ANALYSIS/COMMENTS/QUESTIONS OF COPPER FLAT MINE EIS

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5. Winner of New Mexico Green Business of the Year Award, 2011, awarded by NM State Government, Santa Fe, Santa Fe Mayor and City Council, Santa Fe Chamber of Commerce and Santa Fe Community College.

6. Ten year's research on growth requirements for Arizona sycamore and other native trees and forests.

7. Ten years daily recording Animas Creek stream flow 2 ½ miles below Copper Flat Mine pumps.

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PURPOSE AND PROCEDURE

My purpose is to study the Copper Flat Mine Environmental Impact Statement (EIS) Volumes 1, 2 and 3 and to ask questions and make recommendations based on computer model sand extensive data presented in Copper Flat EIS.

I will limit my analysis to areas of my expertise: well output, stream flow, riparian species and damage to Animas Creek farms. My analysis can be useful to BLM and cooperating state agencies in avoiding decisions based on opinion and helpful to avoid future litigation.

I have read or briefed every page of Copper Flat Mine EIS Volumes 1, 2 and 3, and have condensed data to make my report easy to read and understand. I have copied and included several pages of graphs and charts from the Copper Flat EIS.

I have underlined parts of interest and put notes on some of these copies.

Lee Newman BSF
Animas Creek
March 29, 2016

WORLD RECORD ARIZONA SYCAMORES

Animas Creek riparian hardwood community "depends on a shallow water table reachable to riparian species." (Copper Flat Mine EIS Vol. 1 David and Spegial 1967)

Arizona sycamore is lower Animas Creek's climax tree species with trees reaching great size and age. The world's largest Arizona sycamore is located approximately 1 mile up Animas Creek from Animas Creek Nursery on the Sycamore Ranch. This forest of sycamores is most vigorous over the lower Animas Creek low water table.

The Copper Flat EIS shows a 20 to 40-foot drop in water table for this area.

This drop will result in a high mortality for Arizona sycamores, probably losing world record trees.

Page 3-80 Copper Flat EIS impact on regional water budget Figure 3-15-A and 3-15-B paragraph 2 states "reductions in flow are shown and additional loss" of farm water would occur "should artesian wells increase their pumping to compensate for decreased artesian flow." 3-13-C

Only 1 out of 10 artesian wells we sampled had pumps. Pumping in lower Animas Creek artesian wells is not a good option. Table 3-13-C shows that the mine pumping will cause lower Animas Creek artesian wells to be dry at the end of mining. This action which is recommended by the Copper Flat Mine EIS would further lower the water table of Animas Creek 4 to 7 feet. See Figure 13-C.

This suggestion would further dry out the Arizona sycamore and the entire Animas Creek Canyon hardwood riparian community.

ANIMAS CREEK VILLAGE

Lower Animas Creek is a four-mile long farm village. The Post Office delivers mail to about 210 homes, with 65 additional inside boxes.
Lower Animas Creek Water Users Association maintains a dam and four-mile underground pipelines, serving seventy acre Animas Creek Tree Farm and approximately 100 acres of pecan orchards and laser-leveled alfalfa fields owned by other members of the Animas Creek Water Users Association. See Map 13-C-A.

ANIMAS CREEK NURSERY AND TREE FARM

1. Animas Creek Nursery and Tree Farm produces approximately 75,000 tree and shrub units per year, which are hauled to our Newman's Nursery in Santa Fe and sold.

2. Newman's Nursery and Animas Creek Nursery and Tree Farm employ 10-16 full-time, well-paid employees.

3. Our New Mexico Gross Receipts Taxes for 2015 were $128,773.00.

4. Animas Creek Tree Farm is located 2 ½ miles below Copper Flat Mine pumping station.

Animas Creek Nursery and Tree Farm is composed of 5 projects:

1. 11,000 sq. ft. propagation greenhouses
2. 5 acres buffalo grass seed farm field Boutelous dactyloides
3. 2 acres blue grama seed farm field Boutelou Gracilis
4. 4 acre Award Winning solar artesian powered drip irrigated field, refered to locally as "the pride of Caballo".
5. 3.5 acres other drip and sprinkler irrigated tree beds.

HOW COPPER FLATS MINE WILL DRY UP ANIMAS CREEK FARMS

According to Copper Flats Mine EIS, Animas Creek farms will lose their water three ways:

1. Level 1 water table, domestic wells of Animas Creek Village drop 40' will dry many domestic wells (Paragraph 1, 3-80, 3-76 3-14-B)

2. Reduce flow of Animas Creek will reduce the water available for community pipeline of lower Animas Creek Water Users Association.

3. Reduction in flow of Animas Creek artesian wells of 28 million gallons per year. This will dry out our artesian irrigation well and dry up Animas Creek Nursery's solar artesian powered aware winning tree fields. See Figure 3-15-A. Flowing well discharge (Figure 3-15-B) shows a reduction of 700 acre feet or 625,000 gallons per day of Animas Creek artesian wells. Figure 3-15-B page 3-81 shows a drop of wells of 10 to 20 feet Level 2 artesian water at Animas Creek Nursery.

COPPER FLATS MINE PROBLEMS

Copper Flats Mine has located massive pumps on the edge of Animas Creek Canyon, 2 ½ miles from Animas Creek Tree Farm, with plans to pump over 6,000,000 gallons per day from below Animas Creek Canyon.

According to the Copper Flats Mine EIS, Animas Creek's flow will be reduced and all lower Animas Creek artesian wells will dry up. See Table 3-5 page 3-55. The top chart shows Animas Creek 100 years after mining stops. Animas Creek, Rio Grande and all streams in the area still suffering! The bottom chart page 3-55 shows what will happen to Animas Creek when the mine starts pumping. Animas Creek drops by 45,619,140 gallons. These are massive losses of water and Animas Creek will result in 10' drop in Tree Farm artesian wells and a 20' drop for other Animas Creek Water Users Association members' artesian wells and an estimated 40' drop in domestic wells of Animas Creek Village. (Figure 3-13-B page 3-77.)

CONCLUSIONS AND COMMENTS

Dear BLM and cooperating agency fellow scientists:

"Examining each question of what is ethically and esthetically right as well as economically expedient, a right thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise." Aldo Leopold Land Ethic, Sand Country Almanac pgs. 224-225.

CONCLUSIONS

1. According to the EIS, Animas Creek Tree Farm solar artesian project will dry up.

2. According to EIS, Animas Creek farms will lose some irrigation water.

3. According to EIS, shallow domestic wells will dry. (Most domestic wells in Animas Creek are shallow.)

4. Mine pumping probably will result in death of world record sycamore.

QUESTIONS

1. Who wrote Copper Flat Mine EIS?

2. Who paid for EIS?

3. What did EIS cost?

4. Does the BLM agree the mine pumping will damage local agriculture?

5. EIS Table 3-15 shows loss of water one hundred years after mine closes. What is the future value of all the water lost for a hundred years after the mine closes?

6. Can BLM require super fund be set up by Copper Flats Mine to compensate farms and homes for loss of wells and loss of land and home value?

7. Does the BLM believe the employment analysis and the multipliers used to determine employment benefits from mine? (In the analysis business this is called blue sky analysis, you take out the clouds and you multiply by 5.)

8. Does the BLM support the real estate analysis of the EIS? Question: Which is worth more—farm with flowing irrigation well or farm with dry well?

9. Does the BLM or cooperating agencies plan on challenging conclusion based on opinion in the EIS?

10. What will be more financially important to Sierra County in twenty-five years—the Copper Flat Mine or recreation?

11. How many domestic wells in lower Animas Creek and how deep are they?
12. If BLM permits mine, how much time will Animas Creek well owners have before shallow wells fail?

13. Does the BLM believe a hundred or more shallow wells in Animas Creek could be repaired and pumps installed quickly? And by whom?

14. Why is there no plan for dangerous chemical spills other than diesel?

15. Will the BLM send copies of my statement to cooperating agencies?

16. Why is the reclamation plan using less than one-tenth the amount of seed needed to re-establish vegetation?

17. Why does the reclamation plan not require successful re-establishment of grass and forbs, not just put down a tiny amount of seed and leave the sight bare to wind and water erosion?

18. In view of these and other flaws, will the BLM require the EIS contract author to rewrite this statement to follow 3.3.1.4 titled "Regulatory Requirements Related to Climate Change and Sustainability?" According to EO 13148, "Greening the Government", all Federal agencies must take necessary actions to integrate environmental accountability into day-to-day decisions.

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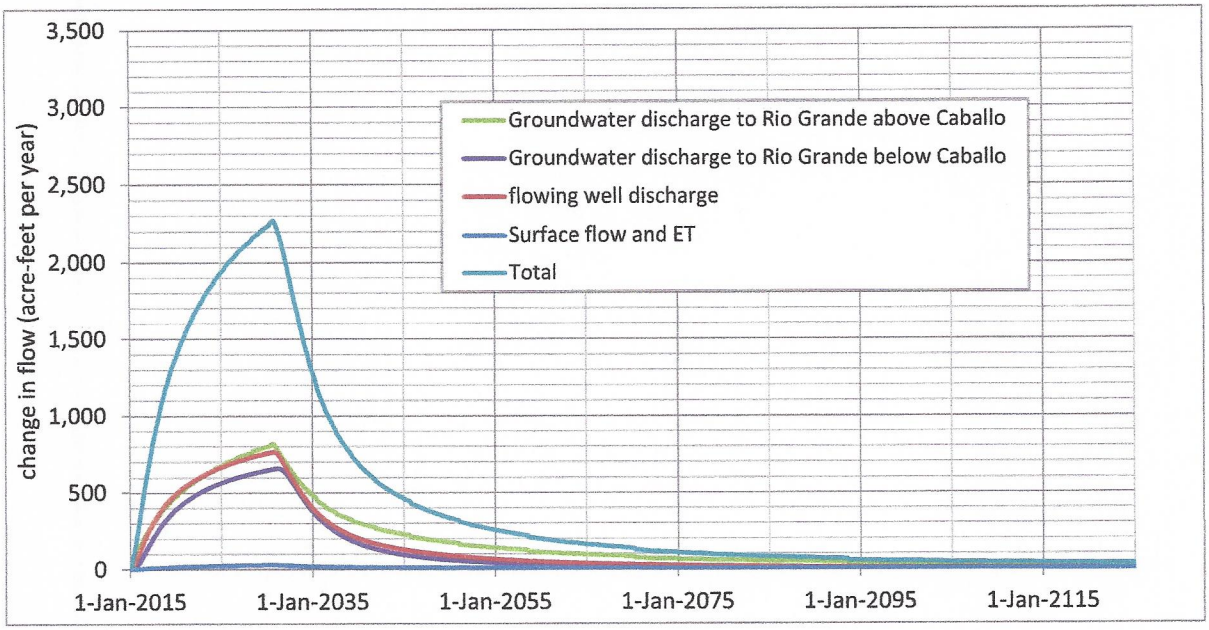
Figure 3-15b. Breakout of "Reduced Discharge" Impact in Figure 3-15a



Source: JSAI 2015.

Note: The term "flowing well" is equivalent to "artesian well."

Streamflow Impacts: Construction of the JSAI model effectively results in almost all streamflow depletions being accounted to the Rio Grande. In Table 3-20a, the maximum impact "to Rio Grande" is 1,464 AFY. Other flow changes in the table may also include a component of Rio Grande impact and the actual maximum river impact could exceed 2,500 AFY. Measures that might be taken by NMCC to mitigate or offset depletion effects are not considered in this quantification.

A simple check on the model was made by computing Rio Grande streamflow effects using an analytical method (Glover-Balmer equation), which is often applied by the New Mexico OSE. The results are consistent with the projections made by the model.

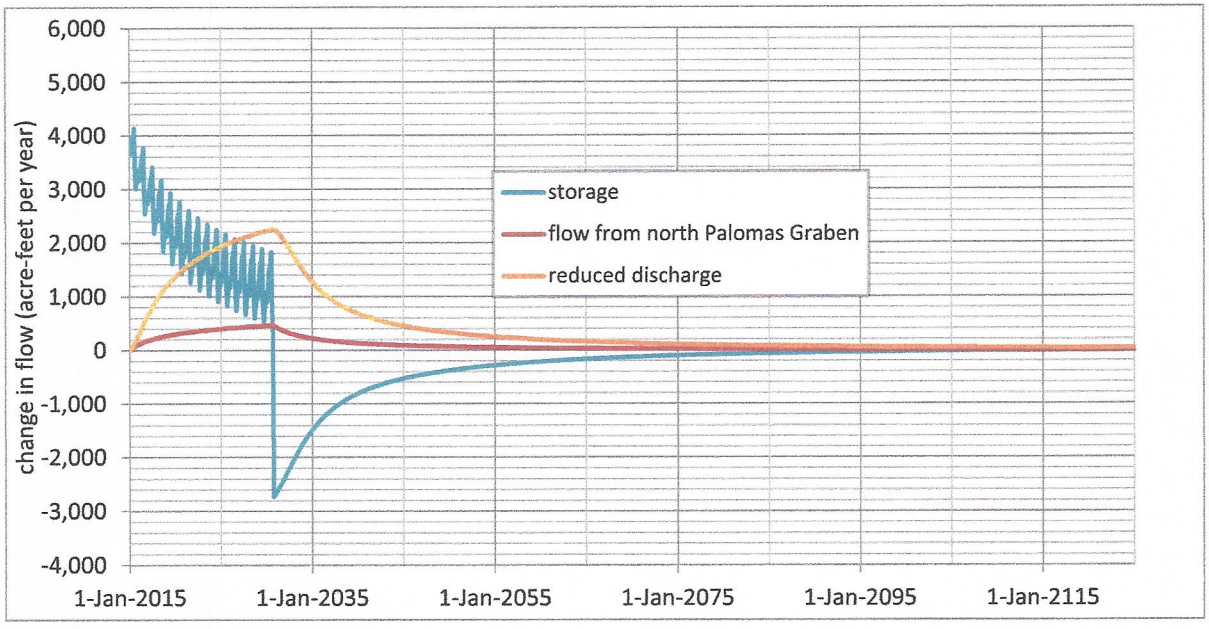
Impacts on Other Components of the Water Budget: Water budget impacts beyond those discussed above would include the following:

- The groundwater model simulates a small subflow in the alluvium along Greyback Arroyo. The simulated impact of the mine pit would be to deplete about 20 AFY of this flow, which in effect would be a permanent reduction in recharge to the Santa Fe Group aquifer.
- ET is a water balance term that represents shallow groundwater directly taken up by riparian or wetland vegetation. Shallow groundwater in riparian areas is often sustained by recharge from streamflow. Riparian vegetation in the model area is at least partly dependent on this groundwater supply and associated streamflow. Areas of such vegetation are shown in green on Figure 3-13a and are largely limited to the Rio Grande corridor, Las Animas Creek, and the upper reaches of Percha Creek in and above Percha Box.
- Mine operations (primarily the production wells) are simulated as causing a small reduction (maximum of 30 AFY) in ET and streamflow in areas of riparian vegetation (See Table 3-20a). Impacts to flow in Upper Las Animas Creek and to Percha Box are each estimated to reach a maximum of 1 to 2 AFY. The lack of impact in riparian areas is further illustrated by flat hydrographs for a location in Percha Box and for a location along Las Animas Creek

Impacts to individual private wells, other than artesian wells, are not simulated in the model. Drawdowns can impact pumping costs and well yield. Measurable impacts to well yield would be expected only to wells that: a) draw their water from the Santa Fe Group aquifer; b) are close enough to the production wells that impacts to water levels might be measured in tens of feet; and c) are so shallow such drawdown would impede production (i.e., penetrate only several tens of feet into the aquifer). At this time, the BLM has identified no such wells.

Impacts to Regional Water Budget: Figures 3-15a and 3-15b illustrates the simulated effect of the Proposed Action on the components of the regional water budget over time. Figure 3-15a separates out impacts to the depletion of storage, the simulated direct effects on discharge to the Rio Grande which is further broken out in Figure 3-15b, and flow across the northern model boundary, some portion of which would have a river impact. The reductions in flow are shown as increasing steadily once mining begins, peaking at the end of mining, then declining fairly rapidly once mining is over, but continuing on for decades. Additional water budget impacts would occur should owners of artesian wells increase their pumping to compensate for decreased artesian flow.

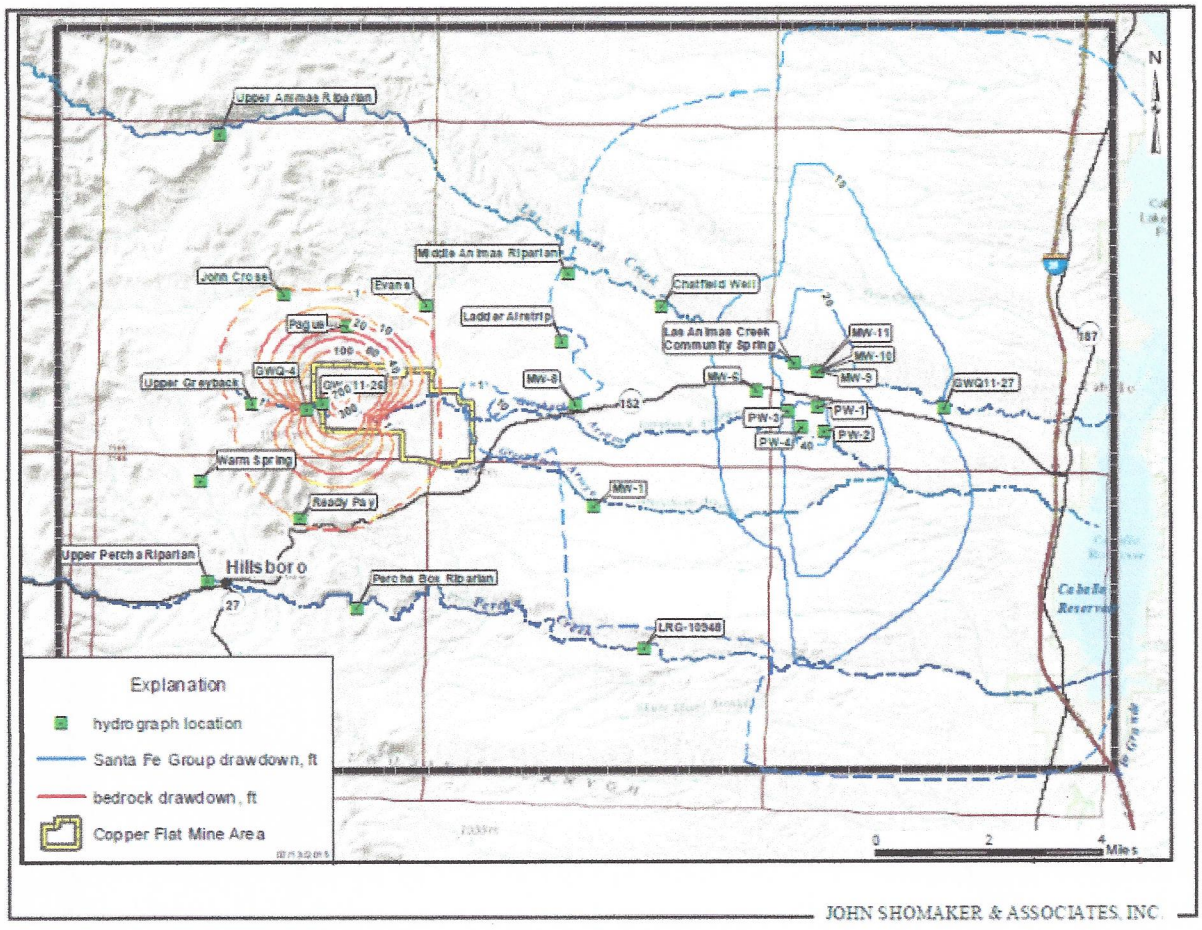
Figure 3-15a. Impacts of Proposed Action on Water Budget



Source: JSAI 2015.

Additional hydrographs are provided in Appendix E. The locations of the hydrographs are shown by labeled symbols on Figures 3-13a and 3-13b. Hydrographs for locations near the pit are similar to Figure 3-14a; impacts would decrease rapidly away from the pit but would be permanent within the bedrock aquifer. Hydrographs for wells in the Santa Fe Group aquifer east of the mine are similar to Figure 3-14b; impacts decrease gradually away from the supply wells and show relatively rapid recovery. Hydrographs for wells in layer 1 show essentially no change.

Figure 3-13b. Map of Water Level Declines in Layer 2 at End of Mining - Proposed Action



Source: JSAI 2015.

Las Animas Creek: The only published report specific to the hydrology of Las Animas Creek is Davie and Spiegel (1967). This reference provides information on area groundwater, for both pre-development and the historic conditions resulting from the development of surface irrigation systems and drilling of artesian wells, and was an important source of information used to construct the groundwater model. In the area near the project well field, the valley of Las Animas Creek is locally underlain by alluvial materials in the range of 20-60 feet thick. The materials contain shallow groundwater that is generally close enough to the land surface to be within the riparian root zone. Intera (2012) provides the results of a seepage study along Las Animas Creek. In most areas the creek is a losing stream (when there is runoff) and a source of recharge to the water moving in the underlying alluvium. Reaches with perennial flow occur near the water supply well field; the stream dries up below these reaches. (See Figures 3-9 and 3-10.)

Wilson et al. (1981) observed that the static water levels in the area of what is now the project well field were 25 to 50 feet lower than the water table in the Las Animas alluvium. That relationship is also shown in Intera 2012, is consistent with BLM (1999), and is illustrated by several triangular symbols on Figure 3-10 that indicate a shallow water table in the area labeled 'zone 2'. The data indicate that perched alluvial groundwater occurs in Las Animas Creek in the reach near the supply wells. This perched water has quite limited hydraulic connection to the main aquifer that will be directly impacted by the supply wells. Hydrology within the perched layer reflects localized conditions such as seepage from irrigation canals and irrigated fields, and pumping of domestic and other small capacity wells. The amount of downward seepage from the perched groundwater to the Santa Fe Group sediments is considered small (BLM 1999) and independent of water levels in the Santa Fe.

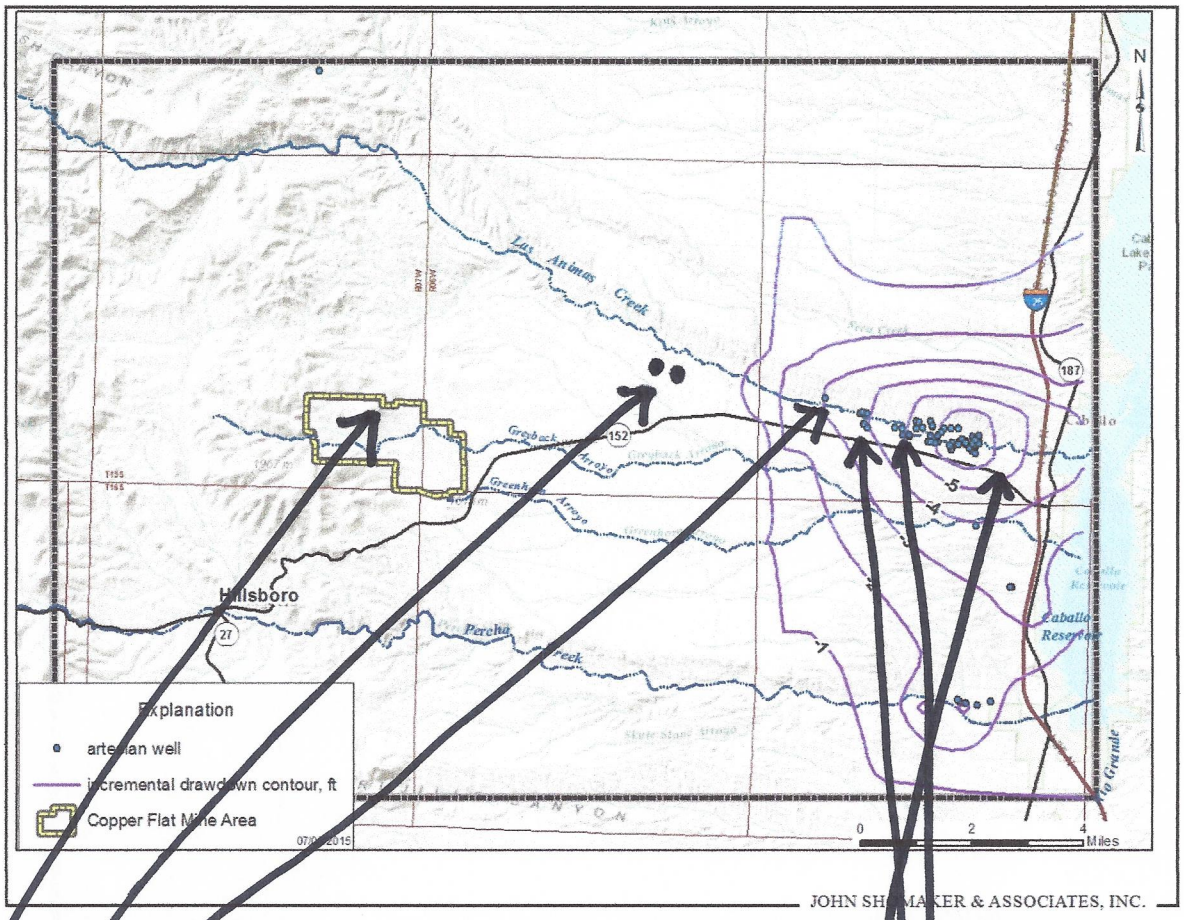
The clays in the Santa Fe Group east of the well field created artesian conditions, in which water levels were above the land surface before the aquifer was developed (Intera 2012). In that area there are large capacity irrigation wells that penetrate several hundred feet or more into the permeable materials of the Santa Fe Group. Artesian flows of tens to a few hundred gpm have been reported in these wells at various points in time. Pressures have declined over time, and some wells no longer flow (Jones et al. 2013). However, such wells can still produce several hundred gpm if pumped. According to Jones et al. (2012), the decline in artesian pressure may be due in part to poor well construction that resulted in leakage upward from the artesian zone by means of flow in and around the well casings.

Percha Creek: Near the supply wells, the valley of Percha Creek is underlain by alluvial materials up to 50 feet thick that contain groundwater (Wilson et al. 1981). The primary area where groundwater supports riparian vegetation or surface flow is in and just downstream of the Percha Box, where Paleozoic bedrock is at the surface and forces groundwater to flow to the surface. Elsewhere the stream is typically dry and such flow that does occur (e.g., from storm runoff) provides recharge to groundwater.

Many wells are found near Percha Creek in the vicinity of Hillsboro, New Mexico. These wells typically draw from shallow alluvium or from silts and clays in the Santa Fe Group (Seager et al. 1984) and yields are generally low. Data are not available on the water table elevation in the Percha Creek alluvium in the area of the supply wells, and the extent of perched conditions (if any) is not defined. Some artesian wells do occur near the downstream end of the creek, where the hydrogeology is similar to that in lower Las Animas Creek.

Arroyos: Alluvium is found along Greyback and Greenhorn Arroyos and consists primarily of sand and gravel; thickness varies between 5 and 50 feet (Intera 2012). Alluvium in Greyback Arroyo may be locally and seasonally saturated in the vicinity of the mine. Hydrologic conditions in arroyos near the supply wells have not been defined. No wells are known to obtain their supply from arroyo alluvium.

Figure 3-13c. Map of Water Level Declines in Layer 2 at End of Mining, Proposed Action, Resulting From Potential Increased Pumping of Artesian Wells



Source: JSAI 2015.

NEW DIAMOND PECAN ORCHARD

ANIMAS CREEK NURSERY TREE FARM

CHAVEZ M & A LASER LEVELED FIELDS

WORLD RECORD SYCAMORE

MINE PUMPS

MINE LOCATION

Table 3-15. Predicted Surface Water Depletion Rates at End of Mining and 100 Years After Closure Due to the Proposed Action and Two Mining Alternatives

Table 3-15. Predicted Surface Water Depletion Rates at End of Mining and 100 Years After Closure Due to the Proposed Action and Two Mining Alternatives						
Surface Water Feature	Rate (AFY)					
	Proposed Action		Alternative 1		Alternative 2	
	End of Mining	Closure	End of Mining	Closure	End of Mining	Closure
Caballo Reservoir (upstream of dam)	807	24	939	22	1,093	25
Rio Grande (downstream of dam)	657	3	803	3	932	3
Las Animas Creek [1]	12	1	14	1	17	1
Percha Creek [1]	18	3	20	3	24	4

Notes: Predicted surface water depletion rates provided by JSAI (2014a and 2014b). End of mining values represent maximum depletion rates, which occur 3 months after the cessation of mining. Closure values are for 100 years after mining.

[1] Predicted surface water depletion rates of Las Animas and Percha Creeks include water available for surface water flows and ET.

Table 3-16. Predicted Cumulative Surface Water Depletion Volumes Due to the Proposed Action and Two Mining Alternatives

Table 3-16. Predicted Cumulative Surface Water Depletion Volumes Due to the Proposed Action and Two Mining Alternatives			
Surface Water Feature	Volume (AF)		
	Proposed Action	Alternative 1	Alternative 2
Caballo Reservoir (upstream of dam)	8,845	6,934	8,353
Rio Grande (downstream of dam)	7,106	5,553	6,730
Las Animas Creek [1]	140	113	136
Percha Creek [1]	178	134	165

Note: Predicted cumulative surface water depletion volumes at 3 months post mining.

[1] Predicted surface water depletion rates of Las Animas and Percha Creeks include water available for surface water flows and ET.

3.5.2.1 Proposed Action

The Proposed Action is expected to result in significant impacts, with long-term minor to moderate adverse effects. The Proposed Action, to process ore at a nominal throughput of 17,500 tpd, is predicted to reduce groundwater discharge to Las Animas and Percha Creeks, Caballo Reservoir, and Rio Grande below Caballo Dam, decreasing the amount of water available for surface water flow and plant evapotranspiration. The predicted depletions are not expected to have substantial impacts to the surface water flow characteristics at or vegetation along Las Animas and Percha Creeks; the reductions are relatively small and the majority of the creeks' reaches within the Palomas basin, where most of the depletions occur, are ephemeral. However, the predicted reductions in groundwater discharge are expected to have a more notable effect on the Rio Grande, reducing surface water flows and potentially

3.3.1.4 Regulatory Requirements Related to Climate Change and Sustainability

According to EO 13148, "Greening the Government," all Federal agencies must take necessary actions to integrate environmental accountability into day-to-day decision making and long-term planning processes, across all agency missions, activities, and functions. Consequently, environmental management considerations must be a fundamental and integral component of all Federal agencies' policies, operations, planning, and management. The following Federal mandates and regulations shape the BLM's responsibilities related to climate change and sustainability:

- The Energy Independence and Security Act of 2007;
- The Energy Policy Act of 2005;
- EO 12873, "Federal Acquisition, Recycling, and Waste Prevention";
- EO 13031, "Federal Alternative Fuel Vehicle Leadership";
- EO 13134, "Development and Promotion of Biobased Products and Bioenergy";
- EO 13352. "Facilitation of Cooperative Conservation";
- EO 13423, "Strengthening Federal Environmental, Energy, and Transportation Management";
- EO 13514, "Federal Leadership in Environmental, Energy, and Economic Performance";
- The Federal Leadership in High Performance and Sustainable Building Memorandum of Understanding (MOU) 2006;
- Energy Independence and Security Act of 2007; and
- Pollution Prevention Act, 42 USC § 13101 *et seq.*

3.3.2 Environmental Effects

3.3.2.1 Proposed Action

Short- and medium-term minor adverse effects to climate would be expected under the Proposed Action. Short-term effects would be due to heavy vehicle emissions and the construction of facilities during site preparation, while medium-term effects would be due to heavy vehicle emissions and operation of facilities during mine operation and reclamation. The Proposed Action would not exceed major source thresholds outlined in the PSD regulations, generate emissions that would exceed the NAAQS at any nearby location, or contribute to a violation of any Federal, State, or local regulation associated with emissions, climate, or sustainability.

3.3.2.1.1 Mine Development and Operation

Mine development activities that would affect air quality include the use of heavy equipment that creates exhaust emissions during construction and site preparation and the construction of facilities at the site. Particulate emissions levels from development activities would vary, and impacts off-site would depend on the construction location and the daily wind and weather. Although some impacts would occur, they would be transitory, temporary, and controlled through BMPs described in Section 3.2, Air Quality. These effects would be less than significant.

Mine operational activities would cause the emission of pollutants such as NO_x, CO, and SO_2 from the operation of facilities and exhaust emissions from heavy equipment, generators, personal vehicles, and other mobile equipment used on-site (i.e., small and medium trucks). The total direct and indirect