UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8, MONTANA OFFICE
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HELENA, MONTANA 59626

Ref: 8MO

February 23, 2011

Patrick Pierson, Project Coordinator
Custer National Forest
1310 Main Street
Billings, Montana 59105

and

Emily Corsi, Project Coordinator
Montana Department of Environmental Quality
P.O. Box 200901
Helena, Montana 59601-0901

Re: CEQ # 20100449; EPA Comments on Stillwater Mining Company's Revised Water Management Plans and Boe Ranch LAD Project DEIS

Dear Mr. Pierson and Ms. Corsi:

The Environmental Protection Agency (EPA) Region VIII Montana Office has reviewed the Draft Environmental Impact Statement (DEIS) for the Custer and Gallatin National Forest's and Montana Dept. of Environmental Quality's (MDEQ's) Stillwater Mining Company Revised Water Management Plans and Boe Ranch LAD Project in accordance with EPA responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act. Section 309 of the Clean Air Act directs EPA to review and comment in writing on the environmental impacts of any major Federal agency action. EPA's comments include a rating of both the environmental impact of the proposed action and the adequacy of the NEPA document.

The DEIS presents proposed revisions to the water management plans for the Stillwater and East Boulder mines, including modifications with additional mitigation measures proposed by the Forest Service and MDEQ (e.g., reclamation cover requirements, reclamation cap design, use of biological treatment systems for treatment of undiluted tailings water at closure, and post-closure water routing and channel design), as well as a proposal for a new land application disposal (LAD) system for the East Boulder Mine at the Boe Ranch.

The EPA is generally pleased with and supports the lead agency mitigations added to the proposed revisions with the preferred alternatives for the Stillwater and East Boulder Mine Closure and Post-Closure Water Management Plans (i.e., Stillwater Mine Agency Mitigated Alternative 3A; East Boulder Mine Agency Mitigated Alternative 3B; and Boe Ranch LAD Agency Mitigated Alternative 3C). EPA does have comments, however, regarding the revised water management alternatives and the environmental impact analysis and disclosure. EPA's comments are discussed below and in our more detailed comments enclosed with this letter.

WATER QUALITY LIMITED SURFACE WATERS

The DEIS does not include a complete and up-to-date disclosure of water quality impaired surface waters listed by MDEQ under Section 303(d) of the Clean Water Act near the mines, particularly the Stillwater River, East Boulder River, and the Boulder River below its confluence with the East Boulder River (see our detailed comments). We recommend that the FEIS include more complete and updated information regarding impairments for waters in the vicinity of both mines, including the magnitude and sources of impairments for waters receiving mine wastewater discharges. It would be helpful if a clearer map (or maps) were included in the FEIS showing Stillwater and East Boulder Mine facilities, particularly LADs, percolation ponds and mine wastewater discharge and seepage points, including the proposed new Boe Ranch LAD, in relation to the 303(d) listed segments of both the Stillwater and East Boulder Rivers.

NUTRIENT DISCHARGES & CONSISTENCY WITH TMDL DEVELOPMENT

It is not clear to us if discharges of additional nitrogen to the Stillwater and East Boulder Rivers, as well as other pollutant load increases, would be consistent with development of TMDLs and associated wasteload allocations for the impaired segments of these rivers. The DEIS indicates that percolation or land application of mine waste water would result in temporary increases in nitrogen concentrations in surface waters at the Stillwater and East Boulder mines. At closure, the Stillwater Mine would dispose of approximately 35 million gallons (MG) of tailings waters from the Stillwater tailings impoundment, 45 MG of tailings waters from the Hertzler Ranch tailings impoundment, and up to 2,020 gpm of adit water. The East Boulder Mine would dispose of approximately 40 MG of tailings waters and up to 737 gpm of adit water at closure.

During post-closure some or all of the inflows into both mines could be used to flood the underground workings, and untreated adit water would be routed directly to the Stillwater and East Boulder Rivers. Nitrogen concentrations in mine waters could become a particular water quality concern at closure when treated waters are discharged or post-closure when treatment would not be occurring. The DEIS states that the agencies' analyses indicate that nitrogen would increase, although gains in nitrogen concentrations within the rivers are anticipated to be short-term and to flush over time, and nitrogen concentrations in the Stillwater and East Boulder Rivers' would be anticipated to return to near baseline levels within a couple of years at post-closure. It is also stated that nitrogen levels would be below the nitrogen surface water standard

of 1 mg/l in receiving waters at both mines.

As you know, Montana Water Quality Standards include a general narrative standard requiring *"surface waters to be free from substances that will create conditions which produce undesirable aquatic life"* (ARM 17.30.637). Recent scientific findings indicate that in-stream nitrogen levels less than 1 mg/l may promote creation of conditions which produce undesirable aquatic life. EPA is concerned that the current MPDES permit nitrogen loads based on the 1 mg/l in-stream nitrogen standard have potential to create aquatic conditions that may not be consistent with the narrative water quality standard. It is our understanding that Montana is developing numeric criteria for nitrogen in surface waters within the next year that may be lower than 1 mg/l total nitrogen. We encourage reevaluation of MPDES permit nitrogen loads based on the current scientific findings regarding nitrogen levels that are protective of beneficial uses in future MPDES permitting.

We note that the MDEQ's December 2008 *"East Boulder River Watershed Nutrient Assessment Report,"* (available from the MDEQ Water Quality Planning Bureau) indicates in regard to MPDES permit limits for nitrogen containing discharges at the East Boulder Mine:

> *"The allowable nitrogen load limits under existing permit no MT-0026808 are incongruent with downstream growing-season nitrate indicator values for segments MT43B004_141 and MT43B004_142 and could lead to impairment conditions."*
>
> *"Monitoring of nitrate levels in ground water down-gradient of the East Boulder Mine's ground water discharge point shows an increasing trend in NO3 + NO2 concentrations from 2000 through 2005, suggesting the potential for ground water impacts to surface waters." (Figure 4-13 in this report evidences increasing nitrite+nitrate-nitrogen concentrations in groundwater).*

This report also states that existing East Boulder Mine operations and discharges do not appear to be contributing to nutrient impairment of the East Boulder River, but the report recommends continued monitoring of nitrogen levels in ground and surface waters and that these issues be considered in future MPDES permitting. We concur with these recommendations, emphasizing our belief that MPDES permitted nitrogen loads for both mines should be consistent with current scientific findings regarding nitrogen levels and aquatic effects in surface waters.

It is also important that proposed revisions to water management plans for both mines be consistent with applicable TMDLs being developed for impaired waters receiving mine water discharges in order to avoid further degradation of impaired waters and to promote water quality improvement and restoration of full support of beneficial uses in such waters. We recommend that staff of the Custer and Gallatin National Forests and DEQ Hardrock Section consult with DEQ and EPA TMDL program staff to assure consistency of proposed water management plan revisions at both mines with the development of TMDLs (contact DEQ TMDL staff Dean Yashan at 406-444-5317; Mr. Robert Ray of DEQ at 406-444-5319; and Ms. Lisa Kusnierz of

EPA at 406-457-5001).

Also, the criteria that will be used and the decision-making process, including water monitoring data analysis, that will be used to determine when water treatment is no longer necessary at mine closure/post-closure is not well described. The methods used to analyze when "water quality standards are met" at closure/post-closure so that water treatment can be ended are critical. Will all the parameters in the MPDES permit be analyzed in making decisions to end water treatment? Will one sampling event be sufficient or will a number of samples be statistically analyzed? Will it be a 30- day average or will the discharges be evaluated on a seasonal basis? We recommend that the discussion of the decision-making process in regard to ending water treatment at closure/post-closure at the mines be more fully described.

METALS LEVELS - WATER QUALITY MONITORING

The DEIS states that ore body geochemistry is analyzed quarterly to determine acid rock production potential and little potential for acid generation and near metal leaching is indicated. We are pleased that there appears to be low potential for elevated levels of metals to occur in mine waters, although it is stated that metals such as cadmium, chromium, copper, lead, and zinc are found in mine waters at low levels. Table 2-3 identifies maximum levels of cadmium and lead in adit and tailings water and the East Boulder River and some of these levels exceed water quality criteria at 25 mg/l hardness (e.g., Cd chronic aquatic life criteria is 0.097 ug/l and this level is exceeded in adit and tailings water and the East Boulder River; and the Pb chronic aquatic life criteria is 0.545 ug/l and Table 2-3 only indicates that Pb levels are <3 ug/l in adit and tailings water and the East Boulder River; so it is not clear if they exceed the criteria level).

Table 2-3 does not display any metals concentrations for Stillwater mine adit and tailings water and the Stillwater River, so it is not known if there may be any metals criteria exceedances in Stillwater Mine adit or tailings water. We note that the Stillwater River 303(d) listing includes cadmium, chromium, copper, cyanide, mercury, nickel among the probable causes of water quality impairment, and identifies hardrock mining discharges (permitted) among the probable sources of impairment. Disclosure of Stillwater Mine adit and tailings water quality data and analysis in regard to metals levels is needed in the FEIS for more comprehensive environmental impact analysis.

The DEIS states that the monitoring plans in the agency-mitigated alternatives include long-term monitoring of mine waters prior to direct discharge, although details about the parameters analyzed in the long-term water monitoring plans are not provided. We believe it is important that the water quality monitoring program periodically evaluate potential metals release and transport from waste rock, tailings and mine drainage to ground and surface waters to assure that mine drainage and runoff waters remain free of elevated metals levels over the long-term, post-closure. We believe there should be periodic monitoring for potential acid generation and elevated levels of metals (e.g., Al, As, Cd, Cu, Fe, Pb, Mn, Hg, Se, Ag, Zn, Pt,

Pd, total hardness, Ca, Mg and SO4). The FEIS should summarize long-term monitoring for potential acid generation and leaching of metals post-closure.

The EPA's further discussion, questions, and comments regarding the analysis, documentation, or potential environmental impacts of the Stillwater Mining Company Revised Water Management Plans and Boe Ranch LAD DEIS are included in the enclosure with this letter. Based on the procedures EPA uses to evaluate the adequacy of the information and the potential environmental impacts of the proposed action and alternatives in an EIS, the DEIS has been rated as Category EC-2 (Environmental Concerns - Insufficient Information) due to potential for adverse effects to water quality and designated beneficial uses from elevated nitrogen levels, and possibly post-closure over the long-term from elevated metals levels. A copy of EPA's rating criteria is attached. We also want to reiterate that we are generally pleased with and support the many mitigation measures the agencies have included with the preferred alternatives to reduce and avoid adverse environmental effects.

The EPA appreciates the opportunity to review and comment on the DEIS. If we may provide further explanation of our comments please contact Mr. Steve Potts of my staff in Helena at 406-457-5022 or in Missoula at 406-329-3313 or via e-mail at potts.stephen@epa.gov. Thank you for your consideration.

Sincerely,

Joseph Vranka

for Julie A. DalSoglio
Director
Montana Office

Enclosures
cc: Larry Svoboda/Connie Collins, EPA 8EPR-N, Denver
Dean Yashan/Pete Schade/Mike Suplee, MDEQ, Helena

EPA COMMENTS ON THE STILLWATER MINING COMPANY'S REVISED WATER MANAGEMENT PLANS and BOE RANCH LAD DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)

Brief Project Overview:

The Montana Department of Environmental Quality (MDEQ), Custer National Forest (CNF), and Gallatin National Forest (GNF) prepared the DEIS for the Stillwater Mining Company's Revised Water Management Plans and Boe Ranch Land Application Disposal (LAD) Project to evaluate proposed revisions to the water management plans for the Stillwater and East Boulder mines, as well as a new LAD system for the East Boulder Mine at the Boe Ranch.

The Stillwater Mine is located on the CNF in Stillwater County near Nye, Montana and includes mine wastewater discharges to the Stillwater River. The East Boulder Mine is located on the GNF in Sweet Grass County south of Big Timber, Montana, and includes mine wastewater discharges to the East Boulder River. Both mines are underground platinum and palladium mines operated by the Stillwater Mining Company (SMC). Operations at the Stillwater Mine began in 1985, and ore production is approximately 777,100 tons per year. Although permitted in 1993, operations at the East Boulder Mine did not begin until 1998. Ore production at the East Boulder Mine is approximately 407,400 tons per year. SMC upgrades the ore at each mine by crushing, grinding, flotation, and filtration to produce a concentrate, which is shipped by truck to the Stillwater Smelter and Base Metal Refinery (BMR) in Columbus, Montana for further upgrading, and concentrate is then shipped to New Jersey for final refining. Water management revisions involve:

1) Development of closure and post-closure water management plans (WMPs) for adits, tailings impoundments, and storm water for the Stillwater and East Boulder mines. SMC proposes to discharge water directly to the rivers once adit and tailings waters have met Montana water quality standards or, in the case of nitrogen, have met the grandfathered nondegradation limit of 100 pounds per day (lbs/day) in the Stillwater River and 30 lbs/day in the East Boulder River; and
2) Construction and operation of a pipeline and land application disposal (LAD) system at its Boe Ranch property, if needed, to dispose of treated adit and tailings waters from the East Boulder Mine during operations and at closure.

Nine alternatives are analyzed in detail in the DEIS. These include a no action alternative, SMC's proposed action, and agency mitigated alternatives for: A) the Stillwater Mine Closure and Post-Closure Water Management Plan; B) the East Boulder Mine Closure and Post-Closure Water Management Plan; and C) the Boe Ranch LAD System, respectively. Additional mitigation measures proposed by the agencies at the two mines include reclamation cover requirements, reclamation cap design, use of biological treatment systems for treatment of undiluted tailings water at closure, and post-closure water routing and channel design. A**gency mitigated alternatives 3A, 3B, and 3C are identified as the preferred alternatives.**

Comments:

1. Thank you for providing information on the history of the Stillwater and East Boulder Mines (pages 1-3 to 1-6), and discussion of 17 significant issues associated with the proposed project (pages 2-2 to 2-14). We also appreciate the clear descriptions of alternatives in Chapter 2 of the DEIS; Table 2-6, Table 2-7 and Table 2-8 comparing alternative components for the Stillwater Mine, East Boulder Mine and Boe Ranch LAD, respectively; Table 2-9, Table 2-10 and Table 2-11 comparing effects among the Stillwater Mine, East Boulder Mine and Boe Ranch LAD alternatives, respectively; as well as the many Figures and maps in Chapter 2 showing Water Routing and Handling Schematics, and locations of components for the various alternatives; and the helpful Appendices including a Monitoring Plan for the Boe Ranch LAD (Appendix B) and Agency Water Quality & Quantity Analyses (Appendix C).

   The DEIS information on mine history, significant issues, alternatives descriptions, tables, maps, figures and appendices facilitate improved project understanding, help define issues, and assist in evaluation of alternatives providing a clearer basis of choice among options for the decision maker and the public in accordance with the goals of NEPA.

   We also appreciate coverage of topics that have sometimes been overlooked in other mine project DEIS's that we have reviewed such as:

   a. Expressing water quality goals as standards and trigger/action levels for mitigation before standards are exceeded,
   b. Disclosing water movement at different stages of the mining life cycle,
   c. Modeling likely outcomes and identifying assumptions made during alternatives analysis of the water management plan (a sensitivity analysis would have made this even more robust),
   d. Monitoring over time to determine if the assumptions were valid, and
   e. Contingency planning and proactive reevaluation of alternatives.

303(d) Listed River Segments

2. The DEIS displays Stillwater Mining Company (SMC) biomonitoring results that indicate full support of beneficial uses for both the Stillwater River and East Boulder River (pages 4-79, 4-83), and Stillwater River water quality is stated to be generally "good to excellent" (page 3-11). The DEIS also states that the East Boulder River segment where the East Boulder Mine is located (segment MT43B004_143) fully supports all designated beneficial uses, but that downstream reaches of the East Boulder River from the Gallatin National Forest (GNF) boundary to the confluence with the Boulder River, (MT43B004_141 and MT43B004_142) were "impaired" (page 3-14). The water quality impairment status of the Stillwater River was not completely or accurately disclosed in the DEIS.

   The MDEQ's Clean Water Act website (http://cwaic.mt.gov/query.aspx) lists the Stillwater River (from the Forest Service boundary to the Yellowstone River, segment

MT43C001_020) as water quality impaired under Section 303(d) of the Clean Water Act due to lack of support for drinking water uses and only partial support for aquatic life and cold water fishery uses. Probable causes of impairment are listed as cadmium, chromium, copper, cyanide, mercury, nickel and Nitrite/Nitrate nitrogen (NO2 + NO3-N). Probable sources of impairment are listed as impacts from abandoned mine lands (inactive), unknown sources, hardrock mining discharges (permitted), natural sources, and watershed runoff following forest fire. A Total Maximum Daily Load (TMDL) will be needed to address these impairments (Stillwater-Columbus TMDL Planning Area). The Clean Water Act 303(d) listing website also indicates that there is insufficient data to assess use support for Nye Creek, tributary to the Stillwater River in the vicinity of the Stillwater Mine.

The MDEQ 303(d) listing website also lists both East Boulder River segments MT43B004_142 (from the Forest Service boundary to Elk Creek) and MT43B004_141 (from Elk Creek to the confluence with the Boulder River) as impaired with only partial support for aquatic life, cold water fishery and primary contact recreation uses. Chlorophyll-*a* and low flow alterations are listed as probable causes of impairments in both segments, and sedimentation/siltation and other anthropogenic substrate alterations are also listed as probable causes of impairment for the downstream segment (MT43B004_141). A TMDL is required for the downstream river segment (Boulder-Big Timber TMDL Planning Area), but a TMDL is not required for segment MT43B004_142, since impairment in this segment is believed to be caused by low flows rather than pollutant additions.

The lower Boulder River downstream from the confluence of the East Boulder River is also water quality impaired (segments MT43B004_133, MT43B004_132, and MT43B004_131). Copper, iron, lead, excess algal growth, nitrite+nitrate-nitrogen, kjehldahl nitrogen, and phosphorus listed as probable sources of impairment in Boulder River segment MT43B004_133 immediately below the confluence of the Boulder and East Boulder Rivers. We note that TMDLs for metals were completed in 2009 (for copper, iron, and lead) for all segments of the Boulder River.

We recommend that the FEIS discussion of surface waters in the vicinity of both mines be revised and updated to include the most current and accurate information regarding water quality impairments and 303(d) listing information, including the magnitude and sources of impairment for waters receiving mine discharges. It would be helpful if a clearer map (or maps) were included in the FEIS showing Stillwater and East Boulder Mine facilities, particularly LADs, percolation ponds and mine wastewater discharge and seepage points, including the proposed new Boe Ranch LAD, in relation to the 303(d) listed segments of both the Stillwater and East Boulder Rivers.

3. The DEIS indicates that SMC conducted benthic macroinvertebrate monitoring in the Stillwater River between August 1998 and September 2002, and results indicated full support of designated water quality uses in each year of the study, with the exception of 2001 (page 4-79). The September 2001 collection was lower in both taxa richness and organism abundance, but summer 2002 samples confirmed that the condition was

temporary and related to climatic regional drought. It is also stated that diatom bioassessment results based on general criteria for mountain streams in Montana indicated excellent biotic integrity and no impairment of water quality or habitat at all sample sites. While mean chlorophyll-*a* concentration showed a trend to increase downstream, these differences were stated to be statistically not significant. It was stated that the higher mean chlorophyll-*a* concentration at the downstream sample site corresponds with nitrogen concentrations, but the magnitude of the chlorophyll a concentration values is not characteristic of nutrient enrichment.

Biomonitoring was also carried out in the East Boulder River between April 1998 and September 2006 (page 4-83). The DEIS stated that benthic macroinvertebrate and diatom bioassessments showed "full support" (no impairment) conditions from upstream to below the East Boulder Mine. Macroinvertebrate Bioassessment Index values indicated "Partial Support" (minor impairment) in the lower reaches of the East Boulder River likely caused by stream dewatering and sedimentation.

This SMC biomonitoring information indicating no impairments in the Stillwater and East Boulder Rivers brings into question whether the MDEQ 303(d) listings in regard to nutrients and perhaps other parameters are accurate or up to date. We recommend that the SMC water quality monitoring data be submitted to and reviewed by MDEQ water quality assessment staff as MDEQ further evaluates 303(d) listings and develops TMDLs for the Stillwater and East Boulder Rivers.

4. We note that the SMC East Boulder River biomonitoring results summarized in the DEIS indicate that periphyton was dominated by the stalked diatom *Didymosphenia geminata* (page 4-83). This is not stated in regard to biomonitoring in the Stillwater River. This recent proliferation of *D. geminata* in the East Boulder River is of interest, since excessive algal growth problems can be related to excess nutrient concentrations, although it is our understanding that excessive nutrient levels has not been identified as a cause for the proliferation of *D. geminata* in the East Boulder River.

   Is the *Didymosphenia geminata* dominance evident in the East Boulder River both above and below East Boulder Mine water discharge/seepage locations? If not, this may be an indication of a relationship between mine discharges and this periphyton dominance. Is it believed that the dominance of *Didymosphenia geminata* in the East Boulder River may in any way be related to nutrient enrichment coming from the East Boulder Mine?

Water Quality Standards, MPDES Permits, TMDLs

5. The DEIS states that the Stillwater Mine MPDES permit sets a maximum nitrogen concentration limit of 1 mg/L total nitrogen (TN) in surface water (page 4-8), and that the East Boulder Mine MPDES permit sets a maximum nitrogen concentration limit of 1 mg/L TIN in surface water (page 4-24). We do not see these 1 mg/l nitrogen surface waters standards included in the MPDES permits for these mines (permits MT-0026808 and MT-0024716). It would be helpful to more fully explain or describe the origin or

basis for the 1 mg/l nitrogen instream standard for surface waters at these mines in the FEIS.

6. The DEIS states that adherence to MPDES permit nitrogen discharge limits at the Stillwater Mine (100 lbs/day) and the East Boulder Mine (30 lbs/day) would ensure that water quality would support existing healthy macroinvertebrate communities and coldwater fisheries within both river systems (page 4-79). Although it is stated that percolation or land application of mine waste water would result in temporary increases in nitrogen and salts concentrations in surface waters at the Stillwater and East Boulder mines.

   The DEIS also states that the agencies' analyses indicate that nitrogen would increase, but it would be below the MPDES permit nitrogen surface water standard of 1 mg/L (page 4-94). MPDES permit limits for both mines are based on meeting a maximum nitrogen concentration limit of 1 mg/l total inorganic nitrogen (TIN) in surface waters (i.e., Stillwater River and East Boulder River, page 2-82).

   As you know, Montana Water Quality Standards include a general narrative standard requiring *"surface waters to be free from substances that will create conditions which produce undesirable aquatic life"* (ARM 17.30.637). Recent scientific findings indicate that in-stream nitrogen levels less than 1 mg/l may promote creation of conditions which produce undesirable aquatic life. EPA is concerned, therefore, that the current MPDES permit nitrogen loads based on the 1 mg/l in-stream nitrogen standard have potential to create aquatic conditions that may not be consistent with the narrative water quality standard.

   MDEQ has developed draft numeric nutrient criteria that, if achieved, ensure protection of designated uses (MTDEQ 2008). Table 1 summarizes these values. We recommend that treatment alternatives take this science into consideration and that the closure and post-closure monitoring plan include growing season chlorophyll sampling so that the response of the algal community to any increases in nitrogen loading can be evaluated.

Table 1. Example Draft Numeric Nutrient and Benthic Algae Criteria for Different Ecoregions of Montana. Excerpted from Suplee et al. 2008.

		Nutrient Criteria			
Level III Ecoregion	**Period When Criteria Apply**	**Total P (mg/L)**	**Total N (mg/L)**		**Benthic Algae Criteria**
Northern Rockies	July 1 -Sept. 30	0.012	0.233		150 mg Chl *a*/m^2 (36 g AFDW/m^2)
Canadian Rockies	July 1 -Sept. 30	0.006	0.209		150 mg Chl *a*/m^2 (36 g AFDW/m^2)
Middle Rockies	July 1 -Sept. 30	0.048	0.320		150 mg Chl *a*/m^2 (36 g AFDW/m^2)

Idaho Batholith	July 1 -Sept. 30	0.011	0.130		150 mg Chl *a*/m^2 (36 g AFDW/m^2)
Northwestern Glaciated Plains*	June 16-Sept. 30	0.123	1.311		n/a
Northwestern Great Plains*, Wyoming Basin*	July 1 -Sept. 30	0.124	1.358		n/a
*Response variables for these ecoregions are the Montana dissolved oxygen standards (per DEQ-7) rather than benthic algae criteria.					

Note: Work carried out by MT DEQ since 2008 will cause the numeric nutrient criteria in Table 1 to be updated, probably in 2011.

Suplee, M., V. Waterson, A. Varghese, and J. Cleland. 2008. Scientific and Technical Basis of the Numeric Nutrient Criteria for Montana's Wadeable Streams and Rivers. Montana Department of Environmental Quality.

7. We also understand that SMC entered into a Good Neighbor Agreement with local conservation groups (http://www.northernplains.org/the-issues/good-neighbor-agreement/) that provides for establishment of clear and enforceable water quality standards that go above and beyond state requirements. We have been advised that this agreement specifies a 0.3 mg/l in-stream standard for TIN in the Stillwater and East Boulder River, and this in-stream nitrogen level has been consistently met in both rivers. Is this correct?

   In light of recent scientific findings indicating that in-stream nitrogen levels less than 1 mg/l (and closer to that specified in the Good Neighbor Agreement) may promote conditions which produce undesirable aquatic life, we recommend that the FEIS emphasize that in addition to meeting the MPDES permit requirements, SMC will strive to minimize adverse effects to water quality by treating nitrogen to the maximum extent practical, which is typically < 0.3 mg/L.

8. The MDEQ's December 2008 *"East Boulder River Watershed Nutrient Assessment Report,"* (available from the MDEQ Water Quality Planning Bureau) indicates in regard to MPDES permit limits for nitrogen containing discharges at the East Boulder Mine (page 15):

   "The allowable nitrogen load limits under existing permit no MT-0026808 are incongruent with downstream growing-season nitrate indicator values for segments MT43B004_141 and MT43B004_142 and could lead to impairment conditions."

   "Monitoring of nitrate levels in ground water down-gradient of the East Boulder Mine's ground water discharge point shows an increasing trend in NO3 + NO2 concentrations from 2000 through 2005, suggesting the potential for ground water impacts to surface waters." (Figure 4-13 in this report evidences increasing nitrite+nitrate-nitrogen concentrations in groundwater).

   This report also states that existing East Boulder Mine operations and discharges do not appear to be contributing to nutrient impairment of the East Boulder River, and

recommends continued monitoring of nitrogen levels in ground and surface waters, and recommends that these issues be considered in future MPDES permitting

We concur with the recommendations in the *East Boulder River Watershed Nutrient Assessment Report*. We encourage reevaluation of MPDES permit nitrogen loads based on the current scientific findings regarding nitrogen levels that are protective of beneficial uses in future MPDES permitting. We also note that there are concerns about nutrient loading impacts to the Stillwater River as well as the East Boulder River, although a similar Nutrient Assessment Report for the Stillwater River watershed has not been prepared.

9. The MDEQ *"East Boulder River Watershed Nutrient Assessment Report,"* recommends monitoring activities for continued assessment of assess potential impacts to surface waters from potential ground water nitrate loading as follows (report pages 18,19):
   - Continue monitoring of ground water nitrate concentrations at established monitoring wells, EBMW-2, EBMW-3, EBMW-6, EBMW-7, EBMW-8 and EBMW-9 and at surface water monitoring locations EBR-003 and EBR-004 as stipulated in permit no. MT-0026808.
   - Assess the potential for groundwater loading to surface waters upstream of ground water monitoring well EBMW-7, throughout the reach from EBR-001 to EBR-003.
   - Continued biological monitoring in accordance with the *Biological Monitoring Plan for Stillwater Mining Company – East Boulder Project* (1998) as stipulated in permit no. MT-0026808.
   - Quarterly nutrient sampling and annual macroinvertebrate and chlorophyll-a (late summer) at surface water monitoring station EBR-005 – EBR-009
   - Track coverage and spread of *Didymosphenia geminata* in the upper Boulder River through stream reach assessments.

   Are these monitoring recommendations all being carried out?

10. It is stated (page 3-14) that permitted discharges from the East Boulder Mine represent potential nutrient sources to downstream impaired water bodies. We note that the same is true of discharges from the Stillwater Mine, although we did not see this clearly stated in the DEIS. We also note that the Stillwater River 303(d) listing includes nitrite+nitrate nitrogen among the probable causes of water quality impairment, and hardrock mining discharges (permitted) among the probable sources of impairment, so evaluation of mine nitrogen discharges to the Stillwater River is an important issue.

    The DEIS states that during post-closure, some or all of the inflows into both mines could be used to flood the underground workings (pages 4-18, 4-27), and untreated adit water would be routed directly to the Stillwater and East Boulder rivers. At post-closure SMC would not have to treat adit water at both mines if the discharge complies with the MPDES permit nitrogen load limit and ground and surface water analyses criteria (pages 4-18, 4-27).

At closure, the Stillwater Mine would dispose of approximately 35 million gallons (MG) of tailings waters from the Stillwater tailings impoundment, 45 MG of tailings waters from the Hertzler Ranch tailings impoundment, and up to 2,020 gpm of adit water. The East Boulder Mine would dispose of approximately 40 MG of tailings waters and up to 737 gpm of adit water at closure (technical memo in Appendix C). Any gains in nitrogen or salts concentrations within the rivers are anticipated to be short-term and to flush over time, and Stillwater and East Boulder Rivers' nitrogen and salts concentrations would be anticipated to return to near baseline levels within a couple of years at post-closure (page 4-95). The Appendix C memo acknowledges that nitrogen concentrations in mine waters could become a water quality concern at closure when treated waters are discharged or post-closure when treatment would not be occurring.

It is not clear to us if discharges of additional nitrogen to the Stillwater and East Boulder Rivers as well as minor sediment loading or other pollutant loading increases (pages 4-81, 4-85) would be consistent with development of TMDLs and associated wasteload allocations for the impaired segments of these rivers. It will be important that proposed revisions to WMPs for both mines be consistent with applicable TMDLs being developed for impaired waters to avoid further degradation of impaired waters and promote water quality improvement and restoration of full support of beneficial uses in such waters. Particular attention needs to be directed at concerns regarding nitrogen loading to surface waters. This may be a more significant issue for the Stillwater Mine since nitrate/nitrite nitrogen are identified among the probable causes of impairment in the Stillwater River, but not in either 303(d) listed segment of the East Boulder River (although chlorophyll-*a* is identified as a probable cause of impairment in the East Boulder River, and nitrogen is listed as a probable cause of impairment in the Boulder River downstream).

TMDL consistency means that revised mine water management resulting in pollutant discharges to 303(d) listed streams should not cause further degradation of water quality, and should be consistent with promoting water quality improvement to restore full support for beneficial uses. If additional pollutant loads to impaired waters may be generated during project activities, mitigation or restoration activities should also be included to reduce pollutant loads or other sources of pollution to offset or compensate for pollutants generated during project activities.

We recommend that the Custer and Gallatin National Forests and DEQ Hardrock Section staff consult with DEQ and EPA TMDL program staff to assure consistency of proposed water management plan revisions at both mines with the development of TMDLs (contact DEQ TMDL staff Dean Yashan at 406-444-5317; Mr. Robert Ray of DEQ at 406-444-5319; and Ms. Lisa Kusnierz of EPA at 406-457-5001). We also encourage review of the MDEQ's pamphlet, ***"Understanding the Montana TMDL Process."*** http://deq.mt.gov/wqinfo/TMDL/default.mcpx . In addition we draw your attention to comment # 14 below regarding the need for TMDL consistency with respect to Stillwater River metals levels.

Metals

11. We are pleased that the DEIS states that the geochemical consistency of the 28-mile long ore body indicates little potential for acid generation or near-neutral metal leaching over time, and that ore body geochemistry is analyzed quarterly to determine the acid rock production potential. Annual reports and agency site inspections at both the Stillwater Mine and the East Boulder Mine have not identified any geochemical problems to date (page 2-82).

    We understand, however, that the J-M reef of the Stillwater Complex consists of a 2.4-m thick layer of disseminated sulfides, such as pyrrhotite, chalcopyrite and pentlandite, extending over the entire strike zone from the Stillwater Mine to the East Boulder Mine. Platinum group deposits in large, layered intrusions tend to have low sulfide mineral abundances (1-5 weight percent) and low total metal abundances based upon geoenvironmental model evaluations (Foose, et.al.). However, the EIS fails to confirm this geochemical generalization, and we are concerned that sulfidic minerals in the ore and waste rock have potential to oxidize and mobilize metals over long periods of time. Furthermore, actual data on sulfides from the J-M Reef show sulfides ranging from 2- 13 weight percent, averaging approximately 7.9 weight percent sulfide. (Godel, 2006).

    The DEIS indicates that metals, such as cadmium, chromium, copper, lead, and zinc are found in mine waters, although at low levels (page 2-12). Table 2-3 (page 2-12) shows some metals levels for East Boulder Mine adit and tailings water and the East Boulder River that appear to exceed some water quality criteria at 25 mg/l hardness (e.g., Cd chronic aquatic life criteria is 0.097 ug/l and this level is exceeded in adit and tailings water and the East Boulder River; and the Pb chronic aquatic life criteria is 0.545 ug/l and Table 2-3 only indicates that Pb levels are <3 ug/l in adit and tailings water and the East Boulder River, so it is not clear if they exceed surface or groundwater standards).

    Table 2-3 does not display any metals concentrations for Stillwater mine adit and tailings water and the Stillwater River, so it is not known if there may be any metals criteria exceedances in Stillwater Mine adit or tailings water. We note that the Stillwater River 303(d) listing includes cadmium, chromium, copper, cyanide, mercury, nickel among the probable causes of water quality impairment, and includes hardrock mining discharges (permitted) among the probable sources of impairment. Disclosure of Stillwater Mine adit and tailings water quality data and analysis in regard to metals levels is needed in the FEIS for more comprehensive environmental impact analysis.

    We believe it is important that the water quality monitoring program periodically evaluate potential metals release and transport from waste rock, tailings and underground mine drainage to ground and surface waters post-closure over the long-term to assure that adit water and tailings impoundment runoff waters remain free of elevated metals levels over the long-term, post-closure. The DEIS states that the monitoring plans in the agency-mitigated alternatives include long-term monitoring of mine waters prior to direct discharge (page 2-82). Although we could not find details about the parameters to be analyzed in the long-term water monitoring plans in the DEIS. Table 2-6 (page 2-99)

states that surface and groundwater monitoring must be submitted to and approved by the agencies with Stillwater Mine Alternative 3A for operations and closure, and that sampling would include nitrogen, salts and biomonitoring. Metals monitoring is not mentioned in Table 2-6 (or Table 2-7 for the East Boulder Mine).

In addition, we note that the independent contractor that monitors compliance with the provisions in the SMC Good Neighbor Agreement (GNA) prepared a May 2006 report on *"Citizen Sampling, Geochemical Characterization Results,"* that, while it supports the DEIS conclusion that there is very low potential to generate acid or leach metals (report page 41), also states that rock with low sulfur content (<1%) such as that mined at Stillwater and East Boulder Mines has been shown to produce acid over time (report page 42).

This Citizen Sampling report recommends that the Stillwater Mine modify the Waste Rock Characterization Plan to analyze ore, tailings, and waste rock samples for SPLP extractable metals instead of TCLP extractable metals, stating that SPLP tests better simulates short-term interaction with slightly acidic water and measures readily soluble components of mine waste. The report also recommends that a kinetic column test using large scale columns be conducted over several years to better evaluate potential for leaching of metals over the long-term (report page 42). In addition it recommends that periodic geochemical characterization of tailings at the East Boulder Mine be conducted as part of the Waste Rock Characterization Plan, and that quarterly geochemical analysis be conducted at the East Boulder Mine as it is at the Stillwater Mine.

The consultant for this sampling effort reported that the recommendations of the GNA geochemical characterization report (long-term kinetic test and quarterly monitoring at the EB Mine) were discussed by the GNA Oversight Committees for both the Stillwater and East Boulder Mines back in 2006. SMC did initiate quarterly monitoring of tailings/waste rock at the East Boulder Mine and added tailings to their quarterly acid base accounting (ABA) monitoring at Stillwater Mine; and this data is submitted to the GNA parties and MDEQ on a quarterly basis. The recommendation for a long-term field humidity cell was not implemented given the very low probability of acid generation indicated in the continued quarterly monitoring results.

We believe there should be periodic monitoring for potential acid generation and elevated levels of metals (e.g., Al, As,Cd, Cu, Fe, Pb, Mn, Hg, Se, Ag, Zn, Pt, Pd, total hardness, Ca, Mg and SO4). The FEIS should summarize long-term monitoring for potential acid generation and leaching of metals post-closure.

12. We are pleased that the East Boulder Mine MPDES Permit (MT-0026808) includes effluent limits and monitoring for metals (Cd, Cr, Cu, Fe, Mn, Ni, Pb, Zn); and the Stillwater Mine MPDES Permit (MT-0024716) includes effluent limits and monitoring for Cd, Cu, Cr, Fe, Hg, Mn, Ni, Pb, Zn; and both permits specify no acute toxicity in the effluent.

13. Figure 2-3 shows Nye Creek flowing just downgradient of the Stillwater Mine wasterock storage areas and sediment/percolation ponds. If water quality monitoring has been carried out in Nye Creek and in groundwater down-gradient of the Stillwater Mine rock storage area it would be of interest to see a summary of this data, since it may further support the low potential for metals leaching from waste rock. We recommend summary discussion of water quality monitoring results in ground and surface water samples collected down-gradient from the Stillwater Mine waste rock pile. We also recommend similar discussion of water quality monitoring result in ground and surface water down-gradient from the East Boulder Mine waste rock pile if such monitoring has occurred.

14. In comment # 10 above we note the need for the proposed WMP revisions to be consistent with applicable TMDLs being developed for impaired waters to avoid further degradation of impaired waters and promote water quality improvement and restoration of full support of beneficial uses in such waters. Since the 303(d) listing for the Stillwater River includes metals among the probable causes of impairment (i.e., Cd, Cr, Cu, Hg, Ni) and includes hardrock mining discharges (permitted) among the probable sources of impairment, it will be important that attention be directed at concerns regarding metals loading as well as nitrogen and sediment loading to surface waters relative to consistency with TMDLs.

Biological Treatment Systems (BTSs), LADs, Mine Wastewater Discharges, MPDES Permits

15. The Anox Biological Treatment System (BTS) at the East Boulder Mine is different than the BTS system at the Stillwater Mine, but we did not fully understand this difference until reading in Chapter 4 that the there is an additional nitrification circuit at the East Boulder Mine to convert ammonia nitrogen to nitrite/nitrate nitrogen (page 4-25). We did not see this information displayed in the alternatives descriptions in Chapter 2. We also understand that recently a reverse osmosis treatment system has been added to the East Boulder Mine wastewater treatment system.

    To aid in reader understanding we recommend that descriptions of the treatment facilities at each mine be clearly described and updated in the Chapter 2 alternatives descriptions. It would be helpful if complete descriptions of the treatment systems used at both mines were provided, including a process summary, treatment system capacity, typical treatment system influent and effluent quality, and pollutant removal efficiency of the treatment systems at each mine. Such information will help the EIS reader better understand water treatment and management at both mines.

    It would also be helpful if the FEIS described why a nitrification system to convert ammonia nitrogen to nitrate/nitrate nitrogen is in use at East Boulder Mine, but not at the Stillwater Mine. We understand that there are no plans to install a nitrification circuit at the Stillwater Mine, although this appears to be identified as a future option on page 4-7. It would be helpful if the FEIS clarified future options for wastewater treatment at the Stillwater Mine.

16. It is stated that the Biological Treatment System (BTS) at the Stillwater Mine can treat more than 1,000 gpm, although historically SMC treats up to 650 gpm of adit water at up to 40 mg/l nitrogen concentrations (page 2-17), and the Plan of Operations permits a maximum discharge rate from the two adits at the mine of 2,020 gpm (page 2-16). It would be of interest to know the maximum adit flows that have occurred at the Stillwater Mine. Has there ever been a situation where the flow of adit water exceeded the BTS design capacity?

    It is stated that the operational adit flow rate at the East Boulder Mine is 150 gpm (page 2-46) and the maximum permitted discharge is 737 gpm, but the maximum treatment capacity of the BTS/Anox systems at the East Boulder Mine is not disclosed. It would be of interest to know the maximum adit flows that have occurred at the East Boulder Mine and the design capacity of the treatment system. Do adit flows at the East Boulder Mine ever exceed treatment capacity?

17. The DEIS also states that LAD system operation at the Stillwater Mine has been applied at greater than agronomic rates (page 4-103), and there is no requirement for use of an agronomic rate at the Hertzler LAD (pages 2-17, 4-45). The DEIS also states that ammonia removal at the Stillwater Mine occurs using the Hertzler Ranch LAD (page 4-9). Does monitoring of both ammonia-nitrogen and nitrite/nitrate-nitrogen in groundwater downgradient from the LADs occur to evaluate effectiveness of both ammonia and nitrite/nitrate nitrogen removal by the Hertzler and other Stillwater LADs?

    We note that there is a requirement in the East Boulder Mine MPDES permit to apply water to the LAD at agronomic rates (page 2-46, 4-106). It is not clear why water is applied at agronomic rates at the East Boulder Mine LADs, but at greater than agronomic rates at the Stillwater Mine LADs. It would be helpful if this were further explained.

    The proposed agronomic application rate to prevent deep percolation at the Boe Ranch is identified as 7.7 gpm/acre/12-hour LAD day or 743 gpm at all 10 center pivots for Alternative 2C (page 4-116), but would be 10.4 gpm/acre/12-hour LAD day or 863 gpm using 9 center pivots for Preferred Alternative 3C. Is this correct that a higher application rate to the Boe Ranch LAD would occur with the 9 center pivots in Alternative 3C vs. the 10 center pivots in Alternative 2C? We suspect that this is correct since it is stated that with preferred alternative (Alternative 3C) greater than agronomic irrigation rates would be used at the Boe Ranch LAD (pages S-20, 4-37), but it would be helpful to have this verified.

    Would application at greater than agronomic rates at the Boe Ranch LAD be inconsistent with the East Boulder Mine MPDES Permit that says water would be applied at agronomic rates? We are pleased that the Appendix B Monitoring Plan for the Boe Ranch LAD indicates that Mason Ditch monitoring would occur three times per year (spring, summer, fall/winter) to allow LAD effects to groundwater to be determined (page B-5). Is it expected that the higher LAD application rate with Preferred Alternative 3C will provide for adequate nitrogen uptake by crops and minimal nitrogen leaching to groundwater?

18. It is stated in Appendix B that denitrification is appreciable in flooded soils so LAD application rates would be adjusted to maintain 65 to 80 percent saturation in the top 12 to 18 inches of the soil profile (page B-3). However, it also stated that SMC would make adjustments to LAD application rates to maximize nitrogen uptake and minimize potential for nitrogen leaching below the root zone, and we understand there is also a need to provide for leaching of salts below the root zone to avoid build-up of salts in soils.

    It would appear, therefore, that there are trade-offs in maximizing nitrogen uptake by plants and minimizing nitrogen leaching to groundwater, while also maximizing denitrification in saturated soils and leaching of salt from soils. It is not clear how LAD application rates will be adjusted to balance and/or optimize the various trade-offs. Additional FEIS discussion would be appreciated to assist in understanding how LAD application rates will be managed to address these trade-offs at the Boe Ranch LAD.

19. The DEIS states that some groundwater in the area of the Boe Ranch LAD discharges to the East Boulder River (page 2-68), and that the Boe Ranch LAD could result in the release of treated waters containing nitrogen to the ground water system, and mixed LAD-area percolation and ambient ground water would flow towards the East Boulder River (page 4-38). Also Figure 2-28 shows hydrological connectivity between groundwater at the Boe Ranch LAD and the East Boulder River. We agree that this site is likely to have hydrological connectivity of groundwater to the East Boulder River, and note that this differs from the statement on page 1-3 indicting that SMC contends that the Boe Ranch LAD is not hydrologically connected to the East Boulder River.

    Also, it is stated that there is no MPDES permit or nitrogen load limit for the Boe Ranch LAD area (page 4-116). Since the Boe Ranch LAD appears to be hydrologically connected to the East Boulder River, is there a need for a nitrogen load limit in the East Boulder Mine MPDES permit for the Boe Ranch LAD to assure that nitrogen loads from the LAD to the East Boulder River from groundwater are considered?

20. At the East Boulder Mine it is stated that the clarifier and BTS would be retained for up to 18 months or until adit and tailings waters no longer require treatment (page 2-60). This seems to provide flexibility for potentially retaining the BTS after 18 months if treatment of adit and tailings waters is still needed. We did not see such flexibility included in the discussion for decommissioning the BTS at the Stillwater Mine, where it simply states for the Stillwater Mine preferred alternative that the BTS would be available for treatment of tailings waters for 18 months (page 2-39), and the clarifier, BTS, and pipelines would be decommissioned after 18 months (page 2-43).

    Do we understand correctly that the clarifier and BTS may potentially be retained beyond 18 months if adit and tailings waters still require treatment at the East Boulder Mine, but not at the Stillwater Mine? We believe that the clarifier and BTS should be retained at both mines until adit and tailings waters no longer require treatment.

Also the criteria that will be used and how the data will be analyzed to determine that treatment is no longer necessary at mine closure/post-closure is not well described. The methods used to analyze when "water quality standards are met" at closure/post-closure are critical. Will all the parameters in the MPDES permit be analyzed in making decisions to end water treatment? Will one sampling event be sufficient or will a number of samples be statistically analyzed? Will it be a 30- day average or will the discharges be evaluated on a seasonal basis? We recommend that the discussion of the decision making in regard to ending water treatment at closure/post-closure at the mines be more fully described.

21. It is stated that East Boulder Mine nitrogen levels in ground water have slowly increased at monitoring sites, and this has been attributed to the discharge of treated adit water to the percolation pond (page 4-26). A spill of untreated adit water in the spring of 2007 and other sources of nitrogen resulted in a spike in nitrogen levels above ground water standards during late summer and fall of 2007 that remained elevated into 2010. As a result of the spill, the nitrogen concentration in ground water increased above the DEQ-7 ground nitrogen water quality standard (10 mg/L) and the MPDES permit limit (7.5 mg/L TIN) at the end of the mixing zone for the East Boulder MPDES permit. Were other standards or limits exceeded during the 2007 spill? What mitigation measures have been proposed to minimize the potential for a recurrence of a spill?

    Currently the percolation pond is the primary method of disposal for adit water at the East Boulder Mine (page 4-103). The nitrogen and salts content in wells downgradient of the East Boulder percolation pond (prior to the 2007 spill) increased up to 4 mg/L nitrate-nitrogen and 350 µmhos/cm conductivity. The *"East Boulder River Watershed Nutrient Assessment Report"* discussed in earlier comments, also identified the increasing trend of nitrite+nitrate nitrogen in groundwater down-gradient from the East Boulder Mine.

    It is our understanding that the Boe Ranch LAD is being proposed to provide greater assurance that MPDES permit limits are met at the East Boulder Mine during operations and at closure (pages 2-68, 4-84). Accordingly we agree that use of the Boe Ranch LAD is likely to help address concerns about nitrogen exceedances at the East Boulder Mine during operations and at closure. Although we also understand that a new reverse osmosis treatment unit is being used at the East Boulder Mine, and it would appear that such treatment offers an alternative option for addressing concerns about nitrogen exceedances during operations and at closure.

22. The Boe Ranch LAD would not be used post-closure, and after the 18 month closure period untreated East Boulder Mine adit water would be routed directly to the East Boulder River (page 4-148), via a constructed channel from the adit (page 4-51). It is not clear to us how long monitoring of untreated East Boulder Mine adit water discharged directly to the East Boulder River will take place after the 18 month closure period. We recommend that the FEIS clarify post-closure monitoring.

23. It is stated that tailings slimes that accumulate ahead of cover placement at closure of the Hertzler Ranch Tailings Impoundment would be pumped to the south end of the LAD

storage pond (page 2-40). Is it good practice to potentially contaminate the LAD storage pond with tailings slimes? We note that tailings slimes in the Stillwater tailings impoundment during cover placement at closure would be pumped to the underground workings (page 2-39). This seems like a better way to dispose of tailings slimes at closure, although we realize the Hertzler Ranch tailings impoundment is located further from the underground workings. Are there other options for disposing of tailings slimes at the Hertzler Ranch other than the LAD storage pond?

24. It is our understanding that at post-closure, seepage through the cover at the Hertzler tailings impoundment and impoundment runoff post-closure would be directed to the Hertzler LAD storage pond and used for irrigation rather than being discharged to the river (pages 2-33, 2-41, and Figure 2-16). It is not clear why seepage through the Stillwater tailings impoundment cover and impoundment runoff would be routed to the river, while seepage through the Hertzler tailings impoundment cover would be used for irrigation. It would appear that the quality of this seepage water would be similar at both impoundments. Is there any potential for routing Stillwater tailings impoundment runoff to a LAD system or percolation pond rather than to the river? Treatment/disposal of this water through irrigation or percolation ponds is preferred over direct discharge to the river.

25. We appreciate the agencies recognition of potential slope stability/mass wasting concerns with use of the P10 center pivot at the Boe Ranch LAD, and the requirement for development of a monitoring plan for use of center pivots P4 and P9 with Boe Ranch LAD Preferred Alternative 3C (page 4-141).

26. We are pleased that preferred alternative 3C would reduce the size and capacity of the high hazard water storage dam at the Boe Ranch LAD at post-closure to 50 acre-feet (reduction from 330 acre-feet maximum water storage during operation), to reduce long-term risks to water quality and potential loss of life and personal property damage from dam failure (page 4-164). The Boe Ranch LAD storage pond during operations would be 55 feet high, 30 feet wide, and 600 feet long occupying 24 acres (page 2-73). What would the dimensions of the storage pond be after closure? Where would the excess embankment soils and other materials be placed when the storage pond is reduced in size post-closure? Would the storage pond be fenced post-closure?

27. We appreciate the agencies use of a 250 milligrams per liter (mg/L) total dissolved solids (TDS) in-stream goal or recommendation at both mines even though there are no MPDES permit limits for salt (pages 4-6, 4-79). We understand that this 250 (mg/L TDS limit in surface water is a conservative recommendation to avoid adverse effects to trout egg fertilization and development, based on a literature review of TDS effects to trout that indicates that TDS values in excess of 250 mg/L may adversely affect egg fertilization and development.

Boe Ranch LAD Pipeline

28. It is stated that wetlands and riparian zones have been not been identified (to date) along the 11,700 foot long pipeline route to the proposed Boe Ranch LAD facilities, and the potential for adverse effects to wetlands during the disturbance of 16 acres during pipeline construction appears to be low (pages S-15, 2-9, 2-72). Table 1-2 (page 1-14) shows that a Nationwide 404 permit will be required for some discharges of dredged or fill material into waters of the U.S., including wetlands. We note that if any wetlands are identified along the pipeline route it will be important that wetlands along the pipeline route be avoided as much as possible. Also SMC should contact the appropriate regulatory agencies to obtain permits and/or authorizations that may be necessary for any construction activities that may affect aquatic areas (e.g., contact Todd Tillinger of the U.S. Army Corps of Engineers in regard to Clean Water Act Section 404 Dredge and Fill Permits in Helena at 406-441-1375 or Corps staff in the Billings regulatory office at 406-657-5910, and Jeff Ryan at MDEQ at 406-444-4626).

29. The DEIS states that a potential rupture of the proposed Boe Ranch LAD pipeline at an adit flow rate of 150 gpm would likely discharge 180,000 gallons of treated adit water assumed to contain 11.1 mg/L nitrogen and 550 mg/L TDS to the East Boulder River, resulting in adverse short-term effects (page 4-43). We are concerned that this pipeline crosses an area identified with a potential for mass wasting according to Figure 3-17. We are pleased that the pipeline would be equipped with a leak detection system (page 2-72), and that SMC would implement a Pipeline Monitoring and Spill Contingency Plan (PMSCP) and regular pipeline integrity inspections would be performed (page 4-89, B-6). Other potential measures that SMC and the lead agencies may want to consider to reduce risk of a pipeline rupture and resultant spills to the environment include:

    -Locate pipeline as much as possible away from streams, wetlands, and unstable areas, and minimize pipeline crossings of streams, wetlands, and unstable areas.

    -Increase pipeline thickness to 0.50 inches at stream crossings.

    -Use cathodic protection along the entire length of pipeline.

    -Further protect pipeline from corrosion by a minimum of 8 mils of fusion bonded epoxy coating (FBE), 6 mils of copolymer adhesive, and 40-75 mils of high density polyurethane (HDPE).

    -Consider use of double walled pipe, although installation of a casing pipe around pipeline crossings of rivers may actually increase the probability of a spill at or near a river or stream, since air and moisture accumulation between the casing and pipe may aggravate pipe corrosion. Pipeline casings and appropriate technology should be evaluated to decrease the probability and magnitude of a spill or leak.

    -Pipeline valving shut-off arrangements that limit the magnitude/volume of a spill at any one time (periodic block and check valves). Mainline block valves and check

valves located upstream and downstream of river/stream crossings to allow stoppage of flow should leaks or pipeline damage occur at river and stream crossings.

-Use state-of-the art "smart pig" system to detect deformities on the inside of the pipe, and"smart pig" internal pipeline inspections within three years of the initial hydrostatic pipeline testing, and schedule subsequent periodic inspections (e.g. every two years) to reduce the risk of undetected deformities causing spills.

--Regular hydrostatic testing to evaluate pipeline integrity during operations. High sensitivity shut-in leak tests performed at least at monthly intervals to identify the possible occurrence of a very small leak.

-Use pipeline leak detection and alarm systems (e.g., real dynamic flow modeling for flow and pressure deviation detection; and remote control automatic shut off capabilities in the event of a leak).

-Include in the Spill Contingency and Emergency Response Plan for the pipeline information on spill response procedures to be followed and actions to be taken in the event of a spill, including procedures to mitigate potential adverse environmental impacts (i.e., on surface water, ground water, soils, fisheries, wildlife, recreation, human health and safety), and discussion of the location of equipment and expertise available to each length of the route to respond to environmental cleanup. Special conditions such as weather impaired and cold weather response procedures should be also included.

Bonding

30. It is stated in regard to East Boulder Mine Alternative 1B that bond calculations include three years of managing and maintaining water management facilities including channels during post-closure, although post-closure maintenance is included in agency bond calculations in the form of a perpetual care fund (page 2-53). We assume this perpetual care fund would also be included for preferred alternative, Alternative 3B. We did not see similar discussion of a perpetual care fund for the Stillwater Mine preferred alternative, Alternative 3A. Why is there discussion of a perpetual care fund for the East Boulder Mine, but not the Stillwater Mine? What activities specifically are covered under a perpetual care fund? Will this fund cover contingency actions for unforeseen circumstances or long-term water quality maintenance activities that may be needed after traditional mine reclamation requirements are met?

U.S. Environmental Protection Agency Rating System for Draft Environmental Impact Statements

Definitions and Follow-Up Action*

Environmental Impact of the Action

LO - - Lack of Objections: The Environmental Protection Agency (EPA) review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC - - Environmental Concerns: The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce these impacts.

EO - - Environmental Objections: The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no-action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU - - Environmentally Unsatisfactory: The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1 - - Adequate: EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis of data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2 - - Insufficient Information: The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses or discussion should be included in the final EIS.

Category 3 - - Inadequate: EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the National Environmental Policy Act and or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

* From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment. February, 1987.