

Rosemont Copper Project EIS Cooperating Agency Coordination Meeting 05/20/2010 Agenda

Location: Federal Building, 300 West Congress, Tucson, Arizona, Room 4B
Facilitator: Mindee Roth, Special Projects Manager

AGENDA

09:30 – 09:45	Welcome	Roth
09:45 – 10:30	Reclamation Vegetation Studies	Lawson
10:30 – 10:45	BREAK	
10:45 – 11:30	Reclamation Licensing and Bonding	Everson

INVITED COOPERATING AGENCIES

Tribes: Tohono O'odham Nation
Federal: Air Force, Army COE, BLM, Smithsonian Whipple Observatory
State of Arizona: AZDEQ, AZMMR, AZDWR, AZGF, AZGS, AZSMI, AZSLD, AZSP, ADOT
Local: Pima County, City of Tucson, Town of Sahuarita

INVITED GUESTS

Consultants:
Cheniae & Associates
Gordon Cheniae
Rosemont Copper Company
Holly Lawson

Rosemont Copper Project EIS

Cooperating Agency Coordination Meeting 05/20/2010

Meeting Notes

<p>Welcoming Remarks</p> <p>Discussion:</p> <p>⇒ Forest Service shared plans to announce a revised schedule in June and the recent selection of 5 alternatives to be considered in detail: (1) MPO, (2) No Action, (3) Phased Tailings, (4) Barrel Only, and (5) Scholefield.</p>	<p>Reta Laford</p>
<p>Reclamation Vegetation Studies</p> <p>Discussion:</p> <p>⇒ PPT: University of Arizona Revegetation Study</p> <p>⇒ Holly Lawson, University of Arizona graduate student, presented results to date of the 10-year revegetation study initiated by Rosemont Copper Company in 2005, including early findings. These studies have 4 phases: (1) site assessment, (2) greenhouse testing, (3) field testing, and (4) recommendations for future applications. Details on suggested mulch treatments and seed mixes will result from the tests.</p> <p>⇒ Question and Answer period:</p> <p>⇒ Comments included:</p> <ul style="list-style-type: none"> ▪ Concerns that rock, similar to anticipated waste rock, was not incorporated into the study plots ▪ Concerns about erosion and dust ▪ Affirmation of concurrent reclamation as opposed to at the completion of mining 	<p>Holly Lawson (Rosemont Copper Company)</p>
<p>Reclamation Licensing and Bonding</p> <p>Discussion:</p> <p>⇒ PPT: Reclamation Meeting</p> <ul style="list-style-type: none"> ▪ Forest Service presented information regarding reclamation and bonding guidelines and direction. ▪ Forest Service provided numerous references regarding Forest Service and State of Arizona reclamation plan and bonding requirements. <p>⇒ Forest Service has additional guidance in it's <i>2004 Training Guide for Reclamation Bonding Estimation and Administration for Mineral Plans of Operation.</i></p> <p>⇒ Question and Answer period:</p> <p>⇒ Comments included:</p> <ul style="list-style-type: none"> ▪ Desire to see an example or an outline of a bonding document. ▪ Concerns that the volume of "topsoil" may be inadequate ▪ Concerns that waste rock be strategically placed considering its geochemistry ▪ Questions about what would be included in the DEIS regarding: <ul style="list-style-type: none"> ▪ Bonding requirements ▪ Calculations ▪ Level of detail about reclamation requirements <p>⇒ Bev explained that the final reclamation plan and bonding calculations will follow the Record of Decision, when an alternative, including mitigation, is selected and the Final MPO is written to reflect the decision, as well as State of Arizona financial assurance requirements.</p>	<p>Bev Everson</p>

**Rosemont Copper Project
Cooperating Agency Meeting
May 20, 2010**

Attendance Record

Cooperating Agencies	Participant(s)
Tohono O'odham Nation	Addison Smith
Air Force, 162d Fighter Airwing	MARK HARTING, LTC MARK.HARTING@ANG.AF.MIL KURT TEK, LTC KURT.TEK@ANG.AF.MIL
Army Corps of Engineers	Unavailable – advance notice
USDI BLM	D. M.
Smithsonian Institution	Dan Brown
AZ Dept of Environmental Quality	
AZ Dept of Mines and Mineral Resources	MADAN M. SINGH

**Rosemont Copper Project
Cooperating Agency Meeting
May 20, 2010**

Cooperating Agencies	Participant(s)
AZ Department of Transportation	Charles Beck
AZ Dept of Water Resources	Unavailable – advance notice
AZ Game and Fish Department	John Windes
AZ Geological Survey	
AZ State Land Department	
AZ State Mine Inspector	Garrett Fleming
AZ State Parks	
City of Tucson	

**Rosemont Copper Project
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Cooperating Agencies	Participant(s)
Pima County	Mark Bush Richard Grimaldi Grey Maxe Julia Fonseca
Town of Sahuarita	Orlanthea Henderson

Loy Nelf
Newa
Connolly

**Rosemont Copper Project
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Guests	Affiliation
<i>G.L. Cheniaie</i>	G.L. Cheniaie and Associates
<i>Holly Lawson</i>	Rosemont Copper Company

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Tohono O’odham Nation	Addison Smith
Air Force, 162d Fighter Airwing	Mark Harting
Army Corps of Engineers	Unavailable – advance notice
USDI BLM	Dan Moore
Smithsonian Institution	Dan Brocius
AZ Dept of Environmental Quality	
AZ Dept of Mines and Mineral Resources	Madan M. Singh
AZ Department of Transportation	Charles Beck
AZ Dept of Water Resources	Unavailable – advance notice
AZ Game and Fish Department	John Windes
AZ Geological Survey	
AZ State Land Department	
AZ State Mine Inspector	Garrett Fleming
AZ State Parks	Robert Casavant
City of Tucson	
Pima County	Mark Riesh Richard Grimaldi Greg Saxe Loy Neff Julia Fonseca Neva Connolly

**Rosemont Copper Project
Cooperating Agency Meeting
May 20, 2010**

Cooperating Agencies	Participant(s)
Town of Sahuarita	Orlanthia Henderson

Guests	Affiliation
G.L. Cheniae	GL. Cheniae and Associates
Holly Lawson	Rosemont Copper Company



ROSEMONT COPPER

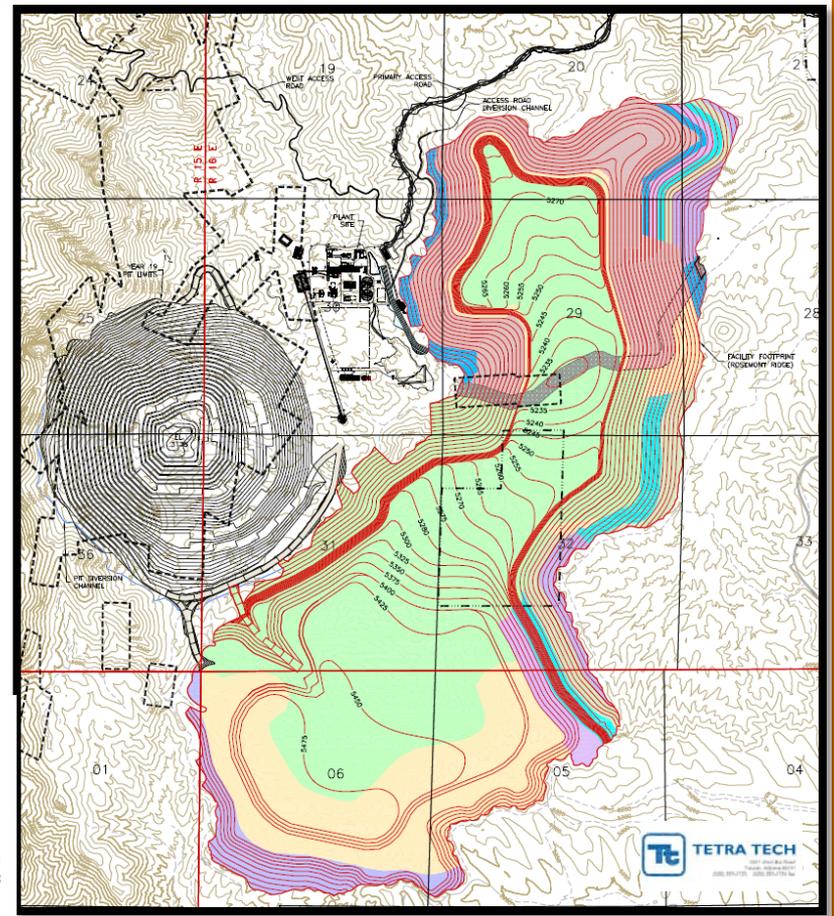
Resourceful.



University of Arizona Revegetation Study

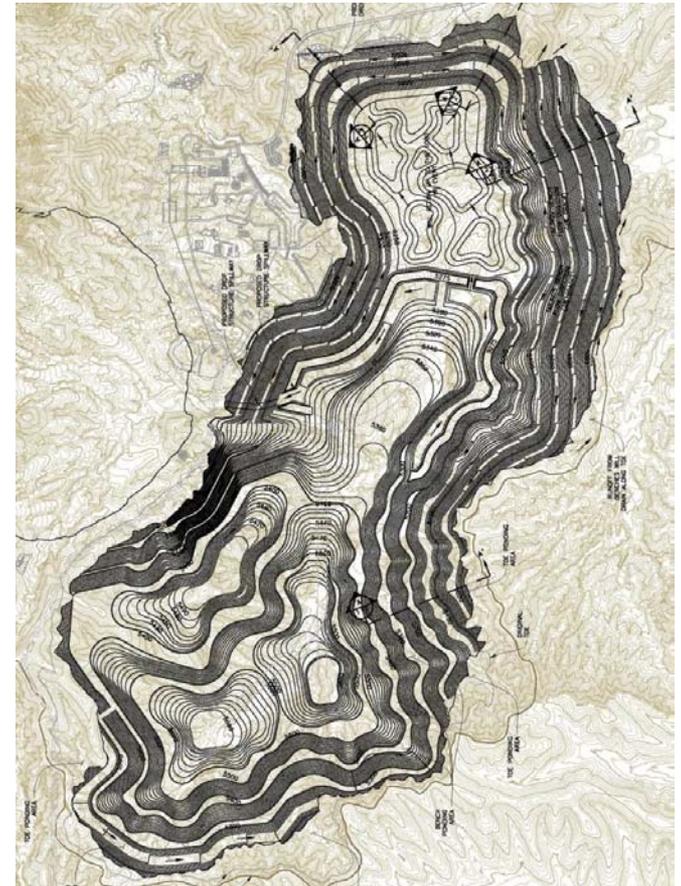
Rosemont Copper Reclamation

- Concurrent Reclamation
- Perimeter Buttress
 - Minimize Visual Impact
- Soil salvage
 - <6" to >36"



Rosemont Copper Reclamation

- Primarily east-facing slopes
- 18-degree slopes
- Future Uses:
 - Ranching
 - Wildlife Habitat
 - Recreation



University of Arizona Reclamation Test Plots



University of Arizona Research Grant

THE UNIVERSITY OF ARIZONA
SCHOOL OF
NATURAL RESOURCES
COLLEGE OF AGRICULTURE AND LIFE SCIENCES



- 10 year revegetation study
- School of Natural Resources, Dr. Jeff Fehmi



- 4-Phase Revegetation Study & Palmer Agave Study



Palmer Agave Study



- Food source
- Translocation Study
- Seed Study



Goals of Revegetation Study

- Prevent soil loss from the site
- Reclaim its capacity for productive use
- Return site to a higher functioning plant community



Phase I: Site Assessment & Seed Mix Development

- Site Assessment
 - Review current species and community structure
- Seed Mix Development – 503 species considered
- Criteria for Mix:
 - Native Species
 - Common to the Area
 - Commercially Available
 - Represent current functional groups





Phase I: Results



- Site Assessment:

Site not currently at its highest potential as a plant community

- Overgrazing in early 1900s
- Fire Suppression since early 1900s
- Invasion of Mesquites and Junipers
- Degraded plant community may cause soil erosion & soil loss → unstable site

Phase I: Site Research

- Soil Amendments- ID & ranked
- Soil Testing – Properties
- 3 Rainfall Scenarios:
 - 31 years of local data used to determine low, average, and high rainfall

Phase II: Greenhouse Testing



- **3 Mulch Treatments**
No Mulch, Straw Mulch,
Straw Mulch & Fertilizer
- **3 Soil Types**
Gila, Glance, Arkose

Experimental Design

- **29 native species:**
4 seed mixes
- **3 Rainfall Scenarios**
High, Average, Low



Replication

- 3 soil types X 3 rainfall scenarios X 3 amendments X 4 seed mixes = 108 treatment combinations
- 108 X 4 replications = 432 pots



Functional Groups

- WSPG - Warm-Season Perennial Grasses
- CSPG - Cool-Season Perennial Grasses
- AG - Annual Grasses
- PF - Perennial Forbs
- AF - Annual Forbs
- SH - Shrubs



Seed Mixes

Common Name	Scientific Name
whitethorn acacia*	<i>Acacia constricta</i>
catclaw acacia*	<i>Acacia greggii</i>
red threeawn	<i>Aristida purpurea var. longiseta</i>
fourwing saltbush*	<i>Atriplex canescens</i>
desert marigold	<i>Baileya multiradiata</i>
cane beardgrass*	<i>Bothriochloa barbinodis</i>
sixweeks needle grama	<i>Bouteloua aristidoides</i>
sideoats grama*	<i>Bouteloua curtipendula</i>
blue grama*	<i>Bouteloua gracilis</i>
Rothrock grama*	<i>Bouteloua rothrockii</i>
false mesquite	<i>Calliandra eriophylla</i>
Arizona cottontop	<i>Digitaria californica</i>
bottlebrush squirreltail	<i>Elymus elymoides</i>
plains lovegrass*	<i>Eragrostis intermedia</i>
Mexican gold poppy	<i>Eschscholzia californica ssp. mexicana</i>
tanglehead*	<i>Heteropogon contortus</i>
curly mesquite	<i>Hilaria belangeri</i>
orange caltrop	<i>Kallstroemia grandiflora</i>
prairie Junegrass	<i>Koeleria macrantha</i>
green sprangletop*	<i>Leptochloa dubia</i>
big purple tansyaster	<i>Machaeranthera tanacetifolia</i>
muttongrass	<i>Poa fendleriana</i>
whitestem paperflower	<i>Psilostrophe cooperi</i>
skunkbush sumac*	<i>Rhus trilobata</i>
desert senna	<i>Senna covesii</i>
desert globemallow	<i>Sphaeralcea ambigua</i>
gooseberryleaf globemallow	<i>Sphaeralcea grossulariifolia</i>
sand dropseed*	<i>Sporobolus cryptandrus</i>

sideoats grama
 blue grama
 green sprangletop
 Rothrock grama
 sand dropseed
 sixweeks needle grama
 bottlebrush squirreltail
 desert marigold
 big purple tansyaster
 whitethorn acacia
 skunkbush sumac

cane beardgrass
 Arizona cottontop
 sideoats grama
 blue grama
 tanglehead
 sixweeks needle grama
 plains lovegrass
 desert senna
 Mexican gold poppy
 false mesquite
 whitestem paperflower

cane beardgrass
 Arizona cottontop
 curly mesquite
 red threeawn
 sixweeks needle grama
 muttongrass
 prairie Junegrass
 gooseberryleaf globemallow
 orange caltrop
 catclaw acacia
 fourwing saltbush

red threeawn
 sand dropseed
 sideoats grama
 Rothrock grama
 sixweeks needle grama
 desert senna
 desert marigold
 desert globemallow
 Mexican gold poppy
 whitethorn acacia

Mix 1

Seed Mixes

Common Name	Scientific Name
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catclaw acacia*	<i>Acacia greggii</i>
red threeawn	<i>Aristida purpurea var. longiseta</i>
fourwing saltbush*	<i>Atriplex canescens</i>
desert marigold	<i>Baileya multiradiata</i>
cane beardgrass*	<i>Bothriochloa barbinodis</i>
sixweeks needle grama	<i>Bouteloua aristidoides</i>
sideoats grama*	<i>Bouteloua curtipendula</i>
blue grama*	<i>Bouteloua gracilis</i>
Rothrock grama*	<i>Bouteloua rothrockii</i>
false mesquite	<i>Calliandra eriophylla</i>
Arizona cottontop	<i>Digitaria californica</i>
bottlebrush squirreltail	<i>Elymus elymoides</i>
plains lovegrass*	<i>Eragrostis intermedia</i>
Mexican gold poppy	<i>Eschscholzia californica ssp. mexicana</i>
tanglehead*	<i>Heteropogon contortus</i>
curly mesquite	<i>Hilaria belangeri</i>
orange caltrop	<i>Kallstroemia grandiflora</i>
prairie Junegrass	<i>Koeleria macrantha</i>
green sprangletop*	<i>Leptochloa dubia</i>
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- orange caltrop
- catclaw acacia
- fourwing saltbush
- red threeawn
- sand dropseed
- sideoats grama
- Rothrock grama
- sixweeks needle grama
- desert senna
- desert marigold
- desert globemallow
- Mexican gold poppy
- whitethorn acacia

Mix 2

Seed Mixes

Common Name	Scientific Name
whitethorn acacia*	<i>Acacia constricta</i>
catclaw acacia*	<i>Acacia greggii</i>
red threeawn	<i>Aristida purpurea var. longiseta</i>
fourwing saltbush*	<i>Atriplex canescens</i>
desert marigold	<i>Baileya multiradiata</i>
cane beardgrass*	<i>Bothriochloa barbinodis</i>
sixweeks needle grama	<i>Bouteloua aristidoides</i>
sideoats grama*	<i>Bouteloua curtipendula</i>
blue grama*	<i>Bouteloua gracilis</i>
Rothrock grama*	<i>Bouteloua rothrockii</i>
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Arizona cottontop	<i>Digitaria californica</i>
bottlebrush squirreltail	<i>Elymus elymoides</i>
plains lovegrass*	<i>Eragrostis intermedia</i>
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prairie Junegrass	<i>Koeleria macrantha</i>
green sprangletop*	<i>Leptochloa dubia</i>
big purple tansyaster	<i>Machaeranthera tanacetifolia</i>
muttongrass	<i>Poa fendleriana</i>
whitestem paperflower	<i>Psilostrophe cooperi</i>
skunkbush sumac*	<i>Rhus trilobata</i>
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sand dropseed*	<i>Sporobolus cryptandrus</i>

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- whitethorn acacia
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- Mexican gold poppy
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- Arizona cottontop
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- muttongrass
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- gooseberryleaf globemallow
- orange caltrop
- catclaw acacia
- fourwing saltbush
- red threeawn
- sand dropseed
- sideoats grama
- Rothrock grama
- sixweeks needle grama
- desert senna
- desert marigold
- desert globemallow
- Mexican gold poppy
- whitethorn acacia

Mix 3

Seed Mixes

Common Name	Scientific Name
whitethorn acacia*	<i>Acacia constricta</i>
catclaw acacia*	<i>Acacia greggii</i>
red threeawn	<i>Aristida purpurea var. longiseta</i>
fourwing saltbush*	<i>Atriplex canescens</i>
desert marigold	<i>Baileya multiradiata</i>
cane beardgrass*	<i>Bothriochloa barbinodis</i>
sixweeks needle grama	<i>Bouteloua aristidoides</i>
sideoats grama*	<i>Bouteloua curtipendula</i>
blue grama*	<i>Bouteloua gracilis</i>
Rothrock grama*	<i>Bouteloua rothrockii</i>
false mesquite	<i>Calliandra eriophylla</i>
Arizona cottontop	<i>Digitaria californica</i>
bottlebrush squirreltail	<i>Elymus elymoides</i>
plains lovegrass*	<i>Eragrostis intermedia</i>
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prairie Junegrass	<i>Koeleria macrantha</i>
green sprangletop*	<i>Leptochloa dubia</i>
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muttongrass	<i>Poa fendleriana</i>
whitestem paperflower	<i>Psilostrophe cooperi</i>
skunkbush sumac*	<i>Rhus trilobata</i>
desert senna	<i>Senna covesii</i>
desert globemallow	<i>Sphaeralcea ambigua</i>
gooseberryleaf globemallow	<i>Sphaeralcea grossulariifolia</i>
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- gooseberryleaf globemallow
- orange caltrop
- catclaw acacia
- fourwing saltbush
- red threeawn
- sand dropseed
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- Rothrock grama
- sixweeks needle grama
- desert senna
- desert marigold
- desert globemallow
- Mexican gold poppy
- whitethorn acacia

Mix 4

Phase II: Results

How species were selected

		<i>Soil Type</i>			Grand Total
		Arkose	Gila	Glance	
<i>Rainfall simulation</i>	High	100	100	92	97
	Ave	92	100	92	94
	Low	100	83	75	86
	Grand Total	97	94	86	93

Table A1-1. *Leptochloa dubia* percent occurrence by pot.

Species not recommended

		<i>Soil Type</i>			Grand Total
		Arkose	Gila	Glance	
<i>Rainfall simulation</i>	High	0	17	33	17
	Ave	0	33	25	19
	Low	0	17	25	14
	Grand Total	0	22	28	17

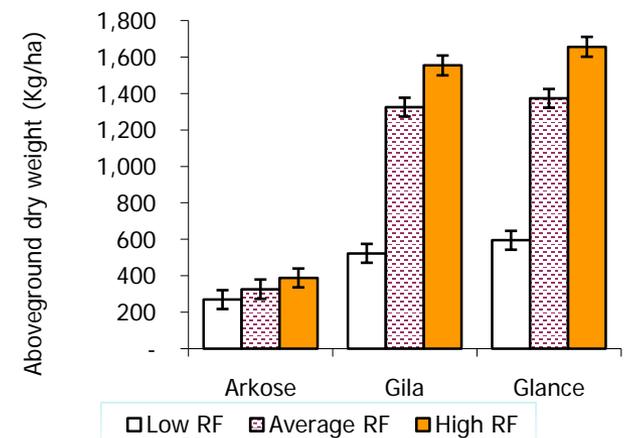
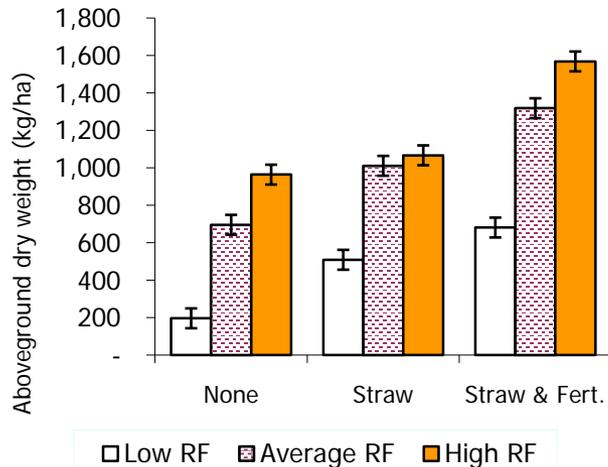
Table A1-17. *Acacia greggii* percent occurrence by pot.



Phase II: Results



- Establishment on all soil types
- Best establishment with high precipitation
- Mulch aided establishment





Recommended Seed Mix



Green sprangletop	(<i>Leptochloa dubia</i>)	WSPG
*Red threeawn	(<i>Aristida purpurea</i>)	WSPG
Blue grama	(<i>Bouteloua gracilis</i>)	WSPG
Arizona cottontop	(<i>Digitaria californica</i>)	WSPG
Curly mesquite	(<i>Hilaria belangeri</i>)	WSPG
Plains lovegrass	(<i>Eragrostis intermedia</i>)	WSPG
Bottlebrush squirreltail	(<i>Elymus elymoides</i>)	CSPG
Desert marigold	(<i>Baileya multiradiata</i>)	PF
Mexican gold poppy	(<i>Eschscholzia californica</i>)	AF
False mesquite	(<i>Calliandra eriophylla</i>)	SH

Alternative Species

Tanglehead	(<i>Heteropogon contortus</i>)	WSPG
*Sideoats grama	(<i>Bouteloua curtipendula</i>)	WSPG
Sand dropseed	(<i>Sporobolus cryptandrus</i>)	WSPG
Cane beardgrass	(<i>Bothriochloa barbinodis</i>)	WSPG
Desert senna	(<i>Senna covesii</i>)	PF

Phase III: Field Testing



- Actual Site Conditions
- Erosion Measurements & Control
- Use of equipment
- Inventory & Monitoring protocol



Replicating Future Reclamation

- East-facing slope
- 3-to-1 slopes
- 2 soil types



3 Areas:

- 2 elevations
- 7.7 acres





Plant Salvage

Tucson Cactus & Succulent Society



- Non-Profit Organization
- Over 650 plants salvaged
- Over 400 crew hours
- Plant sales support Society, Education Grants



Construction

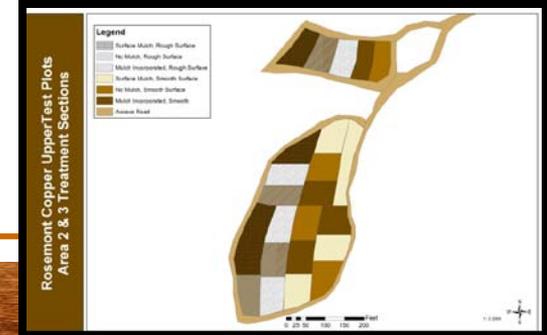
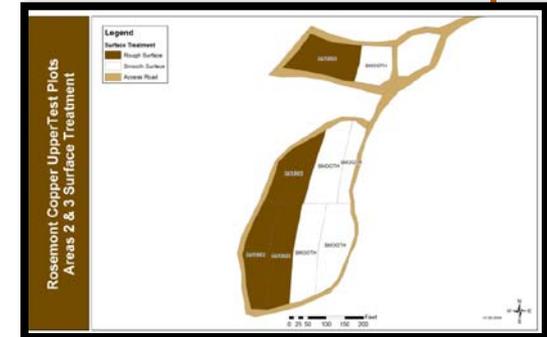
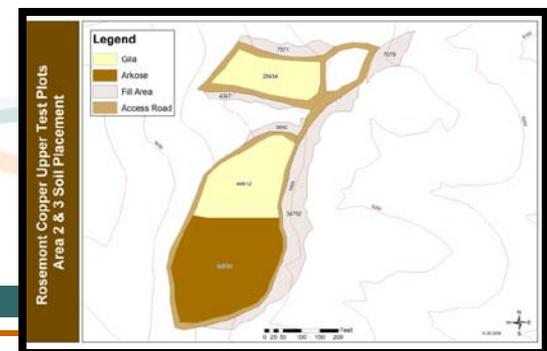
- Palmer Agave transplanted
- Re-contoured
- Soil Placement



Phase III: Field Testing

- 3 mulch treatments x
- 2 soil surface treatments x
- 2 sites x
- 2 replications = 48 sections

Section Treatments	Soil Surface	Mulch Treatment
1	Smooth Surface	No mulch
2	Smooth Surface	Mulch Incorporated
3	Smooth Surface	Mulch Surface
4	Rough Surface	No mulch
5	Rough Surface	Mulch Incorporated
6	Rough Surface	Mulch Surface





Mulch Treatments



Mulch Incorporated in the Soil:

- Improves soil moisture during periods of drought
- Enhances surface roughness





Mulch Treatments

- **Mulch Placed on Soil Surface:**

- Adds a layer of protection from environment and predators
- Preserves moisture
- Tackifier to assist



No Mulch:

- Determines the site conditions and the effects of mulch



Soil Surface



Rough Surface: Shown to reduce wind-erosion, reduce evaporation, retain soil moisture, create microniches.

Smooth Surface: Good soil-to-seed contact is necessary for germination.



Broadcast Seeding

- 10 native species seed mix
- Timing
- Rate



New Mix	Scientific Name	Group	Range (ft)	Composition	PLS Seed/ft ²
Arizona cottontop	<i>Digitaria californica</i>	WSPG	1000-6000	13.7%	6.8
Blue grama	<i>Bouteloua gracilis</i>	WSPG	4000-8000	13.7%	6.8
Curly mesquite	<i>Hilaria belangeri</i>	WSPG	3000-6000	13.7%	6.8
Green sprangletop	<i>Leptochloa dubia</i>	WSPG	2500-6000	13.7%	6.8
Plains Lovegrass	<i>Eragrostis intermedia</i>	WSPG	3000-6000	13.7%	6.8
Sideoats grama	<i>Bouteloua curtipendula</i>	WSPG	2500-7500	13.7%	6.8
Bottlebrush squirreltail	<i>Elymus elymoides</i>	CSPG	2500-10000	3.0%	1.5
	<i>Eschscholzia californica</i>				
Mexican gold poppy	<i>ssp. Mexicana</i>	AF	2000-4500	8.0%	4
Desert marigold	<i>Baileya multiradiata</i>	PF	2000-5000	4.0%	2
False mesquite	<i>Calliandra eriophylla</i>	SH	2000-5000	3.0%	* 0.03
					48.5

Other Contributions to Seeding

Seed Bank Sampling

- Species not in the seed mix
- Viability Testing to determine if re-seeding is necessary before monsoon season in future





Seed Dispersal



- Outside Plots
 - Seed contribution from outside source
 - Natural Plant Community species composition



Other Considerations

- Seed Predation
 - Ants, small mammals, birds
- Invasive Species
 - Outcompeted by natives or dominant





Evaluation



Vegetation

- Density
- Cover
- Species Composition
- Soil Moisture
- Mycorrhizae
- Biomass



Erosion

- Silt Fences
- Topography
- Infiltration
- Compaction



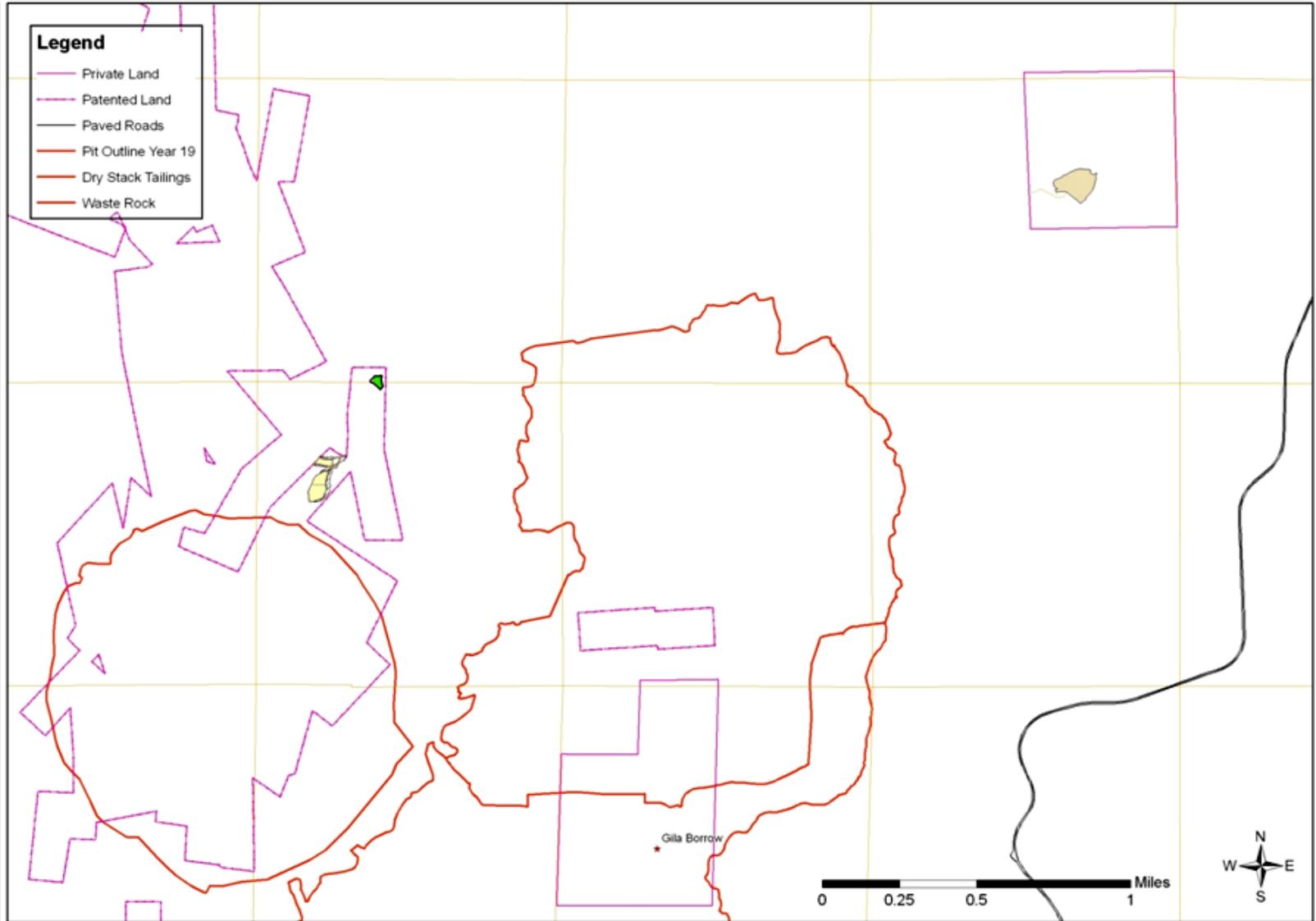
Climate

- Precipitation
- Temperature
- Wind
- Light



Long-Term Testing

Rosemont Copper Reclamation Test Plots



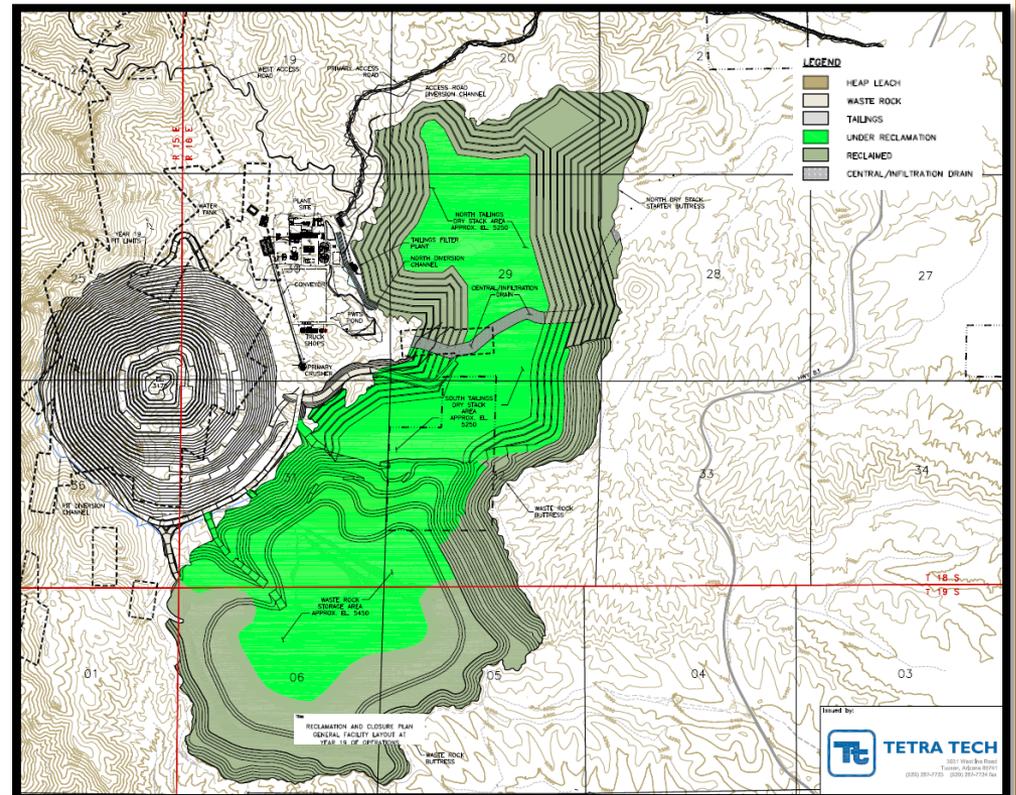
Phase 4: Technology Transfer

- Final product:
 - Best seed mix for the site for desired plant community for site stability and post-mining use
 - Recommended seed bed preparation, soil amendments
 - Overall reclamation sequences and procedures



Successful Methods from the Start

Resulting research will be used with concurrent reclamation starting in year one, producing successful methods for revegetation





ROSEMONT COPPER

Resourceful.



Thank you

Rosemont Copper Project



Reclamation Meeting
May 17, 2010

Legal Direction

Very little statutory direction; most laws do not address reclamation of locatable, or “hardrock” minerals

Forest Service regulatory direction is at 36 CFR 228 Part A (228.8, and 228.13), and in the 2800 Section of the Forest Service Manual.



228.8 (g) Reclamation. Upon exhaustion of the mineral deposit or at the earliest practicable time during operations, or within 1 year of the conclusion of operations, unless a longer time is allowed by the authorized officer, operator shall, where practicable, reclaim the surface disturbed in operations by taking such measures as will prevent or control onsite and off-site damage to the environment and forest surface resources including...



- (1) Control of erosion and landslides;**
- (2) Control of water runoff;**
- (3) Isolation, removal or control of toxic materials;**
- (4) Reshaping and revegetation of disturbed areas, where reasonably practicable;**
- and**
- (5) Rehabilitation of fisheries and wildlife habitat.**



228.13 Bonding

(a) Any operator required to file a plan of operations shall, when required by the authorized officer, furnish a bond conditioned upon compliance with 228.8(g), prior to approval of such plan of operations. In lieu of a bond, the operator may deposit into a Federal depository, as directed by the Forest Service, and maintain therein, cash in an amount equal to the required dollar amount of the bond or negotiable securities of the United States having market value at the time of deposit of not less than the required dollar amount of the bond. A blanket bond covering nationwide or statewide operations may be furnished if the terms and conditions thereof are sufficient to comply with the regulations in this part.

(b) In determining the amount of the bond, consideration will be given to the estimated cost of stabilizing, rehabilitating, and reclaiming the area of operations.



(c) In the event that an approved plan of operations is modified in accordance with 228.4 (d) and (e), the authorized officer will review the initial bond for adequacy and, if necessary, will adjust the bond to conform to the operations plan as modified.

(d) When reclamation has been completed in accordance with 228.8(g), the authorized officer will notify the operator that performance under the bond has been completed: *Provided, however,* that when the Forest Service has accepted as completed any portion of the reclamation, the authorized officer shall notify the operator of such acceptance and reduce proportionally the amount of bond thereafter to be required with respect to the remaining reclamation.



Forest Service Manual Direction (Sections 2800 and 6500)

Reclamation is an activity that is performed during or after mineral activities, to shape, stabilize, revegetate or otherwise treat lands disturbed by minerals activities. It should achieve safe and ecologically stable conditions and land use that's consistent with long-term forest land and resource management plans and local environmental conditions...



Reclamation shall be undertaken in a timely fashion and occur sequentially with ongoing mineral activities

To the extent practicable, reclaimed National Forest System land shall be free of long-term maintenance requirements...

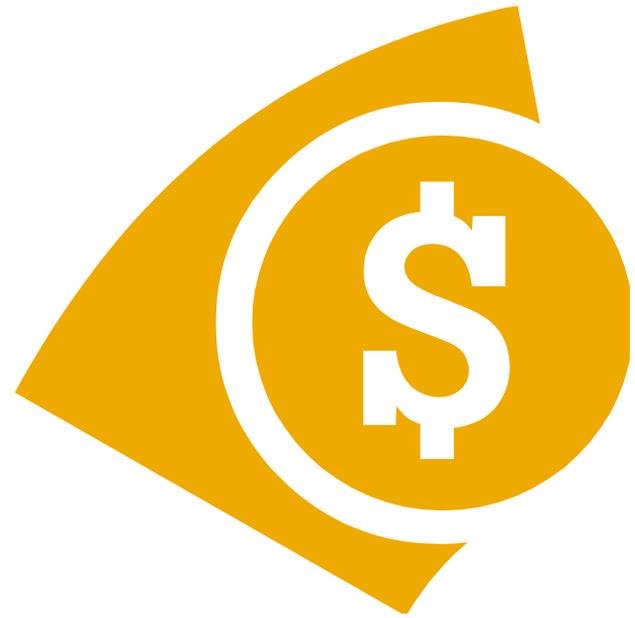


Reclamation should reclaim disturbed areas to a condition that's consistent with applicable State air and water quality requirements

Reclamation requirements included in a Plan of Operations should include measurable performance standards. Requirements should be designed to attain those standards

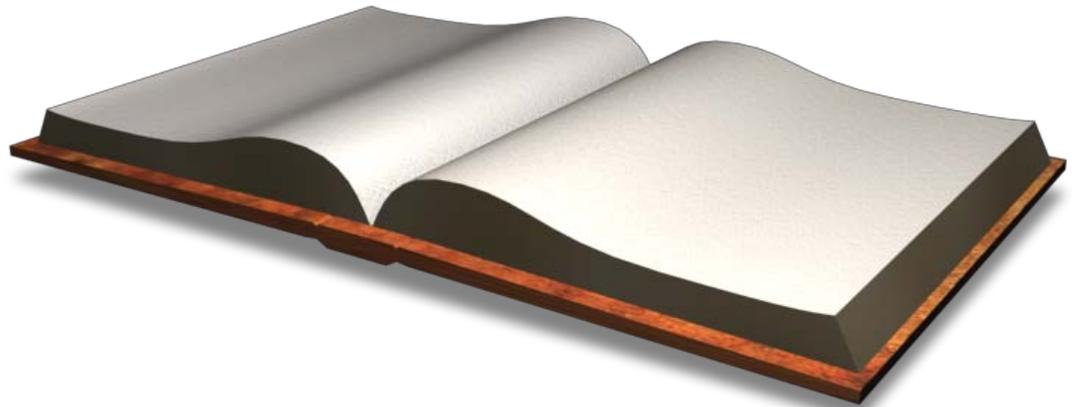


Reclamation bonds, sureties, or other financial guarantees shall ordinarily be required for all mineral activities that require a Plan of Operations; dollar amounts of such guarantees shall be sufficient enough to cover the full cost of reclamation



Other Forest Service Guidance:

Training Guide for Reclamation Bonding Estimation and Administration for Mineral Plans of Operation under 36 CFR 228A (USDA - Forest Service, April 2004)



Training guide developed to address problems with mine closure that came to light in the mid to late 1990s, when precious metal prices plummeted and the Forest Service had to use reclamation bond monies to reclaim abandoned operations. The experience demonstrated that reclamation requirements and bonds for mining operations on federal lands in the Western U.S. were inadequate, particularly in....

- Interim management of process fluids**
- Need for and cost of water treatment**
- Detoxification and rinsing of spent ore from heap leach piles**
- Closure of tailings impoundments**

- **Removal, isolation, and treatment of hazardous materials such as chemicals, spent ore, and waste rock**
- **Site drainage (both interim and long term)**
- **Monitoring and maintenance of the mine site during and after closure**
- **Indirect costs of closure and reclamation, and**
- **Lack of site specific information in plans of operation**

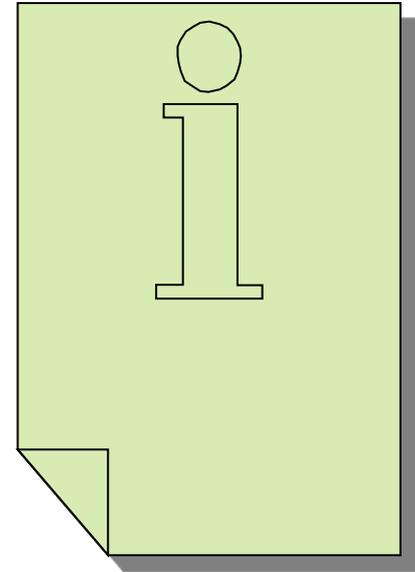
The training guide recognizes the reasons for historical inadequate bonding of locatable mining operations including:

- A perception that Forest Service regulations limit what can be bonded, including long term maintenance and monitoring, and interim management of a mining operation**
- Incomplete plans of operation**
- Bonding based on conceptual project design**
- Erroneous assumptions about environmental effects**
- Lack of Forest Service guidance on how to estimate bonds**
- Lack of education, training or experience in personnel estimating bonds**

The guide provides guidance in:

- What detailed information should be included in a Plan of Operations**
- Determining the period of operation that should be covered by bonding**
- Bond adjustments through time, in response to changing reclamation needs**
- Determining what is to be reclaimed and what the reclamation tasks are**
- What standards are to be met in reclamation**
- What long term site maintenance and monitoring should be done**
- Estimates of direct and indirect costs of reclamation, particularly, cost to agency to reclaim if operator does not**

**Further information
from the training guide
can be found at:**



www.fs.fed.us/geology/bond_guide_042004.pdf

**Coronado National Forest Plan
direction is to:**

***Support environmentally sound energy
and mineral development***



Arizona State Reclamation Plan Requirements

State of Arizona statute for reclamation and bonding of operations on private and state lands (Arizona Revised Statutes §§ 27-901-997 and Arizona Administrative Code R11-2-201 through R11-2-822)

Primarily concerned with safety (such as slope stability), shaping and revegetation

Jurisdiction on private lands

Other state regulation and bonding for reclamation through ADEQ and ADWR



Rosemont reclamation plan at:
www.asmi.az.gov/documents_forms/default.asp
(under Rosemont Reclamation Plan Review)



Bottom line...



**Most conditions of reclamation will be developed
as mitigation through National Environmental
Policy Act analysis and incorporated in the final
Mine Plan of Operations**

Comments and other Discussion

