



2019/20 Reforestation Plan

for Forest Management Units F14, F26, P19, P21

Abstract

A report prepared and submitted annually prior to May 1 by Tolko Industries Limited, Norbord Inc., La Crete Sawmills Ltd., NDEH Limited Partnership and Netaskinan Development (GP) Ltd. to summarize plans and implementation for silvicultural practices that result in reforested stands that meet yield curve assumptions and management objectives of the Forest Management Plan.

The Reforestation Plan articulates in detail the activities within the timber year for Alberta to authorize forest management activities.

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4 REFORESTATION PLAN

The Reforestation Plan is submitted annually to Alberta prior to May 1. The purpose of the Reforestation Plan is to organize and implement silvicultural practices that result in reforested stands that meet yield curve assumptions and management objectives of the Forest Management Plan. The implementation of reforestation activities will follow:

- Reforestation Standards of Alberta
- Forest Management Herbicide Reference Manual
- Forest Harvest Plan Conditions
- Operating Ground Rules
- General Development Plan

The Reforestation Plan contains text, tables, maps, and spatial data. At the time of the Reforestation Plan submission operations from the 2018/19 timber year and proposed 2019 activities is the best available data and forecasting at the time of submission. None of the areas in this plan are deemed sensitive. Information provide to Alberta required by other sections of the Annual Operating Plan or the Ground Rules (i.e. As Built Plan) will supersede information provided in the Reforestation Plan. The Reforestation Plan may be amended during the timber year as new information becomes available.

This plan is a joint submission between the following Tolko Industries, La Crete Saw Mills, Norbord and Netaskinan Development Corporation, hence forth referred to as the companies.

4.1 Silviculture Prescription

The Silviculture matrices below outlines the regeneration path for an opening as per the Forest Management Plans.

As in the past two years, this Reforestation Plan utilizes the F26 Forest Management Plan Silviculture Matrix for Forest Management Unit F14, as there is no approved Forest Management Plan for this area.

4.2 Silviculture Treatment Schedule

Proposed reforestation activities for each harvest area to occur during the 2019/2020 Timber Year is listed in [Appendix 4-3](#). Required access for planting is included in [Appendix 4-4](#) and crossings in [Appendix 4-5](#). The following provides a summary of each treatment.

4.2.1 Silviculture System

An even-aged, clear-cut silviculture system is utilized, with understory protection in broad cover groups C, CD, and DC, and avoidance techniques used in broad cover group D.

4.2.2 Site Preparation

No site preparation was utilized during the 2018/2019 Timber Years. Should site preparation be required an amendment to the plan will be submitted detailing the planned activities.

4.2.3 Reforestation

Planting activities are estimated to commence on or after May 7, 2019. Completion by July 31 for all Summer (1+0) and the end of June for "Over-winter aka. Spring stock". The short, frost free Summers in Northern Alberta are also prone to drought. All seedlings must be in the soil by the end of July to ensure the seedlings can root sufficiently to survive the long northern winter. Norbord and Netaskinan blocks scheduled for reforestation will be planted at 2000 stem/ha on the in-block roads to account for incident conifer volume. Treatment area consists of the entire block area (ha) shown in [Table 4-1](#). A summary of proposed planting and assigned Leave for Natural (LFN) treatments are listed in [Table 4-1](#).

Restricted zones are avoided wherever possible. In restricted zones snow caches, planting camps and ground access are avoided wherever possible. The exception is in Wadlin 1 and Wadlin 6 working areas. In these areas' quads will be flown in to facilitate tree delivery. These working areas will be planted with Spring stock which must be installed by the end of June to ensure establishment success.

Planting boxes are planned to be disposed of within 12 months of planting. Boxes will be removed to an appropriate disposal facility where ground access exists, or the block does not contain any debris piles. Where ground access does not exist, boxes may be securely placed within existing debris piles and disposed by burning. Where debris piles are not present, the boxes will be concentrated for burning at the end of fire season. Location of the piles will be reported to Alberta in Section 7: Operating Schedule which will be submitted by Tolko prior to October 1st. All plastic is to be removed from boxes and disposed of at an approved waste disposal site prior to burning.

Table 4-1: Reforestation Summary

PLANT	Harvested Area Count	Area (ha)
F14	1,149	12,912.2
High Level Forest Products (Tolko/LCSM)	25	335.0
F14	25	335.0
F26	1,110	12,395.0
High Level Forest Products (Tolko/LCSM)	1,096	11,488.7
BASSETT-2	31	334.5
BASSETT-4	208	2,296.0
BASSETT-5	12	170.6
NEGUS-3	112	1,375.8
NEGUS-5	20	284.7
PONTON-3	1	2.0
PONTON-4	8	59.6
PONTON-5	2	14.4
PONTON-6	62	495.0
WADLIN-1	69	652.9
WADLIN-4	58	560.0
WADLIN-5	38	520.8
WADLIN-6	162	1,378.1
WATT-3	162	1,288.0
WATT-4	43	665.8
ZAMA-1	64	704.7
ZAMA-2	43	657.9
ZAMA-3	1	28.0
Netaskinan Development (GP) Ltd.	7	235.5
WATT-4	7	235.5
Norbord Inc.	7	670.8
BASSETT-4	4	478.0
WATT-4	3	192.8
P19	14	182.2
High Level Forest Products (Tolko/LCSM)	14	182.2
Botha River	8	79.4
Twin Lakes	6	102.8
LFN	66	2,071.2
F26	64	2,055.0
Netaskinan Development (GP) Ltd.	8	234.0
WATT-4	8	234.0
Norbord Inc.	56	1,821.0
BASSETT-4	3	473.0
PONTON-6	53	1,348.0
P19	2	16.2
High Level Forest Products (Tolko/LCSM)	2	16.2
Hawk Hills Tower	1	8.3
Twin Lakes	1	7.9
Grand Total	1,215	14,983.4

4.2.3.1 Seed Collection and Inventory

No collection was conducted in during the 2018/19 Timber Year. Tolko is working in cooperation with the Smokey Lake Tree Improvement Center to enter into a seed purchase agreement. The dialogue started in 2018 and is anticipated to be completed in 2019. A listing of current seed inventory is in [Appendix 4-6](#). Seed inventories are sufficient as per the Alberta Forest Genetic Resource Management and Conservation Standards (section 11.2). <https://www.alberta.ca/forest-management-manuals-and-guidelines.aspx#toc-5>

4.2.3.2 Snow Cache

Constructed snow caches from 2018/19 are listed in [Table 4-2](#). Blocks included in the 2019/20 Annual Operating Plan - Section 7: Operating Schedule may have a snow cache constructed during the winter season. Locations for these cache sites are authorized under a Temporary Field Authority (TFA). Reclamation strategies are found in the TFA request forms that were approved.

Table 4-2: Constructed 2018/19 Snow Caches

FMU	Compartment	Company	Location	Authority	Approval Date
F26	Bassett 4	Tolko	58.4027628643 -118.614063049	TFA191858	February 19, 2019
F26	Negus 3	Tolko	58.88340249 -118.09086122	TFA186538	December 03, 2019
F26	Negus 3	Tolko	58.84600319 -118.14839883	TFA186538	December 03, 2019
F26	Negus 3	Tolko	58.8169049 -118.09262236	TFA186538	December 03, 2019
F26	Negus 3	Tolko	58.72481304 -118.0848037	TFA186538	December 03, 2019
F26	Zama 1	Tolko	58.8887551957 -119.821691735	TFA191858	February 19, 2019
F26	Zama 2	Tolko	58.9978732763 -119.736916329	TFA191485	January 29, 2019
F26	Zama 2	Tolko	58.9131685874 -119.646363371	TFA191485	January 29, 2019

4.2.3.3 Planting Camps

A Silviculture camp is a temporary camp used to accommodate people in the reforestation of harvested areas (generally during spring/summer months). Preference is given to locating camps within a harvest area or disposition to minimize disturbance. Factors used in the selection of a camp location include:

- proximity to a suitable water course
- proximity to a main haul route,
- meets helicopter safety requirements,
- centrally located, and
- cellular service.

Some of these indicators can only be determined once a field visit has occurred. Should a site not be suitable the camp location will be moved to another proposed location. Additional proposed planting camps will be submitted in a TFA for approval once they have been determined. Approved planting camps under a TFA for 2019 are listed in [Table 4-3](#). Reclamation strategies are found in the current TFA request forms that were approved.

Table 4-3: Approved Planting Camp Summary

FMU	Compartment	Company	Location	Authority	Approval Date
F26	Zama 1	Tolko	6111153662	TFA192198	March 11, 2019
F26	Watt 4	Tolko	Norbord Processing Yard	TFA192198	March 11, 2019

4.2.3.4 Planting Access and Crossings

Access required for planting has been listed in [Appendix 4-4](#) and crossings required for planting have been listed in [Appendix 4-5](#). Refer to the current General Development Plan for Tolko's crossing monitoring program.

4.2.3.5 Deferred Harvest Areas

There will be no planting in Forest Management Unit (FMU) P21 during the 2018/2019 Timber year. Openings harvested in 2018/2019 in FMU P21 will be planted in 2020 due to the correct seedlot is not available at this time.

4.2.3.6 Leave for Natural Harvest Areas

Harvest areas declared Leave for Natural (LFN) are identified in [Appendix 4-3](#) and will be reported through ARIS. The strata assigned is the target species the companies are regenerating for blocks with an LFN status.

4.2.4 Stand Tending

Vegetation Site Assessments are completed aurally with a helicopter to evaluate the competition from grass and deciduous plants which may be impacting seedling survival within a regenerating harvest area. These assessments are planned for 5 years from skid clearance. Competition impact on crop trees is assessed with adversely impacted sites becoming part of the stand tending program. Harvest areas assessed to not be adversely affected by competition are revaluated between years 10-12.

4.2.4.4 Herbicide

No aerial herbicide application program is planned for 2019.

4.2.4.5 Manual Stand Tending – Bend and Break

Manual Stand Tending - Bend and Break is a method used between 5-10 years after planting to impair the growth of competing deciduous species. The tactic involves striking competing deciduous trees below the lowest green limb with a sharp-edged tool and then bending the tree over at a 70-90 degree angle. Trembling Aspen (Aw) and Balsam Poplar (Pb) within 1m of a planted conifer tree will be treated with this tactic. This is a manual method of releasing the designated “C” crop tree while preserving the balance of other species and not employing aerial application of a registered herbicide. The entire block area is planned to be treated with this method unless a field visit determines otherwise. A summary of proposed stand tending is listed in [Table 4-4](#).

Table 4-4: Stand Tending Manual - Bend and Break Summary

	Harvested Area Count	Area (ha)
COMH: Hand Comp Reduction (Brush/Chain/No Chem)	313	5,835.8
F26	313	5,835.8
High Level Forest Products (Tolko/LCSM)	172	3,058.9
BASSETT-1	6	179.1
BASSETT-2	5	80.7
BASSETT-5	8	184.3
BISTCHO-2	24	259.1
NEGUS-1	26	506.3
NEGUS-2	3	13.2
NEGUS-5	10	186.1
PONTON-5	1	2.9
WADLIN-2	30	875.7
WADLIN-5	8	117.0
WADLIN-6	36	482.6
WATT-3	2	1.3
WATT-4	2	37.5
WATT-5	11	133.1
Tolko WRP 2012	141	2,776.8
BISTCHO-2	141	2,776.8
Grand Total	313	5,835.8

4.2.5 Surveys

Blocks that will require ground access will follow the current Operating Ground Rules. If an access plan is required, it will be submitted as an amendment once the intensive survey populations are selected.

4.2.5.1 Establishment Surveys

All blocks are planned for completion using the Reforestation Standard of Alberta and will be assessed initially using the aerial method starting May 1, 2018. Field intensive survey will be completed in September/October 2019 and all survey results will be reported as required to Alberta and ARIS following completion. Tolko holds reforestation liability for blocks 5211130222 and 5231102736 to conduct establishment surveys. Tolko is currently working with Silvacom and the Forest Management Branch (ARIS) to remove the liability of these blocks. Once the liability is removed, the blocks will not require a survey. A summary of proposed Establishment Surveys for the companies are listed in Table 4-5.

Table 4-5: Establishment Survey Summary

	Harvested Area Count	Area (ha)
F26	55	1,704.4
High Level Forest Products (Tolko/LCSM)	55	1,704.4
PONTON-3	27	816.3
PONTON-5	2	12.9
WATT-2	2	218.2
WATT-3	23	493.3
WATT-4	1	163.7
Grand Total	55	1,704.4

Blocks surveyed in 2018 with a result of NSR (Not Satisfactorily Restocked) will be reforested, assigned a Let it Grow (LIG) strategy or a stratum change. A summary of the 2018 NSR Establishment Surveys is listed below Table 4-8. Block stratum changes will be submitted to ARIS by May 15th, 2019.

Table 4-6: Establishment Survey NSR Results

	Establishment Survey Area Count	Area (ha)
F26	3	59.42
High Level Forest Products (Tolko/LCSM)	3	59.42
Intensive	3	59.42
NSR: Not Satisfactorily Restocked	3	59.42
P21	2	19.13
High Level Forest Products (Tolko/LCSM)	2	19.13
Intensive	2	19.13
NSR: Not Satisfactorily Restocked	2	19.13
Grand Total	5	78.56

4.2.5.2 Performance Survey

Leaf off photography for the harvest area in the performance window will be flown beginning in late April 2019, as the snow pack melts. Photo interpretation and stratification will be completed in September 2019, at which time field audits of the photo interpretation will be conducted. Field surveys on the sample population extracted from the compiler will commence in September/October of 2019. A summary of proposed Performance Surveys for the companies are listed in Table 4-9.

Table 4-7: Performance Survey Summary

	Harvested Area Count	Area (ha)
F26	305	6,666.3
High Level Forest Products (Tolko/LCSM)	260	4,991.2
BASSETT-1	1	16.1
BISTCHO-2	24	798.3
HAY-4	34	260.8
NEGUS-3	11	467.0
NEGUS-5	2	25.1
PONTON-3	1	24.8
STEEN-1	5	64.5
STEEN-2	23	702.2
WABASCA-6	41	592.9
WADLIN-5	1	4.0
WATT-1	33	510.5
WATT-2	1	26.5
ZAMA-4	40	704.7
ZAMA-7	43	793.8
Norbord Inc.	45	1,675.1
BASSETT-4	3	90.7
NEGUS-5	11	505.7
WABASCA-6	8	110.4
WATT-4	7	204.0
WATT-6	5	125.5
RAINBOW-5	11	638.9
Grand Total	305	6,666.3

4.3 Species of Special Management Concern

This Reforestation Plan will meet the commitments identified in the approved 2018/19 Species of Special Management Concern.

For the 2019 field season one camp is proposed in the Caribou zone.

4.4 Maps

Maps are prepared for the Reforestation Plan depicting harvest areas to be treated, roads and crossings to be constructed or used. Maps are included in the submission. Not all roads are connected to all weather road access. This is a circumstance where quads will be flow into the blocks for seedling distribution and quality control. Blocks that do not have a network of roads or crossings will be accessed by helicopter.

4.5 Proposed Blocks for Declaration In lieu of Survey and Re-Treatment

There are no harvest areas proposed for declaration in lieu of survey and re-treatment.

4.6 Strata Balancing

Harvested areas are balanced to the landbase designation codes following the completion of a Final Block Area as determined by the Final Cut block Digital Data Submission. This balance is to be within the 5% tolerance requirement of the Reforestation Standard of Alberta (RSA) across each Forest Management Unit (FMU). As per Section 5.1 of the RSA manual (2018), the companies have 1-year after the timber year of harvest to complete and submit final strata balancing.

4.6.1 Forest Management Unit F14 and F26

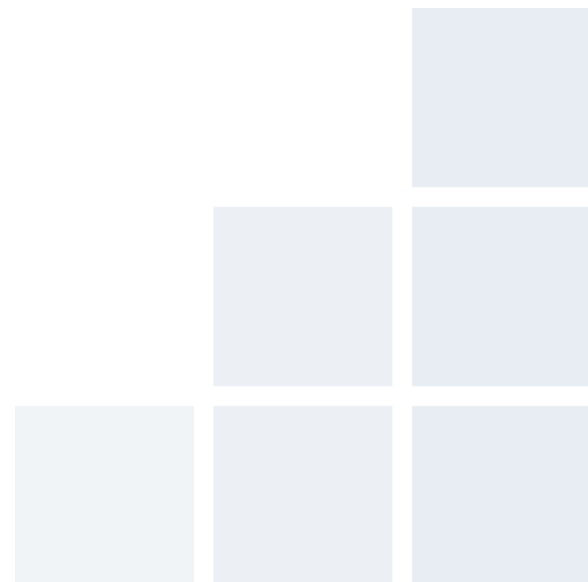
Strata balancing for the 2016/2017 and 2017/2018 blocks are awaiting the installation of the stratum approved under the May 1, 2016 Forest Management Plan for F26. The Companies have retained Silvacom Ltd. to complete this task. In accordance with RSA, Tolko will submit on behalf of the companies the final strata balance reports for the 2017/2018 harvest year blocks in FMU’s F14 and F26 by May 15, 2019. A preliminary strata balance report for 2018/2019 harvest year blocks in FMU’s F14 and F26 will be submitted by Tolko on behalf of the companies to the Government of Alberta by April 30th, 2019.

4.6.2 Forest Management Unit P19 and P21

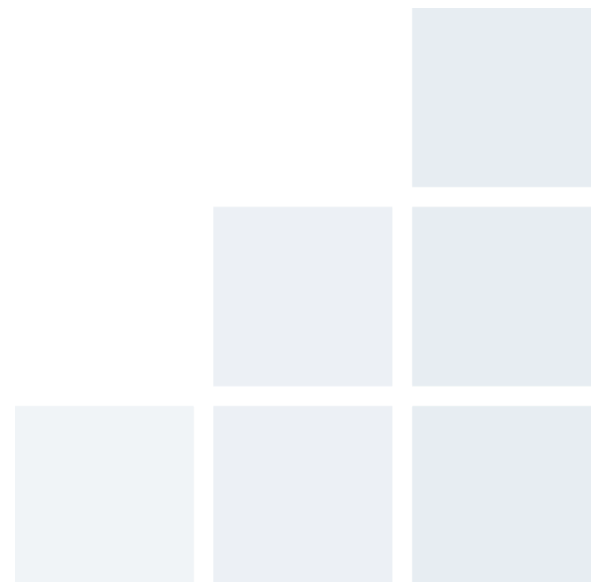
Tolko will complete a preliminary strata balance for their 2018/2019 harvest year blocks in FMU’s P19 and P21 by April 30th, 2019. The preliminary declarations will be provided to Mercer Peace River Pulp Ltd. The final strata balancing for FMU’s P19 and P21 is completed and submitted by Mercer Peace River Pulp Ltd. and included in their Reforestation Plan.

4.7 Reporting

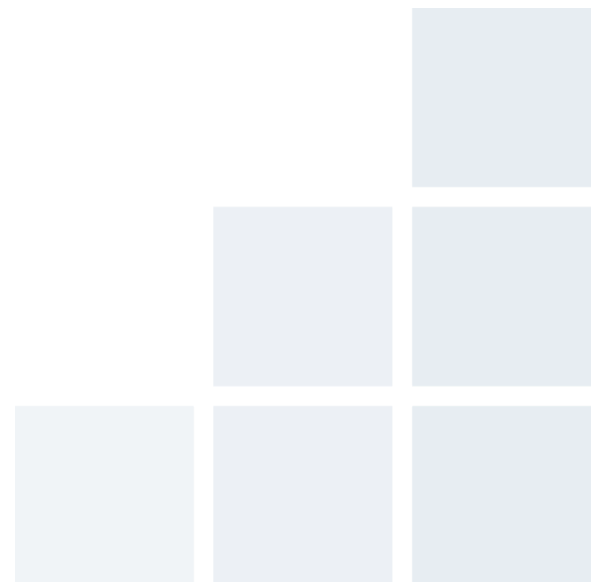
Each disposition holder conducting silviculture work within their disposition is responsible to report the details of all work completed in the previous year annually to as per the Alberta Reforestation Standard of Alberta no later than May 15th to ARIS.



Appendix 4-1: FMU F14 and F26 Silviculture Prescription Matrix

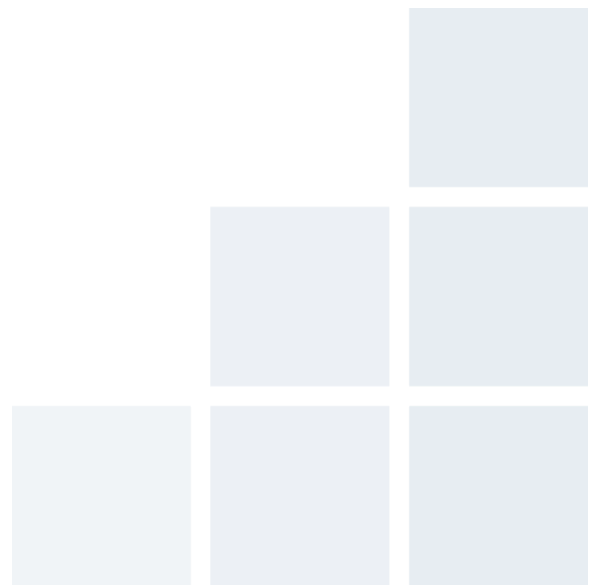


Appendix 4-2: FMU P19 and P21 Silviculture Prescription Matrix



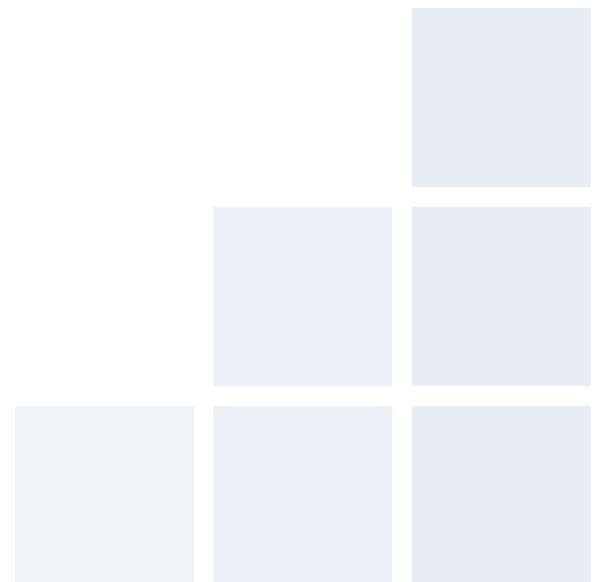
Appendix 4-3: Block Summary

This data is in the attached electronic file as both original format (Word) and pdf.



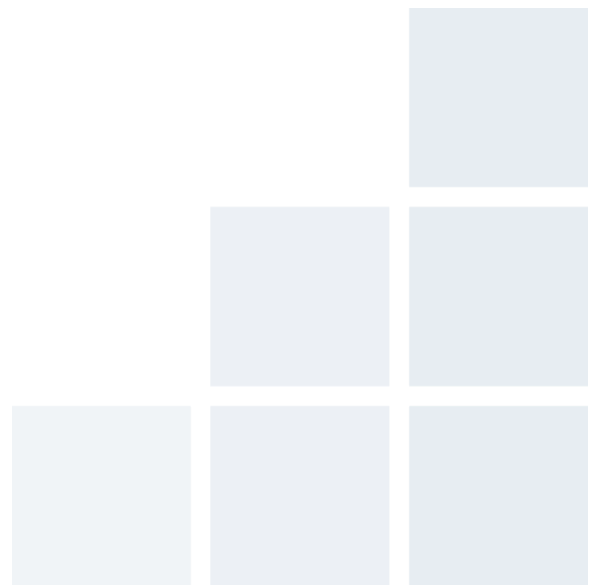
Appendix 4-4: Road Summary

This data is in the attached electronic file as both original format (Word) and pdf.



Appendix 4-5: Crossing Summary

This data is in the attached electronic file as both original format (Word) and pdf.



Appendix 4-6: Seed Inventory Summary

Species	Inventory Number	Seed Zone	Seedlot	Current Seed Inventory (KG)	Useable Seed (KG)	Seed Zone Total (Useable KG)
PL/PJ	141	LBH 1.1	HLFP 111-5-6-1989 PL	78.47	78.47	78.67
	3075	LBH 1.1	HLFP 111-5-6-1989 PL STRAT	0.6	0.2	
	5077	LBH 1.4	HLFP 24-102-15-5-2012 PL	13.33	13.33	13.33
	6349	LBH 1.6	HLFP 21-106-6-6-2014 PL	56.91	56.91	68.81
	5580	LBH 1.6	HLFP 8-98-22-5-2013 PL	11.9	11.9	
	5085	UBH 1.2	HLFP 17-100-10-5-2012 PL	16.14	16.14	16.14
	3853	DM 1.1	HLFP 15-104-19-5-2003 PJ	12.53	12.53	12.53
	4948	CM 1.3	HLFP 27-111-17-5-2011 PJ	12.65	12.65	12.65
Total				202.53	202.12	202.12
SB	2373	CM 1.1	HLFP 111-5-5-1992 SB	0.2	0.2	0.2
	2127	CM 1.2	HLFP 102-10-5-1991 SB	0.2	0.2	0.49
	2863	CM 1.2	HLFP 2-100-9-5-1995 SB	0.29	0.29	
	5909	CM 1.3	HLFP 20-112-18-5-2014 SB	4.94	4.94	16.94
	6973	CM 1.3	HLFP 27-110-24-5-2015 SB	10.22	10.22	
	4830	CM 1.3	HLFP 30-109-23-5-2011 SB	1.78	1.78	
	5526	LBH 1.1	HLFP 17-106-2-6-2013 SB	4.61	4.61	4.61
	4315	NM 1.1	HLFP 22-117-4-6-2007 SB	0.09	0.09	4.28
5908	NM 1.1	HLFP 25-126-19-5-2014 SB	4.19	4.19		
Total				26.51	26.51	26.51
SW	3299	CM 1.1	HLFP 110-3-5-1998 SW	24.1	24.1	24.1
	2568	CM 1.2	HLFP 102-9-5-1993 SW	63.77	63.77	92.9
	4898	CM 1.2	HLFP 34-103-10-5-2011 SW	29.12	29.12	
	2694	CM 1.3	HLFP 110-8-5-1979 SW STRAT	0.2	0.2	204.45
	530	CM 1.3	HLFP 111-4-6-1979 SW	7.36	7.36	
	2443	CM 1.3	HLFP 113-4-6-1993 SW	412.54	195.31	
	2700	CM 1.3	HLFP 113-4-6-1993 SW STRAT	1.58	1.58	
	538	CM 2.3	HLFP 89-10-5-1987 SW	10	10	71.33
	46	CM 2.3	HLFP 90-8-5-1988 SW SEPT16	36.2	36.2	
	1917	CM 2.3	HLFP 91-4-5-1990 SW	24.93	24.93	
	2065	CM 2.3	HLFP 98-9-5-1991 SW	89.2	0.2	194.63
	3908	DM 1.1	HLFP 1-108-11-5-2003 SW	7.7	7.7	
	2551	DM 1.1	HLFP 103-21-5-1993 SW	21.4	21.4	
	537	DM 1.1	HLFP 103-22-5-1986 SW	29.69	29.69	
	1916	DM 1.1	HLFP 103-22-5-1990 SW	7.32	7.32	
	3443	DM 1.1	HLFP 104-21-5-1999 SW	72.37	72.37	
	3444	DM 1.1	HLFP 105-15-5-1999 SW	4.6	4.6	
	2454	DM 1.1	HLFP 109-8-5-1993 SW	20.13	20.13	
	3445	DM 1.1	HLFP 110-20-5-1999 SW	31.43	31.43	128.44
	524	DM 1.2	HLFP 99-22-5-1979 SW	7.31	7.31	
	533	DM 1.2	HLFP 99-22-5-1983 SW	195.23	121.13	105.8
	4056	LBH 1.1	HLFP 18-118-4-6-2005 SW	2.36	2.36	
	4722	LBH 1.1	HLFP 31-107-9-6-2005 SW Strat	2.36	0.2	
	4901	LBH 1.1	HLFP 4-111-5-6-2011 SW	59.52	59.52	
	5614	LBH 1.1	HLFP 8-118-4-6-2013 SW	43.73	43.73	36.38
	5609	LBH 1.2	HLFP 36-111-7-5-2013 SW	36.38	36.38	
	5620	LBH 1.4	HLFP 14-101-10-5-2013 SW	48.42	48.42	48.42
	4897	LBH 1.6	HLFP 32-95-22-5-2011 SW	59.52	59.52	65.83
	3322	LBH 1.6	HLFP 95-1-6-1998 SW	6.31	6.31	
	5610	NM 1.1	HLFP 11-119-20-5-2013 SW	31.66	31.66	63.65
	122	NM 1.1	HLFP 118-20-5-1989 SW S	0.01	0.01	
	123	NM 1.1	HLFP 123-19-5-1989 SW	1.86	1.86	
4899	NM 1.1	HLFP 19-118-20-5-2011 SW	30.13	30.13		
4077	UBH 1.2	HLFP 19-101-9-5-2005 SW	38.6	38.6	62.47	
3608	UBH 1.2	HLFP 5-102-10-5-2001 SW	23.87	23.87		
Total				1,480.91	1,098.42	1,098.40

