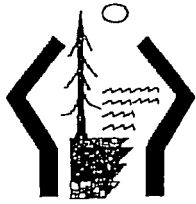


Attachment 7

June 6, 2011 Letter from Dr. Curry



Watershed Systems

Robert Curry, Ph.D.,

P.G.

Hydrology - Geology - Soil Science

600 Twin Lanes, Soquel, Calif. 95073

831 426-6131; curry@ucsc.edu

field: 760 932-7700

Ms. Jennifer Lee
115 Quatal Canyon Road
Maricopa, California 93252

Re: Agenda Items 1 & 2,
Santa Barbara County Planning Commission Meeting June 6, 2011

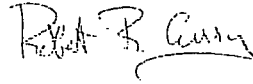
Dear Ms. Lee,

Attached is a brief report on some of the technical issues relating to the Proposed Diamond Rock Mine and on the proposed Joint Venture between Diamond Rock and the GPS Mine adjacent to it in the Cuyama River streambed of northeast Santa Barbara County. As you know, I had previously submitted a professional analysis of the GPS Mine activities and site sediment budget to the County Planning Commission on June 6, 2009 and on Diamond Rock site hydrology in September, 2008. You have now secured extensive documentation through Freedom of Information Act requests and direct inquiries on this matter from U.S. Army Corps of Engineers (ACOE), U.S. Environmental Protection Agency (EPA), California Department of Fish and Game (CDFG), California Office of Mine Reclamation (OMR), CalTrans, and County agencies. I feel that I now have a good grasp of the complex and often contradictory proposals for new and continuing in-stream mining activities. Also, we now have a preliminary compilation of the U.S. Geological Survey's ongoing Cuyama Valley Project with much of the data posted online. I have now been able to review the extensive correspondence files from the applicants and their predecessors, as well as the reports and documentation used to attempt to justify the matters before the Planning Commission this coming week.

The record reveals that the applicants' objectives have been changing as they became aware of the considerable regulatory requirements for direct removal of streambed materials from a live river system that is classed as a Water of the United States. Santa Barbara County has likewise been asked to reconsider its long-standing approval procedures and has had to deal with appeals and revise its Conditional Use Permit (CUP). Lack of initial understanding of the potential consequences of this kind of operation and assumptions that historical activities can proceed as before has led the applicants to believe that they could develop economic aggregate mining operations similar to those conducted in the Cuyama River in the past. In effect, the applications for expanded areas of Cuyama River in-stream mining are simply in the wrong place at the wrong time. This site is where mining has taken place in the past, where their processing plant exists, and where they own or control the property. But the regulations that restrict in-channel mining in a statutory water of the United States are soundly based and do not restrict all sand and gravel mining operations; only those in watercourses, wetlands and some kinds of wildlife habitat. Similar challenges and disappointments have happened throughout California in this industry. I have worked for landowners, mining companies, regulators, and planning agencies for more than 50 years as this regulatory environment has changed. The

importance of water supply, agriculture, water quality, and our understanding of river functions or fluvial geomorphology (my field of specialization and lifelong teaching) have improved and changed through those 50 years.

Respectfully Submitted:

A handwritten signature in black ink that reads "Robert R. Curry". The signature is written in a cursive style with a horizontal line underlining the name.

Robert R. Curry
Registered California Geologist

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Cc: Gary Kaiser, SB County

Via Email: David Villalobos : dvillalo@co.santa-barbara.ca.us

EVALUATION OF PROPOSED MINING ACTIVITIES IN THE CUYAMA RIVER ALLUVIAL AQUIFER

-Robert R. Curry PhD
June 2, 2011

For the GPS and proposed Diamond Rock mining ventures, the regulatory record is quite clear. All of the review agencies except Santa Barbara County have echoed the basic concerns of protection of hydrologic functions, sediment transport budgets, and maintenance of the stability of the river system. Yet, the applicants continue to request extraction by deep excavation, not skimming, and removal of more material than is naturally replenished within a time frame of years to decades. It is simply not true that one can dig holes in the river bed and deflect the annual flows of the river around those holes without upsetting the equilibrium of the river *system*. This *system* is one of water and sediment and gradient or energy expenditure. The records presented by the applicants clearly show that fundamental changes have occurred and continue to occur in association with the deep streambed extraction of material at the GPS mine site. Proposed constraints on depth of mining (45 feet) and rates of extraction are not calculated to mitigate ongoing damage. They are simply a compromise proposed by the agencies to try to let mining proceed for 5 years and then reassess the situation. The applicants need a 30-year window and 90-foot depth for economic viability. Under current regulatory constraints, the mine sites are too small and the haul distances too great to simply hope that each five-year window of opportunity can be renewed without indications that the fluvial system is imbalanced and causing damage to adjacent and regional properties and habitats.

The County is now being asked to approve a piecemeal mining effort under the pretext that the original mining plan might be approved in the future after a 5-year regulatory restriction has expired. In my professional opinion, based on my studies of sediment transport in the Cuyama River at the mines' location, and based on groundwater status and recharge at this somewhat critical point in the valley, there is no reason at all to expect that conditions five years from now will differ sufficiently to permit the proposed expansion and autonomous operation of two separate immediately-adjacent mines. Federal and State regulators cannot be expected to change their regulatory requirements and statutes to weaken protections. Ongoing proposed changes in the regulatory language of the Corps of Engineers are designed to reinforce, not weaken, the current language that addresses in-stream mining.

Cuyama River Underflow is the local water source

The Cuyama River carries surface water at the mine sites infrequently, and usually only during winter storm periods. Local agriculture and domestic water is almost all supplied from wells. But that water is not from some source such as rainfall that recharges a regional aquifer. For the agricultural and residential parts of the Cuyama Valley in Santa Barbara County, Cuyama River *underflow* is the primary source of shallow potable groundwater. The river bed sand and gravel carries water throughout the year and feeds water to the water table. That kind of arid-land stream is termed *influent*, and is usually ephemeral and carries runoff throughout its length only during persistent rainfall. Thus, wells near the Cuyama River can be shallower than those at a distance from the water source.

A critical issue is that the water in the upper river valley at the mine site flows all year in the gravel bed of the river – even in dry years when there is little or no surface runoff. During heavy rainfall years, the water table may be recharged directly from surface rain and some of that water may seep into the river or feed its ephemeral tributaries (*effluent* to the Cuyama River), but reliable upper Cuyama Valley water supplies must rely on river recharge, not rainfall. Thus protecting the shallow underflow of the river is of paramount importance to all upper valley water users.

Underflow is considered part of the river – not part of the groundwater. California law considers underflow as part of the river subject to water rights but once it is tapped by a well away from the river, it is considered as a property of the landowner. In the case of the Santa Barbara section of the Cuyama Valley, that is not really valid. Here wells 100 feet deep or more tap river water fed primarily by the underflow. Geologically old water in deep aquifers that can be recovered with deep wells with large pumps, and is gone after it is consumed, also exists in the Cuyama Valley. Deep agricultural wells (300 to 500 feet) may or may not be recharged from the river but water percolates so slowly to those depths that such water may be considered a finite non-renewable resource. The U.S. Geological Survey Cuyama Valley study¹ shows that while well depths may be much deeper, the static water tables near the river may be at river level in mid winter but then drop as much as 50 to 100 feet during periods of summer pumping of nearby wells.

This variation is part of the problem that faces the in-stream mines. The applicants would have us believe that it is possible to mine gravel without exposing the alluvial underflow. As pointed out by the ACOE, OMR and EPA, that is possible only for “skimming” operations that take the top few feet of gravel off seasonal gravel bars. This is the most common type of gravel mining in California rivers. With repeated reference cross-section surveys to insure that the elevation above sea level of the skimmed bars is not reduced in subsequent years, this kind of operation can maintain reasonable channel stability, and it usually only requires one repeat survey each year. But that is not what is proposed for GPS and Diamond Rock where economically sufficient volumes of material cannot be recovered in the space and time available. Here any surface flow during the year that passes the mine site may aggrade (build up) or erode the streambed downward.

Requiring backfilling with clean aggregate to provide 6 feet of cover “if” the underflow is encountered is ludicrous. Sooner or later it will be encountered because it is not a static fixed depth of flow but is instead seasonally higher and lower. The streambed underflow flows in a porous sand and gravel matrix. Surface dikes and berms constructed in the channel will not affect the ability of water to flow and seep into the mine pit. The underflow will be exposed as it has in the past and will require an independent monitor to enforce the cover-constraint provision. How can the companies expect to supply gravel if they have to stop and backfill every other year, and stop mining completely after a few years of excavation?

Maintaining water quality in the underflow is important. That is the reason the agencies require recovering an exposed surface of free water. The underflow water has reasonably high levels of dissolved constituents that will be evaporatively concentrated if exposed. This is a real issue and one cannot ignore the requirement when it is not convenient.

The CDFG Section 1603 Streambed Alteration Agreement in 2003 for what became the GPS Mine contained documents from the operator that state “*The property will not be suitable for additional sand and gravel mining upon termination. The river annually replenishes the mined*”

¹ Hansen, Randy, in progress, Cuyama Valley Water Resources. <http://ca.water.usgs.gov/projects/cuyama/gmaps/studyarea.html>

material with fine grained sediment unsuitable for construction material." This statement differs from more contemporary claims that both Diamond Rock and GPS pits can be refilled without physical or chemical underflow aquifer or economic impacts.

Instream berms or dikes are damaging the north bank of the river

A braided stream with ephemeral or intermittent surface flow moves sediment by carrying finer particles in suspension and rolling sand and cobbles along the bed. These are termed suspended load and bed material loads. The gradient of the river and water depth determine the water velocity and carrying capacity of the sediment load. When barriers are placed in the channel to divert flow around the mining excavation sites, the channel width is effectively constrained. This means the flow diverted by the protective berms is deeper and faster and thus has more capacity to transport sediment. The river flow is no longer balanced with the sediment that can be bounced and rolled along the bottom and thus becomes "hungry" and erodes any place it can. Since the banks are either finer grained and/or more vertical and the river can only downcut slowly because of its overall regional gradient, the channel expands laterally and tries to maintain its equilibrium width. In this case it can only expand westward away from the mines.

The 1999 CDFG Stream Bed Alteration Permit required that that *"The Operator shall not construct any above grade structures so as to divert any surface flows around the mine"*. This was interpreted by the Operator to not prevent construction of earthen berms 4 feet above grade. But such features were constructed and did indeed divert surface flows while providing opportunities to operate the mine throughout most of the year.

Since at least 2005, lateral expansion of the channel has been dramatic. Geologically old (late Pliocene – early Pleistocene) deposits that have never been part of the Cuyama River system are being exposed in steep-slumping riverside banks upstream of the GPS berms. This is the area where the flows have been diverted to the left bank (west side) of the river. This accelerated erosion extends upstream well above the site of the proposed new Diamond Rock mining. It is important to appreciate that this is not caused by high flood flows that ultimately overtop the ~4-foot-high berms or levees, but by the lower more common annual flow events that are prevented from entering the pit.

Plate 1 is a photograph of the left (west) bank of the river taken October 11, 2005 when the river first cut deeply into its historic natural banks. This site is upstream from the GPS site and across the channel from the up-stream end of the proposed Diamond Rock site. This site is an old, now abandoned, strath (bedrock) river terrace. About 3 feet of old flood deposits with a well-developed soil lie on top of 10-15 feet of "bedrock" made up of folded poorly-consolidated siltstones. This is contemporary channel-bank erosion that is at least partly the result of channel constriction downstream at the GPS mine. The proposed protective structures for the Diamond Rock mine will exacerbate and expand this bank-cutting.

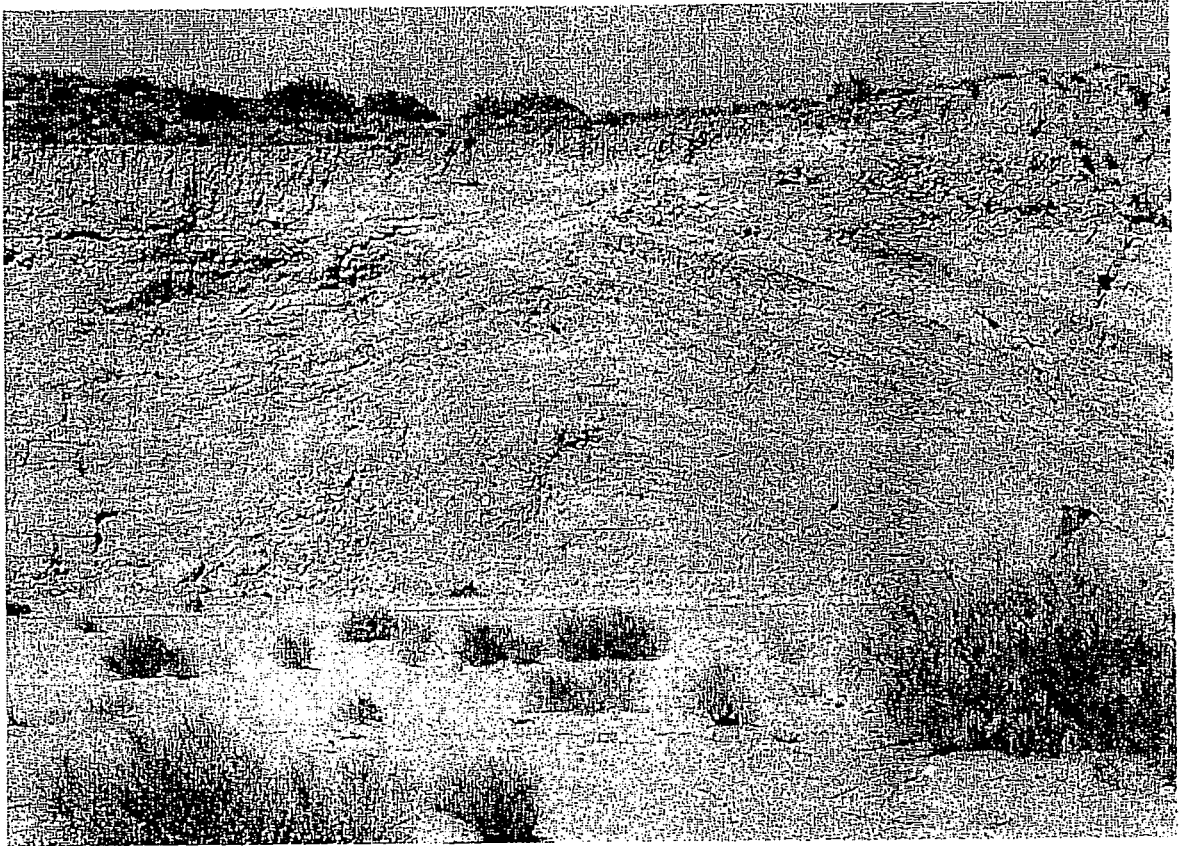


Plate 1. Antlclinal fold on left bank of Cuyama River across from Diamond Rock Mine parcel.
Oct 11, 2005

Plate 2 is a close up of the left-bank cutting near the Plate 1 photo. This is a photo taken January 11, 2009. It shows slumping of the poorly consolidated silty bedrock just downstream (right) of the Plate 1 photo. This silt is carried downstream by subsequent flows.

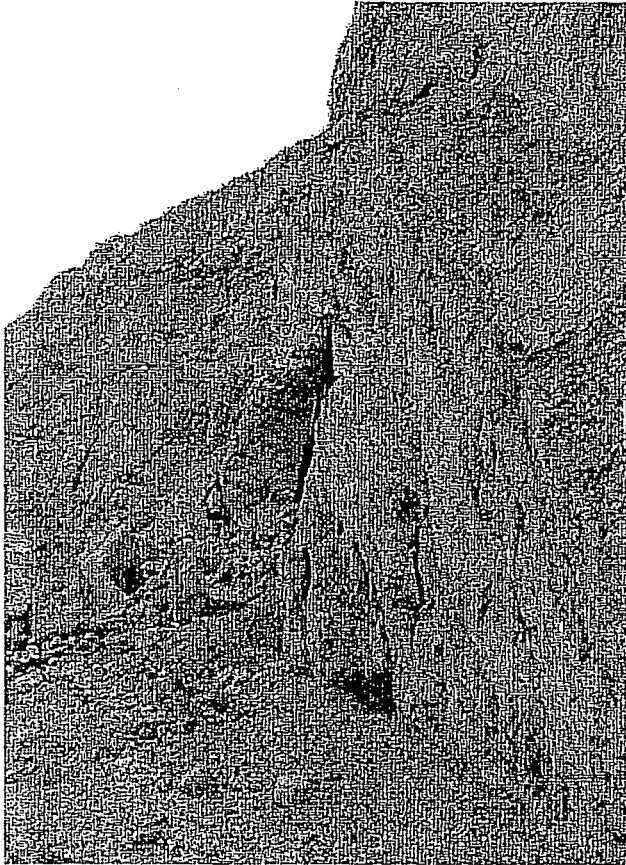


Plate 2. Slump in folded poorly consolidated early Pleistocene/Late Pliocene bedrock sediments.

It is apparent that downstream protective berms slow flows across the entire channel and that the highest velocity flows are thus deflected westward. Ultimately the river may bypass the mine sites completely with a resulting increased fine sediment load in the river to be carried in suspension into Twitchell Reservoir.

These photos are only two of many that illustrate both incision (downcutting) of the channel in the vicinity of the GPS mine and proposed Diamond Rock mine and lateral erosion into the left (west) bank of the river.

Channel Incision versus Natural Replenishment

The RAM Engineering Services personnel who have prepared the documentation for the ACOE 404, CDFG biological documents, and the GPS Storm Water documents for EPA have

documented the incision of the channel that is occurring because of the cumulative net removal of in-stream sediments. Their statements to the County that attempt to claim that natural replenishment can keep up with mining over a several year period are simply not borne out by observations of their own consultants.

As the channel cuts deeper into its bed in response to removal of mined sediments, the elevation of Ordinary High Water Mark (OHWM) that defines the regulatory environment for ACOE 404 and Waters of the United States jurisdiction also changes. Significant floods that breached the protective berms and/or flowed through the pits occurred in the 1995, 1998, and 2005 water years. At these times headcutting occurs and the overall elevation of the riverbed becomes lower. In the RAM March 5, 1996 letter to Mike Jewell of the ACOE Ventura Office, RAM engineer Lyn Ivanowicz, points out that the January/February 1995 flooding "*Natural meandering of the river upstream [of the GPS site] resulted in a shift of the river to the west.*" She states that "*The river subsided off our property and widened to the west.*" This, she says, "*...left a 5' elevation drop....and resulted in an actual raising of our mined property by an average of 3'.*" "*After the flooding subsided, the pit was full of fine sediment of about 2,000,000 cu yds.- This fine sediment material is not of value in mining.*" Of course it was not "natural meandering" of this straight braided channel. Ultimately the ACOE was asked to redefine the OHWM jurisdictional boundary because doing so increased area that could be mined without Section 404 Clean Water Act jurisdiction.

There is little chance and no evidence that this changed bed elevation and lateral channel migration can have occurred naturally without an open pit in the river-bed that accommodated 2 million cubic yards of upstream sediment. Downtcutting has necessitated regrading access roads, creating a ramp up to Deer Park Creek tributary, and increased fine sediment discharges downstream of the Diamond Rock mine site from both the trapped sediment in the pit and the accelerated erosion of the west bank silty bedrock across the river.

The RAM Consultants early Reclamation Plan from 1997 (p. 12) estimated that the natural replenishment rate at the present GPS and Diamond Rock sites was 225,500 cubic yards which even back then resulted in ongoing extraction of 5 X the replenishment rate. The more recent studies commissioned by Santa Barbara County Planning through URS of theoretical sediment transport rates show that severe sediment deficits can be predicted based on different calculated bed material transport rates. In my June, 2009 letter report directly to Santa Barbara County Planning and Development I evaluated the County's URS consultants' report regarding replenishment rates based on theoretical models for stream sediment transport. The 1997 Balanced Hydrologics and RAM consultants' report is no more or less accurate and precise in predicting sediment flux in the river at the GPS Expansion and proposed Diamond Rock sites. I find the initial replenishment rate calculations based on proportional inputs to Twitchell Reservoir as presented in the 1997 Reclamation plan no less plausible than the models chosen by URS for the County in 2009. In my opinion, the sediment replenishment rate remains a critical flaw in the proposed mining plans.

Instream Mining and the Tulloch Rule

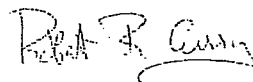
The record obtained from EPA through FOIA requests by Jennifer Lee reveals that the ACOE specialists who first realized that in-stream mining would require a Section 404 permit were confused. The ACOE apparently was not clear that the mining operations were not just a skimming operation and pointed out that if it was a "clean" mining operation scraping and picking up surface deposits, a 404 Permit would not be required. This followed the January

1997 US Supreme Court ruling that exempted mining operations from the requirements of a 404 Permit operation in jurisdictional Waters of the United States if there was little or no fall-back of excavated materials from the earth-moving equipment. The idea was that equipment operators at mine sites in a jurisdictional Water of the US should not have to seek a permit for unintentional spillage of material in the course of its excavation. Thus, in September 2002, James Mace of the ACOE Los Angeles Regulatory Office told the Cuyama operators that they did not need a 404 Permit as long as the mining was carried out to cleanly remove sediment and carry it above the OHWM elevation. But then the ACOE discovered that the mines were constructing berms and levees below OHWM elevation and moving unmarketable fine sediments back into the river to refill parts of the pits. This was clearly in violation of the Clean Water Act.

Conclusions

The proposed Diamond Rock Mine immediately upstream from the existing GPS mine is almost guaranteed to far exceed the sediment replenishment capacity of the Cuyama River with rather profound impacts on the surrounding channel stability and water resources. The analyses and assumptions that are the basis for the Santa Barbara County CUP for Diamond Rock and the compromises sought to combine operations between the two adjacent mines are, in my professional opinion, far too optimistic in evaluating prospective environmental impacts. Although the regulatory agencies such as EPA, ACOE, and CDFG have restricted permits to rates, extraction volumes, and mine depths far more conservative than those requested of the County by the applicants, approval of the two proposed actions at this time would not be prudent because of the existing legacy damage of instream headcutting incision and lateral left-bank erosion. The proposed scaled-back applications for a new open pit in-stream mine, no matter how or where the materials are processed and no matter what further mining may take place downstream at the GPS site, is bound to exacerbate the ongoing damage to the river system.

The recommendations of James Pompy of California Office of Mine Reclamation in his August 19, 1996 initial letter-review to the ACOE regarding the proposed in-stream mining at this site and those concerns inherent in the questions expressed by local CalTrans authorities relating to the future stability of Highway 33 have not been adequately addressed by the applicants or the County. The proposed annual monitoring of river cross sections needs to be more frequent after flows occur and needs to be carefully documented as suggested by OMR. This river is already disequibrated and actively cutting downward and laterally. While that activity may facilitate in-stream mining, it causes off-site property and infrastructure damage. Costs for those losses cannot be easily internalized to the mine operators who may be long gone by the time incision leads to highway damage and losses of agricultural lands.



Robert R. Curry
Registered California Geologist

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