

# Rosemont Copper Project EIS

## Cooperating Agency Coordination Meeting

7/16/2009  
 9:30 AM to 12:00 PM  
 Federal Building  
 300 West Congress  
 Tucson, Arizona  
 Conference Room 4B

### Agenda

|  |   |
|--|---|
| <b>Meeting Called by:</b>  | Jeanine Derby, Forest Supervisor  |
| <b>Facilitator:</b>  | Teresa Ann Ciapusci, Cooperating Agency Liaison   |
| <b>Type of Meeting:</b>  | Information Sharing   |
| <b>09:30 – 09:45 Welcome and Introductions</b>   | Teresa Ann Ciapusci, Cooperating Agency Liaison   |
| <b>09:45 – 10:00 NEPA Training Opportunity</b><br>Forest Service funded <i>Introduction to NEPA</i> webinar on July 29 and 30, 2009  | Teresa Ann Ciapusci, Cooperating Agency Liaison   |
| <b>10:00 – 10:15 Regulatory and Permit Requirements</b><br>Overview of regulatory and permitting requirements by those cooperating agencies having authority or jurisdiction for some aspect of the Rosemont Copper Project                                  | Roll call of agencies – those with information to share will be given an opportunity to present   |
| <b>10:15 – 10:30 Break</b>   |   |
| <b>10:30 – 11:30 Issue and Alternative Development</b><br>Overview of interdisciplinary team process for issue and alternative development, including conceptual overview of alternatives at this stage of analysis followed by question period (3 handouts) | Teresa Ann Ciapusci, Cooperating Agency Liaison (Discussion Overview and Purpose)<br>Beverly Everson, Interdisciplinary Team Leader (Presentation and Questions)  |
| <b>11:30 – 11:45 Public Release of Socio-Economic Report</b>   | Dr. Madan Singh, Arizona Department of Mines and Mineral Resources  |
| <b>11:45 – 12:00 Open Discussion</b>   | Teresa Ann Ciapusci, Cooperating Agency Liaison   |
| <b>Invited Cooperating Agencies:</b>   | <u>Cooperating Tribes</u><br>Tohono O’odham Nation<br><br><u>Cooperating Federal Agencies</u><br>Air Force, 162d Fighter Airwing<br>Army Corps of Engineers<br>Smithsonian Institution<br>USDI Bureau of Land Management<br><br><u>Cooperating State Agencies</u><br>Arizona Department of Environmental Quality<br>Arizona Department of Mines and Mineral Resources<br>Arizona Department of Water Resources<br>Arizona Game and Fish Department<br>Arizona Geological Survey<br>Arizona State Land Department<br>Arizona State Parks<br><br><u>Cooperating Local Governments</u><br>City of Tucson<br>Pima County<br>Town of Sahuarita |

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Tucson, Arizona  
Conference Room 4B

### Meeting Notes

#### Attendees:

Note:

Checked box () indicates agency representative in attendance

#### Cooperating Tribes

- Tohono O'odham Nation

#### Cooperating Federal Agencies

- Air Force, 162d Fighter Airwing
- Army Corps of Engineers, Los Angeles District, Regulatory Division
- USDA Forest Service, Coronado National Forest
- USDI Bureau of Land Management
- Smithsonian Institution

#### Cooperating State Agencies

- Arizona Department of Environmental Quality
- Arizona Department of Mines and Mineral Resources
- Arizona Department of Water Resources
- Arizona Game and Fish Department
- Arizona Geological Survey
- Arizona State Land Department
- Arizona State Mine Inspector
- Arizona State Parks

#### Cooperating Local Governments

- Pima County
- City of Tucson
- Town of Sahuarita

#### Guests

G. L. Cheniae, Cheniae and Associates  
Brian Lindenlaub, Westland Resources, Inc.

**NEPA Training Opportunity****Teresa Ann Ciapusci****Discussion:**

- ⇒ Introduced Mindee Roth as interim coordinator for NEPA Webinar while Teresa Ann is on leave
- ⇒ Described overview and logistics for participation in the NEPA Webinar hosted by the Forest Service for Rosemont Copper Project cooperating agencies
- ⇒ Pima County agreed to host the Tucson session – Forest Service session in Tucson combined with Pima County session
- ⇒ Pima County session to be held in the Pima County Board of Supervisor’s meeting room located at 130 West Congress, first floor

**Regulatory and Permit Requirements****Roll Call of Agencies****Discussion:**

- |                                  |   |
|----------------------------------|---|
| ⇒ <i>Tohono O’odham Nation</i>   | <ul style="list-style-type: none"> <li>• Traditional use lands</li> <li>• NAGPRA</li> <li>• Archeological sites</li> <li>• Cultural sites (none)</li> </ul>   |
| ⇒ <i>Air Force</i>               | Airspace jurisdiction   |
| ⇒ <i>Army Corps of Engineers</i> | Section 404 permit  |
| ⇒ <i>BLM</i>                     |   |
| ⇒ <i>Smithsonian</i>             | None  |
| ⇒ <i>AZ DEQ</i>                  | Water quality aquifer protection; storm water permit;   |
| ⇒ <i>AZ MMR</i>                  | Pass  |
| ⇒ <i>AZ DOT</i>                  |   |
| ⇒ <i>AZ DWR</i>                  | <ul style="list-style-type: none"> <li>• Groundwater withdrawals</li> <li>• Recharge water storage</li> <li>• Central Arizona Project (CAP) storage</li> <li>• Exchange withdrawal wells to recovery wells</li> <li>• Ground water conservation best management practices (BMPs)</li> </ul> |
| ⇒ <i>AZGF</i>                    | None  |
| ⇒ <i>AZGS</i>                    | None  |
| ⇒ <i>AZ SLD</i>                  | Utility corridors   |
| ⇒ <i>AZ SMI</i>                  |   |
| ⇒ <i>AZ SP</i>                   | None, but concern with proximity to State Parks   |
| ⇒ <i>City of Tucson</i>          | None, but concern with impacts to long-term water availability  |
| ⇒ <i>Pima County</i>             | <ul style="list-style-type: none"> <li>• Air quality</li> <li>• Hazardous waste</li> <li>• Hazardous waste storage</li> <li>• Flood plain</li> <li>• Right-of-way to County roads</li> <li>• Power substation</li> <li>• Building permits on private land</li> </ul>                        |

|                            |  |
|----------------------------|--|
| ⇨ <i>Town of Sahuarita</i> | <ul style="list-style-type: none"> <li>• Type II contractor yard</li> <li>• Rezoning for warehouse</li> <li>• Grading of an area exceeding 14,000 square feet</li> </ul> <p>None</p> |
|----------------------------|--|

|   |  |
|---|--|
| <b>Issue and Alternative Development</b>  | <b>Teresa Ann Ciapusci and Beverly Everson</b> |
| <b>Discussion:</b>  |  |
| ⇨ PowerPoint presentation by IDT Leader Bev Everson reviewing the 12 issue themes and 6 of the conceptual alternatives designed to date that the IDT is focusing attention on with the caution that for some of the 6 conceptual alternatives the IDT needs more information about archeological survey results and additional visual simulations in order to complete its work |  |
| ⇨ Handout of all alternative ideas and elements compiled by IDT to date   |  |
| ⇨ Handout of all mitigation ideas and components compiled by IDT to date  |  |
| <b>Action items:</b>  |  |
| Bev verbally requested that cooperating agencies review the handout materials and submit agency comments by the end of the month (approximately 2 weeks for response)   |  |
| Teresa Ann requested that cooperating agency comments on the presentation materials be submitted in writing on agency letterhead  |  |

|   |                        |
|---|------------------------|
| <b>Public Release of Socio-Economic Report</b>  | <b>Dr. Madan Singh</b> |
| <b>Discussion:</b>  |                        |
| ⇨ PowerPoint presentation describing results of Arizona Mine and Mineral Resources study of copper mineral production, including descriptions of supply and demand for copper in the state, national, and world economies |                        |
| ⇨ PowerPoint presentation describing copper mining economic impact projections for Pima and Santa Cruz Counties   |                        |
| ⇨   |                        |
| ⇨   |                        |
| ⇨   |                        |
| <b>Action items:</b>  |                        |
|   |                        |

Attendance Record

| Agency                                 | Participant(s)<br>Please Print Legibly |
|--|--|
| Tohono O'odham Nation                  | Peter L. Steere, Addison Smith         |
| Air Force, 162d Fighter Airwing        | LTC MARK L HARTING                     |
| Army Corps of Engineers                |  |
| USDI BLM                               |  |
| Smithsonian Institution                | Dan Brocius                            |
| AZ Dept of Environmental Quality       | DENNIS TURNER                          |
| AZ Dept of Mines and Mineral Resources | MADAN M. SINGH                         |
| AZ Department of Transportation        |  |
| AZ Dept of Water Resources             | Lama Grignani                          |

| Agency                      | Participant(s)<br>Please Print Legibly |
|-----------------------------|--|
| AZ Game and Fish Department | Locana de Souza                        |
| AZ Geological Survey        | JUN SPENCER                            |
| AZ State Land Dept          | David Jones                            |
| AZ State Mine Inspector     |  |
| AZ State Parks              | Bob Sejkora                            |
| City of Tucson              | Leslie Liberti                         |
| Pima County                 | Hudson Agnew PCAO                      |
| Town of Sahuarita           | Orlanthia Henderson<br>Joe Marques     |

Westland Resources, Inc.

GL Chemiac  $\longrightarrow$

Julian Fonseca

Luiza Mayo

Michael Bende

Brian Lindvall

Chemiac + Assoc  
Pima County

Pima County

San Xavier District / TON

**Rosemont Copper Project  
Cooperating Agency Meeting  
July 16, 2009**

**Attendance Record**

| Cooperating Agencies                   | Participant(s)                                    |
|--|---|
| Tohono O'odham Nation                  | Peter L. Steere<br>Addison Smith<br>Michael Bends |
| Air Force, 162d Fighter Airwing        | LTC Mark Harting                                  |
| Army Corps of Engineers                |   |
| USDI BLM                               |   |
| Smithsonian Institution                | Dan Brocious                                      |
| AZ Dept of Environmental Quality       | Dennis Turner                                     |
| AZ Dept of Mines and Mineral Resources | Madan M. Singh                                    |
| AZ Department of Transportation        |   |
| AZ Dept of Water Resources             | Laura Grignano                                    |
| AZ Game and Fish Department            | Locana de Souza                                   |
| AZ Geological Survey                   | Jon Spencer                                       |
| AZ State Land Department               | David Jacobs                                      |
| AZ State Mine Inspector                |   |
| AZ State Parks                         | Bob Sejorka                                       |
| City of Tucson                         | Leslie Liberti                                    |
| Pima County                            | Harlan Agnew<br>Julia Fonseca<br>Lindee Mayor     |
| Town of Sahuarita                      | Orlanthia Henderson<br>Joe Marques                |

Attendance Record

| Guests           | Affiliation  |
|------------------|--|
| G.L. Cheniae     | Cheniae & Associates<br>(Contractor for Rosemont Copper Company)     |
| Brian Lindenlaub | Westland Resources, Inc.<br>(Contractor for Rosemont Copper Company) |

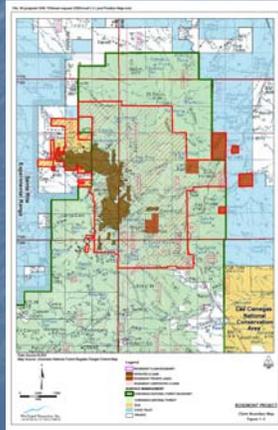
# Rosemont Copper Project Preliminary Alternatives

Shared with Cooperating Agencies  
July 16, 2009

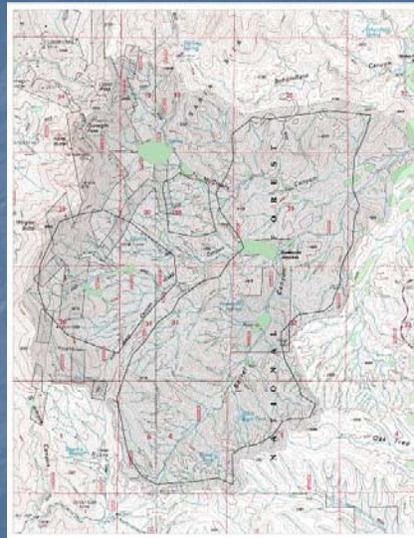
## Issues Driving Alternative Development, Mitigation, and Effects Analysis

- Air
- Heritage Resources
- Night Skies
- Noise and Vibration
- Recreation
- Riparian Habitat
- Plants and Animals
- Transportation
- Water
- Visual Resources
- Reclamation Plan
- Soils

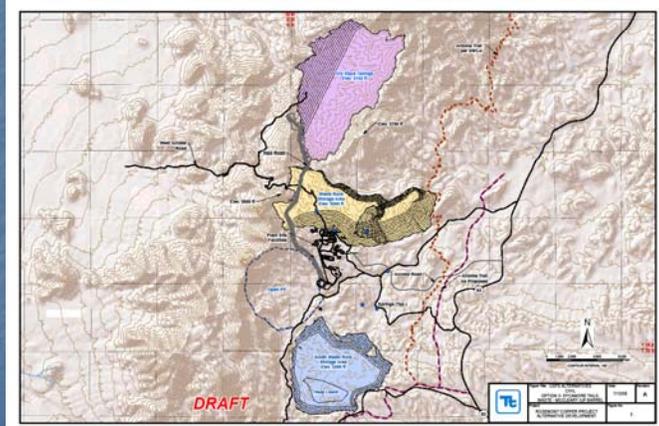
# Project Location



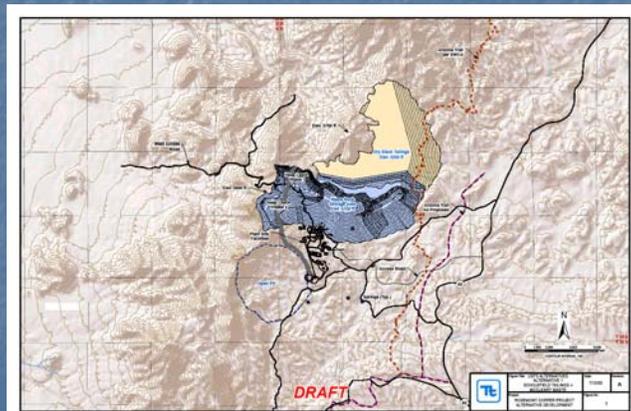
# Proposed Action Waste Rock and Tailings Placement



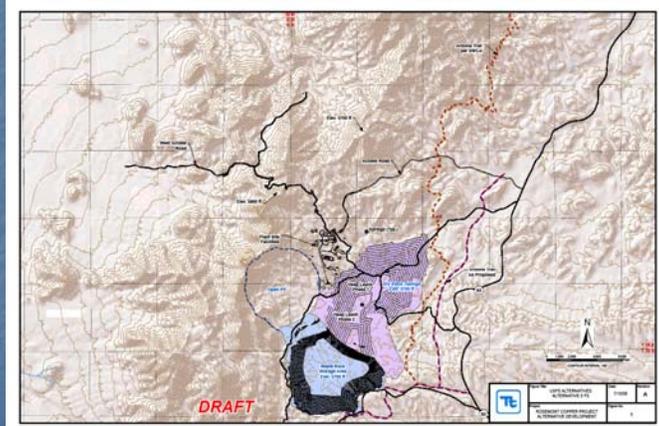
### Sycamore Canyon Tailings Placement and McCleary Canyon and Upper Barrel Canyon Waste Rock Disposal



### Scholefield Canyon and McCleary Canyon Waste Rock and Tailings Placement

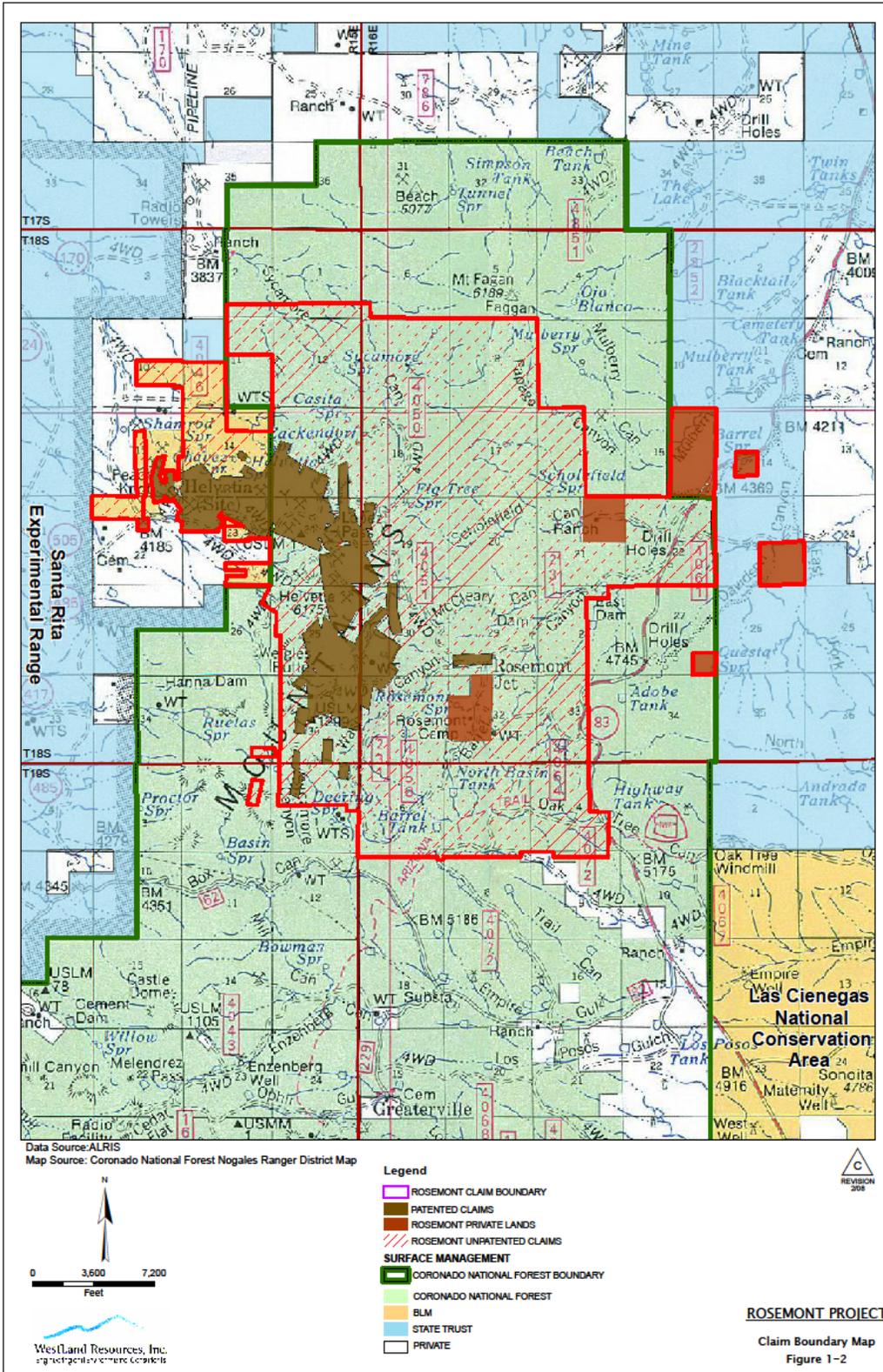


# Tailings and Waste Rock Facilities in Barrel Canyon Only, McCleary Canyon Open

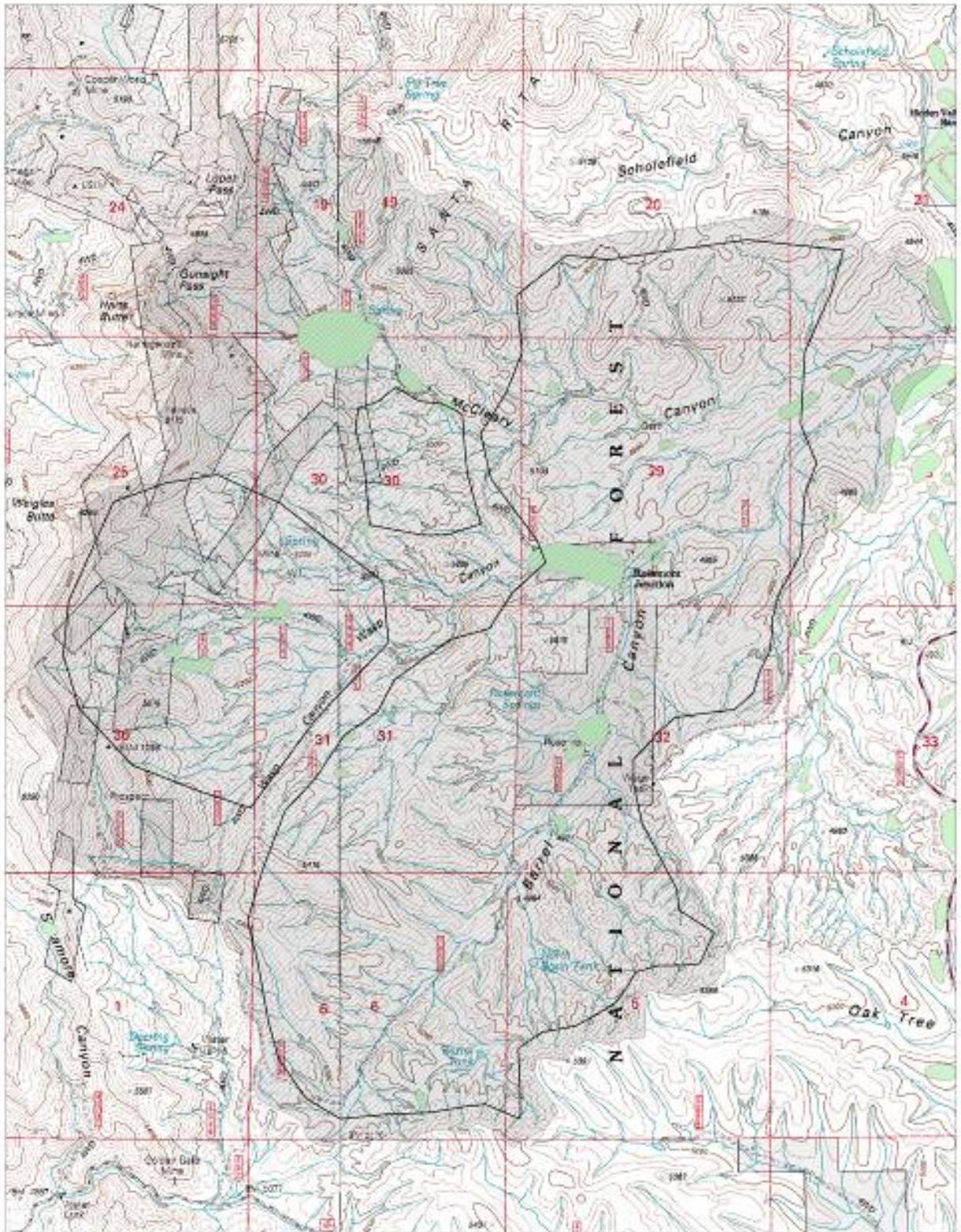


### Project Location

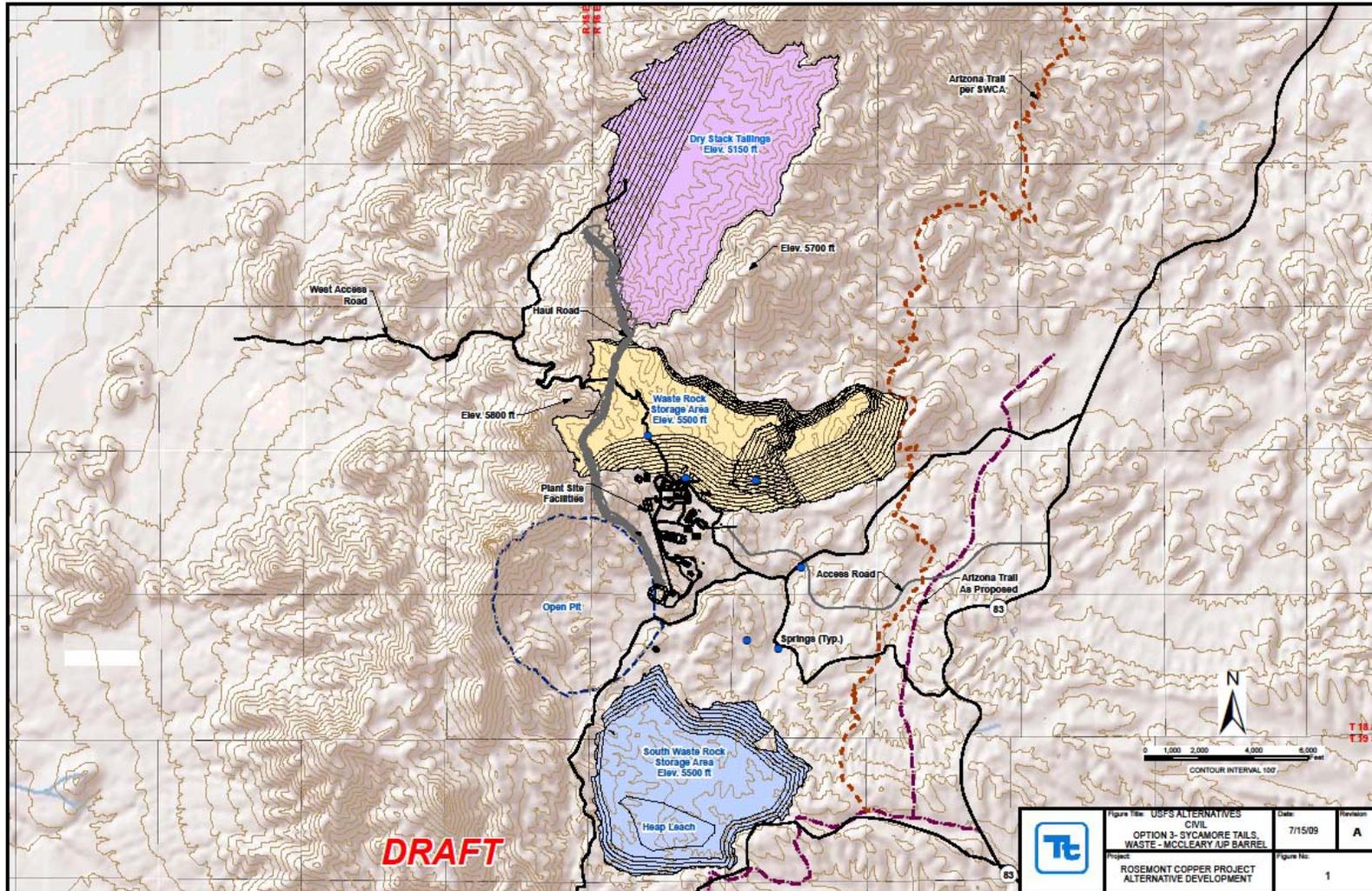
File: M:\projects\11049\_10\forest request 2008\mxd\1-2 Land Position Map.mxd



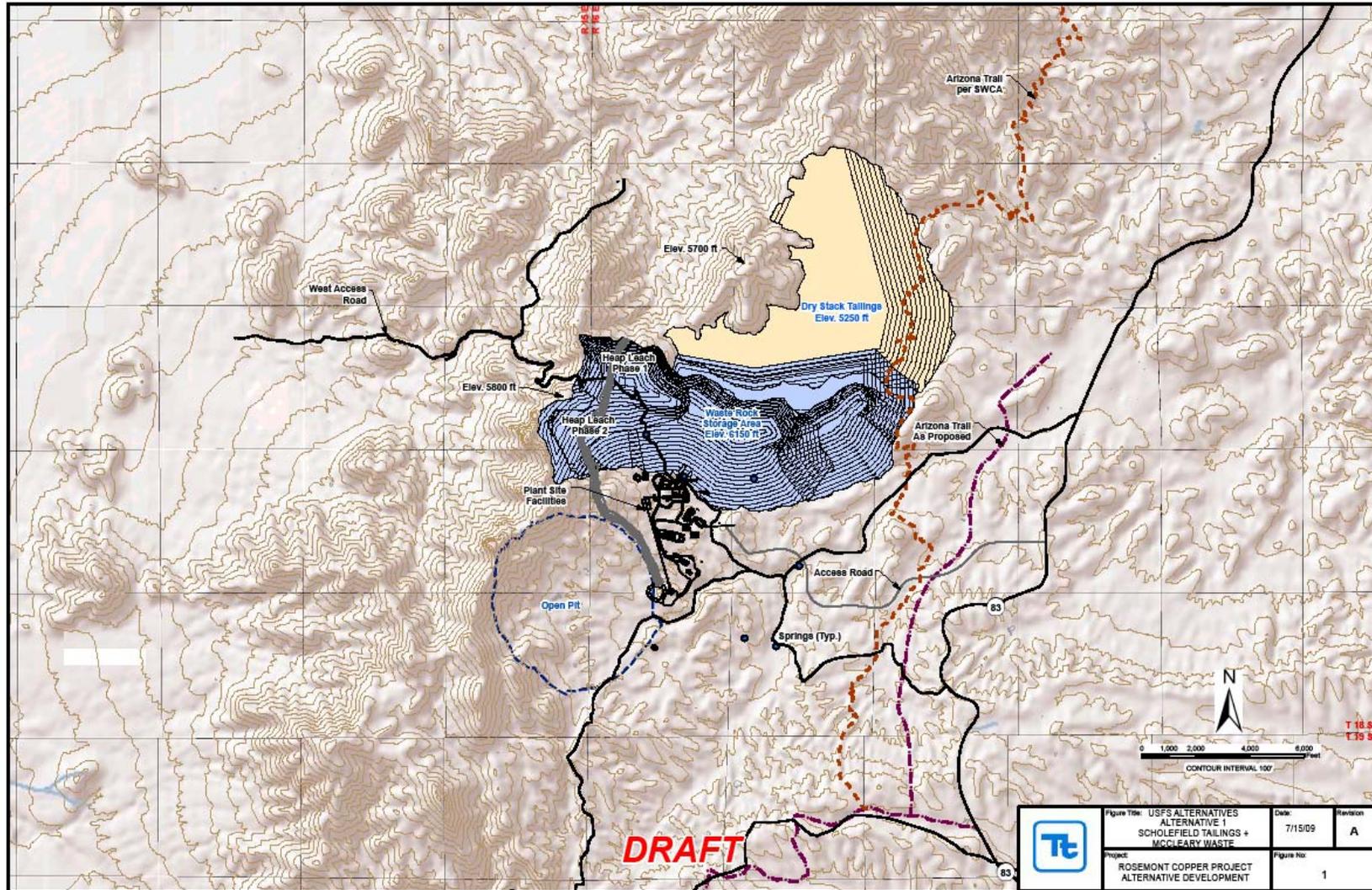
# Proposed Action Waste Rock and Tailings Placement



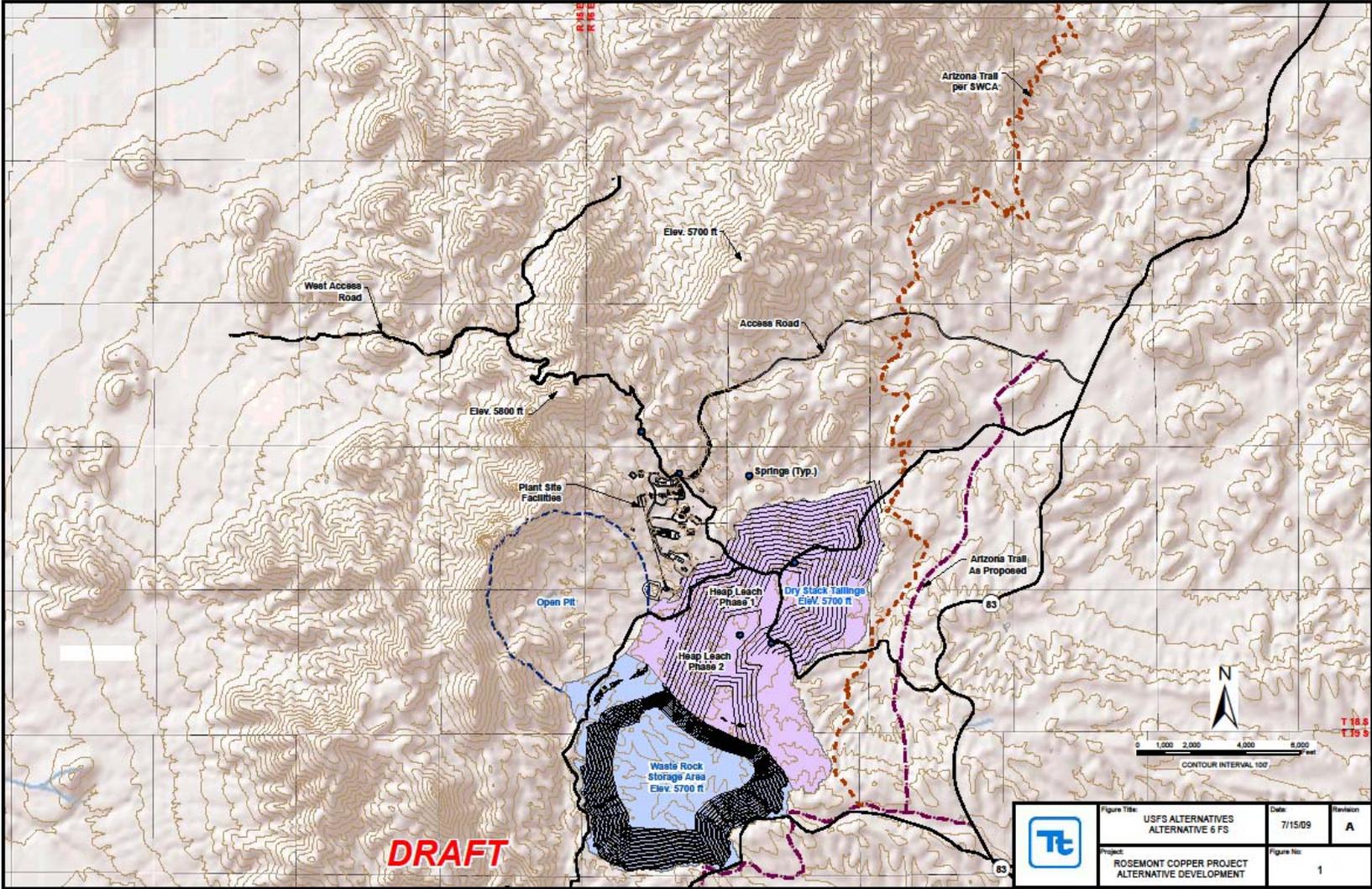
## Sycamore Canyon Tailings Placement and McCleary Canyon and Upper Barrel Canyon Waste Rock Disposal



# Scholefield Canyon and McCleary Canyon Waste Rock and Tailings Placement



# Tailings and Waste Rock Facilities in Barrel Canyon Only, McCleary Canyon Open



**Alternatives Shared with Cooperating Agencies  
07/16/09**

| ALTERNATIVE or ALTERNATIVE ELEMENT  | SOURCE                                       | ISSUE DRIVER(S)               | NOTES  |
|---|--|-------------------------------|--|
| Proposed Action   | Rosemont Copper Company (Rosemont Copper)    | NA                            | Fully described in the 2007 Mine Plan of Operations and supporting documents |
| No Action   | Council on Environmental Quality Regulations | NA                            | Baseline for effects   |
| <p>Rosemont Copper's Alternative Responsive to Public Comments Includes:</p> <ul style="list-style-type: none"> <li>• Modifying stormwater management around the tailings facility and placing additional drains through the waste and tails (instead of the Central Drain); increasing the number and size of stormwater retention ponds; realigning the pit diversion for water management in area of upper pit elevation</li> <li>• Reconfiguring key plant facilities to better contain contaminants in the event of failure and enhancing facility stability</li> <li>• Tailing storage staging to consolidate water management system</li> <li>• Reorienting haul roads (may only be mitigation)</li> </ul> | Rosemont Copper (July 2008)                  | Air Heritage Recreation Water |  |

**Alternatives Shared with Cooperating Agencies  
07/16/09**

| ALTERNATIVE or<br>ALTERNATIVE ELEMENT  | SOURCE                              | ISSUE<br>DRIVER(S)                        | NOTES |
|--|-------------------------------------|---|-------|
| <ul style="list-style-type: none"> <li>• Changing access road alignment</li> <li>• Phasing the placement of tailings</li> <li>• Realigning west service road and utility corridor to maintain recreation access</li> <li>• Modifying toe of the waste rock and tailings facilities to avoid some heritage resource sites</li> </ul>  |                                     |   |       |
| <p>Tailings facility located in Sycamore Canyon. Tailings would be conveyed via a slurry line and then dewatered at a filtering facility in the canyon. Rock to create the buttress around the tailings would be quarried in the vicinity. Recovered water would be piped back over the ridge. Waste and heap leach facility located in Upper Barrel and Upper McCleary canyons.</p> | Public Interdisciplinary Team (IDT) | Heritage Recreation<br>Riparian<br>Visual |       |
| <p>Tailings facility in Scholefield Canyon, with waste rock and heap leach facility in McCleary Canyon</p>   | Public & Cooperators                | Heritage Recreation<br>Riparian<br>Visual |       |
| <p>Tailings and waste rock facilities only in Barrel Canyon, leaving McCleary Canyon open.</p>   |                                     | Riparian<br>Visual                        |       |
| <p>One right-of-way for utilities and roads</p>  | IDT                                 | Land Use                                  |       |
| <p>Conveyor belt transport of tails</p>  | Public &                            | Air?                                      |       |

**Alternatives Shared with Cooperating Agencies  
07/16/09**

| ALTERNATIVE or ALTERNATIVE ELEMENT                                  | SOURCE             | ISSUE DRIVER(S)   | NOTES  |
|---|--------------------|---|--|
|   | IDT                |   |  |
| Compensatory land designation                                       | Cooperators        | Recreation<br>Riparian<br>Vegetation<br>Wildlife and<br>Habitat |  |
| Dam in Barrel Canyon  | Public &<br>IDT    |   | This will eliminate water being released into barrel drainage and provides no operational value. However, Arizona Department of Water Resources has never given the U.S. Forest Service surface water rights; reservoir could harbor invasive species. |
| Hydrological conveyance of wet ore to west side                     | Public             | Transportation  |  |
| Expand size of tailings filter plant                                | Rosemont<br>Copper |   | May not be an alternative element  |
| Realign East Access Road to facilitate overlook of project site     | Rosemont<br>Copper |   |  |
| Relocate raffinate pond to use gravity flow                         | Rosemont<br>Copper |   |  |
| Relocate thickeners to minimize potential for differential settling | Rosemont<br>Copper | Noise   |  |
| Sequenced blasting  | Rosemont<br>Copper |   | Likely to be mitigation  |
| Submerge fill for fuel tanks  | Rosemont<br>Copper | Air   | Likely to be mitigation  |

**Alternatives Shared with Cooperating Agencies  
07/16/09**

| ALTERNATIVE or ALTERNATIVE ELEMENT   | SOURCE                       | ISSUE DRIVER(S)        | NOTES   |
|--|------------------------------|------------------------|---|
| Place tails and waste in a horseshoe shape around Barrel Drainage                              | Interdisciplinary Team (IDT) | IDT                    | In order for there to be sufficient volume, the piles would need to extend to State Route (SR) 83. If all of the high land is eliminated as a water source, the riparian area in Barrel Canyon would become starved and die. The impacts of this alternative would likely be more than the Proposed Action (IDT meeting). |
| Relocate tails and waste to west side of ridge   | Public & IDT                 | Rosemont Copper IDT    | Not financially feasible to haul waste rock over the ridge. Furthermore, Rosemont does not control enough claim area on the western slope of the Santa Rita Mountains to accommodate the volume of both waste rock and tailings.  |
| Create a dome around project   | IDT                          | IDT<br>Rosemont Copper | Technologically infeasible. This would require the construction of a structure that would be more than 1 mile in diameter. No such structure has been engineered (IDT Meeting).   |
| Electric/trolley system or rail out of area  | IDT                          | Rosemont Copper        | Would require right-of-way access for private and state lands from the Coronado National Forest boundary to near Interstate 10 (I-10). The line would result in impacts above and beyond what is currently proposed (IDT Meeting).  |
| Government/U.S. Forest Service (Forest Service) purchases the mine for U.S. future consumption | IDT                          | IDT                    | Does not meet the Purpose and Need and outside Forest Supervisor authority. This would likely require an act of Congress (IDT Meeting & Rosemont response table dated 4-22-09).   |
| Mining through the ridge   | IDT                          | IDT<br>Rosemont Copper | Would likely result in greater impacts to all issues of concern. Rosemont believes this to be Infeasible because of the additional requirements   |

**Alternatives Shared with Cooperating Agencies  
07/16/09**

| ALTERNATIVE or ALTERNATIVE ELEMENT                              | SOURCE | ISSUE DRIVER(S)           | NOTES  |
|---|--------|---------------------------|--|
|   |        |                           | to blast, haul, and dump substantially more waste rock (Rosemont response table dated 4-22-09).  |
| Remove ridge behind the pit                                     | IDT    | IDT<br>Rosemont<br>Copper | Would result in greater waste rock to dispose of and a larger footprint and would be visible from Sahuarita and Green Valley (IDT). Furthermore, Rosemont believes this is not economically feasible because the mineralization does not extend west of the pit (Rosemont response table dated 4-22-09). |
| Keep all waste rock and tailings out of canyon bottoms          | IDT    | IDT                       | Would result in placing waste rock next to SR 83   |
| Move electric underground                                       | IDT    | Rosemont<br>Copper        | This would result in greater impacts as a result of increased ground disturbance. Furthermore, the line would need to be cooled by oil and would pose a greater potential for environmental damage (Rosemont response table dated 4-22-09).  |
| Relocate SR 83 or portions of it                                | IDT    | Rosemont<br>Copper        | Outside the jurisdiction of the Forest Service and Rosemont. Arizona Department of Transportation has scheduled changes not associated with this project (Rosemont response table dated 4-22-09).  |
| Shorten operation   | IDT    | Rosemont<br>Copper        | Not financially feasible. The cost to Rosemont would increase \$500+ million for equipment such as shovels, haul trucks, milling equipment, additional infrastructure, etc. This would also result in the need for an increased footprint for the plant facilities (IDT meeting).                        |
| Use Central Arizona Project (CAP) water with groundwater backup | IDT    | Rosemont<br>Copper        | Rosemont does not have water rights associated with CAP and can only purchase excess water   |

**Alternatives Shared with Cooperating Agencies  
07/16/09**

| ALTERNATIVE or ALTERNATIVE ELEMENT                          | SOURCE | ISSUE DRIVER(S)           | NOTES  |
|---|--------|---------------------------|--|
|   |        |                           | allocations. Furthermore, Rosemont has already acquired legal water rights to their well field (Rosemont response table dated 4-22-09).  |
| Use Old Sonoita Hwy   | IDT    | IDT                       | Would not alleviate use of the SR 83/I-10 interchange and much of SR 83 from the proposed mine to I-10. Furthermore, the character of Old Sonoita Highway is more of a rural arterial that serves rural homes (IDT Meeting and Rosemont response table dated 4-22-09).   |
| Wet tailings  | IDT    | IDT                       | Would increase impacts to all significant issues identified during scoping, especially water resources. Furthermore, wet tailings would require substantially more area for the tailings facility (IDT Meeting).   |
| Alternate mine site or ore bodies/ mine in a different area | Public | IDT<br>Rosemont<br>Copper | Rosemont has a legal right to access the minerals associated with their claims. Therefore, this alternative does not meet the Purpose and Need. Furthermore, the Forest Service is required to consider all proposals for mining that meet the requirements under 36 CFR 228(a) (IDT Meeting & Rosemont response table dated 4-22-09). |
| Alternative processing technologies                         | Public | IDT                       | This alternative is too vague to address in detail. However, Rosemont has proposed to use contemporary mining technologies such as dry stack tailings (Rosemont response table dated 4-22-09).   |
| Alternative uses of public lands                            | Public | IDT                       | Rosemont possesses legal mining claims where the project is proposed. Therefore, the Forest  |

**Alternatives Shared with Cooperating Agencies  
07/16/09**

| ALTERNATIVE or ALTERNATIVE ELEMENT   | SOURCE        | ISSUE DRIVER(S) | NOTES   |
|--|---------------|-----------------|---|
|  |               |                 | Service lacks the authority to deny a legally permittable mine with reasonable mitigation (IDT Meeting and Rosemont response table dated 4-22-09).  |
| Create a lake with CAP water on west side of Santa Rita Mountains for recreation and process water | Public        | Rosemont Copper | Excess CAP allocations have already been purchased for ground water recharge, and lakes would not create recharge—they would create a surface area for evaporation (Rosemont response table dated 4-22-09).   |
| Create completely separate road access   | Public        | IDT             | Rosemont is proposing to construct a separate access road from SR 83 (IDT Meeting).   |
| Extend mine project to 40 to 50 years/modified timetable   | Public<br>IDT | Rosemont Copper | This would increase the duration of most impacts rather than mitigate them. Furthermore, this is considered financially infeasible because the life span of most mining equipment is approximately 20 years. Therefore, this would result in the need to buy new trucks and processing equipment halfway through the life of the project (IDT Meeting). |
| In situ mining   | Public        | Rosemont Copper | This is technically infeasible because it will not work on a sulfide ore body. Furthermore, this technique has never been commercially proven (Rosemont response table dated 4-22-09).  |
| Limited project—limit to fee simple and patented mining claims                                     | Public        | Rosemont Copper | The largest contiguous parcel of land consists of a combination of both patented land and Bureau of Land Management land and is located north and west of the pit area. After evaluating storage volume of this area, it would fit, at the most, 852  |

**Alternatives Shared with Cooperating Agencies  
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| ALTERNATIVE or ALTERNATIVE ELEMENT   | SOURCE     | ISSUE DRIVER(S) | NOTES  |
|--|------------|-----------------|--|
|  |            |                 | million cubic yards. This is insufficient for this operation (Rosemont letter dated 5-29-09 with figures in support of statement).   |
| Mechanical conveyance of ore to rail head/rail or trolley transport of ore, spoils, and tailings out of area | Public IDT | Rosemont Copper | Technically infeasible because no existing conveyor technology exists for the size conveyor that would be needed. Furthermore, Rosemont does not control right-of-way or land from the proposed project site to the nearest rail head in southern Tucson. Financially infeasible; may not be possible to get approval for pipeline to connect at current port, cost prohibitive to acquire the right-of-way (IDT Meeting). |
| Mine in a different location   | Public     | IDT             | Rosemont has a legal right to access the minerals associated with their claims. Furthermore, the Forest Service is required to consider all proposals for mining that meet the requirements under 36 CFR 228.  |
| On-site high-pressure high-temperature leaching technology   | Public     | Rosemont Copper | This is technically infeasible because it will not work on a sulfide ore body. Furthermore, this technique has never been commercially proven (Rosemont response table dated 4-22-09).   |
| Reclamation—create a lake out of pit   | Public     | IDT             | A lake created in the pit during reclamation would not be safe for recreational boaters. Therefore, it would serve no purpose (Rosemont response table dated 4-22-09).   |
| Reclamation with solar farm  | Public     | Rosemont Copper | Rosemont willing to explore this idea; however, this alternative element does not create a trade-off between impacts to different resources (Rosemont  |

**Alternatives Shared with Cooperating Agencies  
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| ALTERNATIVE or ALTERNATIVE ELEMENT  | SOURCE        | ISSUE DRIVER(S)    | NOTES   |
|---|---------------|--------------------|---|
|   |               |                    | response table dated 4-22-09).  |
| Relocate tails and overburden to other Green Valley mines and Twin Buttes Mine  | Public        | Rosemont Copper    | Impractical because of distance, increased impact to Santa Rita Experimental Range, energy costs, and lack of existing conveyor technology. Furthermore, these mines are controlled by competing mining companies (Rosemont response table dated 4-22-09).  |
| Remove all tails from public land   | Public        | Rosemont Copper    | Not financially feasible because of the volume of tailings (Rosemont response table dated 4-22-09).   |
| Reopen closed copper mines  | Public        | Rosemont Copper    | Rosemont does not own any of these other operations (Rosemont response table dated 4-22-09).  |
| Ship tailings to Canada   | Public        | Rosemont Copper    | This is not financially feasible  |
| Sublevel caving mining/vertical crater retreat  | Public        | Rosemont Copper    | The type of ore body owned by Rosemont is not conducive to this type of mining (Rosemont response table dated 4-22-09).   |
| Suspend mining during high winds, extreme drought, excellent "seeing conditions," and/or at night/daytime operations only | Public<br>IDT | Rosemont<br>Copper | This is technically infeasible because machines cannot be turned off easily/daily. Processes are continuous-flow processes that are not amenable to being shut down daily. Furthermore, because of large capital costs, it is financially infeasible not to operate the mine 24 hours a day. This is the standard practice for large, open pit mines (Rosemont response table dated 4-22-09). |
| Switch proposed primary and secondary access roads/loop road circulation  | Public<br>IDT | IDT<br>Rosemont    | Impacts resulting from the combination of the construction of a road over Gun Site Pass   |

**Alternatives Shared with Cooperating Agencies  
07/16/09**

| ALTERNATIVE or ALTERNATIVE ELEMENT   | SOURCE | ISSUE DRIVER(S)    | NOTES  |
|--|--------|--------------------|--|
| system/in from SR 83 out through Santa Rita Road/expand and use secondary access |        | Copper             | sufficient to support primary access and impacts resulting from additional traffic through the town of Sahuarita would likely create additional impacts on top of what is already proposed. The west access road would have to be completely upgraded to handle loaded traffic in either direction. The overall impact of this would be greater than the proposal (IDT Meeting and Rosemont response table dated 4-22-09). |
| Tunnel through the Santa Rita Mountains  | Public | Rosemont<br>Copper | While some utilities could be located in a tunnel through the upper portion of the Santa Rita Mountains, it would be cost prohibitive to mine the ore body via a tunnel (IDT Meeting & Rosemont response table dated 4-22-09).   |
| Underground mine   | Public | Rosemont<br>Copper | Ore grades are not high enough to sustain economic viable underground operation. This would also not significantly reduce the amount of tails or waste (Rosemont response table dated 4-22-09).  |
| Use Box Canyon road  | Public | IDT                | Construction of a road in Box Canyon, suitable for large trucks, would likely disproportionately increase impacts to popular recreation areas, sensitive riparian areas and animal species, and population centers such as Green Valley (IDT Meeting).   |
| Use CAP water  | Public | Rosemont<br>Copper | CAP is not a reliable source. Outside the jurisdiction of the Forest Service to require this of Rosemont. Furthermore, Rosemont has already acquired legal water rights to their well field (IDT   |

**Alternatives Shared with Cooperating Agencies  
07/16/09**

| ALTERNATIVE or ALTERNATIVE ELEMENT                    | SOURCE       | ISSUE DRIVER(S) | NOTES  |
|---|--------------|-----------------|--|
|   |              |                 | Meeting and Rosemont response table dated 4-22-09).  |
| Use Helvetia Mine road                                | Public       | IDT             | Impacts resulting from the combination of the construction of a road over Gun Site Pass sufficient to support primary access and impacts resulting from additional traffic through the town of Sahuarita would likely create additional impacts beyond what is already proposed (Cooperators and IDT Meeting). |
| Use high-pressure/high-temperature leaching           | Public       | Rosemont Copper | Because of low acid generation (pyrite) of the ore, it is not amenable to the high-pressure concentrate leach method (Rosemont response table dated 4-22-09).  |
| Use ocean water for operations                        | Public       | Rosemont Copper | This would require infrastructure that would make the project financially infeasible (Rosemont response table dated 4-22-09).  |
| Use of solar, wind, natural gas, or geothermal energy | Public       | Rosemont Copper | Tucson Electric Power is required to use 15% renewable energy by 2015 (?) and Rosemont has proposed solar in the Mine Plan of Operations (Rosemont response table dated 4-22-09).  |
| Use Rosemont Junction road                            | Public       | Rosemont Copper |  |
| Use sinking mine shafts to subterranean levels        | Public       | Rosemont Copper | Not suitable for this type of ore body; the ore is disseminated, rather than in veins or isolated zones (Rosemont response table dated 4-22-09).   |
| Land Exchange   | Public & IDT | IDT<br>Rosemont | Does not meet the Purpose and Need and does not decrease impacts. May also be outside Forest   |

**Alternatives Shared with Cooperating Agencies  
07/16/09**

| ALTERNATIVE or ALTERNATIVE ELEMENT                 | SOURCE                             | ISSUE DRIVER(S)        | NOTES   |
|--|------------------------------------|------------------------|---|
|  |                                    | Copper                 | Supervisor signing authority (IDT Meeting and Rosemont response table dated 4-22-09)  |
| Rail transport of ore, spoils, and tailings        | Public & IDT                       | Rosemont Copper        | Financially infeasible; may not be possible to get approval for pipeline to connect at current port, cost prohibitive to acquire the right-of-way (IDT Meeting).  |
| Use gray water                                     | Public & IDT                       | Rosemont Copper        | Not able to gain legal access to this water; Sahuarita uses theirs, and Green Valley leased all of theirs to private party for foreseeable future (IDT Meeting).  |
| Use waste rock for industrial uses                 | Public & IDT                       | Rosemont Copper        | Has been tried at Sacaton, and there has not been enough demand to reduce any impacts (IDT Meeting).  |
| Backfill, continuous backfill, or partial backfill | Public, Cooperators, IDT, & tribes | IDT<br>Rosemont Copper | It will take 20 years to excavate the pit, 15 to refill; effects on most resources will increase in duration, result in questionable stability, and increase resource use (fuel); concurrent reclamation would not occur, and effects are likely to be worse than Proposed Action. Furthermore, the configuration of the ore body does not allow for a continuous backfill like a coal bed (IDT Meeting and Rosemont response table dated 4-22-09). |
| Use Cienega Creek as primary water source          | Public                             | IDT<br>Rosemont Copper | Rosemont does not have water rights associated with Cienega Creek. Rosemont has already acquired legal water rights to their well field. Furthermore, this would likely impact habitat for the endangered southwestern willow flycatcher and Gila topminnow. Other sensitive species could  |

**Alternatives Shared with Cooperating Agencies  
07/16/09**

| ALTERNATIVE or<br>ALTERNATIVE ELEMENT | SOURCE | ISSUE<br>DRIVER(S) | NOTES                              |
|---------------------------------------|--------|--------------------|------------------------------------|
|                                       |        |                    | be impacted as well (IDT Meeting). |

***Draft, Deliberative—Not For Public Distribution***

**Table 1.** Potential Mitigation Developed during the Identification of Alternatives for the Rosemont Copper Project

| <b>Issue</b>                    | <b>Proposed Mitigation</b>  | <b>Source</b>                | <b>Notes</b>  |
|---------------------------------|---|------------------------------|---|
| Air                             | Use contemporary equipment that is fuel efficient   | Interdisciplinary Team (IDT) | Rosemont Copper Company (Rosemont Copper) already plans to purchase the most efficient available.   |
| Air                             | Mix tails with a dust suppressant instead of polymers   | Public                       |   |
| Air                             | Dust mitigation—something other than polymers—permeable concrete?   | Public & IDT                 |   |
| Air                             | Cover dry stack tailings conveyor at transfer points  | Rosemont                     |   |
| Air<br>Water                    | Pave roads  | Public & IDT                 | Proposal describes 8-inch-thick compacted gravel on East Access Road. All other roads are characterized by infrequent use. Haul roads will be dynamic in location and elevation. Any hard surfacing would be substantial in order to support the heavy loads and would be short lived and therefore impractical. Water spray is proposed for these roads (Rosemont Copper letter dated 05-29-09). |
| Air                             | Implement dust management for Santa Rita Road and U.S. Forest Service (Forest Service) roads on west side of Santa Rita Mountains | Rosemont Copper              |   |
| Air                             | Establish truck specifications to reduce emissions  | Rosemont Copper              |   |
| Air                             | Reduce need for on-site construction power generation   | Rosemont Copper              |   |
| Air                             | Reorient haul road system to facilitate dust control  | Rosemont Copper              |   |
| Air                             | Secondary acid mist controls in electrowinning tank house   | Rosemont Copper              |   |
| Air<br>Public Health and Safety | Set and enforce speed limits within project area  | Rosemont Copper              |   |
| Air                             | Stipulate usage of low-sulfur diesel fuel on-site   | Rosemont Copper              |   |
| Air                             | Use water sprays on gravel access road  | Rosemont Copper              |   |
| Fire Management                 | Identify water sources for fire and installing hookups for both wildland and structural engines                                   | IDT                          | Mine Safety and Health Administration has requirements for on-site fires. Off-site water rights are regulated by the Forest Service, state, and private entities.   |
| Grazing                         | Develop ranch livestock water system to include one sustainable source per individual pasture of Rosemont Copper's lease          | Rosemont Copper              |   |
| Hazardous Materials             | Create and implement a spill protection plan for trucks transporting hazardous materials  | IDT                          | Federal Department of Transportation rules already require this, and Rosemont Copper's Emergency Response Plans would cover incidents.  |

**Draft, Deliberative—Not For Public Distribution**

**Table 1.** Potential Mitigation Developed during the Identification of Alternatives for the Rosemont Copper Project (Continued)

| <b>Issue</b>        | <b>Proposed Mitigation</b>  | <b>Source</b>   | <b>Notes</b>  |
|---------------------|---|-----------------|---|
| Heritage Resources  | Reconfigure/design toe waste and tailings facilities to avoid heritage resources                              | IDT             | The sites identified are not isolated, and because no other areas were given a Class III review, it is impossible to determine anything other than moving the toes around exterior sites. |
| Heritage Resources  | Avoid ball court in Trail Creek area  | Rosemont Copper |   |
| Heritage Resources  | Conduct data recovery and testing at eligible sites within the area of potential effect                       | Rosemont Copper |   |
| Heritage Resources  | Install interpretive kiosks for cultural sites along Arizona Trail  | Rosemont Copper |   |
| Land Use Recreation | Relocate legal public access roads  | IDT             | Some were already proposed in Mine Plan of Operations.  |
| Land Use            | Re-establish land ownership boundaries after operation (at Rosemont Copper's cost)                            | IDT             | Rosemont Copper has already done so and plans to maintain boundaries through operations.  |
| Land Use Recreation | Allow public access on private lands within Forest Service boundaries   | Rosemont Copper |   |
| Land Use            | Use Small Tracts Act to sell small Forest Service allotments among the private parcels                        | IDT             | Mining activities will likely make it impossible to establish survey corners. This will make management of the boundary of National Forest System lands difficult and expensive.          |
| Night Skies         | Use shielded lights   | Public          |   |
| Night Skies         | Use low-pressure sodium lighting  | IDT             | Already included in Proposed Action.  |
| Night Skies         | Create a management position for a person to develop and implement lighting program                           | Rosemont Copper |   |
| Night Skies         | Use hooded light fixtures and directional lighting  | Rosemont Copper |   |
| Night Skies         | Minimize decorative lighting  | Rosemont Copper |   |
| Night Skies         | Develop plan for monitoring, auditing, and reporting on light emissions                                       | Rosemont Copper |   |
| Noise and Vibration | Restrict blasting to only daylight hours  | Rosemont Copper |   |
| Noise and Vibration | Monitor for blasting effects  | Rosemont Copper |   |
| Noise and Vibration | Monitor for noise levels at claim boundary  | Rosemont Copper |   |
| Noise and Vibration | Attenuated backup alarms  | Rosemont Copper |   |
| Noise and Vibration | Prohibit jake-brake use on East Access Road   | Rosemont Copper |   |
| Other               | Renewable energy use  | Public          |   |
| Other               | Comply with International Organization for Standardization (ISO) 14001 Standards for Environmental Management | Public          | Rosemont Copper plans to develop an Environmental Management System; full certification under ISO may not be available or practicable.  |

**Draft, Deliberative—Not For Public Distribution**

**Table 1.** Potential Mitigation Developed during the Identification of Alternatives for the Rosemont Copper Project (Continued)

| <b>Issue</b>             | <b>Proposed Mitigation</b>  | <b>Source</b>   | <b>Notes</b>   |
|--------------------------|---|-----------------|--|
| Public Health and Safety | Co-locate communication tower for more coverage   | IDT             | Out of scope, but Rosemont Copper has worked with Verizon to realign a transmitter for better coverage.                            |
| Public Health and Safety | Identify key protection area and adjust scheduling of operations  | IDT             | Operations will run 24/7.  |
| Reclamation              | Create different slope structures based on reclamation goals (livestock, vegetation, erosion)   | IDT             |  |
| Reclamation              | Final reclamation should include trees, roads, trails, and water capture on top of tails  | IDT             |  |
| Reclamation              | Optimize soil placement for aspect  | Rosemont Copper |  |
| Recreation               | Create a lake in the pit at reclamation   | Public          |  |
| Recreation               | Relocate off-highway vehicle (OHV) recreation to east side of State Route (SR) 83   | IDT             | Rosemont Copper open to discussing this.   |
| Recreation               | Relocate Arizona Trail  | IDT             |  |
| Recreation               | Create interpretive segment along Arizona Trail   | Rosemont Copper |  |
| Recreation               | Build roads and trails on top of tailings   | IDT             | Would need to be done in a way that does not create additional risk of erosion.  |
| Recreation               | Preserve access to Gunsight, Arizona Trail, and Sycamore Canyon   | IDT             | Possibility, based on alternative locations.   |
| Recreation               | Build new segment of Arizona Trail to an observation point at Sentinel Peak; relocate Arizona Trail as needed                           | Rosemont Copper |  |
| Recreation               | Create new OHV trailhead on east side of SR 83  | Rosemont Copper |  |
| Recreation               | Provide alternative viewpoint access  | Rosemont Copper |  |
| Recreation               | Provide areas where lower impact recreational uses may be appropriate   | Rosemont Copper |  |
| Recreation               | Construct a water station for horses at Los Colinas segment   | Rosemont Copper |  |
| Riparian                 | Change east access to avoid riparian  | IDT             |  |
| Riparian                 | Fenced livestock enclosures for highest-value riparian habitat  | Rosemont Copper |  |
| Socioeconomic            | Develop community endowment program for \$25 million plus \$500,000 annual contribution, to be managed by independent Board of Trustees | Rosemont Copper |  |
| Soils                    | Identify and use soil stockpile areas   | Rosemont Copper |  |
| Transportation           | Add public road section across primary and secondary access   | IDT             |  |
| Transportation           | Alter trucking schedule around school buses   | IDT             | Has proposed a schedule that currently works around peak travel times. Willing to review bus schedules to consider for scheduling. |

**Draft, Deliberative—Not For Public Distribution**

**Table 1.** Potential Mitigation Developed during the Identification of Alternatives for the Rosemont Copper Project (Continued)

| <b>Issue</b>                               | <b>Proposed Mitigation</b>   | <b>Source</b>   | <b>Notes</b>   |
|--|--|-----------------|--|
| Transportation                             | Improve SR 83  | Public          |  |
| Transportation                             | Create a carpooling program (off-site park and ride) for employees and construction labor  | Rosemont Copper |  |
| Transportation                             | Design upgrade to SR 83–Rosemont Access Road intersection; could include divided highway passthrough lanes and dedicated turn and acceleration lanes | Rosemont Copper |  |
| Transportation<br>Public Health and Safety | Provide truck and school bus turnout designs to Arizona Department of Transportation   | Rosemont Copper |  |
| Water                                      | Coach water accumulation   | IDT             | Unsure what was intended by this comment.  |
| Water                                      | Lining tails, waste, and/or all facilities   | Public & IDT    | Testing has shown that water seepage would be of equal or better water quality than current groundwater, so lining would not provide any protection and would eliminate any natural water processes. |
| Water                                      | Store stormwater on-site to contribute to groundwater  | Public & IDT    |  |
| Water (Section 404)<br>Wildlife            | Purchase and set-aside areas for off-site mitigation to meet permit conditions for other agencies  | Rosemont Copper |  |
| Water                                      | Change design and increase capacity of process water tailings storage  | Rosemont Copper |  |
| Water                                      | Purchase Central Arizona Project water for groundwater recharge at nearest site  | Rosemont Copper |  |
| Water                                      | Resident Well-Owner Protection Program   | Rosemont Copper |  |
| Wildlife and Habitat                       | Convert ranch stock ponds and wells to wildlife water areas  | IDT             | Currently working with Arizona Department of Game and Fish.  |
| Wildlife and Habitat                       | Create water features  | IDT             |  |
| Wildlife and Habitat                       | Fence off a portion of livestock water areas for priority wildlife areas   | Rosemont Copper |  |
| Wildlife and Habitat                       | Where safety permits, place west side lands in the Arizona Game and Fish Department cooperative land owner program                                   | Rosemont Copper |  |
| Wildlife and Habitat                       | Protection for Chiricahua leopard frog (CLF) habitat at stock ponds  | Rosemont Copper |  |
| Wildlife and Habitat                       | Reclamation upgrade to include habitat mosaic for wildlife, bats, snails, and CLF and livestock ranching   | Rosemont Copper |  |
| Wildlife and Habitat                       | Replant agave species from nursery stock   | Rosemont Copper |  |
| Wildlife and Habitat                       | Develop sustainable wildlife water resources during reclamation  | Rosemont Copper |  |
| Vegetation                                 | Integrate grubbing waste as organic matter into soil matrix  | Rosemont Copper |  |

**Draft, Deliberative—Not For Public Distribution**

**Table 1.** Potential Mitigation Developed during the Identification of Alternatives for the Rosemont Copper Project (Continued)

| <b>Issue</b>  | <b>Proposed Mitigation</b>  | <b>Source</b>      | <b>Notes</b> |
|---|---|--------------------|--------------|
| Vegetation<br>Wildlife and Habitat                                  | Create wetland  | IDT                |              |
| Visual Resource<br>Management                                       | Vary heights of waste rock and tailings facilities  | IDT                |              |
| Visual Resource<br>Management<br>Vegetation                         | Install test plots prior to mining to develop soil management techniques  | Rosemont<br>Copper |              |
| Visual Resource<br>Management<br>Vegetation<br>Wildlife and Habitat | Use trees in reclamation  | IDT                |              |
| Visual Resource<br>Management<br>Vegetation<br>Wildlife and Habitat | Plant tree seedlings in reclaimed areas   | IDT                |              |
| Visual Resource<br>Management                                       | Increase slope diversity  | Rosemont<br>Copper |              |
| Visual Resource<br>Management                                       | Plant vegetation on upper benches of pit highwall   | Rosemont<br>Copper |              |
| Visual Resource<br>Management                                       | Stain visible portions of the pit highwall and waste rock or buttresses that may be visible key observation points<br><br>Alternatively, use rocks of varying lithologies and color to avoid large areas with monochromatic tones | IDT                |              |

# Study of Mineral Production

(with reference to Rosemont Copper Project)

Madan M. Singh

Presentation of a Report

July 16, 2009



State of Arizona  
Department of Mines  
& Mineral Resources



## Standard of Living

Just as DNA is the building blocks of life, minerals are the building blocks of our way of life – our civilization!

## Uses of Copper

- Electrical – cables, motors, generators, transformers
- Electronics and Communications – telephone lines, computers, mobile phones
- Pipes – plumbing, sprinklers, refrigeration, air-conditioners
- Transportation | automobiles, airplanes, ships, trains
- Architecture – roofing, statuary
- Biostatic – hospitals, ships, door knobs

## Copper Alloys & Compounds

### Alloys

- Brass
- Bronze
- Monel

### Compounds

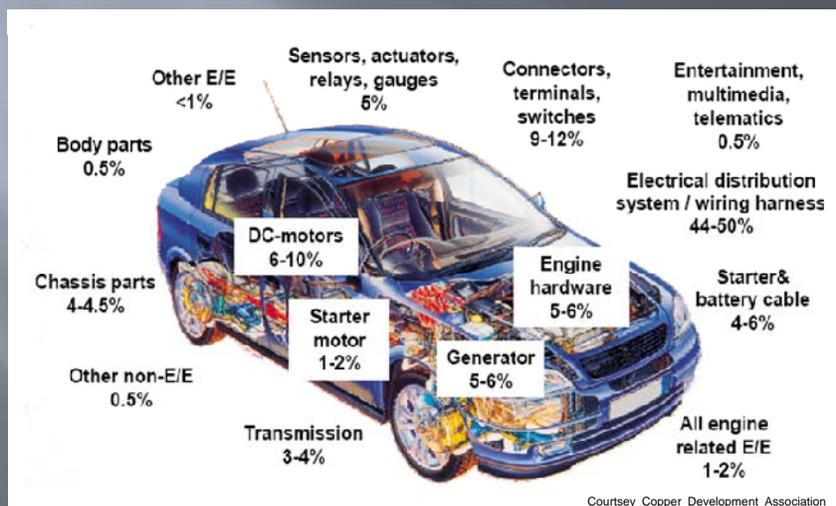
- Copper sulfate – fungicide
- Preservatives for wood
- Chemicals
- Copper-62-PTSM – positron emission tomography radiotracer for heart blood flow measurements
- Complexed with chelate for cancer treatment through radiation therapy

## Specific Examples

|                              |             |
|------------------------------|-------------|
| □ Average American Home      | 440 lbs     |
| □ Appliances                 |             |
| Air Conditioner              | 52 lbs      |
| Heat Pump                    | 48 lbs      |
| Dishwasher                   | 5 lbs       |
| Refrigerator/Freezer         | 4.8 lbs     |
| □ Diesel-electric Locomotive | 12,000 lbs  |
| □ Boeing 747-200             | 9,000 lbs   |
| □ Triton-class Submarine     | 200,000 lbs |
| □ Space Shuttle              | 10,000 lbs  |

## Conventional Automobile

Copper Usage: 15 to 75 lb



## Hybrid Electric Car



### Additional Up To 75 lbs

|                     |        |
|---------------------|--------|
| HV Wiring           | 15 lbs |
| Battery (Li-ion)    | 15 lbs |
| Converter/Rectifier | 5 lbs  |
| Electric Motor      | 27 lbs |
| Electric Converter  | 7 lbs  |

## Wind Power Generation

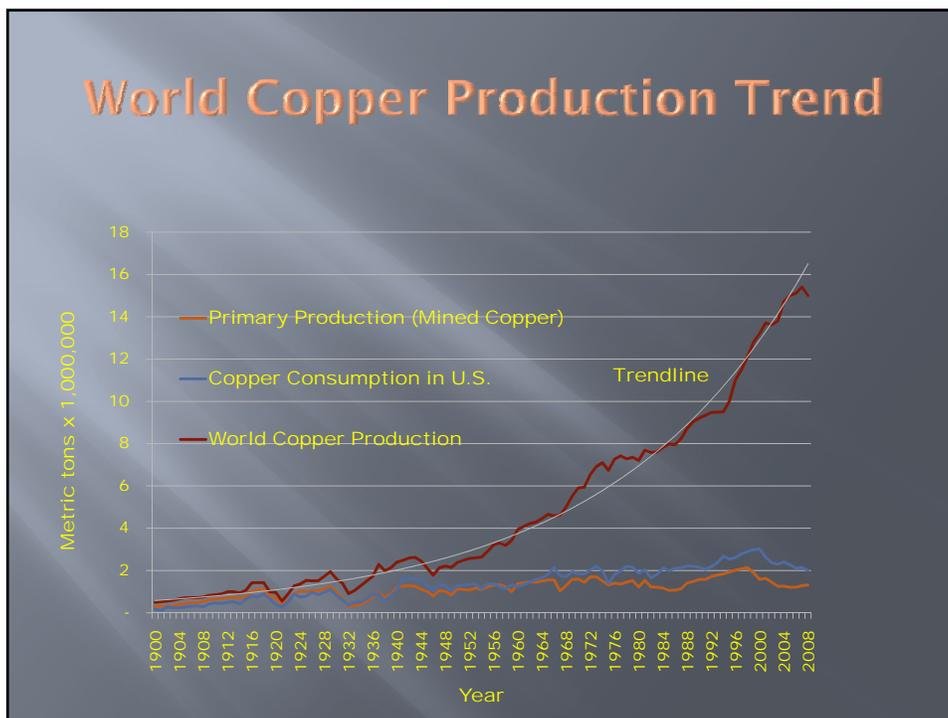
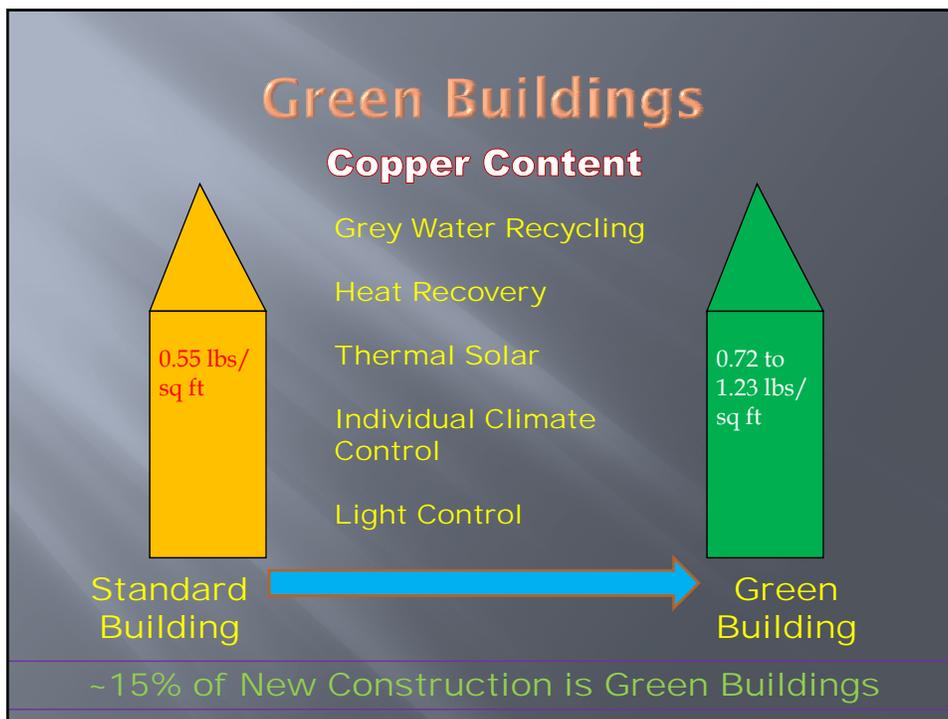
### Distributed Generation

Conventional 800 Mw Plant  
Requires 100 tons of copper

Wind Power Requires 160  
Turbines rated at 7.5 Mw  
Using 1,200 tons of copper

Ratio is 12:1





## Copper Demand & Supply

World Demand            15 million mt  
 Expected Increase      575 kt /year

56 Discoveries made in last 30 years  
 Rate peaked in 1996  
 Of 28 largest mines, 21 cannot expand; will  
 exhaust between 2010 and 2015

Depletion rate equivalent to 3 mines/year

Consumption may accelerate when developing  
 countries build infrastructure and power  
 generation

## Balance of Payments

U.S. Consumption in 2008            2.09 million mt  
 Value                                        \$13.5 billion  
 U. S. Imports in 2008                690 kt  
 Cost of Imports                         \$4.9 billion

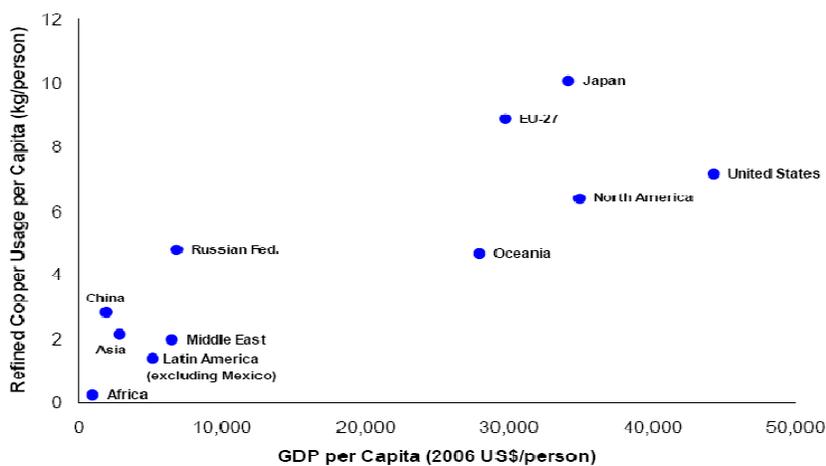
This could be reduced if the copper is mined in  
 U.S.

GDP for Arizona (2007)                \$247 billion  
 Mining (incl. oil & gas) & Support Indust \$4.5 bill.  
 (1.8%)  
 Agriculture (incl. fishing & hunting) \$2.3 billion  
 (0.09%)  
 Accommodations & food services    \$8.3 billion  
 (3.3%)

## Regional Benefits

- Southern Arizona has a tradition and culture of mining
- Three operating copper mines produced 388.5 million lbs in 2008; valued at \$1.26 billion
- Number of mining company headquartered in Tucson
- Nearly 20 mining consulting companies in region
- Several contractors and suppliers located here
- Specimen dealers in the area
- Cement plant, aggregate, and sand-gravel operations
- Personal Income in Pima County in 2006 was \$134.6 million
- Average annual wages in 2007
  - Mining \$55,600
  - Average in Tucson MSA \$38,200
  - Average in Pima County \$31,755

## Intensity of Refined Copper Use (2006)



Courtesy International Copper Study Group

## National Security

A 2008 study by The National Academies entitled "*Managing Materials for a Twentieth Century Military*," recognizes that "owing to changes in the global threat environment and changes in the U.S. industrial base, the emergence of new demands on material supplies, the ineffectiveness of the National Defense Stockpile, and resultant potential for new disruptions to the supply chains for defense-critical materials, the committee believes there is a need for a new approach in the form of a national defense-materials management system."

Similar comments apply to Homeland Security

Minerals mined within the U.S. boundaries are the most reliable source; these are both accessible and economical

# Rosemont Copper Project

## Economic Impact on Pima & Santa Cruz Counties

Prepared for  
Arizona Department of Mines & Mineral Resources  
by  
Seidman Research Institute



# Study Components

- 1. Phases of Rosemont Project overlap**
  - a. Engineering/construction phase (4 yrs)
  - b. Production/post-production phase (25 yrs)
- 2. Direct impacts of Rosemont spending**
- 3. Indirect impacts on study area economy**
- 4. Analysis with dynamic REMI model**



## REMI Analysis Model

1. Regional Economic Models, Inc
2. Used by Arizona, nationwide agencies
3. Year-by-year dynamic analysis
4. Integrates growth factors, such as:
  - a. migration/population growth
  - b. new business development



## Direct Economic Impacts

### Spending by Rosemont Mine\* (Construction + Production/Reclamation Phases)

| Total Rosemont Expenditures |            | In Pima & Santa Cruz County |            |
|-----------------------------|------------|-----------------------------|------------|
| Construction                | Production | Construction                | Production |
| \$880.6                     | \$5,138.2  | \$190.8                     | \$2,027.7  |

\* Figures in millions of \$2008



## Direct Economic Impacts

### Spending by Rosemont Mine\* (Construction + Production/Reclamation Phases)

| Total Rosemont Expenditures |            | In Pima & Santa Cruz County |            |
|-----------------------------|------------|-----------------------------|------------|
| Construction                | Production | Construction                | Production |
| \$880.6                     | \$5,138.2  | \$190.8                     | \$2,027.7  |

\* Figures in millions of \$2008



## Direct Economic Impacts

### Engineering/Construction Spending\*

| Rosemont Expenditures In Pima & Santa Cruz County |        |        |         |        |         |
|---|--------|--------|---------|--------|---------|
| Total   | Year 1 | Year 2 | Year 3  | Year 4 | Average |
| \$190.8   | \$12.8 | \$59.1 | \$105.6 | \$13.2 | \$47.7  |

\* Figures in millions of \$2008



## Direct Economic Impacts

### Spending by Rosemont Mine\* (Construction + Production/Reclamation Phases)

| Total Rosemont Expenditures |            | In Pima & Santa Cruz County |            |
|-----------------------------|------------|-----------------------------|------------|
| Construction                | Production | Construction                | Production |
| \$880.6                     | \$5,138.2  | \$190.8                     | \$2,027.7  |

\* Figures in millions of \$2008



## Direct Economic Impacts

### Production/Post-Production Spending\*

| Rosemont Expenditures In Pima & Santa Cruz County |                   |         |                  |
|---|-------------------|---------|------------------|
| Spending  | Supplies/Services | Wages   | Local Government |
| \$2,027.7   | \$1,505.7         | \$437.8 | \$84.3           |
| Annual Average: 20 Years                          |                   |         |                  |
| \$97.4  | \$73.1            | \$20.2  | \$4.0            |

\* Figures in millions of \$2008



# Economic Impact Sources

## Direct Impacts

Spending by Rosemont for goods, services, and labor in Pima & Santa Cruz Co.

## Indirect Impacts

Multiplier Effects

Within region

## Total Impacts:

Output  
Incomes  
Jobs  
Govt.  
Revenues

# Total Economic Impacts

## Engineering/Construction Phase

| Rosemont Project Impact In Pima & Santa Cruz County |               |         |                  |
|---|---------------|---------|------------------|
| Output  | Gross Product | Incomes | Local Government |
| \$327.6   | \$190.9       | \$118.0 | \$14.6           |
| Annual Average: 4 Years                             |               |         |                  |
| \$81.9  | \$47.7        | \$29.5  | \$3.6            |

## Total Economic Impacts

### Engineering/Construction Phase

| Job Creation In Pima & Santa Cruz County |        |        |        |         |
|--|--------|--------|--------|---------|
| Year 1                                   | Year 2 | Year 3 | Year 4 | Average |
| 170                                      | 770    | 1,370  | 260    | 640     |

## Total Economic Impacts

### Production/Post-Production Phase\*

| Rosemont Project Impact In Pima & Santa Cruz County |               |           |                  |
|---|---------------|-----------|------------------|
| Output  | Gross Product | Incomes   | Local Government |
| \$15,696.1  | \$9,593.8     | \$2,649.7 | \$306.0          |
| Annual Average: 20 Years                            |               |           |                  |
| \$745.1   | \$454.8       | \$118.7   | \$13.9           |

\* Figures in millions of \$2008

## Total Economic Impacts

### Production/Post-Production Phase

| Job Creation In Pima & Santa Cruz County |                                    |
|--|------------------------------------|
| Mining Jobs:<br>Annual Average*          | All Other Jobs:<br>Annual Average* |
| 406                                      | 1,594                              |

\* Based on 20 year full production period



## Residual Impact Summary

### REMI Model Dynamic Growth Analysis

1. Population grows by 2,400
2. Five years after mine closure
  - a. Output \$75 million greater
  - b. Incomes \$37 million higher
  - c. Compared to “no mine” alternative





# Data Sources

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Arizona Department of Revenue  
Mined Land Reclamation Plan  
Regional Economic Models, Inc.  
U.S. Bureau of Labor Statistics  
U. S. Bureau of Economic Analysis  
Arizona Department of Commerce  
Mine Plan of Operations: Rosemont Project  
Rosemont Copper Project Updated Feasibility Study



# Rosemont Copper Project

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## Economic Impact on Pima & Santa Cruz Counties

Prepared for  
Arizona Department of Mines & Mineral Resources  
by  
Seidman Research Institute

