erosion Prevention and Control requires the Purchaser to construct cross ditches for road runoff and take other reasonable measures needed to prevent soil erosion and silt runoff into streams. C5.34# - Obliteration of Temporary Roads, Skid trails and Landings meet these requirements.

14.1 - Management Measure (13)

Manage land treatments to limit the sum of severely burned soil and detrimentally compacted, eroded, and displaced soil to no more than 15% of any activity area.

- Restrict landings, skid trails, concentrated-use sites, and similar soil disturbances to designated sites.

Response: B6.6 – Erosion Prevention and control prohibits operation of equipment “when ground conditions are such that excessive damage will result”. B6.422 – Landings and Skid Trails requires the location of skid trails and landings to be agreed upon by the sale administrator.

- 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 at or below the plastic limit*), or protected by at least 1 foot of packed snow or 2 inches of frozen soil.

Response: B6.422 – Landings and Skid Trails requires the location of skid trails and landings to be agreed upon by the sale administrator. B5.1 – Authorization and C6.6# - Erosion Prevention and Control are also included in the contract. B6.6 – Erosion Prevention and Control prohibits operation of equipment “when ground conditions are such that excessive damage will result.”

- Conduct prescribed fires to minimize the residence time on the soil while meeting the burn objectives. This is usually done when the soil and duff are moist.

Response: The Fire and Fuels specialists will ensure this requirement will be met.

14.2 - Management Measure (14)

Maintain or improve long-term levels of organic matter and nutrients on all lands.

- If machine piling of slash is done, conduct piling to leave topsoil in place and to avoid displacing soil into piles or windrows.
- *Maintain the forest plan standard of 10 – 20 tons/acre or more of logs and other down woody material where feasible to maintain soil productivity and biodiversity. A range of size classes is preferred, but material > 6 inches in diameter is desirable to protect planed seedlings. Limbs and tops (fine fuels) will be lopped and scattered and not burned in piles.*

Response: These requirements are included in C6.7# - Slash Treatment.

15.1 – Management Measure (15)

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

- Locate vehicle service and fuel areas, chemical storage and use areas, and waste dumps and areas on gentle upland sites. Mix, load and clean on gentle upland sites. Dispose of chemicals, *fuel, oil, and, empty* containers in State-certified disposal areas.

Response: B6.34 – Sanitation and Servicing meets these requirements.

Special Uses

There are several reservoirs located within the Project Area, including Upper Eggleston, Rockland and Upper Hotel Reservoirs. In order to protect water quality and quantity during and after timber harvest, the following mitigation measures shall be incorporated into the timber sale contract:

- Storm water best management practices (BMPs) shall be used near water facilities in order to reduce or eliminate sedimentation in the reservoirs.
- Haul routes should not cross dams in order to protect the integrity of the dam.
- The temporary road crossing the drainage below Upper Hotel Lake Reservoir shall be constructed in such a way as to not impeded quality or quantity of the flow coming from the reservoir.

Response: The haul route does not cross any dams. B6.63 – Temporary Roads requires the purchaser to place water bars, rolling dips, or ditch relief pipes as directed by the Forest Service. C6.6# - Erosion Prevention and Control requires the Purchaser to construct cross ditches for road runoff and take other reasonable measures needed to prevent soil erosion and silt runoff into streams. C5.1-Designed Temporary Roads, includes an engineering plan to install about 2 harden fords that cross wet areas. Harden fords will not be removed after harvesting. A temporary bridge will be installed crossing below a reservoir dam on NFSR 121.1N.

The Coldstream Domestic Pipeline Company has an authorized spring development and pipeline located within the Project Area. The pipeline is not buried but runs over the top of the ground and supplies drinking water to several cabins located on the Grand Mesa Resort Company property. The proposed action does not currently anticipate timber harvest activities occurring near the spring and pipeline; however, if that should change, the pipeline should be protected with a bridge, matting, soil cover, etc., from potential damage or water contamination caused by equipment crossing it. Care should be taken during activities occurring near the building covering the spring development to ensure that it is not damaged.

Response: Harvest units currently do not occur in this area. BB6.221 – Protection of improvements not own by Forest Service is included in the contract and will meet this requirement.

Operation and maintenance of water facilities occurs generally from May to November each year, although access is sometime needed while snow is on the ground. State employees, who release the water from the reservoirs and perform inspections on the structural integrity of the dams, will require access to perform their duties during road construction and timber harvesting activities. Reservoir owners could need access with heavy equipment during timber harvesting activities to perform maintenance on the dams, as directed by the State employees. Access to water facilities should not be restricted during timber harvesting activities; however, advanced notice to the timber sale administrator of the need will be given by the Grand Valley Ranger District lands specialist.

Response: This will be the responsibility of the Sale Administrator to coordinate with the Water users and Ranger District.

Transportation/Engineering

SP Snowmobile Trail – if hauling in the winter

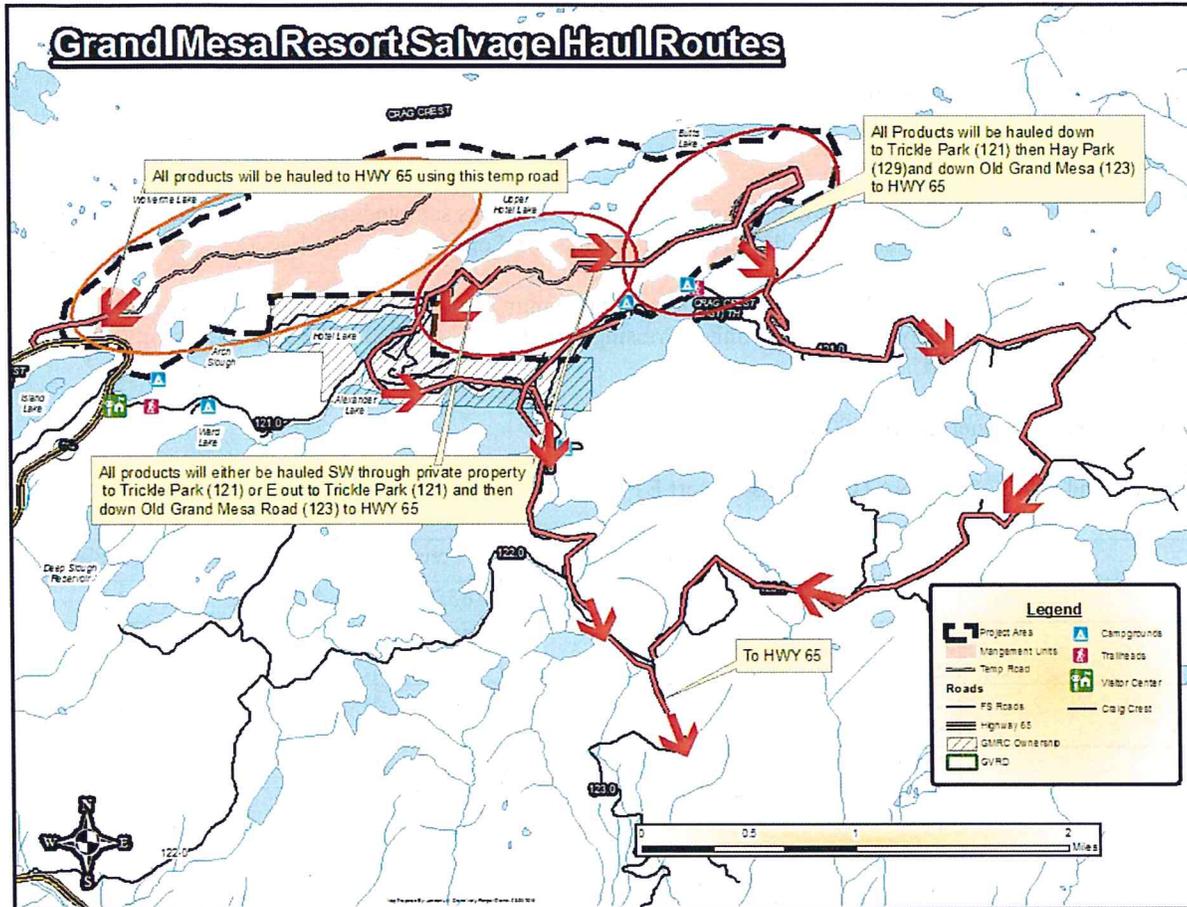
- Do a two level plowing to accommodate groomer, snowmobiles and log trucks along the SP Trail.
- No hauling allowed from 2 days before Christmas until 2 days after new years.
- Create ingress and egress for snowmobiles when the trail crosses the plowed haul route.
- Only Frozen ground hauling – during breakup only hauling in the mornings while roads are still solid. Maintain 6” compacted snow.

Response: C5.12# - Use of Roads by Purchaser and C5.36 – Snow Removal includes these requirements.

General Hauling Rules

- Must have appropriate signing to warn travelers of log truck hauling
- No hauling on weekends or holidays.

Response: C5.12# - Use of Roads by Purchaser and B6.33 – Safety includes these requirements.



Probable haul routes to be used to remove timber products

Wildlife

- Standing snags which have evidence of bird nests or hollow created by birds or other animals shall not be marked for harvest. Desired wildlife trees are snags that are 20 inches or greater in diameter. Reserve trees will also be marked around the snag from 1/10 th to a ¼ acre in size. They will be designated with orange slanted slash on each side of the tree, at six to eight feet from ground level, and one stump mark at ground level.
- Maintain 90 to 225 snags per 100 acres, 10 inches in diameter at breast height (dbh) or greater (where biologically feasible). Snags would be maintained away from structures, roads and trails so that they do not create safety hazards to the public.

Response: Wildlife tree requirement were met through reserve areas and large un-merchantable snags.

- Created openings in group selection harvest units would be less than 2 tree lengths in width to provide special habitat requirements for species such as marten, snowshoe hare, etc.

Response: This was done during layout of groups.

- DHC data will be collected after the implementation is complete to assess suitability after implementation.

Response: This is the responsibility of the Wildlife Biologist.

- Advanced regeneration would be maintained, as much as possible, in all treatment units, to provide foraging habitat for lynx.
- Designate skid trails, temporary roads, and landings in previously disturbed sites, natural openings, or through sites that will have trees targeted for removal as part of timber harvest prescriptions.
- Protect and maintain existing dense horizontal cover ($\geq 35\%$) where it is currently present ($\geq 35\%$), where feasible.

Response: Wildlife surveys were conducted during the summer of 2015 to determine dense horizontal cover. These areas were excluded from the cutting units during layout and marking.

- Identified winter haul routes are roads that are already plowed or groomed, thus winter hauling will not increase the amount of compacted snow routes within the project area.

Response: Haul routes were identified during the planning phase.

CRUISE VOLUMES

This sale was laid out in the summer of 2015 and cruised in the summer of 2015. This was sampled using the sample tree cruise method with two sampling strata. Field data was entered and processed using the U.S Forest software NATCRS, Version 10.04.2011.

This is a scaled sale estimated to have a value of \$135,802.68; therefore, the maximum sampling error for this sale as a whole is 20% or lower. This information can be found in Chapter 40 of the Timber Cruising Handbook (2409.12). The combined sampling error for this cruise is 17.83% (NATCRS DS1 report).

This Sale was check cruised by Kurt Stagner in July of 2016 and is satisfactory.

The final processing run was made 07/27/2016. NATCRS cruise report B1 shows the following net volumes:

Species	Product	Net Vol (CCF)	# Trees	QMD	Net BF/CF Ratio
ES	Live Sawtimber	4130.14	18320	13.4	
ESR	Dead Sawtimber	1400.25	4731	15.2	
ESD	Dead Sawtimber	1697.78	6760	16.8	
TF	Live Sawtimber	130.56	626	13.3	
Total		7358.73	30437		

A. Cruise Volume Summary and Contract Volume Calculations

See the following worksheet computations for calculations of (AT2) Appraised Volumes. Use of the TIM system creates a few CCF differences from the cruise results because TIM rounds before aggregating volumes. POL is grouped as Live & Dead ES & POL (Reference FSH 2409.22, 06.6).

Volume Worksheet Computations Sawlog and POL Volume (CCF)

	ES & TF
Cruised Gross Volume from NATCRS CS1	9144.22
Net Volume from NATCRS	7358.73
Difference	1785.49
Total Defect 1/	20%
[1-Defect]	0.87

1/Report B1 truncates the defect. Decimal places are calculated by $[\text{gross-net}] / [\text{gross}]$

Unseen defect and breakage were included in the cruise run as follows (based on cruisers estimate): 3% for ES, 7% for ESD, 7% for ESR, 3% for TF and 0% for POL.

Unit volumes are calculated by the TIM program from cruise data that included tree counts by units.

Acreage of the cutting units was determined using Global Positioning System (GPS) in 2015 with 466 acres. Total Gross Sale Area determined by ArcGIS is 1326 acres.

Unit Volume: Harvest Unit Acres and Net Volume (CCF)					
Unit	Acres	Net Live&Dead ES	TF	Total Saw	Total POL
1	122	1196.91	87.39	1284.3	0
2	132	2531.4	0	2531.4	0
3	127	2435.51	0	2435.51	0
4	67	925.56	42.76	968.32	0
5	9	73.91	0	73.91	0
6	9	64.87	0.42	65.29	0
TOTAL	466	7228.16	130.57	7358.73	0

15.8	Total ST CCF/Total Acres = Average Net Volume/Acre (ST=Sawtimber)					
0	Total POL CCF/Total Acres = Average Net Volume/Acre (POL= Product other than Logs)					
15.8	Total CCF/Total Acres = Average Net Volume/Acre (combined)					
41	Total ST CF/ST trees = CF/tree (ST)					
0	Total POL CF/POL trees = CF/Tree (POL)					
41	Total CF/ trees = CF/Tree (combined)					
	Net Board Foot/cubic Foot Ratio (ST) = 5.0715					

APPRAISAL

A. Appraisal Data

Current TE sawtimber Appraisal Data – FSH 2409.22, 51.3; Bulletin No. BU230416, Zone 3 effective May 2 2016. The conifer sawlog appraisal direction is located in chapter 50 of FSH 2409.22, amended by 2409.22-96-5.

Sawtimber-

Basic Data Period: 2nd QTR CY 15 – 1st QTR CY 15

	<u>Live ES</u>
Base Period Price	\$15.73
Market Adjustment	\$0.25
Adjusted Base Period Price	\$15.98
Base Haul	\$84.06
Base RD Maintenance	\$4.30
Base Slash	\$1.36
Base Temp. RD	\$2.39

B. Skid/Yard

The skid/yard cost adjustment (formerly called the logging cost adjustment) is now figured on the TEA 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)

Database average dbh = 12.1

Database average volume per acre = 18.7 CCF/acre

Sale quadratic mean diameter = 14.3

Sale average volume per acre = 15.04CCF/acre

-2.2	D = Database Ave DBH - Sale Ave DBH
3.66	V = Database Ave Volume/Ac - Sale Ave Volume/Ac

Skid/yard cost adjustment (Calculated in the TEA program) = +\$3.46 (applied to sawtimber volume only)

C. Haul Cost Calculation

Round Trip Minutes Time Per Mile and from FSM 2406.22 Sec. 44.1 Exhibit 1

1) Sawtimber: Haul to Montrose, CO

Road Segment FSR #	From	To	Haul Class	% Grade	RTM	One Way Miles	% Vol	% Delay	Adj RTM
T1	U2	U1	5C3	-10 to 4	6.5	0.58	23.0%	0	0.87
T1	U1	Hwy 65	5C3	-10 to 4	6.5	1.65	41.0%	25	5.50
Hwy 65	T1	123	2C1	-6 to 2	4.2	6.62	41.0%	0	11.40
T2	end	T3	5C3	-10 to 4	6.5	0.06	11.0%	0	0.04
T3	end	T2	5C3	-10 to 4	6.5	0.06	3.0%	0	0.01
T2	T3	U3	5C3	-10 to 4	6.5	0.13	14.0%	0	0.12
T2	U3	U4	5C3	-10 to 4	6.5	1.4	43.0%	0	3.91
T2	U4	U5	5C3	-10 to 4	6.5	0.98	57.0%	0	3.63
121.1N	U5	121	5C3	-10 to 4	6.5	0.86	58.0%	0	3.24
121	U6	121.1N	3B2	-7 to 2	4.9	0.83	1.0%	0	0.04
121	121.1N	129	3B2	-7 to 2	4.9	1.73	59.0%	0	5.00
129	121	123	3C2	-9 to 4	5.8	3.5	59.0%	0	11.98
123	129	Hwy 65	3C2	-9 to 4	5.8	3.3	59.0%	0	11.29
Hwy 65			2C1	-6 to 2	4.2	9.2	100.0%	0	38.64
Hwy 65			2C1	-6 to 2	4.2	2	100.0%	25	10.50
Hwy 65			2B1	-4 to 1	3.6	9.9	100.0%	0	35.64
Hwy 92			1A1	0	2.8	3.5	100.0%	0	9.80
Hwy 50			1A1	0	2.8	24.4	100.0%	0	68.32
Mill Access			3B2	0	4.9	0.01	100.0%	100	0.98
TOTAL						70.71			220.92

(Reference FSH 2409.22, 44.1 Exhibit 1) Miles X % volume X (% increase + 100) x RT min. /mi. / 10000.

71	One Way Miles
221	Round Trip Minutes (RTM)
281	RTM + 60 min delay

\$31.74	RTM x \$.1130/ccf/min = Haul cost/CCF ST
\$3.23	(71-52) x \$.17/ccf/min = Haul cost/CCF POL

D. Road Maintenance Cost

Road Maintenance: Costs are from the Cost Estimating Guide for Road Construction for Regions 2, 3, and 4, dated March 2013. All wage rates were downloaded from the Division of Labor website as instructed by the Cost Guide (pg 7). Rate will be increased for two years for inflation at 3% to 2015. All costs reduced 23% for construction overhead, profit and risk, increased account from inflation, and increased 31.54% for timber purchaser overhead (TPOH).

- 1) **Pre-haul** Pre-haul maintenance will be required on 121.3N. Fill will be needed on a section of the road as well as some surface grading. It is estimated that 60 cubic yards of aggregate of ¾ minus, CDOT class 6 and 60foot by 15 foot of non-woven geotextile will be needed. Costs are from forest engineers.

Road Maintenance Pre Haul			
Work Item	Equipment Rental Rates/Hour *	Hours	Item Cost
Laborer	\$15.00	2	\$30.00
4x4 gas PU	\$23.09	2	\$46.18
Grader Operator	\$34.89	2	\$69.78
Deer 770C II Grader	\$56.20	2	\$112.40
Semi/Lowboy Driver	\$24.31	2	\$48.62
Truck w/lowboy (50 ton capacity)	112.35	2	\$224.70
Subtotal			\$531.68
Less OH, profit / risk @ 23%.			\$409.39
Increase 31.54% for TPOH			\$538.52

Rock: \$30/cu.yd rock delivered X 60 cu. Yds = **\$1,800.00**
 Geotextile: \$4.50/sq.yd X 100 sq.yd = **\$450.00**

Total Pre-haul Maintenance = \$2,788.52

- 2) **During-haul and Post -Maintenance:** Purchaser responsible on temporary roads. Road Maintenance Deposits will be made for FSR 121, 123, and 129. Post-haul maintenance will be included except for temporary roads which will be obliterated.

Native surface and temporary roads generally need grading once every 500 CCF. Graveled roads generally need grading once every 1000 CCF.

“Times maintained” in the following table include post-haul maintenance.

During & Post Haul Maintenance					
Road	Segment miles	CCF	Times Maintained	Total Miles	Hours
FSR 123 Old Grand Mesa	3.3	4145	4	13.2	26.4
FSR 129 Hay Park	3.5	4145	4	14	28.0

FSR 121 Trickle Park	1.73	4145	4	6.92	13.8
T1	2.23	2880	4	8.92	17.8
T2	3.4	4074	8	27.44	54.9
Total	14.19			70.48	141

years for inflation at 3% to 2015. All costs reduced 23% for construction overhead, profit and risk, increas

Road	Segment miles	CCF	Times Maintained	Total Miles	Hours
T1	2.23	2880	4	8.92	17.8
T2	3.4	4074	8	27.44	54.9
Total	5.66			36.36	73

During & Post Haul Maintenance (Purchaser Responsibility)					
Road	Segment miles	CCF	Times Maintained	Total Miles	Hours
T1	2.23	2880	4	8.92	17.8
T2	3.4	4074	8	27.44	54.9
Total	5.66			36.36	73

Road Maintenance: Costs are from the Cost Estimating Guide for Road Construction for Regions 2, 3, and 4, dated March 2013. All wage rates were downloaded from the Division of Labor website as instructed by the Cost Guide (pg 7). Rate will be increased for two

Assumptions:

1. Roads to be maintained per B5.3 and C5.31#
2. Blade one mile in 2.0 hours
3. Labor to clean culverts, remove rocks, etc.
4. Labor and operator have other work to round out days when full days are not worked on road maintenance.
5. Use pickup truck 2 hours per 10 hours of work
6. Move in cost figured for 2 times equaling 6 hours.
7. 5.66 miles x 2 hours per mile for grader and labor = 73 hours
8. Pick up use 2 hours per 10 hours = 14.6 hour
9. Maintain once for every 500 CCF removed over native or pit-run surface, with a final maintenance.

Road Maintenance During & Post Haul			
Work Item	Equipment Rental Rates/Hour *	Hours	Item Cost
Laborer	\$15.00	73	\$1,090.80
4x4 gas PU	\$23.09	14.6	\$337.11
Grader Operator	\$34.89	73	\$2,537.20
Deer 770C II Grader	\$56.20	73	\$4,086.86
Semi/Lowboy Driver	\$24.31	6	\$145.86
Truck w/lowboy (50 ton capacity)	\$112.35	6	\$674.10

Subtotal			\$8,871.94
Less OH, profit / risk @ 23%.			\$6,831.39
Increase 31.54% for TPOH			\$8,986.01

Road Segment FSR #	From	To	Haul Class	% Grade	RTM	One Way Miles	% Vol	% Delay	Adj RTM
T1	U2	U1	5C3	-10 to 4	6.5	0.58	23.0%	0	0.87
T1	U1	Hwy 65	5C3	-10 to 4	6.5	1.65	41.0%	25	5.50
Hwy 65	T1	123	2C1	-6 to 2	4.2	6.62	41.0%	0	11.40
T2	end	T3	5C3	-10 to 4	6.5	0.06	11.0%	0	0.04
T3	end	T2	5C3	-10 to 4	6.5	0.06	3.0%	0	0.01
T2	T3	U3	5C3	-10 to 4	6.5	0.13	14.0%	0	0.12
T2	U3	U4	5C3	-10 to 4	6.5	1.4	43.0%	0	3.91
T2	U4	U5	5C3	-10 to 4	6.5	0.98	57.0%	0	3.63
121.1N	U5	121	5C3	-10 to 4	6.5	0.86	58.0%	0	3.24
121	U6	121.1N	3B2	-7 to 2	4.9	0.83	1.0%	0	0.04
121	121.1N	129	3B2	-7 to 2	4.9	1.73	59.0%	0	5.00
129	121	123	3C2	-9 to 4	5.8	3.5	59.0%	0	11.98
123	129	Hwy 65	3C2	-9 to 4	5.8	3.3	59.0%	0	11.29
Hwy 65			2C1	-6 to 2	4.2	9.2	100.0%	0	38.64
Hwy 65			2C1	-6 to 2	4.2	2	100.0%	25	10.50
Hwy 65			2B1	-4 to 1	3.6	9.9	100.0%	0	35.64
Hwy 92			1A1	0	2.8	3.5	100.0%	0	9.80
Hwy 50			1A1	0	2.8	24.4	100.0%	0	68.32
Mill Access			3B2	0	4.9	0.01	100.0%	100	0.98
TOTAL						70.71			220.92

71	One Way Miles
221	Round Trip Minutes (RTM)
281	RTM + 60 min delay
\$31.74	RTM x \$.1130/ccf/min = Haul cost/CCF ST
\$3.23	(71-52) x \$.17/ccf/min = Haul cost/CCF POL

Road Maintenance Deposits will be made for FSR 121, 124 and 129. These roads are under Schedule A with the county and will be maintained by the county.

Road Maintenance Deposits					
Road	Segment miles	CCF	Maintained Miles	Total Miles	Hours
FSR 123 Old Grand Mesa	3.3	4145	4	13.2	26.4
FSR 129 Hay Park	3.5	4145	4	14	28
FSR 121 Trickle Park	1.73	4145	4	6.92	13.84
Total	8.53				68.24

1. Roads to be maintained per B5.3 and C5.31#
2. Blade one mile in 2.0 hours
3. Maintain once for every 1000 CCF removed Gravel surface, with a final maintenance

Road Maintenance Deposits			
Work Item	Equipment Rental Rates/Hour *	Hours	Item Cost
Grader Operator	\$34.89	68.24	\$2,380.89
Deer 770C II Grader	\$56.20	68.24	\$3,835.09

Subtotal			\$6,215.98
Less OH, profit / risk @ 23%.			\$4,786.31
Increase 31.54% for TPOH			\$6,295.91

3) Surface Rock Replacement

Rock Replacement collections will be made for the gravel portions of the haul route according to the following worksheets. Rock replacement is sale as a whole, thus the cost will be distributed over all the volume.

3.3	NFSR 123 – Old Grand Mesa
3.5	NFSR 129 – Hay Park
1.7	NFSR 121 – Trickle Park
8.5	Miles NSFR Used

7358	Total Net Appraised CCF (all products & species)
3.3	NFSR 123 – Old Grand Mesa
3.5	NFSR 129 – Hay Park
1.7	NFSR 121 – Trickle Park
8.5	Miles NSFR Used

\$10.00	Local Rock Cost / cu yd
\$1.60	Appication (process, water, compact) cost / cu yd
\$34.00	Subtotal Cost / Cu Yd
\$8.33	24.5% Government Overhead Increase
\$42.33	TOTAL ROCK COST

- 1/ Use previous graph for haul costs per cu. yd. per mile.
2/ Use local costs if forest average is not applicable.
3/ GMUG Supplement to FSM 6520.42, Chapter 20 (CWFS)

8.50	Miles of Gravel Road
597.13	100cu yd/MMCF/mile x .3456MMCF x 8.5 miles = cu yd

Cubic Yard Loss Calculation	
8.50	Miles of Gravel Road
625.43	100cu yd/MMCF/mile x .7358MMCF x 8.5 miles = cu yd

Gravel loss = 100 cu. yd./ MMCF/mile,
20 cu. yd./MMBF/mile,
0.100 cu. yd. /Semi-Truck Load/mile.

Cost Summary	
\$26,474.45	Total Rock Cost x Total CU YD = Total SRR cost
\$3.60	Total SRR Cost / Total CCF = Cost / CCF
\$0.13	Total SRR Cost / Total CCF / Ave Haul = CCF/Mile

4. Snow Removal

It is unlikely that snow plowing will be necessary during the normal Operating Season, therefore, a cost adjustment is not necessary for this timber sale. (FSH 2409.22, Section 44.23)

Road Maintenance Summary

Purchaser Pre-haul Maintenance	\$2,788.52
Purchaser During and Post Haul Maintenance	\$8,986.01
Forest Service Road Maintenance Deposit	\$6,295.91
Surface Rock Replacement Deposit	\$26,474.45
Snow Removal	\$0.00
Total Cost	\$44,544.89

Total Road Maint Cost / Sale Volume = Cost/CCF	\$6.05
Total Deposit Cost / Sale Volume = Cost /CCF	\$4.46

SRR = \$3.60/CCF
 Schedule A= \$.86/CCF

E. Sale Slash Disposal

See the Brush Disposal Treatment Plan FS-2400-62 for calculations of the contract deposit costs. Allowance is not accounted for piling slash and scarification within group selections openings. Normally this is accomplished during operations.

Required deposits: \$1.88/CCF

F. Temporary Roads

As estimated in the Logging Plan, 4.9 mile of temporary roads will be needed to complete this sale. Forest engineers have flagged the location of the temporary roads. There is approximately 3,300 feet of temp. road that will be "Designed Temporary Road" under C5.14 of the contract. See Logging Plan Map for locations.

Temporary road construction and obliteration costs were calculated with a worksheet developed by the Forest Engineer using estimates for the Cost Estimating Guide for Road Construction for Regions 2, 3, and 4, dated 2015. Refer to worksheet attached.

1.

Temp Construction \$ per Mile = Standard Combined Unit Rate per Mile x Factor					
\$3,891.13	x	1.00	=		\$3,891.13

Obliteration \$ per Mile = Excavation per Mile x Unit Rate 1 x 2(Factor)						
1023	x	2.65	x	1.26	=	\$3,415.80

Total Temp Road Costs per Mile = (Temp Const + Temp Obliteration) x 10.5% Mob						
\$3,891.13	+	\$3,415.80	x	10.50%	=	\$8,074.15

4.9 Miles x Temp Cost per Mile	=	\$39,563.36	Grand Mesa Resort Temp Road Costs
Total Temp Road Cost / Total Volume	=	\$5.38	Cost per CCF

2. Harden Fords

4 areas were identified that would require Harden Fords. The locations are identified on the logging map. Forest engineers estimate \$2,175 per Harden Ford. Fords will not be removed after the sale.
 \$2175 X 4 = **\$8,700**

3. Rolling Dips

Forest engineers estimate that 12 rolling dips per mile @ \$200 per dip.
 12 dips/mile x 4.9 miles of temp = 59 dip
 59 dips x \$200 = **\$11,800**

4. Temporary Bridge

Installation: A local estimate from Doughty Steel & Machine, Inc was given. The estimate includes the crane rental with operator and mobilization to and from site.

Mobilization = \$1,800.00

Working crane time = \$240.00/hr

FS engineers estimate a cost of \$500 to load the bridge in N Delta and \$500 to transport to the timber sale

\$500 + \$500 = **\$1,000**

It is estimated it will take 2 days at 10 hour/day for the use of the crane and operator

\$240 X 20 hours = \$4,800 + \$1,800 mobilization = **\$6,600**

Removal: It is estimated it will take half the time to remove the temporary bridge and the same cost for mobilization.

\$240 X 10 hours = \$2,400+ \$1,800 mobilization = **\$4,200**

Total for Temp bridge: \$6,600 + \$4,200 + \$1,000 = \$11,800

5. Gate installation

It is required this road be closed per C5.41#

A gate will need to be installed at the entrance of the road off of Hwy 65. Locale price of a swinging gate is \$450. Cost to install the gate for 2 labors at 4 hours = \$15.00 x 8 hour = \$120.00

Less OH, profit / risk @ 23%.

Increase 31.54% for TPOH

Labor Cost = \$120.00 / 1.23 x 1.3154 x = \$132.10

Total Cost = \$132.10 + \$450 = **\$582.10**

Temporary Road Cost Summary

Temp Road Construction + Obliteration	\$39,563.36
Harden Fords	\$8,700
Rolling Dips	\$11,800
Temp Bridge Installation/removal	\$11,800
Gate Installation	\$582.10
Total Cost	\$72,445.46

Total Temp Rd Cost / Sale Volume = Cost/CCF	\$9.85
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G. Unusual Adjustments

1. Skid Distance Adjustment (FSH 2409.22, 51.6)

The average skid distance for this sale is ≤570 feet; therefore no adjustment.

2. Sorting and Handling (FSH 2409.22, 51.6)

This sale contains <1% of other species within the sale volume. No adjustments for sorting and handling.

3. High Risk (FSH 2409.22, 51.6)

Normal operating season is more than 4 months. No adjustments are needed.

4. Deterioration Live Unusual Adjustment (FSH 2409.22, 51.6(2)):

Refer to Adjustment for Deteriorating Timber spreadsheet for calculations

Live ES, 50% deterioration for bark beetle attacks

ESR, 50% deterioration at midpoint to dead

From spreadsheets

ES = (-) **\$22.34 applied to ES & Other sawtimber**

Total Unusual Adjustments:

ES & O sawtimber: (-)22.34

H. Quality Adjustment (BU230416)

Haul cost adjustment for each species will be capped at +\$25.00. If the base cost for species exceeds the sale haul cost for that species by more than \$25.00, a negative quality adjustment will be made for the amount by which the Sale Haul Cost Adjustment exceeds \$25.00.

ES – Base Haul Cost = \$84.06

ES – Sale Haul Cost = \$31.74

\$84.06 - \$31.74 = 52.32

\$52.32 - \$25.00 = (-) **\$27.32 quality adjustment for ES**

I. Competition Factor (FSH 2409.55, 51.3, BU230416)

Live & Dead ES & O sawtimber	\$1.60/CCF
All except PP and Aspen POL	\$0.10/CCF

J. Specified Roads

There is no specified construction related to this sale.

K. Base Rates (FSM 2431.31b)

Live & Dead ES & O sawtimber	\$5.00/CCF
All except PP and Aspen POL	\$1.00/CCF

L. Fire Precautionary Period (AT9)

July 15 – October 31

M. Fire Suppression Reinforcement (AT10)

From the furthest corner of the sale to the appraised mill is 71 miles; rounded to the next 5 miles, 75 miles will be used.

N. Purchasers Obligation for fire (AT11)

Western Area Wage Rate for AD-C, type 2 firefighter = \$18.00/hr (FSH 5109.34 – Interagency Fire Business Handbook, section 13.6, ID 5109.34-2007-1)

Estimate: woods crew = 5 people

5 people X \$18.00/hr X 12 hr shift X 3 Days = \$3,240.00

Rounded up to the nearest hundred = \$3,300.00

O. Termination Date (AT12)

Termination date for this sale will be October 31, 2019. (R2 supplement No. 2409.18-2006-2, section 53.4)

P. Performance Bond Calculation (AT14)

There are two methods of calculating the performance bond per FSH 2409.18, 54.1. The larger of the two calculations is used for the minimum performance bond.

Method I – Bond based on 10% of Advertised Stumpage Value:

\$7,931.92 Calculated in bid guarantee section

Rounded up to the next thousand **\$8,000.00**

Method II – Bond based on Penal Sum, work required for 1 logging season (w/o TPOH):

Assumptions:

a) Sale Volume/ # of seasons: 7358 CCF / 3 operating seasons = 2453 CCF

b) Seeding costs for all temporary roads in one season (all roads in a season typically seeded in the Fall) 4.9 mile (7 acres) of temporary roads = \$1,557.57 (seeding cost).

c) Purchaser road maintenance = \$2,995.33

d) Temp. road obliteration = \$16,737.42 (for 4.9 miles temp)

e) Removal of temp. bridge = \$4,200.00

Total = **\$25,490.32**

Round up to next thousand → **\$26,000.00**

The greater of Method I or Method II is: **\$26,000.00**

Q. Distribution of Funds

Distribution of Funds			
Stumpage at Advertised Rates	\$ / CCF	CCF	Total Value
Live & Dead ES & Other Sawtimber	\$10.78	7358	\$79,319.24
TOTAL VALUE			\$79,319.24
Minimum to NFF (\$.25/CCF x Sale CF)			\$1,839.68
Less Essential KV			0
Remainder Available for NFF, KV, SSF			\$77,479.56
Less Non-Essential KV			\$304,000.00
Remainder available for SSF			-\$226,520.44