



ZAMA - 1 FOREST HARVEST PLAN

FMU F26

Abstract

A report and map clearly documenting and showing the harvest area boundaries, roads and watercourse crossings for the compartment. A Forest Harvest Plan is valid for five years from the time of approval, unless issues deemed significant by Alberta arise.

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INTRODUCTION

The Zama-1 Forest Harvest Plan is located within Forest Management Unit F26. It has been prepared by Tolko Industries Ltd., Norbord Inc., and La Crete Sawmills Ltd. (the Companies). Additional Information regarding the Companies and a copy of approved Forest Harvest Plans are located on the High Level Woodlands website (www.highlevelwoodlands.com). Forest Harvest Plans are submitted to Alberta Agriculture and Forestry (Alberta) by the Companies throughout the year. The purpose of a Forest Harvest Plan is to articulate in detail the laid out harvest area boundaries, roads, and watercourse crossings within a compartment.

Zama-1 is within the Central Mixedwood and the Lower Boreal Highlands natural subregions. The Central Mixedwood is a mosaic of aspen, mixedwood and white spruce forests on uplands, with extensive areas of mainly treed fens, with short warm summers and long cold winters. The Lower Boreal Highlands contains diverse forests of aspen and white spruce on uplands, balsam poplar and white birch in seepages areas, and pine in pure and mixed stands with black spruce and deciduous species, cooler and moister than the adjacent Central Mixedwood.

This Forest Harvest Plan only addresses conifer, and conifer dominate mixedwood cover types from the 2016 Spatial Harvest Sequence. The conifer landbase within the Spatial Harvest Sequence is predominantly white spruce leading stands. The deciduous landbase within the Spatial Harvest Sequence is predominantly aspen leading stands. The terrain is level with elevated slopes along watercourses. Intense beaver activity is prevalent throughout the compartment.

There has not been extensive harvesting within Zama-1 in recent history (1996-Present). Recent harvest activities are located within the north half of the compartment, occurring in 2004/05 and 2006/07. Recent Fire history within the compartment includes fires in 2007 and 2015.

This Forest Harvest Plan contains text, tables, maps (block and overview), and spatial data of harvest area boundaries, roads, and watercourse crossings. Reasonable efforts have been made to ensure the information presented in the various formats is consistent and correct. The Companies are requesting Alberta's Forest Harvest Plan approval utilize the spatial data submitted as per the Spatial Data Submissions Directive as the authoritative source for harvest area boundaries, roads, and watercourse crossings.

1 SUBMISSION STANDARD

A Forest Harvest Plan Checklist is included in the submission to Alberta.

1.1 Registered Forest Practitioner Validation

This Forest Harvest Plan is validated by a Registered Forest Practitioner.

1.2 Additions Less Than 20%

The additions in this Forest Harvest Plan include no more than 20% of the total Spatial Harvest Sequence area in each compartment in any decade by 16 yield strata used in the Forest Management Plan, as per the Forest Management Approval Decision dated June 15, 2018. Additional information regarding additions is located in Section 6 of this Forest Harvest Plan.

1.3 Additions do not Exceed Deletions and Deferrals

The area of substantial additions does not exceed the sum of the area in substantial deletions and deferrals, as per the Forest Management Approval Decision dated June 15, 2018.



1.4 Does not Exceed 100% of Area Sequenced

The total area within the Forest Harvest Plan and Harvested does not exceed 100% of the Spatial Harvest Sequence.

1.5 Adheres to the Operating Ground Rules

This Forest Harvest Plan was prepared in accordance to the approved 2016 Forest Management Plan, 2016 Spatial Harvest Sequence, and 2015 Upper Hay Regional Timber Harvest Planning and Operating Ground Rules.

The following summarizes the Operating Ground Rule deviations requested in this Forest Harvest Plan. The full listing of Operating Ground Rule deviations by harvest block can be found in [Appendix 9-1](#):

- Temporary Class IV roads are required within 30m of intermittent watercourses
- Temporary Class IV block roads exceed 5% road disturbance

2 COMPARTMENT ASSESSMENT

Alberta has not requested a Compartment Assessment be completed for the Zama-1 Compartment.

3 MAPS

3.1 Block Maps

Block maps have been created for each block, showing the required information as per Operating Ground Rule 3.4.5. Information not displayed at the block level will be included on the Overview Map, see [Appendix 9-4](#).

3.2 Forest Harvest Plan Overview Maps

A Forest Harvest Plan Overview Map has been created for the compartment, see [Appendix 9-5](#).

3.3 Forest Harvest Plan Variance Summary Map

A Forest Harvest Plan Spatial Harvest Sequence Variance Summary Map has been created for the compartment, see [Appendix 9-5](#).

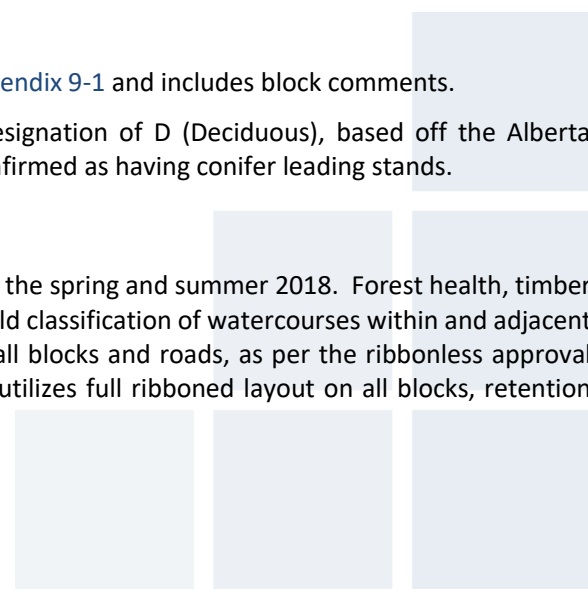
4 BLOCKS

A summary of the blocks within the Forest Harvest Plan are in [Appendix 9-1](#) and includes block comments.

There are a few blocks that have a Pre-Strata Reforestation Designation of D (Deciduous), based off the Alberta Vegetative Inventory. These blocks have been field verified as confirmed as having conifer leading stands.

4.1 Field Verification

Field layout of the proposed blocks and roads was conducted over the spring and summer 2018. Forest health, timber quality, sensitive areas, operability, as well as the presence and field classification of watercourses within and adjacent to blocks was assessed. Ribbonless layout was implemented on all blocks and roads, as per the ribbonless approval letter. Tolko has implemented ribbonless layout while Norbord utilizes full ribboned layout on all blocks, retention patches, creeks and buffers.





4.2 Understory

Understory protection will be practiced within the conifer landbase and understory avoidance will be practiced within the deciduous landbase as per the Operating Ground Rules.

During field verification, there were no stands identified requiring understory protection. A minimum of 50% of acceptable trees in the understory will be retained without harvest damage should understory be noted during harvest operations. The Area Supervisors and Logging Contractors will evaluate the understory to minimize damage. Acceptable stems will be determined as per the Operating Ground Rules. In addition, the Companies are requesting balsam fir not be considered an acceptable species due to the species inability to survive once a stand is opened.

4.3 Structure Retention

Merchantable and non-merchantable structure will be retained in harvest areas during operations (including salvage operations).

4.3.1 Merchantable Retention

Merchantable structure retention will be maintained at the landscape level. Deciduous and Coniferous volume retained will be charged against the Annual Allowable Cuts and reported in the General Development Plan. An average of 3% of the standing merchantable coniferous and deciduous volume retained will be representative of pre-harvested stands. Retention will be calculated from single stems, clumps, islands, and standing trees along in-block creeks and standing trees along block edge within the sequenced boundary. Merchantable retention is to be representative of the block and should target areas such as:

- Understorey conifer and advanced regeneration
- Standing larch, black spruce, poor form pine and shrubs
- Wet areas, especially those with surface water and pools, or near ephemeral or intermittent watercourses
- Standing snags with no safety concerns
- Large diameter trees of high wildlife value and poor timber value
- Previous blowdown areas containing dead and damaged timber, or areas susceptible to blowdown
- Bear and animal dens, which should leave at least half an overstory tree length retention radius
- Distance to wildlife hiding cover can be reduced (i.e. large blocks)
- Sensitive to disturbance, such as steep slope areas, or problematic soil features
- Identified non-timber values (i.e. trapper cabins, historical resources, aesthetic values)
- Adjacent to non-merchantable retention

The minimum retention patch size is 0.5 ha. Areas this size and larger are more easily mapped, provide better thermal cover and protection value to wildlife, and are more wind-firm. When scattered individual trees are used to meet retention objectives they should be merchantable and meet the conifer and deciduous utilization parameters.

In addition to leaving representative pre-harvest stand retention, areas with a high concentration of deciduous within a block has been identified as merchantable retention. This is to reduce the amount of incidental deciduous generated as Zama-1 has not been identified within Daishowa-Marubeni International Ltd's General Development Plan.

4.3.2 Non-Merchantable Retention

In addition to merchantable volume, non-merchantable areas within harvested blocks will be retained for further structure. Areas within the proposed harvest blocks may be left to contribute to specific residual structure retention strategies outlined within the Operating Ground Rules and the Forest Management Plan. For the purposes of the



variance reporting and company operating procedures, these retention patches may be removed from the proposed harvest block and contribute to the spatial harvest sequence variance as a deletion. Typically, patches are identified through the use of aerial photography, the Lidar Canopy Height Model, and during field verification. Non-merchantable retention patches or trees are areas of:

- Wet areas with surface water and pools
- Lesser vegetation
- Larch, Balsam Fir, and/or poor-form trees
- Standing dead, broken, or decaying trees
- Unique flora, hydrological, or terrain features

4.4 Soil Protection Measures

Blocks and road designs within sensitive areas have mitigated the potential environmental impact from harvest and silviculture activities through the following methods:

- operations will occur under frozen conditions,
- planned areas with primary consideration to terrain features, such as avoidance of slumping/seepages, minimizing cut/fill in road design, and minimize long term disturbance by reducing multiple entries,
- buffers applied to watercourses and sensitive areas as per the Operating Ground Rules and the Companies Environmental Monitoring Systems and Sustainable Forestry Initiative certification standards,
- designed roads to avoid sensitive areas and minimize disturbance and watercourse crossings,
- designed blocks using most current technology and planning tools, such as Lidar, 3D imagery, current photo imagery, and
- field verification of roads within sensitive locations.

4.4.1 Permafrost

There are blocks, roads, and watercourse crossings within this Forest Harvest Plan that overlap within possible identified areas of permafrost, as per the government data set. During layout there were no observed specific sites identified with permafrost. Should permafrost be identified during Field Assessments, Operational Activities, or Silviculture Activities the Operating Ground Rules will be followed, specifically 9.11 and 9.12. Mitigation strategies for permafrost are as follows:

- Permafrost Awareness for staff and contractors,
- Utilize existing LOC/DLO dispositions for access,
- Minimize the development of new linear disturbance for access,
- Complete activities during frozen conditions,
- Remove non-merchantable areas from the block boundary, and within the block, and
- Complete a Detailed Harvest Area Plan for blocks with known permafrost locations.

4.5 Forest Health

The Zama-1 compartment has historically had Spruce Budworm outbreaks, and there is record of infestation from the Spruce Bud Worm surveys in this area. However, no known occurrences of Spruce Budworm was observed during layout within the compartment. No other significant disease or insect infestations have been identified at this time. Harvesting operations within the Zama-1 compartment have not targeted forested stands that may have been damaged by this forest pest; therefore, coniferous areas that are harvested may or may not contain white spruce with historical



damage from these infestations. If directed by Alberta, the Companies will adjust the harvest strategy to access any recently damaged stands. The Companies will continue to monitor for forest pests and adjust future plans if required.

The Preferred Forest Management Strategy Plan identified the stands within Forest Management Unit that are over mature and in decline, as the age class distribution is near the maximum. The Spatial Harvest Sequence has been modeled to minimize loss of timber within stands.

4.6 Debris Management

There are no blocks which fall within the ten-kilometer community zone. Debris disposal will be in accordance with the Operating Ground Rules and the Debris Management Standards for Timber Harvest Operations Directive.

4.7 Non-Industrial Dispositions

The Land Status Automated System and DIDs were reviewed for current dispositions. A summary of non-industrial dispositions within the extent of the harvest areas are identified in Table 1.

Table 1: Other Dispositions Summary

Number	Holder	Blocks and Roads within Disposition	Comment
CNT090008	HIGH LEVEL OFFICE - FORESTRY DEPT. OF SUSTAINABLE RESOURCE DEV	Main access	The Ten-Kilometer Community Zone intersects the main access off of Highway 58 and north in Forest Management Unit F14. This access is within existing road dispositions.

4.8 Detailed Harvest Area Plans

There are blocks within this Forest Harvest that require a Detailed Harvest Area Plan map. These blocks have been identified in Appendix 9-1 and the maps located within Appendix 9-4. Detailed Harvest Area Plan Maps are provided under the following conditions:

- Operating Ground Rule Variance
- Steep terrain
- Large block size (>100 ha)
- Complex or substantial surface drainage patterns within or adjacent to the block
- Smaller map scale required to show detail
- Blocks requiring additional clarification of block design

4.9 Water Table

The Companies are committed to maintaining the productive landbase to support the growth of future forests, as per 7.2.4 of the Operating Ground Rules. The following measures are taken to manage reforestation success:

- During block design remove non-merchantable areas of the Spatial Harvest Sequence.
- During layout indicator species are noted that suggest the possibility of a high amount of available soil moisture. Areas supporting indicator species are noted and may be excluded from the block boundary or incorporated into the silviculture plan (site preparation or planting techniques).
- Upon availability, utilize the Wet Areas Mapping during block design and layout.
- Commitment to the Reforestation Monitoring Program, as outlined in the 2016 Forest Management Plan. This includes the review of regeneration results of not-satisfactory restocked plots in areas larger than 4ha.



4.10 Beaver Activity

Extensive beaver activity is prevalent across the entire compartment. Many watercourses identified in the Government of Alberta Provincial base stream layer are no longer present. Furthermore, extensive networks of flooded lands across linear watercourse features have severely impacted the surface water flow. The Companies have identified beaver flooded lands as high-water marks and have applied a 5m no machine zone buffer and a 30m lesser vegetation and soil protection buffer where no discernible outflow channel is present.

5 TEMPORARY CLASS IV ROADS

The objective for road design within this Forest Harvest Plan is to:

- comply with the Operating Ground Rules, specifically section 11,
- utilize existing linear disturbances,
- minimize overall area of disturbance,
- minimize the number of watercourse crossings,
- minimize haul distance, and
- maximize the number of blocks accessed per road.

5.1 Road Classification

There are no new Class I, II or III Roads proposed within this Forest Harvest Plan. All proposed roads will be built to the Class IV requirements as per the Operating Ground Rules Table 3.

5.2 Road Planning and Design

Access to the compartment is west of High Level off Highway 58, north through Forest Management Unit F14 on existing graveled dispositions (high grade industrial access), and seismic lines for a cut to length haul. The compartment can also be accessed north of High Level off Highway 35, through the North Processing Yard, west on the Zama Zipper, and on other roads under disposition for a full tree haul. Only one of these haul routes is intended to be used within a Timber Year and will be identified within the Annual Operating Plan. All proposed interior block roads within this Forest Harvest Plan will be submitted to Alberta as a spatial data set as per the Forest Harvest Plan/Annual Operating Plan/As-Built Spatial Digital Data Submission Directive and have been listed in the Road Summary in [Appendix 9-2](#).

5.2.1 Protection of Roadside Vegetation

Roadside vegetation is a combination of non-merchantable trees, shrubs, forbs, and grasses located adjacent to a Class I, II or III road. During operations this vegetation will be maintained by working around the vegetation and removing the merchantable timber, where possible. When a Class I, II or III road is used for the decking of harvested timber to utilize an existing disturbance and reduce the road disturbance for the harvested area, roadside vegetation will not be protected.

5.2.2 Minimizing Line of Sight

During the development of the Forest Harvest Plan each harvest area adjacent to truck accessible permanent Class I, II or III roads was reviewed. If the line of sight exceeded 400m the harvest area was further reviewed to determine if the presence of roadside vegetation, watercourses or topography would reduce the line of sight. If the line of sight could not be impeded through natural features, tree retention patches were designed.



5.3 Road Construction

Road construction will comply with the Operating Ground Rules, specifically section 11.3.1 and 11.3.2, unless approval for a deviation has been obtained.

5.4 Road Maintenance (Erosion Control/Prevention)

Constructed roads will be maintained as necessary for timber hauling operations, and will comply with the Operating Ground Rules, specifically section 11.3.3, unless approval for a deviation has been obtained.

5.5 Road Reclamation

Road reclamation will comply with the Operating Ground Rules, specifically section 11.3.4, unless approval for a deviation has been obtained.

5.5.1 Seasonal Reclamation

Roads required for more than one season will be reclaimed as per the Operating Ground Rules, specifically 11.3.4.5, unless otherwise approved in the Annual Operating Plan.

5.5.2 Partial Reclamation

Roads required for more than one timber year will be reclaimed as per the Operating Ground Rules, specifically 11.3.4.6, unless otherwise approved in the Annual Operating Plan.

5.5.3 Total Reclamation

Roads and associated bared areas that are not required will be permanently reclaimed as per the Operating Ground Rules, specifically 11.3.4.7, unless otherwise approved in the Annual Operating Plan.

The Annual Operating Plan will identify and request roads that require all-terrain vehicle access for silviculture purposes, to maintain historical access for a Registered Fur Management holder, or for other users. Rollback will be completed on approaches to all watercourses.

5.6 Watercourse Crossings

The Forest Harvest Plan utilized a combination of field assessments and lidar to identify watercourses and to avoid watercourse crossings. Currently, the Wet Areas Mapping is not available within Zama-1 and therefore was not utilized in the plan development.

During operations if an unidentified watercourse is encountered Alberta will be notified with a minor or major amendment and approval will be obtained. The watercourse location, construction and reclamation activities will be completed as per the Operating Ground Rules, specifically section 11.4.

Some ephemeral watercourse crossings within this Forest Harvest Plan will be constructed as low-profile crossings where conditions permit. Low-profile crossings are utilized where the watercourse crossing location has no relief or topography and bank protection is achieved by freezing conditions. Where there is topography (i.e. incised banks) snow or log fills will be utilized.

All proposed watercourse crossings within this Forest Harvest Plan will be submitted to Alberta as a spatial data set as per the Forest Harvest Plan/Annual Operating Plan/As-Built Spatial Digital Data Submission Directive.



5.6.1 Watercourse Monitoring Program

The watercourse monitoring program as described in the General Development Plan is observed for all constructed watercourse crossings.

5.7 Access Control

Access control measures will be addressed in the Annual Operating Plan or Species of Special Management Concern Plan. All operations are scheduled to occur under frozen conditions. Zama-1 is not accessible by highway vehicles under non-frozen conditions, this is expected to restrict some access to the public.

5.8 Camps and Facilities

There are proposed logging camp locations within Blocks 6111140458, 6111160492, and 6111160597. After the final determination of the exact camp location the Companies will notify Alberta. This final camp location will be applied for under a Temporary Field Authority.

5.9 Agreements

A Land Status Automated System (LSAS) search has been completed on the areas contained within the Forest Harvest Plan, and will be reviewed annually for potential changes. The appropriate agreements will be obtained from a disposition holder and practices required by a disposition holder will be implemented as per agreement.

5.9.1 Road Use Agreements

A current Road Use Agreement will be obtained prior to using a road under disposition.

5.9.2 Pipeline Crossing Agreements

Pipeline crossing agreements are required prior to crossing any pipeline. There are known pipeline crossings and proximity agreements required to access or operate the blocks included in this Forest Harvest Plan.

5.9.3 Powerline Crossing Agreements

A powerline crossing agreement is required prior to crossing a powerline right of way. There are no known powerline crossings required to access the blocks included in this Forest Harvest Plan.

5.9.4 Highway Approaches

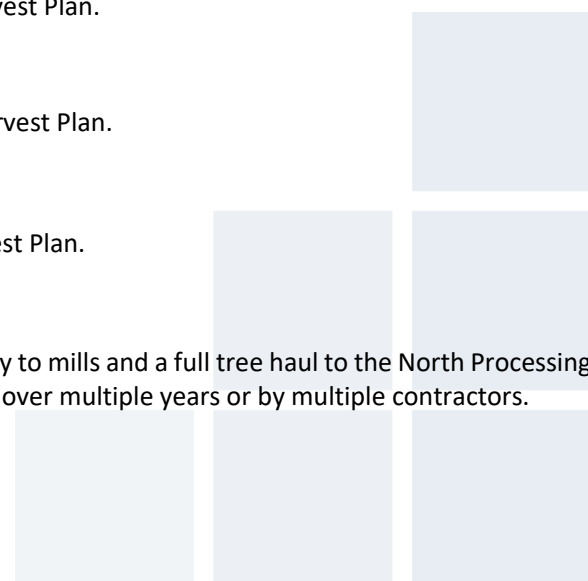
There are no new highway approaches required for this Forest Harvest Plan.

5.10 Special Access Zone

There are no Special Access Zones located within this Forest Harvest Plan.

5.11 Processing Yard

The proposed road plan accommodates a cut to length haul directly to mills and a full tree haul to the North Processing Yard to allow for hauling flexibility should the blocks be harvested over multiple years or by multiple contractors.





6 SPATIAL HARVEST SEQUENCE

The Companies have tracked and reported the variance according to the methodology described in the Alberta Government Forest Management Planning Standard Interpretive Bulletin: Stewardship Reporting Requirements, as per The Forest Management Approval Decision dated June 15, 2018. The thresholds for acceptable Spatial Harvest Sequence variance is as follows:

- Spatial Harvest Sequence variance (Additions %) shall be less than 20% of the operator's harvest area by compartment per decade,
- Area of substantial additions shall not exceed the sum of area in substantial deletions and deferrals, and
- Total area harvested shall be less than the area in the 10-year Spatial Harvest Sequence of the approved Forest Management Plan.

6.1 Variance Summary

A variance summary has been completed to track variance from the 2016 Spatial Harvest Sequence as well as total area harvested, post May 1, 2015 to:

- ensure a sustainable harvest level and future forest objectives are maintained through operations adhering to the Spatial Harvest Sequence,
- improve information for the next Spatial Harvest Sequence (e.g. landbase, yields), and
- make decisions around Forest Harvest Plan acceptance.

The Variance Overview Map shows the comparison of the Spatial Harvest Sequence to the harvested and laid out Forest Harvest Plan area highlighting variance and additions. The Spatial Harvest Sequence Summary in [Table 3](#) shows a tabular representation of the variance and additions for the compartment. A detailed summary for Additions, Deletions, and Deferrals has been included in [Table 2](#).

6.2 Unplanned

There is unplanned Spatial Harvest sequence within the compartment for stands yet to be designed and field verified or where either the conifer or deciduous operator does not have plans to harvest their spatial harvest sequence.

6.3 Additions

The additions in this Forest Harvest Plan include no more than 20% of the total Spatial Harvest Sequence area in each compartment in any decade by 16 yield strata used in the Forest Management Plan, as per the Forest Management Approval Decision dated June 15, 2018.

The area of substantial additions does not exceed the sum of area in substantial deletions and deferrals. The total area harvested is less than the area in the 10-year Spatial Harvest Sequence of the approved 2016 Forest Management Plan. Additions were made to operationalize a harvest area/road plan and have considered:

- protection of watershed and riparian values,
- maintenance of effective habitat for species of special concern,
- meet visual quality objectives,
- efficient forest management operations are feasible,
- endangerment threat, and
- minimize long term road disturbance / number of entries into key wildlife areas and sensitive slope areas.



As per OGR 4.1.4 stands not part of the contributing landbase that are found to be productive have been considered for addition.

6.4 Deletions and Deferrals

Justification for substantial deletions and deletions are summarized below.

Table 2: Deletion and Deferral Summary

Deferral Reason	Sum of AREA	Deletion Reason	Sum of AREA
sliver	25	sliver	233
harv_adj	126	flooded	17
AVI_mis	257	It	6
Grand Total	408	Watercourse/Waterbody Buffer	157
		Grand Total	412

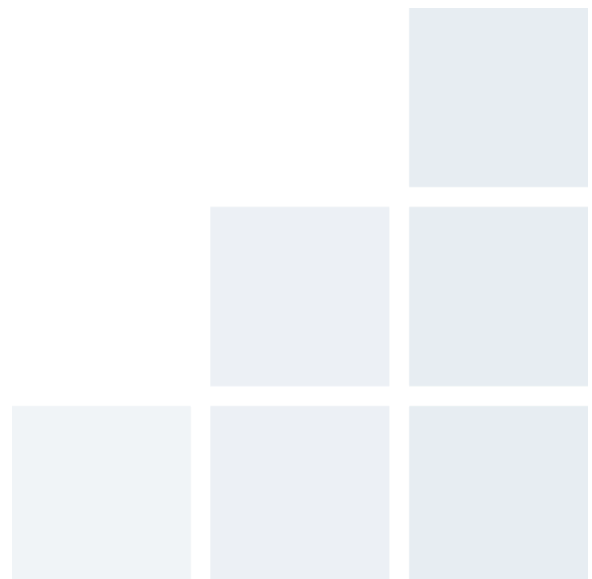


Table 3: Spatial Harvest Sequence Summary

Compartment	Harvest Profile	Approved DFA 10 Year SHS	As-Built															Combined As-Built & Planned											
			Harvested (ha)						Variance			Slivers (Planned + Harvested)			SHS Assessment			Planned for Harvest (ha)			Variance			SHS Assessment					
			SHS 1-10yr	SHS 11-20yr	SHS 21-70yr	Active Landbase	Non-Contributing Landbase	Total	Additions	Deletions	Deferrals	Additions	Deletions & Deferrals	Total	SHS Variance (Additions %)	Difference in Area (Subst. Add. - D&D)	Difference in Area Total Harvested - 10Yr FMP SHS	SHS 1-10yr	SHS 11-20yr	SHS 21-70yr	Active Landbase	Non-Contributing Landbase	Total	Additions	Deletions	Deferrals	SHS Variance (Additions %)	Difference in Area (Subst. Add. - D&D)	Difference in Area Total Harvested & Planned - 10Yr FMP SHS
Zama	All	4123	0	0	0	0	0	0	0	0	0	262	258	520	0%	-	(4,123)	1010	38	90	2	48	1189	179	179	383	4%	(382)	(2,934)
	CD-AB	48	0	0	0	0	0	0	0	0	0	5	7	12	0%	-	(48)	14	0	0	0	0	14	0	6	21	0%	(27)	(34)
	CD-CD	115	0	0	0	0	0	0	0	0	0	0	19	19	0%	-	(115)	64	0	0	0	0	64	0	6	27	0%	(33)	(52)
	C-P-AB	16	0	0	0	0	0	0	0	0	0	0	5	5	0%	-	(16)	11	0	0	0	0	11	0	0	0	0%	-	(5)
	C-P-CD	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	-	-	0	0	0	0	0	0	0	0	0	100%	-	-
	C-SB	159	0	0	0	0	0	0	0	0	0	28	18	45	0%	-	(159)	41	3	20	0	0	64	23	2	98	14%	(78)	(95)
	C-SW-AB-F	87	0	0	0	0	0	0	0	0	0	2	11	13	0%	-	(87)	48	0	0	0	0	48	0	0	29	0%	(28)	(39)
	C-SW-AB-MG	1223	0	0	0	0	0	0	0	0	0	32	167	199	0%	-	(1,223)	714	29	54	1	0	798	84	136	206	7%	(258)	(425)
	C-SW-CD-F	0	0	0	0	0	0	0	0	0	0	3	0	3	0%	-	-	0	0	0	0	0	0	0	0	0	100%	0	0
	C-SW-CD-MG	98	0	0	0	0	0	0	0	0	0	31	15	47	0%	-	(98)	75	3	4	0	0	82	6	5	3	7%	(1)	(17)
	D(u)-AB	0	0	0	0	0	0	0	0	0	0	10	0	10	0%	-	-	0	0	1	0	0	1	1	0	0	100%	1	1
	D(u)-CD	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	-	-	0	0	0	0	0	0	0	0	0	100%	0	0
	D-AB-G	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	-	-	0	0	0	0	0	0	0	0	0	100%	-	-
	D-AB-MF	1123	0	0	0	0	0	0	0	0	0	3	8	11	0%	-	(1,123)	29	4	2	0	0	35	6	11	0	1%	(5)	(1,088)
	DC	0	0	0	0	0	0	0	0	0	0	23	0	23	0%	-	-	0	0	1	0	0	1	1	0	0	100%	1	1
	D-CD-G	2	0	0	0	0	0	0	0	0	0	1	0	1	0%	-	(2)	0	0	0	0	0	0	0	0	0	0%	-	(2)
	D-CD-MF	1251	0	0	0	0	0	0	0	0	0	27	9	36	0%	-	(1,251)	14	0	9	1	0	24	10	12	0	1%	(3)	(1,227)
(blank)	0	0	0	0	0	0	0	0	0	0	96	0	96	0%	-	-	0	0	0	0	48	48	48	0	0	100%	48	48	



7 INTEGRATION WITH OTHER USERS

The Companies consider the needs of other forest users when planning and conducting operations. The Companies strive to notify known users during the planning phase and prior to operations when required. Annually the Companies hold an Open House to provide an opportunity for the public to gain information about the Companies plan development and harvest/haul activities.

7.1.1 Deciduous and Coniferous Integration

This Forest Harvest Plan only addressed the conifer and mixedwood cover types from the 2016 Spatial Harvest Sequence, deciduous cover types have been left unplanned. Currently Zama-1 has not been identified within the deciduous allocated user Power Wood Canada Corp’s General Development Plan, should they have interest in Zama-1 in the future a Forest Harvest Plan will be required addressing the 2016 Spatial Harvest Sequence deciduous stands.

It is the intent of the Companies to ensure the planning, harvesting, and reforestation activities are carried out efficiently and with a minimal environmental impact. The integration of activities is necessary to:

- reduce the amount of time roads are open,
- reduce disturbance of wildlife, and
- enable prompt reforestation.

The Annual Operating Plan will address the utilization of incidental volume within blocks scheduled for harvest. It is the intention of the Companies to make reasonable efforts to sell and purchase harvested incidental wood at prevailing market prices and provide suitable quality. Incidental wood harvested in road construction is to be utilized, unless approved by Alberta. The Companies will approach Alberta for approval, should an operator be unable to accept all or a portion of incidental volume generated during a timber year.

Forest operators with a timber disposition in the area covered by the Forest Harvest Plan will be provided a copy of the Forest Harvest Plan for review.

7.1.2 Forest Recreation and Tourism

There is no known recreation or tourism within the compartment.

7.1.3 Trapping

Holders of a Registered Fur Management Areas were contacted during the development of the Forest Harvest Plan. Communication has been summarized in Table 4. A copy of the Forest Harvest Plan has been mailed to each Registered Fur Management Area holder.

Table 4: Registered Fur Management Areas

RFMA	Senior Partner	Questions/Concerns/Comments
84	HARRY NATANNAH	Preliminary notification mailed out April 2018 Forest Harvest Plan mailed out July 2018
88	HARVEY DENECHOAN	Preliminary notification mailed out April 2018 Forest Harvest Plan mailed out July 2018
99	GABRIEL DIDZENA	Preliminary notification mailed out April 2018 Forest Harvest Plan mailed out July 2018
251	AVALON SENIANTHA	Preliminary notification mailed out April 2018 Forest Harvest Plan mailed out July 2018



7.1.4 Range Management

There are no grazing dispositions within the Zama-1 compartment. When a Grazing Timber Agreement is required the disposition holder will be contacted during the development of the Forest Harvest Plan.

7.1.5 Forest Aesthetics

The Companies may use tactics to reduce the impacts of timber harvest and reforestation on visual quality areas. There are no known areas considered highly sensitive within the Zama-1 compartment that:

- are within, adjacent to or viewed from recreational sites and tourist developments,
- seen from elevated viewpoints,
- adjacent to or viewed from major travel corridors (roads, lakes, and rivers), rural/urban forest interface and site-specific areas identified during the referral and public review process; or
- adjacent to primary and secondary highways in Alberta.

7.1.6 Historical Resources

The Companies have developed and implemented a process for identifying and protecting resources that are regulated by the Historical Resources Act that meets the requirements of Alberta Culture and Tourism.

Historical resource pre-screening has been completed for the Forest Harvest Plan and there are high potential historical sites requiring shovel testing to determine if clearance can be granted. Field screening occurred during the summer of 2018. Any found sites will be buffered and submitted to Alberta Culture prior to operations commencing and reflected in the Annual Operating Plan block map submission.

If a previously unknown historical resource is discovered during road building, harvesting or silviculture operations, operations will cease and the Alberta Culture and Tourism will be notified.

7.1.7 First Nations and Metis

Consultation is completed annually with First Nations and Metis through the General Development Plan. However, as new information may be brought forward at anytime by First Nations and Metis communities, the Forest Harvest Plan may be amended as required.

8 SPECIES OF SPECIAL MANAGEMENT CONCERN

8.1 Woodland Caribou

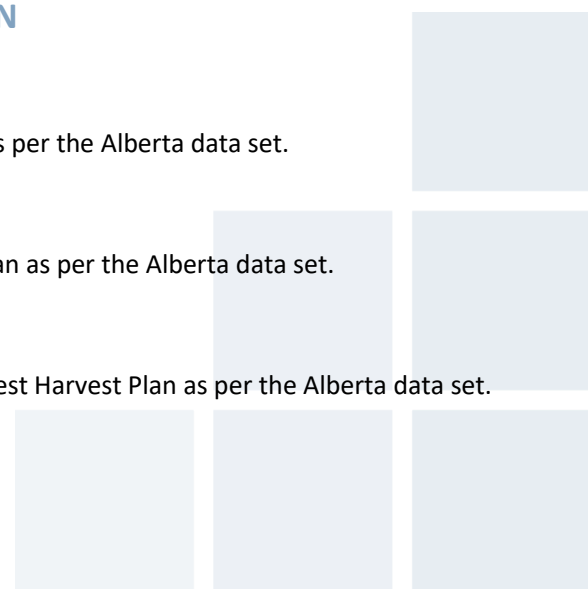
There is no Caribou Zone located within this Forest Harvest Plan as per the Alberta data set.

8.2 Grizzly Bear

There is no Grizzly Bear Zone located within this Forest Harvest Plan as per the Alberta data set.

8.3 Trumpeter Swan

There are no Trumpeter Swan waterbodies located within the Forest Harvest Plan as per the Alberta data set.





8.4 Key Wildlife and Biodiversity Zones

There are no harvest areas within the Key Wildlife and Biodiversity Zone within the compartment, as noted in Appendix 9-1. However, there are sections of the access route within Forest Management Unit F14 within the Key Wildlife and Biodiversity Zone, as shown on the Overview Map in Appendix 9-5. The proposed access has utilized existing dispositions, though there are timing restrictions found in the dispositions Letter of Authority. The Companies are working with the disposition holders and Alberta Energy Regulator for Temporary Field Authorization to allow for hauling operations during the period of January 15 until breakup.

The Companies specific strategies to mitigate and address Operating Ground Rules pertaining to Key Wildlife and Biodiversity Zones will be submitted as part of the Annual Operating Plan’s “Species of Special Management Concern” section.

8.5 Arctic Grayling

There are no known locations of existing arctic grayling referenced from the Fisheries and Wildlife Management Information System using the Fish and Wildlife Internet Mapping Tool. Arctic Grayling watercourses and their associated tributaries have been identified on the block maps and in Appendix 9-1. Specific mitigation strategies to address operations adjacent to Arctic Grayling Waterbodies include:

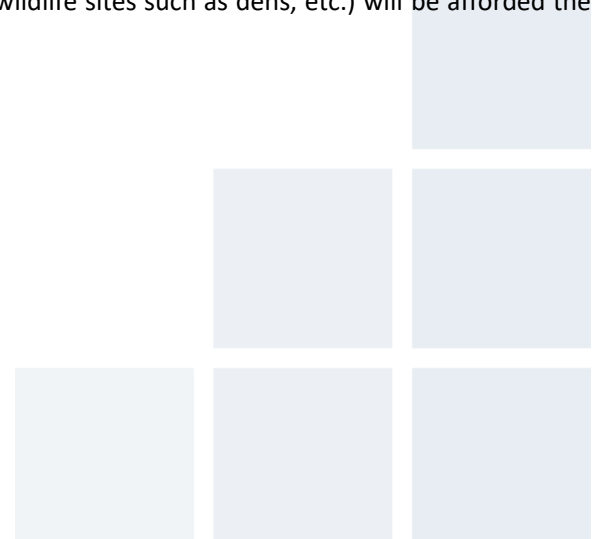
- Committing to no mechanical site preparation of blocks that are within 100m of an identified Arctic Grayling waterbody
- Limiting road and barred areas within 100m of an identified Arctic Grayling waterbody

8.6 Other Species

There were no sensitive sites (i.e. raptor nest, mineral lick) identified during field verification of this Forest Harvest Plan. Any sensitive sites identified post Forest Harvest Plan submission will be buffered as required by the Operating Ground Rules. The Fisheries and Wildlife Management Information System was also referenced to assess other species; no known species were identified.

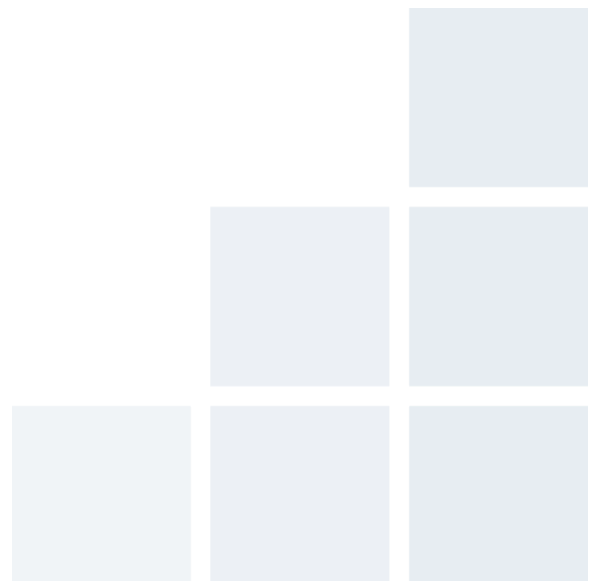
8.7 Highly Sensitive Areas (Elements of Biodiversity Occurrences (EO))

The Alberta Conservation Information Management System has been reviewed. No known rare plants were identified in the Alberta Conservation Information Management System database. Identified sensitive sites found post Forest Harvest Plan submission (i.e. cultural and historic sites, sensitive wildlife sites such as dens, etc.) will be afforded the appropriate protection.



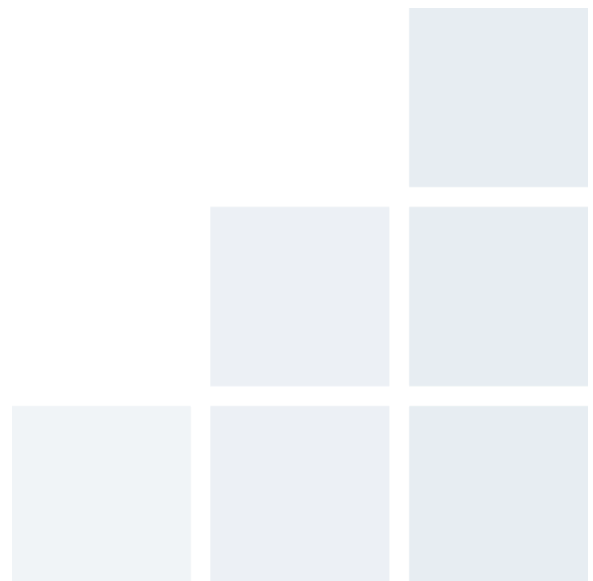


9 APPENDIXES



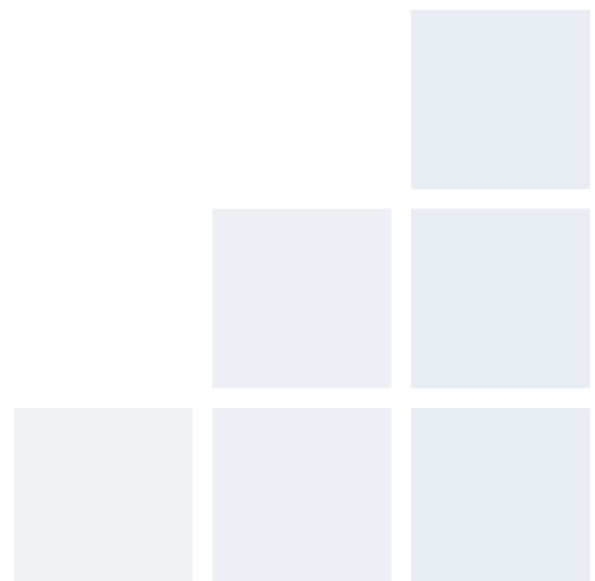


Appendix 9-1: Block Summary



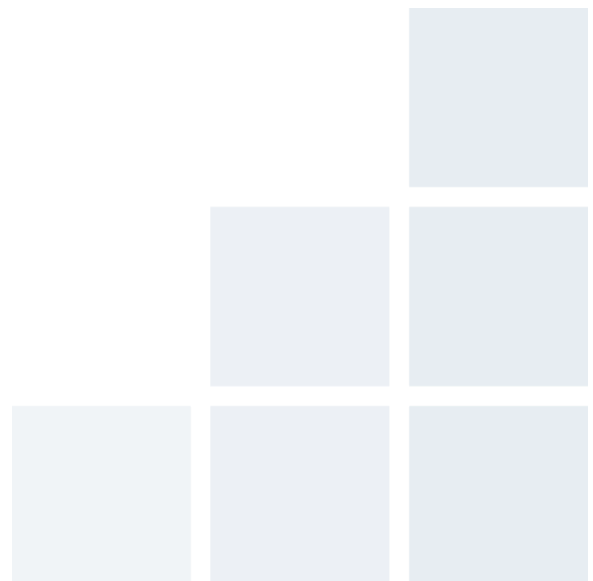


Appendix 9-2: Road Summary



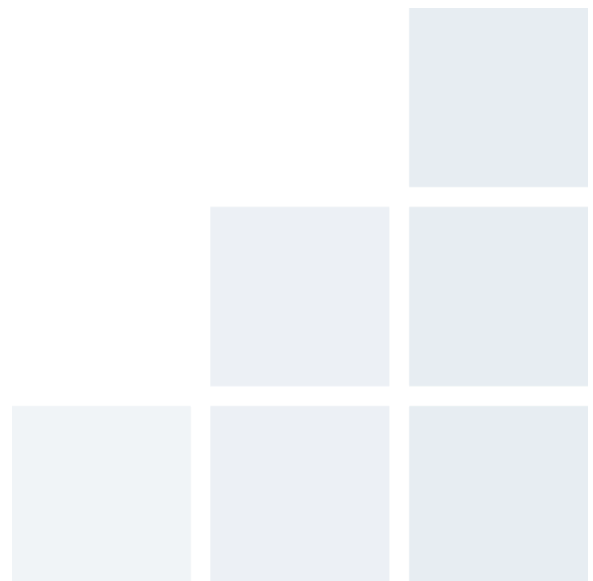


Appendix 9-3: Crossing Summary



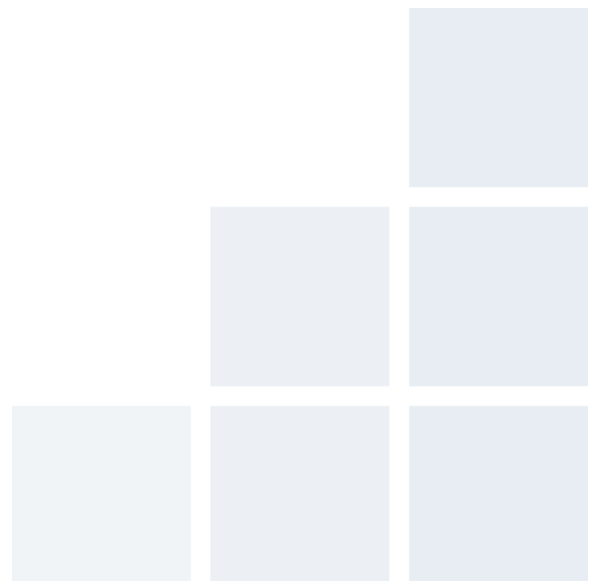


Appendix 9-4: Block Maps





Appendix 9-5: Forest Harvest Plan Overview Map





Appendix 9-6: Forest Harvest Plan Approval(s)

