NEPA Basics

Karen Oden

Environmental Engineer

Los Alamos Field Office

EM Environmental Management

safety ❖ performance ❖ cleanup ❖ closure

National Nuclear Security Administration

What is NEPA?

- ***National Environmental Policy Act of 1969***
- ***Law requires Federal agencies to consider impacts of its actions on the human environment***
- ***Law applies to projects that involve federal funding, work performed by the federal government, or permits issued by a federal agency***
- ***Compliance process with procedural requirements implemented prior to decision and action***

What does NEPA do?

- ***Informs decision-making based on environmental consequences and supports actions that protect, restore, and enhance the environment***
- ***Requires federal agencies to analyze potential impacts on social, economic, and physical environment***
- ***Creates an interagency framework to foster cooperation and coordination of federal actions***
- ***Facilitates public participation in agency planning and decision-making before actions are taken***
- ***Requires mitigation of adverse environmental effects which cannot be avoided***

What are the 3 Levels of NEPA Analysis?

- ***Categorical Exclusion (CX)***
  a class of actions that the agency has determined does not individually or cumulatively have a significant effect on the quality of the human environment
- ***Environmental Assessment (EA)***
  determines whether the proposed action will significantly affect the quality of the human environment and evaluates alternative means to achieve the agency's objectives
- ***Environmental Impact Statement (EIS)***
  a more detailed analysis of the impacts of a federal action and its alternatives and is prepared only on what appear to be major Federal actions significantly impacting the quality of the human environment

What are the Major Steps?

- ***Define the proposed action***
- ***Determine purpose and need of the proposed action***
- ***Develop scope of issues to be considered***
- ***Identify other environmental legal authorities***
- ***Develop alternatives and no action alternative***
- ***Analyze affected environment and the consequences of proposed or alternative actions***

How Can the Public Influence NEPA Decision-Making?

- ***Participate in the scoping process***
- ***Participate in public meetings***
- ***Review and submit comments on NEPA documents***

Where Can I Get More Information?

- ***U.S. Council on Environmental Quality (CEQ)***
  Regulations for Implementing the Procedural Provisions of NEPA 40 CFR 1500 – 1508

- ***Department of Energy - Office of NEPA Policy and Compliance***
  DOE NEPA Implementing Procedures 10 CFR 1021
  www.energy.gov/nepa\council-environmental-quality

- ***A Citizens Guide to NEPA-Having Your Voice Heard***
  www.energy.gov/nepa/downloads/citizens-guide

THE ROSEMONT MINE PROJECT

Sorting out the pluses and minuses of the proposed Rosemont Mine has taken the federal government nearly six years and filled thousands of pages. Below we highlight key issues still facing this project, which would create at least 400 long-term jobs but destroy dozens of cultural resources, hundreds of thousands of trees and thousands of acres of grasslands and woodlands in the Santa Rita Mountains southeast of Tucson.

Biological resources

■ Disturbing more than 5,400 acres of grasslands, woodlands and riparian areas could take a significant toll on plants and wildlife, the Rosemont final environmental-impact statement says. It predicts impacts from dust, noise, night lighting and vibration, reduced surface water flows, drying of riparian areas, springs and stock tanks, and blading and filling of canyons.

■ The Barrel Alternative (see glossary) would disrupt six wildlife corridors where mountain lions, jaguar and other animals roam from one mountain range to another, says the EIS, although it would help three other corridors. Nine protected species and more than 40 others with special status could be impacted.

■ Compared with other options, the Barrel Alternative would clear less vegetation and aquatic habitat, stop the least surface water from flowing downstream, have the least impact on wildlife corridors and be least likely to contaminate water, the Forest Service says.

■ The EIS lists nearly 60 mitigation and monitoring measures. They include preserving 4,500 acres, reducing dust by paving dirt roads, relocating some species and using dry stack tailings (see glossary). Rosemont Copper has promised $10 million more to protect and monitor wildlife.

Cultural resources

■ Impacts on historic and prehistoric properties will be "severe, irreversible and irretrievable," the EIS says. The tentatively approved Barrel Alternative (see glossary) would bury, damage or destroy 82 such sites, the EIS says. The area has five prehistoric sites with human remains and 31 likely to have them.

■ The Tohono O'odham consider the Santa Ritas a Traditional Cultural Property named Ce:wi Duag – a cultural landscape of archaeological sites, springs, plants, animals, landforms, natural resources and vistas. They consider it necessary to perpetuate their culture and believe impacts can't be mitigated.

■ Planned mitigation includes burying human remains, excavating important sites and monitoring construction for cultural discoveries. Artifacts would be removed under federal rules and ground disturbance outside the mine would be limited.

■ Rosemont would create a charitable trust to finance recreation, cultural and environmental conservation projects. It would put in $6 million in the mine's first year of production, $500,000 annually over 25 years and up to $25 million more depending on copper prices.

Mitigation

■ Rosemont will spend $25 million to buy about 4,500 acres of land and more than 1,700 acre-feet of annual water rights to compensate for impacts on streams and washes. Included: 1,122 acre-feet of water rights at Cienega Creek; a 1,200-acre ranch near Sonoita Creek and its 590 acre-feet of water rights; the 1,790-acre Fullerton Ranch southwest of Tucson; and Helvetia Ranch North, 940 acres north of the Santa Rita Mountains.

■ The EPA, The Bureau of Land Management and Pima County say the land and water-rights purchases are inadequate or in the wrong location or will be managed with inadequate money. They say Cienega Creek doesn't carry enough water to make its mitigation plan work and Sonoita Creek is in a different watershed from the mine's impacts.

■ Rosemont's mitigation plan has been better received by the Forest Service and the Arizona Game and Fish Department. Game and Fish would manage Sonoita Creek Ranch plus $10 million in other projects. The plans' ultimate arbiter will be the Army Corps of Engineers, which requires mitigation to approve a crucial federal Clean Water Act permit.

Dark skies

■ The mine would brighten dark skies over most of the Santa Ritas, but not as much as originally thought. A lighting-reduction plan would use LED lights with spectral controls to minimize lighting and shield mobile lights to minimize their upward flow.

■ Sky brightness would increase 3.4 percent at a 20 degree angle above the horizon – the lowest useful area for astronomical observations. The mine has also agreed to a monitoring plan at $218,000 to start and $100,000 a year.

■ The mine will generate about three-quarters the light that glows from Benson, down from the original projection of two-thirds as much light as much larger Nogales, Ariz.

■ Astronomers at the Whipple Observatory on Mount Hopkins, run by the Smithsonian Astrophysical Laboratory, say the new lighting plan is better, but they say the monitoring plan is inadequate. "The negative public perception of having a copper mine next to an observatory has already impacted future observatory revenues," the Smithsonian wrote. One example, it says, was its failure to land the $700 million giant Magellan Telescope.

Air quality

■ The National Park Service is concerned about pollution from mine vehicles, dirt roads, crushers and conveyors. But the Forest Service says the mine will meet air-quality standards for six pollutants, including nitrogen oxide, particulates and sulfur dioxide.

■ The EIS and the park service agree the mine would worsen visibility at Saguaro National Park – East and West and raise the possibility that visibility there wouldn't meet state regional haze goals. But the service says that won't violate federal standards. The mine won't face regulatory controls over visibility until 2018, when the state must turn in its next regional haze-control plan.

■ The park service wants additional mitigation. It's also concerned that nitrogen emissions on Saguaro Park-East could fuel buffelgrass and other non-native grasses that drive out native plants.

Scenic Views

■ The mine would permanently damage the area's "scenic integrity," the EIS says. That means "forest landscapes that appear extremely altered."

■ Of nine viewpoints studied for the EIS, four would have permanent, adverse major impacts, including mileposts 44 and 46 along Arizona 83.

■ Mitigation would reduce impacts to views through revegetation of disturbed areas, coloring mine buildings and some concrete structures to blend into the landscape and using commercial technology such as weathering projects to reduce color contrast of the open pit with its surroundings. The mine also would use dust-control measures and cap dry stack tailings to keep them from blowing into the air.

Jaguar habitat

■ The U.S.' only known wild jaguar, a male, has been photographed just west of the mine site three times since October 2012. As recently as October 2013, it was photographed in a broader area that could be impacted by the mine. The jaguar is one of nine endangered or threatened species known to live on the mine site.

■ The U.S. Fish and Wildlife Service says the mine could drive away a jaguar, but not jeopardize the species because 30,000 jaguars live from here south to Argentina. The mine won't destroy or seriously damage proposed jaguar critical habitat, since it would affect only 0.7 percent or 858,137 acres, the service says.

■ The Center for Biological Diversity says disturbing critical habitat would break federal rules because the area is vital for the jaguar since one lives there.

Traffic

■ The mine would generate 55-88 round-trip truck shipments daily, the EIS says. The Barrel Alternative plus expected population growth would generally more than double peak traffic on Arizona 83; Total traffic would rise 28 to 43 percent, the EIS says. Annual accidents would rise from an average of 32 to a range of 41 to 46, the report says.

■ To improve road conditions, the Arizona Department of Transportation will lay 3 inches of pavement on Highway 83 from Interstate 10 to the mine access road, at Rosemont's expense. The company will add turn lanes and road striping, raise guardrails and signs, and pave school bus pullouts. It also will try to minimize deliveries at peak morning and evening hours.

■ Pima County says that's not enough. It wants passing lanes and paved shoulders to ease congestion and accident risks from slow-moving trucks driving sharp curves and hills. It also says the Forest Service didn't adequately analyze impacts on nearby Sahuarita, Santa Rita and Valencia roads.

Effect on species

■ Coleman's coral root, a rare orchid, lives in four colonies on or near the mine site. At least two colonies could be severely impacted by the mine, but the orchid isn't legally endangered because 22 colonies exist, Fish and Wildlife says. The Center for Biological Diversity, which petitioned for an endangered listing, says the colonies should be protected because they're a core population.

■ The mine will harass up to 6,000 endangered lesser long-nosed bats by destroying one roosting site and possibly damaging or making two other roosts less useful to bats with noise, light and other activity. Fish and Wildlife says. Land disturbance will destroy 196,000 to 306,000 Palmer agaves on which the bats feed and 5,400 acres where they forage. But that won't jeopardize the species because the bat population is large – over 100,000 in Arizona – and because mitigation is planned, the service says. Rosemont will buy and conserve land north and west of the mine and plant about 35,000 agaves. Seasonal livestock-grazing reductions could generate more agaves. Pima County says it's not enough to replace up to 300,000 agaves with about 35,000.

Dry stack tailings

■ Dry stack tailings, which use far less water than conventional mine tailings, lie at the heart of the Forest Service's view that the mine won't contaminate groundwater. The tailings, which are pressed with filters to squeeze out water, won't let pollutants seep into groundwater at levels exceeding state standards, the EIS says.

■ While the mine operates, the water would seep underground at the rate of 13 acre-feet per year – enough to serve nearly 30 families.

■ The EIS says 13 heavy metals studied aren't likely to appear in groundwater at levels approaching state limits. But Arizona Game and Fish notes a separate study has found that two less-toxic compounds are likely to seep through – sulfates and dissolved solids. They've been found in groundwater underneath other area copper mines.

■ Sulfates, linked to diarrhea in humans, will seep through at twice the levels of federal standards for taste, the EIS predicts. Dissolved solids, which can make water corrosive or taste brackish, are likely to be found at levels twice what's in the aquifer naturally. Coronado Forest Supervisor Jim Upchurch says groundwater under the site will be monitored, and the service can require mitigation.

Cienega/Davidson impact

■ The EPA, which has veto power over a Clean Water Act permit for the mine, warned in a Nov. 7 letter that the mine would cut off water running through its washes into Davidson Canyon and ultimately Cienega Creek, and that digging the half-mile-deep open pit would remove enough groundwater to "reduce streamflows, increase water temperatures and disrupt breeding, spawning, rearing and migratory movements."

■ But the EIS says some computer models suggest that Upper Cienega Creek would lose little or no stream flows even 1,000 years after the mine closes. Other models predict the stream could by then be running intermittently, maybe only after storms. The EIS predicts the mine would reduce flows in lower Davidson Canyon up to 11.5 percent.

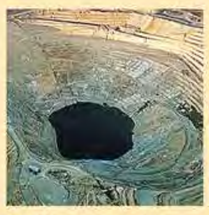
■ The two agencies have disagreed over these issues for two years. Coronado National Forest Supervisor Jim Upchurch says they now have reached broad agreement that mine impacts will resemble what's in the EIS, and are concentrating on how to mitigate the damage. But EPA spokeswoman Margot Perez-Sullivan suggests otherwise, saying, "The November 7 letter is where we're at."

Economic impact

■ The mine would employ an average of 434 people a year and generate 512 to 1,260 indirect jobs, the EIS says, citing different studies. A 2009 Rosemont-financed study predicted 1,594 indirect jobs. Even before the mine opens, Rosemont will create 768 direct and 453 indirect jobs for engineering and construction, the EIS says.

■ With mine salaries averaging $60,000, the EIS predicts $29 million in annual direct pay and $57 million in indirect pay in Pima County. Over the mine's life, employee spending will generate about $576 million annually for local businesses, and mine purchases from vendors will generate $3.6 billion. State and local governments will collect about $136 million in direct tax revenue and $107 million indirectly over the mine's life, the EIS says. It doesn't estimate total economic benefits but Rosemont's 2009 study predicted $30 billion total over 25 years.

■ The EIS cites a 2010 report saying the mine will boost jobs in three surrounding counties by only 0.07 percent, and a 2007 study says if 90 percent of employees live in Pima and Santa Cruz counties, they will account for 0.08 percent of the counties' total jobs. Both studies were by critics of the mine.



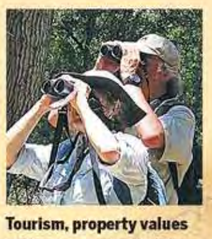
Pit lake, water quality

■ After the mine closes, water will slowly fill the open pit, forming a pit lake the EIS predicts will cover 213 acres and rise 1,229 feet after 700 years. It will hold enough water for nearly 300,000 families for a year.

■ The lake's reactions with the pit's rock walls could cause it to exceed surface-water quality standards for chronic exposure by wildlife to six heavy metals and ammonia, the EIS says. It could cause acute exposure to copper and zinc, damaging aquatic insects and birds that use the lake or feed on insects. The lake won't violate water-quality rules, which don't cover pit lakes. Arizona Game and Fish warns that bird deaths could violate the Migratory Bird Treaty Act. The Forest Service says the lake will be monitored, and that it has asked Rosemont to consider mitigation.

■ The mine's discharge of pollutants to stormwater isn't likely to exceed water-quality standards, the EIS says. The potential for acid rock drainage into streams is also low, the report says.

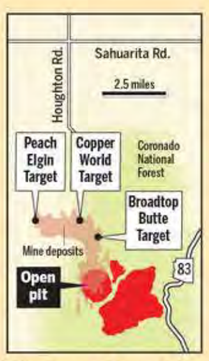
■ Less clear is whether the mine would violate state standards forbidding degradation of Davidson Canyon and Cienega Creek. The Arizona Department of Environmental Quality and the EPA raised that possibility. But in his Dec. 13 draft decision approving the mine, Coronado Forest Supervisor Jim Upchurch wrote that ADEQ had since told him that with mitigation and monitoring, the rules are likely to be met. ADEQ would say only it's still reviewing the issue.



Tourism, property values

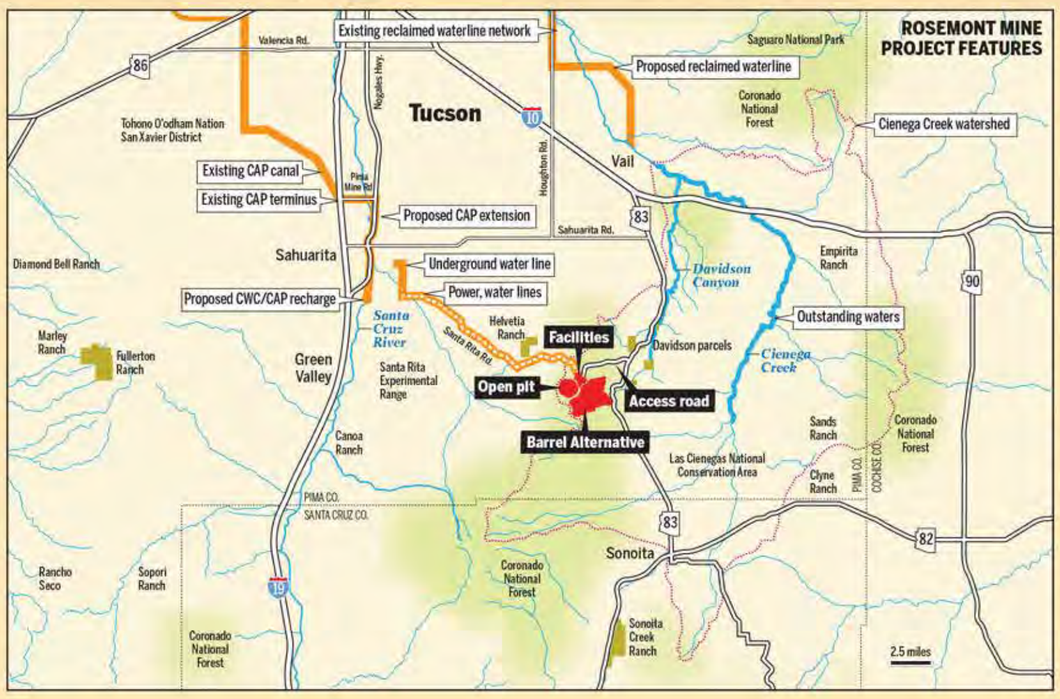
■ The mine could hurt nearby property values and tourism, the EIS says. It projects dust pollution and impact on views will lower property values by an estimated 4.7 percent average for 576 private and 60 state-owned parcels within 5 miles of the mine site. Actual effects depend on how far a property lies from the mine site.

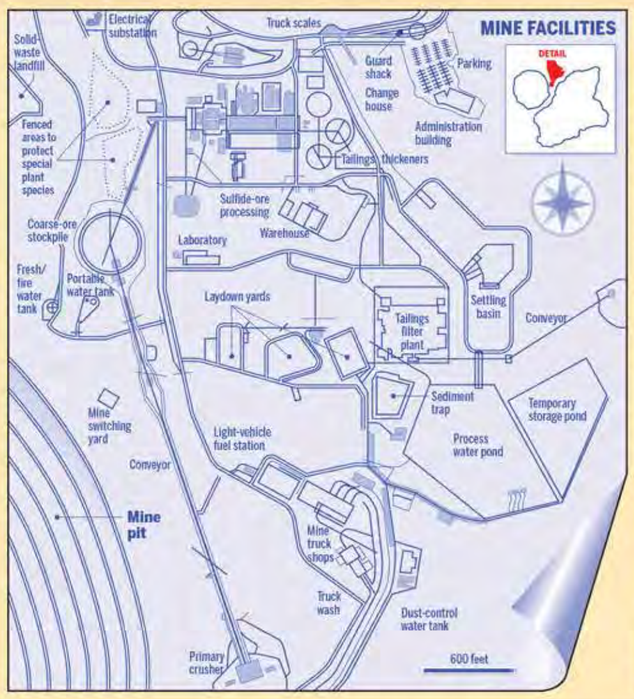
■ Truck traffic and impact on scenic views along up to 4.9 miles of Arizona 83 could reduce tourism by 7.5 to 25 percent in neighboring Sonoita, Patagonia and Elgin and visitor spending by $2 million to $6.8 million, says the EIS. That's based on three studies of tourism impacts in rural Colorado from new residential and business development. Mine supporters dismiss such predictions as unfair and say Rosemont, the country's third-largest copper mine, will draw more tourists than it drives away.



Other Rosemont-owned sites

■ Augusta Resources included these sites in two investor presentations and a feasibility study. But Rosemont Copper says it has no intention of mining them and they were only mapped to show investors they exist.





Reclamation

■ Rosemont would start to restore the mine site to desert the first year of operations. It would build huge rock buttresses over waste rock and tailings, place native soil cover atop the buttresses and plant seed mixes.

■ More than 110 acres would be reclaimed in a year, 590 acres in 5 years, 1,480 acres in 22 years and 3,196 acres after closure, the EIS says. Based on University of Arizona-run studies at the site, soil there could support 17 to 2,856 pounds of vegetation per acre, with final cover of about 70 percent of what's there now. The company will submit a final reclamation plan, which the Forest Service must approve before OK'ing a final mine operating plan.

■ The National Park Service predicts the reclaimed site will support a "minimal percentage" of the plants now there. It fears that clearing and reclaiming the site will let invasive plants spread.

■ Pima County questions earlier predictions that mesquite, acacia and juniper seeds, not easily blown by wind, will naturally recolonize the site. The county warns that soils placed there won't become productive for thousands of years, questions whether enough soil would be available and says Rosemont should have to pay for reclamation even after the mine closes. The county says the EIS doesn't require enough replanting to replace the trees cleared – now estimated at about 291,000.

Well declines

■ East of the Santa Rita Mountains, a falling groundwater table due to digging the open pit would cause the closest household wells to drop more than 10 feet. Wells would drop 5 feet or less in farther-off Corona de Tucson north of the mountains, the EIS says.

■ West of the Santa Ritas, mine well pumping would cause 1.5 to 3.5 feet of additional declines a year, or 10 to 90 feet total, over the next 100 to 140 years. That's on top of the current 3.5-to 6.5-foot annual declines near existing wells, the EIS says. After 20 years, declines would spread up to 3-4 miles from Rosemont's wells. Eventually, about 500 to 550 wells west of the mountains and 360 to 370 to the east could decline at least 10 feet, the EIS says.

■ For mitigation, the Forest Service notes that the mine's dry stack tailings would use 50 percent less water than conventional mine tailings. Rosemont says it will recycle water, and has signed an agreement with well owners in Sahuarita Heights that both sides say will protect owners against major well-level declines. The mine, which has recharged 45,000 acre feet of Central Arizona Project water in Marana, will build a $25 million, 7-mile pipeline to bring CAP water to the Green Valley-Sahuarita area to compensate for pumping. But there is strong disagreement over whether enough CAP water will be available for the mine to meet its recharge promise, due to drought and climate change.

Glossary

Barrel Alternative: The Rosemont Mine layout tentatively selected by the U.S. Forest Service. It would place all tailings and waste rock in upper Barrel and lower Wasp canyons, and leave undisturbed the adjoining McCleary Canyon, which the Forest Service considers the area's most biologically diverse canyon.

EIS: Environmental Impact Statement of the mine, prepared by the U.S. Forest Service.

Mitigation: Steps to reduce the damage or severity of an action.

Outstanding waters: A legal classification the Arizona Department of Environmental Quality has given all 28 miles of Cienega Creek and 3.2 miles of Davidson Canyon. It means the water quality of those streams cannot be degraded.

Reclamation: Restoring land to its original state.

Dry stack tailings: Mine residue that uses less water and takes less space than other types of tailings.

1/19/14 · SOURCES: Pima County, Rosemont Copper, Google

RESEARCH BY STAFF WRITER TONY DAVIS/INFOGRAPHIC BY TAMMIE GRAVES / DESIGN ASSISTANCE BY DANIEL RAMIREZ AND MARIA CAMOU DE TOLEDO / ARIZONA DAILY STAR