



TENURE IDENTIFICATION

ORIGINAL

LICENCE #	CP	BLOCK	UBI	OPENING NUMBER	FDU	LOCATION	LATITUDE / LONGITUDE
A90392	-	1	BF5D6		Big Sheep	Santa Rosa	49 00 12 / 117 59 10

AREA UNDER THE PLAN

GROSS AREA (TAUP)	PAS	NP	WTRA / WTP	RESERVES	OTHER	NAR
28.5	1.0	2.0	1.8	0.0	0.0	23.7

ADDITIONAL COMMENTS

COMMUNITY WATERSHEDS
FSP Section 4.1.2.6. This proposed block is not located within a Community Watershed.
CONSISTENCY STATEMENT
This block and the out of block portion of the Santa Rosa 1100 road are consistent with the approved Arrow Boundary Forest Stewardship Plan and with Operating Plan #8. This Site Plan is prepared for TSL A90392 Block 1, in accordance with FRPA Section 10 (1), (2) & (3)
ENHANCED RESOURCE DEVELOPMENT ZONES
FSP Section 4.1.1.7. This proposed block is not located within an Enhanced Resource Development Zone.
FIRE MAINTAINED ECOSYSTEMS
FSP Section 4.1.1.8. Not applicable as of the date of the FSP.
FISHERIES SENSITIVE WATERSHEDS
FSP Section 4.1.2.5. Not applicable as of the date of the FSP.
INVASIVE PLANTS
FSP Section 5.1. The Invasive Plants database has been reviewed. There are no known areas within and around this proposed block where invasive plants are observed. Operations with regard to Invasive Plants will follow the procedures set out in the BCTS Environmental Field Procedure " Invasive Plants EFP #09".
RANGE
FSP Section 5.2. This proposed block is not located within a licensed Range Use Plan area. No range use is anticipated.
TIMBER
FSP Section 4.1.2.2. Not applicable to this proposed block because no result/strategy has been provided for the timber objective as the timber sales manager is exempt from preparing a result or strategy.
WILDLIFE - CARIBOU
FSP Section 4.1.1.3, Not applicable to this proposed block.
WILDLIFE - GRIZZLY BEAR HABITAT
FSP Section 4.1.1.5 and Amendment #6 (GWM order # 8-373) Mapping of important Grizzly Bear Habitat has been completed. This proposed block is located within the Schedule A area of the GAR Order. This block and the out of block portion of SR1100 road are not located within road location areas specified in Table 1/Schedule 1 of the GAR order or Schedule B area of the GAR Order. Also, the no Riparian Site Series specified in Table 3/Schedule 1 of the GAR order were observed within the block. No main haul roads exist within/near this proposed cutblock, as there are no roads in BCTS Arrow operating areas that meet the definition of 'main haul road' as defined in the GAR Order. GWM 5 is not applicable, as this proposed block does not contain areas with site series listed in Tables 3 and 4 of the GAR order. This block does not contain a BEC Zone identified in GWM 6. Although it is not required to manage for Vaccinium Spp. based on the fact that this area is not currently classified as a good berry producing site, attempts will be made to maintain Vaccinium Spp. productivity within this block by avoiding brushing treatments on Vaccinium Spp. and minimizing the amount of skid trails within the block, where practicable. (GWM 6). This development is not located adjacent to avalanche track(s); therefore, GWM 7 is not applicable. No Riparian Site Series specified in Table 3/Schedule 1 of the GAR order were observed within the development; therefore, GWM 8 is not applicable. No wetlands or riparian management areas with contiguous canopy openings of greater than 40ha are present within/near the development; therefore, GWM 9 is not applicable. The use of herbicides, sheep, domestic goats or cattle for vegetation management for silviculture purposes will not be used except where they may be necessary for the treatment of invasive plants. (GWM 10)

SOIL DISTURBANCE

SU	Max. Allowable Soil Disturbance (%)	Max. Amount TAS May Exceed MASD Prior To Rehab (%)	Max. Allowable Soil Disturbance For Roadside Work Areas (%)	Maximum Permanent Access Structures (%)
1	10.0	5.0	25.0	3.7
SU	CRITICAL SITE CONDITIONS THAT AFFECT THE TIMING OF OPERATIONS, AND HOW THEY AFFECT THE TIMING			
1	<p>Due to the geographical location and elevation of the proposed SU, ground thaw and snow melt usually occur relatively late in the year. Harvest operations must not occur during periods where soils are saturated i.e. When there is abundant hillslope runoff such as during spring breakup or during periods of runoff from heavy precipitation.</p> <p>See the Harvest Constraints Section in the Harvest Plan and the Riparian Management Strategies Section for additional mitigative strategies that should be used during and post harvest in order to prevent/reduce soil disturbance and sediment delivery.</p>			

RESULTS AND STRATEGIES

RESULT OR STRATEGY		HOW THE STRATEGY OR RESULT APPLIES TO THE SITE or RATIONALE (IF NOT APPLIED)
Biodiversity Emphasis		<p>FSP Section 4.1.1.2.</p> <p>This block is not located within an Old Growth Management Area and therefore Spatial OGMAs are not going to be affected and Old forest requirements are met.</p> <p>For Landscape level analysis, mature requirements exist in this Landscape unit for areas within ICH dw1. This block is also located within a connectivity corridor. There will be a surplus of approximately 512 ha within this L.U. after harvesting of A90392. Mature seral targets will be met.</p> <p>Section 4.1.1.4</p> <p>Green-up/Adjacency is not applicable, because this block is not located adjacent to an existing cutblock on crown land and is therefore consistent with FPPR Section 65.</p> <p>Section 4.1.2.7 Objectives Set by Government for Wildlife and Biodiversity - Landscape Level.</p> <p>This block is consistent with the requirements of FSP Section 4.1.2.7 because this development, in accordance with KBHLPO Objective 4, complies with Sections 64 and 65 of the FPPR for the term of this FSP.</p> <p>The proposed block is consistent with FPPR Section 64(1) because it has a Net area of less than 40 hectares.</p> <p>Green-up/Adjacency is not applicable, because this block is not located adjacent to an existing cutblock on crown land and is therefore consistent with FPPR Section 65.</p>
Consumptive Use Streams		<p>FSP Section 4.1.1.6.</p> <p>The provisions of Kootenay Boundary Higher Level Plan Order Objective 6 - Consumptive Use Streams do not apply to this block, as the stream order of the stream located within this block is reduced from the stream that contains the closest water intake for human consumption. The closest POD is located approximately 2.5km down slope from this block.</p> <p>Although Consumptive Use Streams do not directly apply to this block, an indirect connection is recognized; therefore, riparian and water management prescriptions have been created to help protect riparian habitat, and water quality. See the Riparian Strategies field within the Riparian Assessments Section of the Site Plan as well as the Min. Characteristics of Leave Trees field in the Silviculture Systems Section of the Harvest Plan for additional Riparian Management Strategies. See the Harvest Constraints Section in the Harvest Plan for additional mitigative strategies that should be used during and post harvest in order to prevent/reduce soil disturbance and sediment delivery.</p>
Cultural Heritage Resources		<p>4.1.2.10 Objectives set by Government for Cultural Heritage Resources</p> <p>A referral was sent to the appropriate individual(s) and/or group(s) on January 31, 2013. No comments regarding any aspects of this development have been received.</p>
Recreation Sites & Trails		<p>FSP Section 4.1.5.</p> <p>The block is not located within or adjacent to an established recreation site or trail with legal objectives. Although no recreation site or trail exists within the block, the Dewdney Trail Buffer is located near this development; however, there is no overlap or conflict.</p>
Riparian		<p>FSP Section 4.1.2.4.</p> <p>There is one NCD within and adjacent to the block.</p> <p>All non-merchantable stems with good form, health and vigor, and brush species will be reserved within the area that is 5m on either side of all the NCD, where operationally feasible.</p> <p>The NCD has been ribboned with red ribbon and portions within the cutblock area should be treated as outlined in the section above.</p> <p>See the Harvest Constraints Section in the Harvest Plan for additional mitigative strategies that should be used during and post harvest in order to prevent/reduce soil disturbance and sediment delivery.</p>
Soils		<p>FSP or FPPR Section 35 and 36</p> <p>1) SU1 contains non-sensitive soils and soil disturbance will not exceed 10%. Specific measures for mitigating soil disturbance levels are addressed under the Harvesting Constraints and Soil Management Comments Sections of the Harvest Plan.</p> <p>2) Areas of the block where temporary access structures may be required will be rehabilitated. Specific rehabilitation measures are addressed under the Harvesting Constraints and Soil Management Comments Sections of the Harvest Plan.</p> <p>3) The PAS will not exceed the recommended limit of 7.0% and is estimated at 3.7%.</p> <p>4) Areas within the block assigned to roadside work areas will not exceed 25%.</p>
Visual Quality		<p>FSP Section 4.1.2.9.</p> <p>This block is not located within a Polygon that contains a Visual Quality Objective. A VIA is not required.</p>
Wildlife - Species at Risk		<p>FSP Section 4.1.2.3.</p> <p>This block is not within a Wildlife Habitat Area.</p> <p>No Species at Risk were observed within or near this proposed block.</p>

Wildlife - Ungulate Winter Range		FSP Section 4.1.3.2 This block is not located within an Ungulate Winter Range Area/Polygon; therefore, no UWR requirements exist for the block.
Wildlife - Wildlife Tree Retention		FSP Section 4.1.2.8. There are 2 Wildlife Tree Retention Areas totalling 1.8 ha which is approximately 6.7% retention for the cutblock. Note: the value in the summary table in the Reserve/Retention Information section, derived in Cengea, calculates the Retention Area percentage: $WTRA\% = WTRA/Gross\ Area \times 100$. The value obtained by that calculation is different than the value above, which was obtained from the FSP calculation: $WTRA\% = WTRA/(Gross\ Area - WTRA) \times 100$. The 2 wildlife tree retention areas attributed to the block measure 1.8 ha in size and the dispersed leave component of 0.2 hectares, combine to give a total retention area of 2.0 ha post-harvest. Overall Wildlife Tree Retention percentage= 7.5%. This is consistent with the minimum target of 3.5% for the block and 7.0% for the TSL.

STOCKING REQUIREMENTS

SU	NAR	STANDARDS ID #	OTHER PERFORMANCE STANDARDS
1	23.7	1016123	Additional standards and footnotes are found in APPENDIX A of the 2006-2011 BC Timber Sales Arrow Boundary Forest Stewardship Plan. Footnotes: FDi 58: Arrow FD - Fd and Bg limited to planting a max 50% of WSSpa due to Armillaria root rot. No limit following completion of mechanical inoculum removal. PLi 71: Restricted to max 50% of WSS or to the extent previously found on site as a commercial species (based on cruise or scale). CW 42: restricted to fresh soil moisture regimes BL 10: restricted to northerly aspects 13: restricted to upper elevations of biogeoclimatic unit PW 57: Arrow/Columbia forest district - Pw rust-resistant stock may be considered preferred species to a max 50% of WSSpa. Pw naturals - acceptable species only to max 50% /plot, 10% WSSpa. Minimum pruning height 1.0 m applies to natural Pw 2.0 m and taller, required to meet MSSpa
COMMENTS	Additional standards and footnotes are found in APPENDIX A of the 2006-2011 BC Timber Sales Arrow Boundary Forest Stewardship Plan. Footnotes: FDi 58: Arrow FD - Fd and Bg limited to planting a max 50% of WSSpa due to Armillaria root rot. No limit following completion of mechanical inoculum removal. PLi 71: Restricted to max 50% of WSS or to the extent previously found on site as a commercial species (based on cruise or scale). CW 42: restricted to fresh soil moisture regimes BL 10: restricted to northerly aspects 13: restricted to upper elevations of biogeoclimatic unit PW 57: Arrow/Columbia forest district - Pw rust-resistant stock may be considered preferred species to a max 50% of WSSpa. Pw naturals - acceptable species only to max 50% /plot, 10% WSSpa. Minimum pruning height 1.0 m applies to natural Pw 2.0 m and taller, required to meet MSSpa.		

ADMINISTRATION

Amendment number	Date Typed (Yr Mo Dy)	Map Required?
ORIGINAL	2013 07 03	YES

RPF PRINTED NAME		RPF'S SIGNATURE and SEAL	
STEVE DE VUONO			
DATE SIGNED			
2013/07/03			
I certify that the work described herein fulfils standards expected of a member of the Association of British Columbia Forest Professionals, and that I did personally supervise the work.			

Map attached forms an integral part of the site plan.

SUPPORT DOCUMENT

ORIGINAL

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A90392	-	1	BF5D6		Big Sheep	Santa Rosa	49 00 12 / 117 59 10

ASSESSMENTS

VISUAL IMPACT ASSESSMENT INFORMATION
This block is not located within a Polygon that contains a Visual Quality Objective. A VIA is not required.
PEST INCIDENCE SURVEY INFORMATION
Pest Specific Comments
Mountain Pine Beetle: The current level of IBM attack is moderate to high (20-60%); however, there is 1% PI in this block. Current risk to the overall timber inventory is low. Manage for a mixed species stand post harvest. Armillaria Root Disease: Armillaria risk assessment matrix determines a Moderate (26 points) rating for this block. DRA was observed in a few areas within this stand. Current risk to inventory is Low to Moderate. Schweinitzii Butt Rot: Very Low to Nil incidence found on site. Decay fungi are a concern with partial cutting prescriptions. Current risk to inventory is low but could become a concern in the post harvest stand. Larch Dwarf Mistletoe: Lw is a preferred planting species. Plant Lw > 15 meters from any infected Lw stems (in-block and along the harvest boundary). There is very low to nil incidence found on site.
Forest Health Comments
Endemic levels of Armillaria are present throughout the Kootenay region. Evidence of Armillaria was observed in a number of areas during Site Plan field data collection. Mountain pine beetle damage was moderate to high (25-50%) within this block and the species composition information indicates 1% of pine stems exist within this proposed block. Harvesting will remove all/most of the pine stems, where operationally feasible, as they include MPB infected and susceptible stems. Forest health concerns were assessed during SP data collection in October 2012. Expected relative pest occurrence values are from the Establishment to Free Growing Guidebook - Nelson Forest Region 2000. Approximate species composition in this block is 71%Fd, 11%Cw, 9% Lw, 4% B, 2% Ep, 1% PI, 1% Sx and 1%Hw. The average age of the main timber species is 85 years.
ARCHAEOLOGICAL IMPACT ASSESSMENT INFORMATION
Refer to the Site Plan - Results and Strategies. This block is not located within or near an Archaeology polygon with Moderate or High Archaeological Potential; therefore, an AOA is not required.
TERRAIN STABILITY FIELD AND GULLY ASSESSMENTS INFORMATION
Terrain Stability Comments
This block is not located within/near a potentially unstable terrain stability polygon. Completion of the TSA decision matrix tool indicates no requirement to complete a TSA or a Site Review. See the Harvest Constraints Section in the Harvest Plan for recommendations/mitigative strategies that should be used during and post harvest in order to prevent/reduce soil disturbance and sediment delivery.
Gully Comments
Not applicable to this prescription.
VEGETATION
SU 1 has a low with a few areas of moderate current brush hazard. Future brush hazard is expected to be low to moderate. Competitor Species: Oceanspray, Willow, Maple and Thimbleberry. Brushing Methods: Should brushing be necessary, then manual treatments are preferred. Anticipated Timing/Constraints: Treatment needs will be assessed through periodic walkthroughs and silviculture surveys. Treatment timing will be prescribed at the time of brush assessment.

RIPARIAN ASSESSMENTS					
Management Strategies					
<p>Riparian Management Strategies</p> <p>1) Trees must be felled and skidded away from riparian features where practicable. Any debris entering a riparian feature as a result of harvesting will be removed upon completion of harvesting activities unless it does not obstruct water flow or its removal would cause further damage to the riparian feature..</p> <p>2) Where NCDs are encountered and are to be crossed more than once it is recommended to place a temporary skid culvert (logs placed in draw or old culvert) in order to prevent a potential diversion of flow.</p> <p>3) All machine trails and crossings (NCD or S6) should be fully rehabilitated upon the completion of harvesting. Excess material that could cause redirection of natural drainage patterns should not be left at swale or gully crossing locations.</p> <p>4) All surface drainage patterns should be maintained and any that are disrupted as a result of harvesting operations should be restored immediately.</p> <p>5) All non-merchantable stems with good form, health and vigor, and brush species will be reserved around NCDs, where operationally feasible.</p> <p>There is 1 NCD within and adjacent to the block.</p> <p>The NCD has been ribbonned in red. No MFZ has been established around the NCD because it is contained in an incised gully; therefore, redirection and/or damage risk is low.</p> <p>All non-merchantable stems with good form, health and vigor, and brush species will be reserved within the areas that area 5m from the edge of the NCD, where operationally feasible.</p> <p>See the Harvest Constraints Section in the Harvest Plan for additional mitigative strategies that should be used during and post harvest in order to prevent/reduce soil disturbance and sediment delivery.</p>					

Riparian I.D. and Class	RMA	SU	WIDTH (m)	BA or SPH Retained	Comments (Indicate if in a Community Watershed)
NCD-2-1 UC	MFZ	n/a	5.0		No MFZ has been established on NCD-2-1 as it is confined within an incised gully/draw, and the risk of damage/redirection is low. Minimize crossing the NCD and if crossing is required install an appropriate temporary skid crossing. Rehabilitate skid crossing post harvest. All non-merchantable stems with good form, health and vigor, and brush species will be reserved within the area that is 5m on either side of the NCD, where operationally feasible.

SOIL ASSESSMENT							
HAZARD RATINGS				SOIL CHARACTERISTICS			
SU	Soil Comp	Soil Erosion	Soil Disp	Depth To Unfavourable Subsoil		Type of Unfavourable Subsoil	Sediment Delivery Risk (Community Watersheds)
				Min(cm)	Max(cm)		
1	H	H	H		100.0	PMT	

COMMENTS							
<p>SU 1:</p> <p>This unit is located on middle, and variable facing slopes which range from 0-50% (average 15-30%). Soils are well drained with predominantly Silty Loam textures and approximately 40% coarse fragments.</p> <p>Sediment Delivery Risk is predominantly Low due to the relative gentle slope nature of the topography, well drained soil composition, the presence of only one NCD within the SU.</p> <p>SU1 contains non-sensitive soils; however, the proposed block does have High Compaction, Displacement and Erosion Hazards.</p>							

RESERVE / RETENTION INFORMATION

WTRA / WTP (INSIDE OR ATTRIBUTED TO THE BLOCK)		
I.D.#	Area	Description
WTRA	1.8	2 WTRAs WTRA # 1 (0.5ha) - : This WTRA is located in the northern portion of the block. WTRA 1 contains a Fd(7)PI(2)Cw/Lw(1) mature timber type. Fd is 105 years old and 31.0 m in height. PI is 85 years old and 26.0 m in height. Slopes in this WTRA range from 10-30% and CWD cover is generally low. Wildlife evidence consists of deer, bear, moose and elk scats. This WTRA contains significant levels of Rock/Rock Outcrops. Conifer SPH = 300-400sph and Percent crown closure ranges from 10-30%. WTRA # 2 (1.3ha) - : This WTRA is located in the central west portion of the block. WTRA 2 contains a Fd(9)PI/Lw/Cw(1) mature timber type. Fd is 105 years old and 30.0 m in height. PI is 85 years old and 24.0 m in height. Slopes in this WTRA range from 20-50% and CWD cover is generally low. Wildlife evidence consists of deer, bear, moose and elk scats, game/wildlife trail(s) and a frog sighting. This WTRA contains significant levels of Rock/Rock Outcrops. Conifer SPH = 300-400sph and Percent crown closure ranges from 10 to 25%.

GROUP WTRA / WTP AND SITE DEG. CALCULATION (to be retained on the first block of the Permit only)						
Block	Gross Cutblock Area	WTRA / WTP	%	BEC	Perm Access	%
1	28.5	1.8	6.1	ICH/dw/1	1.0	3.7
2	38.9	2.8	7.3	ICH/dw/1	2.0	5.1
3	31.6	3.1	9.7	ICH/mw/2	0.7	2.3
4	36.6	2.3	6.3	ICH/dw/1	2.0	5.5
Total # of Blocks: 4	135.5	10.0	7.3		5.8	4.3

SUPPORTING INFORMATION

HLP/FSP CONSIDERATIONS
Wildlife/Endangered Species Comments
General Observations The amount of wildlife sign observed in this block is low to moderate - tracks, game/wildlife trail(s) and animal scat from bear, and ungulates were observed. A frog sighting occurred within this block (WTRA2) during field development.
Range Comments
Not applicable to this prescription.
Fisheries Comments
Fisheries Sensitive Watershed is Not applicable to this prescription.
This area is not located within a Fisheries Sensitive Watershed; however, this block is located within a Domestic Watershed.
Watersheds/Hydro Assessments Comments
This block is located within the Big Sheep and Swehaw Domestic Watersheds and Santa Rosa Sub Basin. The total watershed ECA for Big Sheep and Swehaw is approximately 17% and 18% respectively and the ECA within the Santa Rosa Sub Basin is approximately 21%. These ECA values are considered to have a low hydrological hazard (< 30% ECA); therefore, the proposed development does not fall within the area of concern and a hydrological assessment is not required. Harvesting of this proposed development will lead to a very small contribution to the overall ECA.
Sensitive Areas Comments
Not applicable to this prescription.
Recreation Comments
The block is not within or adjacent to an established recreation site or trail with legal objectives.
Cultural Heritage Comments
A referral was sent to the appropriate individual(s) and/or group(s) on January 31, 2013. No comments regarding any aspects of this development have been received.
Biodiversity Emphasis/L.U. Comments
Landscape unit N501 (BigSheep): BEO rating is Medium. For Landscape level analysis, mature requirements exist in this Landscape unit for areas within ICH dw1. This block is also located within a connectivity corridor. There will be a surplus of approximately 512 ha within this L.U. after harvesting of A90392. Mature seral targets will be met. Also, no Old forest or OGMA's exist within this block; therefore, spatial OGMA's will not be affected and Old forest requirements are met. Harvesting will predominantly focus on removal of mature trees. Retention will be based on leaving windfirm trees that are long-term candidates for retention. See the Min. Characteristics of Leave Trees Section in the Harvest Plan for a description of the leave trees. The proposed block is consistent with FPPR Section 64(1) because its Net Area is less than 40 hectares. Green-up/Adjacency is not applicable, because this block is consistent with FPPR Section 65, as it is not located adjacent to an existing cutblock.
Other Resources Comments
The Trapper Licence is # TR0409T001. There are no guide outfitters located within or adjacent to the proposed development area.

ADDITIONAL COMMENTS:
Calculations - Permanent Access
Structures
Permanent Access Calculations SU 1 SR 1100 = 858m x 12 = 1.04ha Total PAS = 1.04ha = 3.7% Temporary Access Structures Ldg: 3 @ 0.20ha = 0.6ha Total TAS - 0.6ha = 2.5%
Calculations - Wildlife Tree
Retention Dispersed individual stems: Leave trees will be mature size and/or veteran stems. Spacing of leave trees is expected to be irregular. Leave trees will provide general biodiversity and wildlife values and future coarse woody debris. WTRA retention is 1.8 ha (2 WTRAs) + Dispersed area of (0.2ha) = 2.0ha = 7.5% Basal area conversion to area as follows : ***** Pre-harvest live basal area = 30.4m2/ha Basal area retention of 0.32 m2/ha 0.32 m2/ha x 22.4ha net = 7.17 m2 total 7.17 m2 / 30.4 m2/ha = 0.2 ha equivalent reserve area

ADMINISTRATION

Amendment number	Date Typed (Yr Mo Dy)	Map Required?
ORIGINAL	2013 07 03	YES

HARVEST PLAN

ORIGINAL

LICENCE #	CP	BLOCK	UBI	OPENING NUMBER	FDU	LOCATION	LATITUDE / LONGITUDE
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SILVICULTURE SYSTEMS

SU	SYSTEM	VARIANT	PHASE	RESERVE	Min BA (m2/ha)	Min Residual Density (sph)
1	CCRES		REMOV	G		
Current Stand Structure/Site Conditions			<p>The block is predominantly comprised of age class 4 and 5 stands with approximately 71%Fd, 11%Cw, 9% Lw, 4% B, 2% Ep, 1% Pl, 1% Sx and 1%Hw. See the cruise compilation for more detailed timber information.</p> <p>Although there are some suppressed Pole and Sapling non-merchantable stems with relatively poor health and/or form and/or vigor, a significant portion of Cw Pole and Sapling non-merchantable stems exhibit good form and vigor in a number of areas within the block.</p> <p>The terrain is generally uniform to slightly irregular in surface configuration and slope values are predominantly low.</p>			
Silviculture Systems SU Comments						
Min. Characteristics of Leave Trees (Form, Health, Vigour)			<p>MERCHANTABLE (Layer 1)</p> <p>SU1</p> <p>Reserve deciduous stems, where present, up to a maximum of 10 stems/ha in any one hectare area. Preference must be given to the largest diameter stems.</p> <p>Reserve trees are expected to have an irregular distribution as single stems, small groups and small patches.</p> <p>Reserve all safe snags </= 5m and where operationally feasible, create randomly dispersed stub trees (individually or grouped) throughout the harvestable area. Stub trees >35 cm dbh to a height of 3 - 5m and target larger, dead trees with defects in the lower parts of the bole. Total number of safe snags and stub trees must not exceed 10 sph. Stub trees must not pose a hazard to worker safety.</p> <p>NON-MERCHANTABLE (Layer 2,3 and 4) - SU1</p> <p>Reserve all non-merchantable stems, that have good form, health and vigor, and brush species within the area that is 5m on either side of NCD-2-1. where operationally feasible..</p> <p>Reserve small groups and small patches of non-merchantable stems, with good form, health and vigor, where present and where operationally feasible.</p> <p>CWD remaining on site post harvest will consist of a minimum of 4 logs per hectare, each being a minimum of 2m in length and 7.5 cm in diameter at one end.</p>			

Additional Comments

Constraints - Harvesting	<p>1. Minimize damage to leave trees during logging and site prep.</p> <p>2. Crossing of NCD-2-1 is not permitted except at road and skid crossings. Limit the number of crossings per water feature to 1 or 2 crossings, where practicable.</p> <p>3. Ground skidding across natural drainage paths (gullies, seepage areas or dry swales with no visible channels) should be avoided where practical. If this cannot be avoided, harvesting should be conducted during the drier months of the year, or effort made to ensure timber is skidded butt-first to minimize potential ground disturbance within such drainage features. Spring snow melt and prolonged or heavy periods of rainfall would constitute excessively wet site conditions.</p> <p>4. A post-harvest inspection should be completed to assess the amount of logging debris/excess soil within the wetted perimeter of all streams, watercourses and subtle drainage features. All natural drainage patterns should be maintained and left free of excess debris (slash or soil) that could result in a redirection of seasonal surface runoff/drainage diversion.</p> <p>5. Trees must be felled and skidded away from riparian features (including NCDs) where practicable. Any debris entering a riparian feature as a result of harvesting will be removed upon completion of harvesting activities unless it does not obstruct water flow or its removal would cause further damage to the riparian feature.</p> <p>6. Reserve all non-merchantable stems < 12.5cm dbh, with good form, health and vigor, and brush species within the area that is 5m on either side of NCD-2-1, where operationally feasible.</p> <p>7. Bladed/Excavated Skid trails may be required in the steep slopes areas to maintain safety. Some areas may require hand falling.</p> <p>8. All temporary skid trails may be built using debris-supported fill slopes to reduce cut bank excavation and the potential for groundwater interception. Drainage control measures should be implemented to ensure all natural drainage paths are maintained.</p> <p>9. Proposed skid trails and/or Bladed or Excavated trails may be required in some areas where adverse skidding is required.</p> <p>10. Minimize the amount of skid trails within the block and use low ground pressure equipment for harvesting, where practicable.</p> <p>11. All machine trails and other temporary access structures and crossings (NCD) must be fully rehabilitated upon the completion of harvesting. Excess material that could cause redirection of natural drainage patterns should not be left at swale or gully crossing locations. If harvesting is to be conducted during winter months, trails should be seasonally deactivated prior to the freshet by out sloping where practical and installing cross ditches to maintain natural drainage patterns.</p>
Constraints - Silviculture	<p>1.Manage for a mixed species stand.</p> <p>2.Limit Fd and S to a combined 50% maximum of the planting mixture to avoid Armillaria root disease concerns.</p> <p>3.Plant Lw seedlings > 15 meters from any mistletoe infected Lw stems (in-block and along harvest boundaries).</p>
Safety	<p>In addition to standard safety hazards and risks associated with all areas of forest management, the following safety hazard applies to this block and must be enforced and practiced:</p> <p>1. Some areas within this block have rock outcrops, areas with loose boulders, rock veins and solid rock with shallow soils.</p> <p>2. Public Traffic on Cascade Road from hunters, campers and other recreationalists.</p> <p>3. A number of steep slopes (>35%) are located within this block.</p> <p>Remedial Action</p> <p>1. Ensure all forestry personnel have been made aware of this hazard.</p> <p>2. Personnel will be informed of this hazard and signage will be posted near the proposed development when harvesting and road building activities are present.</p> <p>3. Ensure all forestry personnel have been made aware of this hazard. Harvest Plan maps delineate these areas clearly.</p>

SOIL ASSESSMENT											
SU	HAZARD RATINGS			SOIL DISTURBANCE				SOIL CHARACTERISTICS			
	Soil Comp.	Soil Erosion	Soil Disp.	Max Allow Soil Dist %	Max Allow Max Amount TAS may exceed MASD prior	Max Allow Perm Access Structures %	MASD for Roadside work areas %	Depth to Unfavorable Subsoil		Type of Unfavorable Subsoil	Sediment Delivery Risk (Comm. Watershed)
								Min (cm)	Max (cm)		
1	H	H	H	10.0	5.0	3.7	25.0		100.0	Parent Material	
SU	Critical site conditions that affect the timing of operations and how they affect the timing										
1	<p>Due to the geographical location and elevation of the proposed SU, ground thaw and snow melt usually occur relatively late in the year. Harvest operations must not occur during periods where soils are saturated i.e. When there is abundant hillslope runoff such as during spring breakup or during periods of runoff from heavy precipitation.</p> <p>See the Harvest Constraints Section in the Harvest Plan and the Riparian Management Strategies Section for additional mitigative strategies that should be used during and post harvest in order to prevent/reduce soil disturbance and sediment delivery.</p>										

SU MANAGEMENT COMMENTS	
SU	SU Description
1	<p>ICH dw1 01a(7)01b(3)</p> <p>SU 1 is located within the ICH dw1 01a(7)01b(3)subzone and site series. This SU contains a variable aspect and slopes range from 0-50% (15-30% average). SU 1 predominantly contains Brunisolic soils that have Silty Loam (SiL) textures. Coarse fragments are approximately 40%. The moisture regime is predominantly submesic, and the nutrient regime ranges from poor to medium. Humus form is a Mor (4.5 cm thickness on average). Douglas-fir, Larch and Cedar are the predominant timber species overall. Hemlock, Aspen, Birch and Lodgepole Pine are secondary timber species in some areas of the block. SU 1 has non-sensitive soils.</p> <p>SU 1 will be logged via ground-based harvest methods and a clearcut with reserves silviculture system (24.7ha gross; 23.7 ha net).</p>

SOIL MANAGEMENT COMMENTS
Soil Conservation
<p>SU 1:</p> <p>This unit is located on middle, and variable facing slopes which range from 0-50% (average 15-30%). Soils are well drained with predominantly Silty Loam textures and approximately 40% coarse fragments.</p> <p>Sediment Delivery Risk is predominantly Low due to the relative gentle slope nature of the topography, well drained soil composition, the presence of only one NCD within the SU.</p> <p>SU1 contains non-sensitive soils; however, the proposed block does have High Compaction, Displacement and Erosion Hazards.</p>
Temporary Access
<p>The amount of bladed trail constructed will be kept to a minimum. Maximum trail width is 4 meters. Any excavated/ bladed trails will be rehabilitated following harvest.</p> <p>All temporary access structures will be rehabilitated post harvest.</p>
Slope Instability
<p>This block is not located within/near a potentially unstable terrain stability polygon. Completion of the TSA decision matrix tool indicates no requirement to complete a TSA or a Site Review.</p> <p>See the Harvest Constraints Section in the Harvest Plan for recommendations/mitigative strategies that should be used during and post harvest in order to prevent/reduce soil disturbance and sediment delivery.</p>

RIPARIAN ASSESSMENTS					
Management Strategies					
Riparian Management Strategies					
<p>1) Trees must be felled and skidded away from riparian features where practicable. Any debris entering a riparian feature as a result of harvesting will be removed upon completion of harvesting activities unless it does not obstruct water flow or its removal would cause further damage to the riparian feature..</p> <p>2) Where NCDs are encountered and are to be crossed more than once it is recommended to place a temporary skid culvert (logs placed in draw or old culvert) in order to prevent a potential diversion of flow.</p> <p>3) All machine trails and crossings (NCD or S6) should be fully rehabilitated upon the completion of harvesting. Excess material that could cause redirection of natural drainage patterns should not be left at swale or gully crossing locations.</p> <p>4) All surface drainage patterns should be maintained and any that are disrupted as a result of harvesting operations should be restored immediately.</p> <p>5) All non-merchantable stems with good form, health and vigor, and brush species will be reserved around NCDs, where operationally feasible.</p>					
There is 1 NCD within and adjacent to the block.					
The NCD has been ribboned in red. No MFZ has been established around the NCD because it is contained in an incised gully; therefore, redirection and/or damage risk is low.					
All non-merchantable stems with good form, health and vigor, and brush species will be reserved within the areas that area 5m from the edge of the NCD, where operationally feasible.					
See the Harvest Constraints Section in the Harvest Plan for additional mitigative strategies that should be used during and post harvest in order to prevent/reduce soil disturbance and sediment delivery.					
Riparian I.D. and Class	RMA	SU	WIDTH (m)	BA or SPH Retained	Comments (Indicate if in a Community Watershed)
NCD-2-1 UC	MFZ	n/a	5.0		No MFZ has been established on NCD-2-1 as it is confined within an incised gully/draw, and the risk of damage/redirection is low. Minimize crossing the NCD and if crossing is required install an appropriate temporary skid crossing. Rehabilitate skid crossing post harvest. All non-merchantable stems with good form, health and vigor, and brush species will be reserved within the area that is 5m on either side of the NCD, where operationally feasible.

COARSE WOODY DEBRIS MANAGEMENT STRATEGY INFORMATION		
CWD levels range from Low with some areas of Moderate (<5%-10%) ground cover. Overall, CWD levels are expected to increase to Low to Moderate post-harvest. CWD is predominantly composed of 10-30cm Douglas-fir, Larch and Pine layer 1 and 2 stems in various stages of decay. See the Silviculture Activities Comments (Site Preparation) Section for management strategies.		
In accordance with the coarse woody debris requirements listed under Section 68 of the FPPR, a minimum of 4 logs per hectare will be retained in the block, each being 2 meters in length and 7.5cm in diameter at one end.		
Performance Std. (%) :	Block Target (%) :	Coarse Woody Debris (m3/ha):

DEFINITIONS

ADMINISTRATION

Amendment number	Date Typed (Yr Mo Dy)	Map Required?
ORIGINAL	2013 07 03	YES

Print off the PAS/TAS table located as an attachment on the Block Details Screen and attach to this prescription.

RPF PRINTED NAME	RPF'S SIGNATURE and SEAL
STEVE DE VUONO	
DATE SIGNED	
2013/07/03	
I certify that the work described herein fulfils standards expected of a member of the Association of British Columbia Forest Professionals, and that I did personally supervise the work.	

SILVICULTURE PLAN

ORIGINAL

LICENCE #	CP	BLOCK	UBI	OPENING NUMBER	FDU	LOCATION	LATITUDE / LONGITUDE
A90392	-	1	BF5D6		Big Sheep	Santa Rosa	49 00 12 / 117 59 10

ECOLOGICAL INFORMATION

SU	Ecology Unit	Area	Zone	Subzone	Variant / Phase	Site Series (series - %)	Elevation Avg (m)	Slope Avg (%)	Aspect	Slope Position	Rooting Depth (cm)	Soil Texture
1	A	23.7	ICH	dw	1	01-70 01-30	1,210	25	V	Middle Slope	45	SiL

STOCKING REQUIREMENTS				
ASSESSMENT DATES				
Standard Unit	Standards ID	Regen Delay (yrs)	Freegrow Early (yrs)	Freegrow Late (yrs)
1	1016123	7		15
Min/Max Elevation Regime: 1140 / 1280				

SU : 1 REGENERATION LAYER													
PREFERRED SPECIES				ACCEPTABLE SPECIES				POST SPACING DENSITY(sph)				MAX CONIFEROUS (sph)	
Species		Min Ht. (m)	Footnotes	Species		Min Ht. (m)	Footnotes	Min	700	Max	1800	10000	
								WELL SPACED TREES (sph)					
Cw	Western Red Cedar	1.0		Bg	Grand Fir	1.0		Target Pref/Acc		Minimum Pref/Acc		Minimum Pref	Min Horizontal Dist. Pref/Acc (m)
Fdi	Douglas Fir - Interior	1.4		Bl	Subalpine Fir	1.0							
Py	Yellow Pine	1.0		Sx	Hybrid Spruce (SE x SW)	1.0		1200		700		600	1.7
Pli	Lodgepole Pine - Interior	2.0		Pw	Western White Pine	1.4						Height Relative to Competition (%)	
Lw	Western Larch	2.0		Hw	Western Hemlock	1.0						150	

OTHER REQUIRED STOCKING INFORMATION
Additional standards and footnotes are found in APPENDIX A of the 2006-2011 BC Timber Sales Arrow Boundary Forest Stewardship Plan. Footnotes: FDi 58: Arrow FD - Fd and Bg limited to planting a max 50% of WSSpa due to Armillaria root rot. No limit following completion of mechanical innoculum removal. PLi 71: Restricted to max 50% of WSS or to the extent previously found on site as a commercial species (based on cruise or scale). CW 42: restricted to fresh soil moisture regimes BL 10: restricted to northerly aspects 13: restricted to upper elevations of biogeoclimatic unit PW 57: Arrow/Columbia forest district - Pw rust-resistant stock may be considered preferred species to a max 50% of WSSpa. Pw naturals - acceptable species only to max 50% /plot, 10% WSSpa. Minimum pruning height 1.0 m applies to natural Pw 2.0 m and taller, required to meet MSSpa.

ACTIVITIES

SILVICULTURE ACTIVITY COMMENTS	
ACTIVITY	COMMENT
Planting	<p>1. Manage for a mixed species stand.</p> <p>2. Limit Fd and S to a combined 50% maximum of the planting mixture to avoid Armillaria root disease concerns.</p> <p>3. Plant Lw seedlings > 15 meters from any mistletoe infected Lw stems (in-block and along harvest boundaries).</p> <p>4. No single species should account for more than 70% of the planting mixture.</p> <p>5. Expect low to moderate levels of Cw, Fd, Pl, and Sx natural regeneration.</p> <p>6. Plant as soon as possible after harvest or site preparation. Note: A Post Harvest Plantability Survey may be completed in order to determine if Mechanical Site Preparation is needed. Also, if Mechanical Site Preparation is needed, the Survey will help to determine what Method of Mechanical Site Preparation will be most effective. Planting of larger stock than mentioned below may also be an option and can be decided upon after the Post Harvest Plantability Survey has been completed; therefore, planting should not occur until a Post Harvest Plantability Survey has been completed.</p> <p>Site Limiting Factors</p> <p>1. A number of areas exist where there is High Levels of solid rock/rock outcrops. Also, a number of areas exist where there are shallow soils. Most of these areas have been incorporated within WTRAs or netted out as Inoperable Rock; however, a few rocky areas do exist within the harvest area.</p> <p>2. A number of areas exist where soils are relatively dry (approaching xeric site series).</p> <p>3. A few areas exist in the block where there is evidence of Armillaria and where Larch stems contain Larch Dwarf Mistletoe. These areas are sporadically dispersed within the block.</p> <p>Recommend planting Fdi, Lw, Pli, Py and Cw for SU 1. Recommend planting Cw in low lying areas and areas that contain relatively moist soils.</p> <p>Recommended Age of seedlings will be 1+0 and standard stock type will be PSB 412A and/or PSB 410. Recommend planting PSB 410 in areas that have relatively high levels of rock. Final decision on stock type should be made during the Post harvest plantability survey. Planting will occur during the Spring season and approximately 1400 stems/ha will be planted.</p>
Brushing	<p>SU 1 has a low with a few areas of moderate current brush hazard. Future brush hazard is expected to be low to moderate. Competitor Species: Oceanspray, Willow, Maple and Thimbleberry.</p> <p>Site Limiting Factor</p> <p>Note: If brush competition has not been knocked back significantly post harvest, brush pulling machinery may be required to pull remaining/new brush or Plunge Mounding may be required to ensure effective brush control and cost effectiveness in the long run. The decision of whether Mechanical Site Preparation is needed and/or which Mechanical Site Preparation method to use should be made during the Post Harvest Plantability Survey.</p> <p>Brushing Methods: Manual treatments will be preferred if brush competition becomes a concern in the regenerated post harvest stand.</p> <p>Anticipated Timing/Constraints: Treatment needs will be assessed post harvest and through periodic walkthroughs and silviculture surveys. Treatment timing will be prescribed at the time of brush assessment.</p> <p>Note: It is recommended that during brushing, try to avoid vaccinium spp. unless it is directly competing with crop trees. This will help promote the establishment of some vaccinium spp. to be utilized by bear populations and berry pickers.</p>
Site Preparation	<p>SITE PREPARATION</p> <p>Site Limiting Factors</p> <p>1. A number of areas exist where there is High Levels of solid rock/rock outcrops. Also, a number of areas exist where there are shallow soils. Most of these areas have been incorporated within WTRAs or netted out as Inoperable Rock; however, a few rocky areas do exist within the harvest area.</p> <p>2. CWD is predominantly low with a few small areas of moderate and post harvest there may be a predominantly moderate cover, as a number of non-merchantable stems are located within certain areas of the block.</p> <p>Options for SU1 include:</p> <p>1. No site prep - plant as is.</p> <p>2. Mechanical Site Preparation on slopes </= 50%.</p> <p>If brush competition increases to moderate in a number of areas brush pulling/cutting and/or plunge mounding may be necessary. Rough bunching and piling may be necessary post harvest in a number of areas.</p> <p>Note: A decision on whether Site Preparation is needed, and if needed, what the specific type of Site Preparation Method is required, will have to be finalized during the Post Harvest Plantability Survey (See the Brushing and Planting Sections for more details).</p> <p>3. Spot burn within the NAR to reduce excessive slash cover.</p> <p>ADDITIONAL SITE PREPARATION ACTIVITIES</p> <p>Pile or pile and burn slash accumulations at landings and within the NAR on slopes < 50%. Up to 10% of piles may be left unburned in order to contribute to wildlife habitat and coarse woody debris values. Remove harvest debris from gullies/draws, and all other natural water drainage structures/features unless it does not obstruct water flow or its removal would cause greater site damage.</p>

MANAGEMENT STRATEGY

COARSE WOODY DEBRIS MANAGEMENT STRATEGY INFORMATION		
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ADMINISTRATION

Amendment number	Date Typed (Yr Mo Dy)	Map Required?
ORIGINAL	2013 07 03	YES

RPF PRINTED NAME	RPF'S SIGNATURE and SEAL
STEVE DE VUONO	
DATE SIGNED	
2013/07/03	
I certify that the work described herein fulfils standards expected of a member of the Association of British Columbia Forest Professionals, and that I did personally supervise the work.	