

June 28, 2010

Rosemont Mine Reclamation – What to Expect

The following estimates of plant communities we could expect are based on my observations of recovering burned areas over the past 36 years and recovering mined areas over the same time period. The burned areas I have monitored include those that were burned 5 to 35 ago, the mined areas include those that were mined 20 to 150 years ago.

Five Years

Probable conditions after five years from the start of the operation, which would mean less than 10% of the total material would be handled and either processed or stored as waste, are difficult to predict. Most of the area would scheduled for becoming waste rock storage would still be natural. The beginning of the buttress and the first lift may have a few scattered plants, but certainly no trees.

After 10 years, about 20% of the total material would be handled. The first lift areas may have some plants established:

Elevation	Aspect	Grasses	Trees and shrubs	Basal Area or grasses	Canopy of trees and shrubs	Tree and Shrub Height
4500 – 5000	South	Grasses: Texas bluestem, sideoats grama, hairy grama, plains lovegrass	Shrubs: catclaw and mesquite	0%-2%	0%	No trees
	North	Grasses: Texas bluestem, sideoats grama, hairy grama, blue grama	Shrubs: catclaw and mesquite	0% -10%	<1%	Shrubs to 1.5 feet tall
5000 – 6000	South	Grasses: Texas bluestem, hairy grama, blue grama, plains lovegrass	Shrubs: ocotillo (if it is planted), mesquite	0%-2%	<1%	Shrubs to 3 feet (ocotillo may be 6 feet if mature individuals

						are planted)
	North	Grasses: sideoats grama, hairy grama, blue grama	Shrubs: catclaw and mesquite	0% -5%	<1%	Shrubs to 1.5 feet tall

Twenty Years

After 20 years, the entire operation should be complete. The following conditions could exist:

Elevation	Aspect	Grasses	Trees and shrubs	Basal Area or grasses	Canopy of trees and shrubs	Tree and Shrub Height
4500 – 5000	South	Grasses: Texas bluestem, sideoats grama, hairy grama, plains lovegrass	Shrubs: catclaw and mesquite	10% on the oldest parts of the piles, 0% - 2% on the newer parts	<1%	Shrubs to 3 feet tall in oldest reclamation areas, 1.5 feet tall in more recent (<10 years)
	North	Grasses: Texas bluestem, sideoats grama, hairy grama, blue grama	Shrubs: manzanita, beargrass, desert spoon, and Mearns sumac (if we plant them) Trees: alligator juniper, pinyon pine, Emory oak (if we plant them)	10% on the oldest parts of the piles, 0% - 2% on the newer parts	1%-5% on the oldest parts of the piles, <1% on the newer parts	Shrubs to 3 feet tall in oldest reclamation areas, 1.5 feet tall in more recent (<10 years) Trees 4 feet tall in oldest areas, seedlings less than 3 feet tall in more recent (<10 years)
5000 – 6000	South	Grasses: Texas bluestem,	Shrubs: ocotillo, beargrass,	10% on the oldest parts of the piles,	1%-5% on the oldest parts of the	Shrubs to 3 feet tall in oldest

		hairy grama, blue grama, plains lovegrass	mesquite (if we plant them)	0% - 2% on the newer parts	piles, <1% on the newer parts	reclamation areas, 1.5 feet tall in more recent (<10 years)
	North	Grasses: sideoats grama, hairy grama, blue grama	Shrubs: cercopcarus, manzanita (if we plant them) Trees: alligator juniper, pinyon pine, Emory oak (if we plant them)	10% on the oldest parts of the piles, 0% - 2% on the newer parts	1%-5% on the oldest parts of the piles, <1% on the newer parts	Shrubs to 3 feet tall in oldest reclamation areas, 1.5 feet tall in more recent (<10 years) Trees 4 feet tall in oldest areas, seedlings less than 3 feet tall in more recent (<10 years)

Twenty-Five Years

After 25 years, which means even the newest parts of the piles have had 5 years to revegetate, we could expect:

Elevation	Aspect	Grasses	Trees and shrubs	Basal Area or grasses	Canopy of trees and shrubs	Tree and Shrub Height
4500 – 5000	South	Grasses: Texas bluestem, sideoats grama, hairy grama, plains lovegrass	Shrubs: catclaw and mesquite	10% on the oldest parts of the piles, 0% - 2% on the newer parts	~1%	Shrubs to 3 feet tall in oldest reclamation areas, 1.5 feet tall in more recent (<10 years)
	North	Grasses: Texas	Shrubs: manzanita,	10% on the oldest parts	1%-5% on the oldest	Shrubs to 3 feet tall in oldest

		<p>bluestem, sideoats grama, hairy grama, blue grama</p>	<p>beargrass, desert spoon, and Mearns sumac (if we plant them)</p> <p>Trees: alligator juniper, pinyon pine, Emory oak (if we plant them)</p>	<p>of the piles, 0% - 2% on the newer parts</p>	<p>parts of the piles, ~1% on the newer parts</p>	<p>reclamation areas, 1.5 feet tall in more recent (<10 years)</p> <p>Trees 4 feet tall in oldest areas, seedlings less than 3 feet tall in more recent (<10 years)</p>
5000 – 6000	South	<p>Grasses: Texas bluestem, hairy grama, blue grama, plains lovegrass</p>	<p>Shrubs: ocotillo, beargrass, mesquite (if we plant them)</p>	<p>10% on the oldest parts of the piles, 0% - 2% on the newer parts</p>	<p>1%-5% on the oldest parts of the piles, ~1% on the newer parts</p>	<p>Shrubs to 3 feet tall in oldest reclamation areas, 1.5 feet tall in more recent (<10 years)</p>
	North	<p>Grasses: sideoats grama, hairy grama, blue grama</p>	<p>Shrubs: cercopcarus, manzanita (if we plant them)</p> <p>Trees: alligator juniper, pinyon pine, Emory oak (if we plant them)</p>	<p>10% on the oldest parts of the piles, 0% - 2% on the newer parts</p>	<p>1%-5% on the oldest parts of the piles, ~1% on the newer parts</p>	<p>Shrubs to 3 feet tall in oldest reclamation areas, 1.5 feet tall in more recent (<10 years)</p> <p>Trees 4 to 8 feet tall in oldest areas, seedlings less than 3 feet tall in more recent (<10 years)</p>

If the above conditions do not exist at a minimum, reseeding and replanting of trees and shrubs is required.

One Hundred Years

After 100 years, (80 years after closure) if the growth media stay in place on the piles, we could expect:

Elevation	Aspect	Grasses	Trees and shrubs	Basal Area or grasses	Canopy of trees and shrubs	Tree and Shrub Height
4500 – 5000	South	Grasses: Texas bluestem, sideoats grama, hairy grama, plains lovegrass	Shrubs: catclaw and mesquite	20%	15%	Shrubs 1.5 feet to 3 feet tall
	North	Grasses: Texas bluestem, sideoats grama, hairy grama, blue grama	Shrubs: manzanita, beargrass, desert spoon, and Mearns sumac Trees: alligator juniper, pinyon pine, Emory oak	15%	50%	Shrubs 1.5 to 3 feet tall Trees 8 feet to 20 feet tall, occasional seedlings less than 3 feet tall
5000 – 6000	South	Grasses: Texas bluestem, hairy grama, blue grama, plains lovegrass	Shrubs: ocotillo, beargrass, mesquite	10%	5%	Shrubs 1.5 to 3 feet tall
	North	Grasses: sideoats grama, hairy grama, blue grama	Shrubs: cercopcarus, manzanita Trees: alligator juniper, pinyon pine, Emory oak	10%	30%	Shrubs 1.5 to 3 feet tall Trees 8 feet to 20 feet tall, occasional seedlings less than 3 feet tall

DRAFT