MEMORANDUM

Date: December 11, 2006

To: The Honorable Chairman and Members
Pima County Board of Supervisors

From: C.H. Huckelberry
County Administrator

Re: **Sustainable Mining**

The attached informational report explores the meaning of "sustainable mining," a phrase that has been used recently in the debate over the Rosemont Mine. This report finds that a sustainable mining initiative is supported by the world's largest copper companies, in an effort to secure the willingness of local communities to allow continued or increased levels of mineral extraction.

Sustainable mining was the subject of a recent United States Environmental Protection Agency conference held in Tucson. The "Hard Rock 2006: Sustainable Modern Mining Applications" conference was attended by Pima County Regional Flood Control District and Pima County Department of Environmental Quality staff. The attached report draws from several relevant presentations from the mining industry as well as their critics.

This report also provides information about the declining relevance of the mining industry to the Pima County tax base. As one recent report put it,

> "one of the major problems facing mining in the United States in that while its size is large globally, its import is relatively minuscule domestically. By any measure of value, the metals sector falls well below one percent of GDP..."

Locally, this relevance to our economic viability is reflected in a substantially declining percentage of the overall County property tax base. In 1977 the mines constituted approximately 15 percent of the total tax base. Last year, in 2005, this had diminished to approximately one-half of one percent of the total tax base. While mining and mineral extraction may be important nationally, it is almost irrelevant in the provision of local tax revenues.

The impacts of mineral extraction are felt very directly from a local perspective. Blowing tailings and air pollution experienced by the residents of Green Valley are very much a direct local impact of mining. Water pollution in the Green Valley area from tailings ponds is also a direct local impact. The visual blight on the natural landscape is a local impact seen one time or another by every resident of Pima County. These local impacts without benefit

require mitigation and resolution. To date there are no real attempts to mitigate these adverse local effects of mining, simply an archaic regulatory and permitting process that does nothing to promote what has been coined the new wave of mineral extraction -- "sustainable mining."

Given the onslaught of new mining requests, both on State Trust lands and federal lands, it is important that significant reforms be undertaken so that local communities are not continually expected to burden the adverse impacts of mining.

I certainly understand the need to provide minerals to sustain our modern quality of life. I do not argue with these needs. I do, however, believe that there should be much more attention paid to long-term mitigation of adverse impacts to local communities and the full and complete restoration of historic and abandoned mining sites so that they are returned to the natural landscape.

CHH/jj

"Sustainable Mining"—A Brief Description and Analysis

Prepared by Julia Fonseca, Environmental Planning Management, Pima County Regional Flood Control District

Why Sustainable Mining?

During the debate about whether 3,135 acres of Forest Service land in the Santa Rita Mountains will be used for a new copper mine, our community has been introduced to a new phrase. The metals industry has indicated an interest in "sustainable mining" practices. This report explores the meaning of the term.

"Sustainable mining" is derived from the concept of sustainable development. Sustainable development can mean many things, but the most frequently quoted definition is from the report *Our Common Future*:

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[1]

This is a definition that leaves room for many differing interpretations. Despite this, some general areas of agreement might be:

- the idea of *fairness*, including the concerns of the poor and future generations,
- the practice of *long-term thinking*, and
- the practice of *systems analysis*, to account for the relationships between the environment, society and economics (the "triple bottom line").

The metals industry has adopted the notion that they need to provide the bridge to subsequent socio-economic uses of the land they mine. They acknowledge that this is necessary to help get and maintain the social license they need to continue mining. Thus, as they use the term, "sustainable mining" is not an oxymoron. The industry realizes that mining at a given location is unsustainable. "Sustainable mining" is about creating a social willingness to accept mining, as much as it is about providing local communities or countries a bridge to a future economy which does not include mining. As one mining company put it,

"To secure a continuing license to operate, the mining and resources industry will have to frame its future in economically viable, socially beneficial and environmentally sound practices that are negotiated with communities within which it works."[2]

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[1] 1. World Commission on Environment and Development (WCED). *Our common future.* Oxford: Oxford University Press, 1987 p. 43. The Brundtland Commission's definition was adopted at the 1992 Rio de Janeiro Summit.

[2] Anglo American, one of the ten companies involved in the Global Mining Initiative. See the Initiative report summary at http://www.iied.org/mmsd/mmsd_pdfs/finalreport_es.pdf. Accessed 27 November, 2006.

The Global Mining Initiative (www.globalmining.com) includes BHP Billiton, Newmont, Rio Tinto, and Phelps Dodge (now part of Freeport McMoRan, the world's largest copper company). The Initiative is studying how the mining industry can help transition the world to a sustainable economy.

Pima County has given much copper to this nation. As a result, natural vegetation has been destroyed or displaced on about 35,000 acres. Photograph used with permission from David Briggs.

The Initiative arises out of many conflicts and problems which currently impair access to mineral resources needed for an expanding global economy. One U.S. mining association cites various laws such as the Endangered Species Act and Clean Water Act as impediments to sustainable development.[3] The industry recognizes that local communities often oppose mines due to the toxic legacy left by past mining. Labor disputes, blockades and other forms of community resistance are costly to the mines.

Sustainable mining concepts are being discussed by the major mining companies, not generally the smaller ones. Augusta Resources, a small Canadian firm proposing to mine the Rosemont area of the Santa Rita Mountains, may understand that a social contract with the citizens of Pima County will improve the marketability of Rosemont mining prospect. Small mining companies lack the resources to develop a mine, but if they can negotiate successful agreements with federal, state and local officials, then they will enhance their financial capabilities to either develop the mine or sell the rights to mine at a profit to one of the major companies.

Sustainable Mining as Translated to the Project Level

Mining companies are taking the concepts of sustainability as developed through the Global Mining Initiative and applying them to their specific projects, with various results. The best of the current mining practices were highlighted at a recent conference in Tucson, Arizona. Sponsored by the U. S. Environmental Protection Agency, the conference theme was "Sustainable Modern Mining Applications".

In most cases, companies seem to be translating sustainable mining as the need for mining companies to identify and assist post-closure land uses on mined land and economic development for local communities. This type of planning is occurring concurrent with plans for new mines.

[3] Laura Skaer, Executive Director, Northwest Mining Association , Sorptive Minerals Institute Spring Forum, 2002, accessed November 27 at www.nwma.org

Many of the communities near mines lack the capacity to plan or execute land use planning or economic development on their own. Large mining companies have long-range planning horizons, a technologically advanced staff, and financial capabilities that often far exceed those of the communities in which they operate.

In Superior, AZ, Resolution Copper is assisting the local chamber of commerce in planning their area, and developing tourist facilities. In Pinal County, BHP Billiton is planning a new residential community, located on the mine tailings and other ranch lands owned by the mines. The U. S. Bureau of Land Management in Nevada is streamlining the process for patenting (turning over federal land to private entities) in order to facilitate redevelopment of mined landscapes after closure. In remote areas of the west, landfills and wind farms are being proposed as part of the plans of operations for mines, in order to provide economic returns after mining is done. At Rosemont, ranching has been suggested by Augusta Resources as the post-closure land use on the Forest lands, with provisions for recreation. A foundation would provide long-term funding for various environmental and social concerns.

The other practice which copper companies are embracing is land surface reclamation. Locally, great strides are being made in revegetating mine land at San Manuel, although the reclamation is denuding an area of intact natural vegetation nearby in order to secure clean fill to place on the tailings.

One of the greatest impediments to sustainable mining is the industry's inability to avoid polluting land and water. The industry's primary response to pollution has been to fund innovative new technologies to remediate water quality contamination. One presenter at the conference noted that water quality is the single mostly costly impact at copper mines, not surface damage[4]. A study of 70 Environmental Impact Statements (EISs) for modern-era hardrock mines found consistent underestimation of water quality impacts[5]. The EIS process led to predictions for impacts which took into account all of the mitigation measures that the mines would make to avoid or minimize the water quality problems. Actual water quality measurements more closely resembled what was predicted without mitigation.

Neither industry nor government is successfully addressing the financial components of sustainability. Taxpayers have been saddled with enormous cleanup costs and health risks, and support costs for unemployed work forces stranded by mine closures. Financial assurances for existing large copper mines in the West are on the order of $3000 to 5000 per acre, barely enough to cover surface reclamation, let alone water

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[4] Jim Kuipers, P. E. Reclamation and Bonding in Copper Mining. Presented at Hard Rock 2006: Sustainable Modern Mining Applications, Tucson, AZ, November 2006.

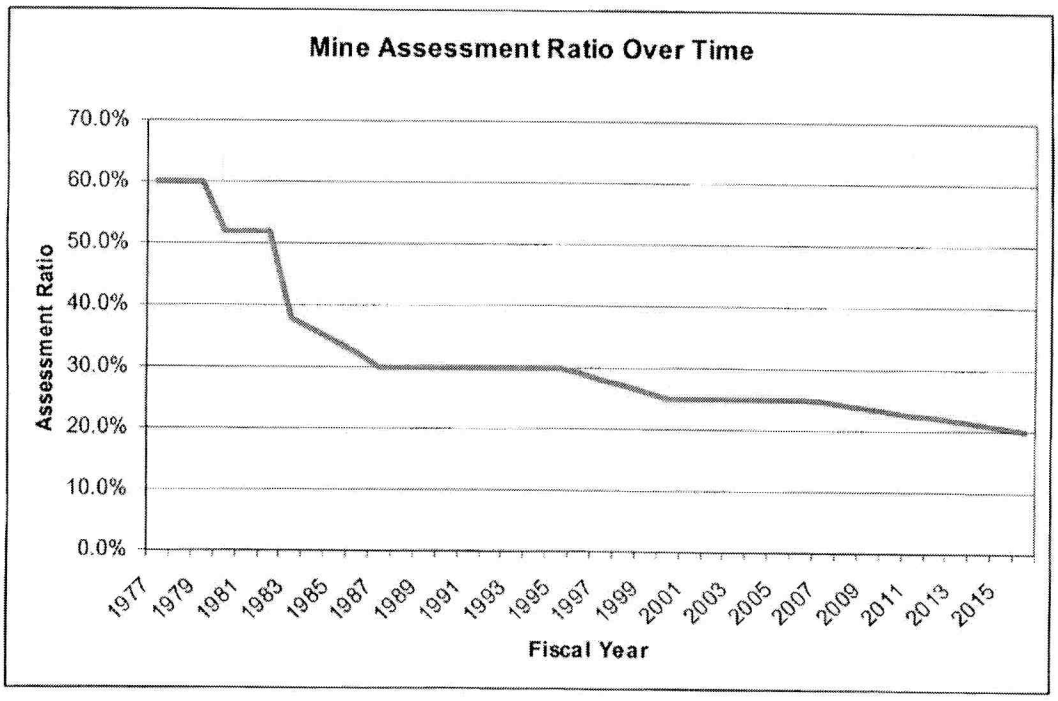
[5] Ann Maest, and others. Predicted versus actual water quality at hardrock mine sites: effect of inherent geochemical and hydrological characteristics. Presented at Hard Rock 2006: Sustainable Modern Mining Applications, Tucson, AZ, November 2006.

quality contamination[6]. In many cases, water quality protection and treatment will be needed *in perpetuity.*

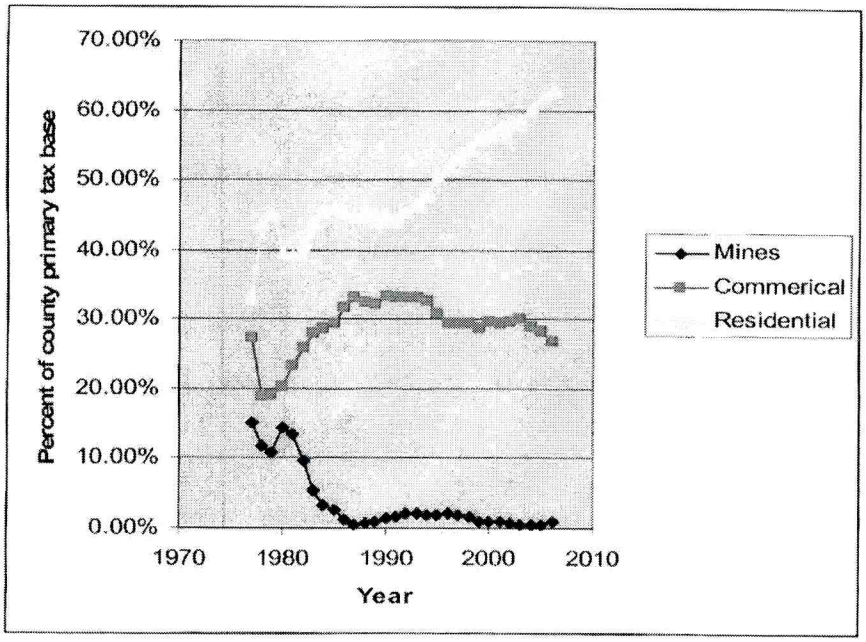
In New Mexico (where water quality and bonding regulations are more restrictive than in Arizona) authorities for the Tyrone closure have financial assurances on the order of $277 million. Based on the information presented at the conference, the financial assurances needed for the Rosemont reclamation would be on the order of $150-$250 million. This may equal or exceed the total current market value of Augusta Resources.

Financial Contributions of Mineral Extraction in Pima County

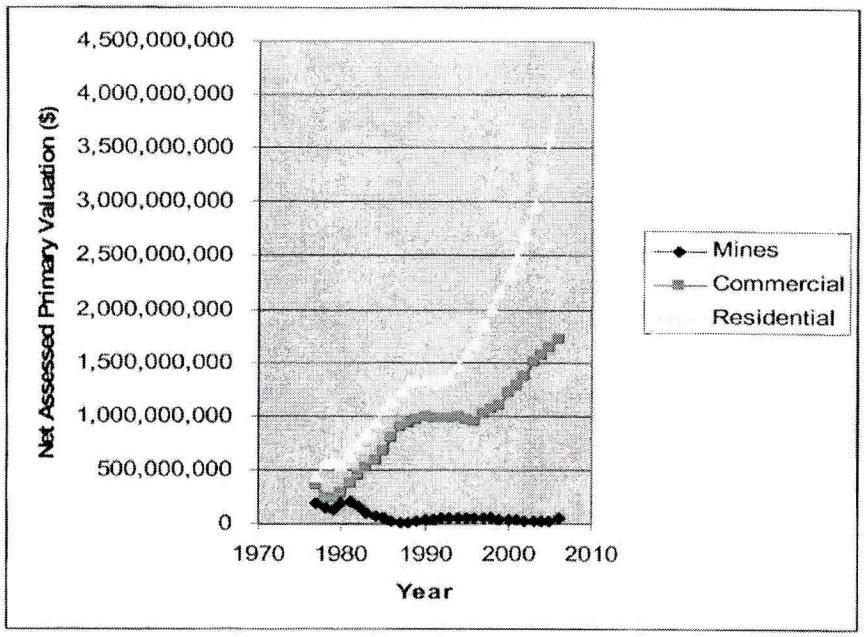
At the same time the public is bearing increasing costs from mining impacts, Arizona's tax assessment ratios on mines have been declining (see below). Tax assessment ratios affect the amount of taxes levied on mines relative to other land uses. Over the years, mines, utilities and commercial property have gotten reduced assessment ratios but tax assessment ratios for vacant, agricultural and residential property have not received any changes. Recently, the legislature approved a law which will continue this declining trend for mines and utilities over the next ten years.[7]



[6] Jim Kuipers, Kuipers and Associates, *ibid.*
[7] Bruce Basemann, Pima County Finance, personal communication, November 30, 2006.



The graph above (prepared from data provided by Bruce Basemann, Pima County Finance) illustrates that the commercial and residential sectors are carrying a proportionally larger share of the tax burden in Pima County.



Although mining was historically important in Pima County, the residential and commercial sectors now far exceed the valuation of the entire mineral sector, despite the recent upswing in mineral production. The total acreage of land in mining use is 48,242 acres, far exceeding commercial acreage.

Local Government Role

The Rosemont mine is by no means inevitable. Anyone involved in mine development knows how risky new mines are. As recently as 2002, the U.S. metals industry was moribund, paralyzed by low commodity prices and lack of investment. Today, for the moment, commodity prices are at an all-time high. The previous incarnation of the Rosemont mine failed when the price of copper plunged, and ASARCO went bankrupt. Local and federal hostility characterized the environment in which mining investments were decided.

At one level, the decision about how National Forest land will be used is a federal one, resting with the Coronado National Forest, in consultation with others in the federal government. At another level, this is major local land use change. The industry, and likely the federal representatives as well, recognize the need for a social agreement to allow mining to proceed.

Unlike most communities, Pima County has a local plan for the landscape, known as the Sonoran Desert Conservation Plan (SDCP). The plan has guidelines to be met. The Board of Supervisors will decide whether a copper mine in the Santa Ritas is compatible with the locally adopted land use plan, and in the best interests of the community in maintaining the tax base, as well as public health, safety and welfare.

In no way is the Board compelled to support the notion of a new mine in order to request that the federal government honor the SDCP or other community standards. Regardless whether the Forest Service approves or disapproves the use of the land, the SDCP and sustainability concepts may be useful in informing the federal, state and local decision-making processes.

A larger question is whether Pima County and the mining industry can or will try to address some of the difficult problems which underlie the search for sustainability. Sustainable development would protect the integrity of the Conservation Lands System and ecosystem processes. Sustainable development would mean planning how overall groundwater uses by mining, not just the municipal sector, will be reduced. It means having an effective safety net for people when mines go bankrupt. Sustainable development would mean planning a post-closure future for the county's existing and abandoned mines. It would involve cleaning up tailings on the San Xavier District and elsewhere.

Sustainable development would mean sharing the wealth created by mining with local communities, not diminishing taxation. Sustainable development would mean improving Arizona's weak laws regarding water quality reclamation and bonding, and supporting measures to use less copper, and recycle more. On a national level, sustainable mining would require modifying the 1872 Mining Law for use and patenting of land. The mining industry would rebuild trust by tackling the underlying problems motivating the "sustainable mining" discussion, in partnership with good governance at state, federal and local levels.