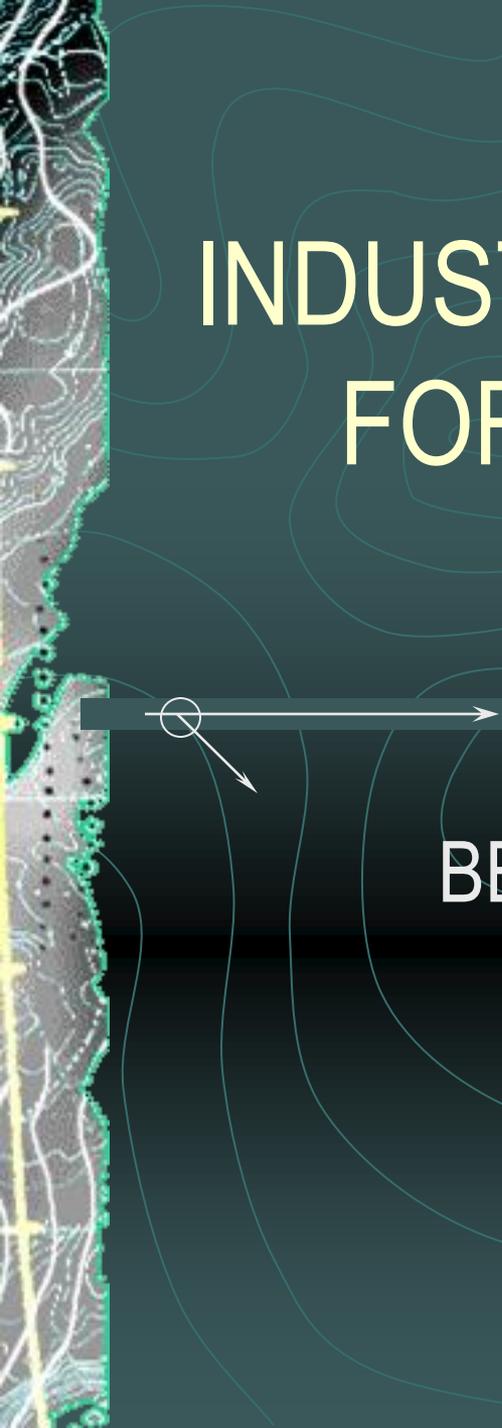


INDUSTRY APPLICATION OF THE FORESTRY RECLAMATION APPROACH



BEARWALLOW SURFACE MINE
Hurley, Va.

BEARWALLOW SURFACE MINE

1,055 ACRES

24 LANDOWNERS

PMLU's-Unmanaged Forestry, Fish & Wildlife (Wetlands) & Industrial (Gas Wells/Pipelines)

Post-Mining Land Use(s)

- Numerous Landowners
- Lease Agreements



2005-2006-Reclamation prior to gaining approval to implement Forestry Reclamation Approach



Planted 2006-Reclamation prior to gaining approval to implement Forestry Reclamation Approach



FRA Plan Submitted in 2006

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9.4 REVEGETATION PLAN

- Narrative, 1 page.

Clintwood Elkhorn agrees with, and hereby incorporates, the Appalachian Regional Reforestation Initiative (ARRI) goals. ARRI's goals⁽¹⁾ are to communicate and encourage mine reforestation practices that:

1. Plant more high-value hardwood trees on reclaimed coal mine lands in Appalachia.
2. Increase the survival rate and growth rate of planted trees.
3. Expedite the establishment of forest habitat through natural succession.

These goals can be achieved when mines are reclaimed using the Forestry Reclamation Approach (FRA)⁽²⁾.

The FRA is a methodology for reclaiming coal-mined land to forest under SMCRA. The FRA can be summarized in the following five (5) steps:

1. Create a suitable rooting medium for good tree growth that is no less than 4 feet deep and comprised of topsoil, weathered sandstone and/or the best available material.
2. Loosely grade the topsoil or topsoil substitute established in step one to create a non-compacted growth medium.
3. Use ground covers that are compatible with growing trees.
4. Plant two types of trees-early successional species for wildlife and soil stability and commercially valuable crop trees.
5. Use proper tree planting techniques.

The FRA technique described above has been confirmed by forestry research.

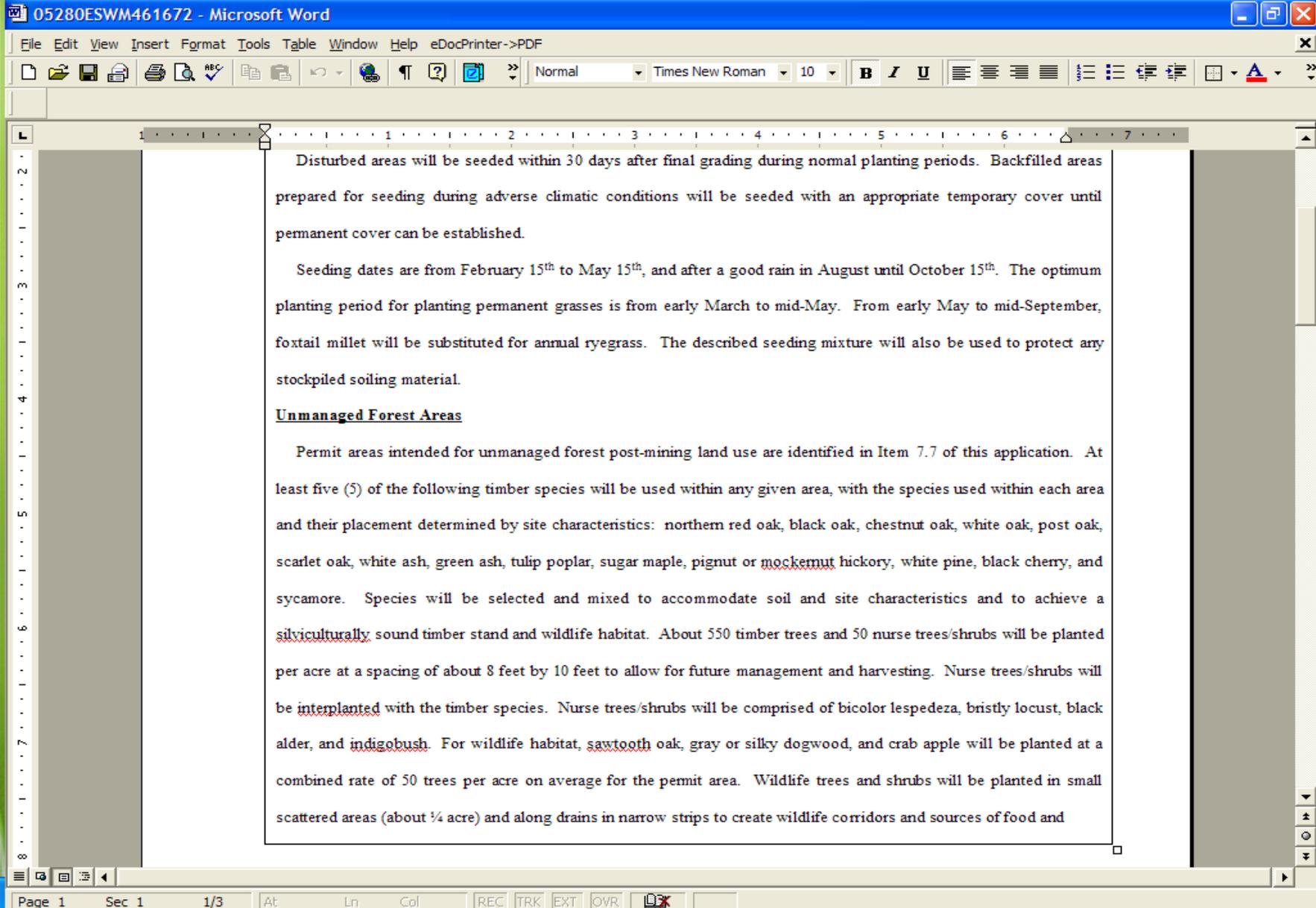
References:

- (1) "The Appalachian Regional Reforestation Initiative"; FRA Number 1, December, 2005; ARRI Academic Team.
- (2) "Appalachian Regional Reforestation Initiative; The Forestry Reclamation Approach", FRA Number 2, December, 2005.

End of Item 9.4 narrative.

Page 1 Sec 1 1/9 At 1" Ln 1 Col 8 REC TRK EXT OVR

Revegetation Plan 2006



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Disturbed areas will be seeded within 30 days after final grading during normal planting periods. Backfilled areas prepared for seeding during adverse climatic conditions will be seeded with an appropriate temporary cover until permanent cover can be established.

Seeding dates are from February 15th to May 15th, and after a good rain in August until October 15th. The optimum planting period for planting permanent grasses is from early March to mid-May. From early May to mid-September, foxtail millet will be substituted for annual ryegrass. The described seeding mixture will also be used to protect any stockpiled soiling material.

Unmanaged Forest Areas

Permit areas intended for unmanaged forest post-mining land use are identified in Item 7.7 of this application. At least five (5) of the following timber species will be used within any given area, with the species used within each area and their placement determined by site characteristics: northern red oak, black oak, chestnut oak, white oak, post oak, scarlet oak, white ash, green ash, tulip poplar, sugar maple, pignut or mockernut hickory, white pine, black cherry, and sycamore. Species will be selected and mixed to accommodate soil and site characteristics and to achieve a silviculturally sound timber stand and wildlife habitat. About 550 timber trees and 50 nurse trees/shrubs will be planted per acre at a spacing of about 8 feet by 10 feet to allow for future management and harvesting. Nurse trees/shrubs will be interplanted with the timber species. Nurse trees/shrubs will be comprised of bicolor lespedeza, bristly locust, black alder, and indigobush. For wildlife habitat, sawtooth oak, gray or silky dogwood, and crab apple will be planted at a combined rate of 50 trees per acre on average for the permit area. Wildlife trees and shrubs will be planted in small scattered areas (about ¼ acre) and along drains in narrow strips to create wildlife corridors and sources of food and

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Revegetation Plan 2006

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Type	Species	Rate/acre
Permanent Grass	Orchardgrass (steep slopes only)	5 lbs.
	redtop	5 lbs.
	perennial ryegrass	2 lbs.
	weeping lovegrass	2 lbs.
Legumes	Kobe lespedeza	5 lbs.
	birdsfoot trefoil	5 - 10 lbs.
	ladino and/or white clover	3 lbs. total
Annuals	Annual Ryegrass (fall or late winter seeding only)	20 lbs.
	Foxtail millet (summer seeding only)	5 lbs.
	Timber Trees	Red Oak, White Oak, Post Oak, Black Oak, Chestnut Oak, Scarlet Oak, Sugar Maple, White Pine, Green Ash, White Ash, Pignut or Mockernut Hickory, Tulip Poplar, Black Cherry, Sycamore*
Wildlife trees	Sawtooth Oak, Crab Apple, Silky Dogwood	50 total**
Nurse trees/shrubs	Bicolor Lespedeza, Indigobush, Bristly Locust, Black Alder	50 total**
Fiber, Mulch	Cellulose or Wood Fiber	1,500 lbs.

9.4 REVEGETATION PLAN - cont.

* Planted trees shall be selected from among these groupings. A minimum of five (5) tree species from this list should be chosen.

** These figures are cumulative averages for the entire permit area. Species composition of areas will vary throughout the site in response to factors such as soil properties, slope and aspect orientation. Thus, the specified planting rate for each tree type can vary from acre as long as these averages are attained. The combination of timber trees, wildlife trees, and nurse trees/shrub planted stems shall total 650 per acre, but per-acre species distributions shall vary across the job site.

References:
 Burger, James A., Carl E. Zipper. 2002. Mine Permitting to Establish Productive Forests as Post-Mining Land Uses. Virginia Cooperative Extension. Publication 460-141.

Page 2 Sec 1 2/2 At 4.5" Ln 22 Col 1 REC TRK EXT OVR

2006—Revision to Incorporate the FRA Minimal Grading Practices and Revegetation Plan Approved



ARRI Forestry Reclamation Approach (FRA) Training

Changing
Reclamation practices
can be difficult for
equipment operators

The Pride Factor



Single Pass/Loose Grading



Minimal run-off on Loose Graded Area



ARRI Forestry Reclamation Approach (FRA) Training

Best Available Material
Timing & Handling



Hydroseeding Application



Williams Forestry has Managed the Planting since 2007.

Date	Acres	Hardwoods	Wildlife/Shrubs	Pines	Total
2006	146	64,500	20,500	15,000	100,000
2007	144	63,360	20,016	14,688	98,064
2007	230	114,420	24,840	17,020	156,280
2009	197	98,050	23,750	19,000	140,800
2010	150	70,940	18,330	12,700	101,970
Total	867	411,270	107,436	78,408	597,114

06/07-FRA Reclamation
“New Ridge Area”





06/07-FRA Reclamation
“New Ridge Area”

A vertical strip on the left side of the slide showing a topographic map with contour lines and a yellow highlighted path.

2008-FRA Reclamation



2009-FRA Reclamation



2010-FRA Reclamation





2010-FRA Reclamation



2010-FRA Reclamation



2010-FRA Reclamation



Promotion of Reforestation on Surface Mined Lands

Arbor Day April, 2009



Arbor Day April, 2009



Arbor Day April, 2009



Arbor Day April, 2009



Reclamation & Reforestation Awards

VMA, Individual and ARRI(State)

Trees species planted: White & Pitch Lob Pines, Red & White Oaks, Black Cherry, Red Maple, White Ash, Sycamore, Crab Apple, Gray Dogwood, Hazelnut, Chestnut, Black Locust, Persimmon, Eastern Redbud, Sawtooth Oak and Red Mulberry



Arbor Day April, 2009

Reclamation & Reforestation Awards



Questions

