IDAHO RIVERS UNITED
20th ANNIVERSARY

PO Box 633
Boise, ID 83701
800-574-7481
Fax 208-343-9376
www.idahorivers.org

Kathleen Collins
EPA Region 10, OWW-1330
1200 Sixth Ave, Suite 900
Seattle, WA 98101
collins.kathleen@epa.gov

Pete Wagner
Idaho Department of Environmental Quality
Boise Regional Office
1445 N. Orchard
Boise, ID 83706
Pete.Wagner@deq.idaho.gov

RE: Comments of Idaho Rivers United on draft NPDES permit for City of Boise West Boise Wastewater Treatment Facility

Dear Ms. Collins and Mr. Wagner,

Idaho Rivers United appreciates the opportunity to comment on the Environmental Protection Agency's draft NPDES permit for the City of Boise West Boise Wastewater Treatment Facility and the Idaho draft 401 Certification.

Idaho Rivers United is a non-profit river conservation organization dedicated to protecting and restoring the rivers of Idaho. Based in Boise, Idaho Rivers United has 3,500 members. Protecting the Boise River watershed is one of our organization's primary goals. Many of our members use and enjoy the Boise River, and we represent their interest in seeing the Clean Water Act fully applied in order that the Boise River is fishable and swimmable.

Please accept the following comments.

Term of permit

The CWA and supporting federal regulations authorize EPA to issue an NPDES permit for a term of five years. The *NATIONAL WATER PROGRAM STRATEGY: RESPONSE TO CLIMATE CHANGE* KEY ACTION UPDATE FOR 2010-2011 reinforces the importance of reviewing NPDES permits on a five-year cycle, "The five-year permitting cycle provides permit writers with a significant amount of flexibility to adapt to changing conditions." The five year term is more important than ever as climate change has the potential to impact water quality–based effluent limitations and other permit conditions.

Idaho Rivers United supports the five year permit term because it allows new information to be considered in a timely manner. This results in better protection for waters of the United States. Idaho Rivers United is concerned that this draft permit contains actions to be carried out after the term of this permit expires. **IRU requests that this permit be limited to actions to be taken during the term of this permit.**

Possible correction: Fact Sheet, pg. 7 – Is the facility operating under the 1994 permit or the 1999 permit, as modified?

Low flow conditions

EPA does not sufficiently explain why the gaging station flow data from March 12, 1982 through Dec. 31, 2009 "more accurately reflects the flows that have occurred since the completion of several dams, diversions and reservoirs." Lucky Peak dam was completed, as noted, in 1955, 27 years before 1982. Streamflow maintenance flows were claimed by the Bureau of Reclamation in 1984 and affirmed by the court in 2008, but those dates and that issue is not discussed in the draft permit.

Low flow conditions are used to determine if "an effluent discharge has the reasonable potential to cause or contribute to an exceedance of a water quality standard," and are therefore highly significant to the permit and the condition of the Boise River. The low flows that will occur during the term of the permit are important to ensuring that the waters of the Boise River are fishable and swimmable, and past flow information is only used to help EPA make a reasoned prediction.

EPA needs to further explain their use of that time period to establish low flow conditions for the term of the permit.

EPA seemingly failed to account for the impact that climate change will have on flows in the Boise River, particularly low flows. It is imperative that CWA permit writers use climate change science to inform their decisions. Information available from the USBOR indicates that flows in the Boise River may not repeat the historical patterns captured in the EPA's calculations. **EPA must address the impacts that climate change is having and will have on low flow conditions in the Boise River in order to establish appropriate effluent discharge limits.**

It's notable that the West Boise Facility discharges into the south channel of the Boise River – a reach where flows are especially unpredictable. Natural hydrologic forces and manmade alterations at the head of Eagle Island can drastically shift flows between the channels. Climate change impacts on Boise River snowpack, snowmelt and rainfall can impact channel geomorphology at the head of Eagle Island that influences flow in the south channel. The U.S. Army Corps of Engineers and local partners will be doing environmental restoration work in the stream channel and along the shore of the Boise River at the head of Eagle Island during the term of the permit. **These issues need to be addressed and explained so reviewers can evaluate effluent discharge limits.**

It would be helpful if information in Table 3 and 4, pg. 9 and 10, was converted to cfs.

Proposed Effluent Limits

Idaho Rivers United supports the Total Phosphorus average monthly limit of .07mg/L. We are concerned that those limits only apply from May 1 – September 30 and question the rational for setting those limits. The situation is complicated because phosphorus pollution

problems commonly manifest at a temporal and geographic distance from the discharge. The argument that "phosphorus is most likely to adversely impact the receiving water" during this time period is weak and **needs to be explained in more detail**.

EPA fails to account for the fact that a TMDL for phosphorus for the Boise River is long overdue and is scheduled to be developed during the term of this permit. The TMDL will have great bearing on the WLA for the West Boise Facility and other dischargers. **EPA needs to explain how they will incorporate the Boise River phosphorus TMDL into this permit.**

Climate change was not addressed in establishing any of the effluent limits. According to the *NATIONAL WATER PROGRAM STRATEGY: RESPONSE TO CLIMATE CHANGE* KEY ACTION UPDATE FOR 2010-2011, NPDES permit writers need to consider changes to water quality standards, effluent guidelines and standards, and TMDLs resulting from climate change. **The discussion should be presented via the Fact Sheet and the conclusions should be reflected in the permit.**

Compliance Schedules and Interim Effluent Limits

Idaho Rivers United agrees that a compliance period is allowed for effluent limits that are permitted for the first time. Accordingly, the permit that is expected to be issued in 2012 may include compliance schedules for a number of effluents. However, the compliance schedule must not exceed the five-year term of the permit. Effluent limits can only be permitted for the first time once. **This draft permit must be revised to mandate full compliance with the permitted limits by the end of the five-year permit term.**

Under the terms of this draft permit, the West Boise Facility is allowed to discharge eighty two times the amount of Total Phosphorus EPA determined is necessary to meet water quality standards in the Boise River. Over the four years this discharge is allowed, an excess of 701,920 lbs of Total Phosphorus will enter the Boise River. This is in addition to the eight years worth of phosphorus that has entered the Boise River since the current permit expired in 2004.

Nancy Stoner, Acting Assistant Administrator of the EPA issued a memo on March 16, 2011 that states, in part, "States, EPA and stakeholders, working in partnership, must make greater progress in accelerating the reduction of nitrogen and phosphorus loadings to our nation's waters." Ms. Stoner referenced the 2009 Urgent Call to Action of the EPA Nutrient Innovations Task Group that said, "nutrients now pose significant water quality and public health concerns across the United States." The compliance schedule in this draft permit does not reflect the urgency with which this serious pollution problem must be eliminated.

The proposed limit for phosphorus is not harsh or severe and should not be described as stringent. While the limit is much smaller than the current effluent load, a limit of .07mg/L is not uncommon and is being met by POTWs across the nation. More importantly, the proposed limit is what EPA has determined is needed to return the Boise River and other downstream waters to fishable and swimmable conditions. This more restrictive limit was

anticipated by the City of Boise for years and it's technologically achievable. The City has had years to explore cost effective alternatives to reduce the pollution of the Boise River.

Portions of the Boise River and the Snake River downstream of the West Boise Facility are seriously polluted. The high levels of phosphorus make it impossible for members of Idaho Rivers United and the public to enjoy the beneficial uses of these incredible river reaches. The draft permit should be revised to require all effluent limits be met in five years.

Sincerely

Liz Paul
Boise River Campaign Coordinator

IRU Comment 7.
IRU supports the Total Phosphorus limit of 0.07 mg/L. We are concerned that those limits only apply from May 1 – September 30 and question the rationale for setting those limits. The situation is complicated because phosphorus pollution problems commonly manifest at a temporal and geographic distance from the discharge. The explanation that "phosphorus is most likely to adversely impact the receiving water" during this period is weak and needs to be explained in more detail.

IRU Response 7.
The EPA based the total phosphorus limits on requirements found in the Snake River-Hells Canyon (SR-HC) TMDL. In that document the phosphorus target (70 µg/L) applies from May through September. The EPA has completed a more thorough review of that document and found that the SR-HC TMDL does not provide an adequate basis for limiting the phosphorus target to the May through September time period. Based on our review EPA has determined that effluent limitations for phosphorus are needed year-round.

The EPA is not including October through April limits in this permit at this time. The EPA will determine the appropriate phosphorus limits to apply to the effluent from October through April and these limits will be incorporated into the next permit that is issued to the facilities. The discussion below presents some of the information the EPA used to determine that year-round limts are required.

High levels of nutrients such as phosphorus and nitrogen can excessively stimulate the growth of algae, both in the water column and attached to the streambed as periphyton. The nutrients also encourage growth of aquatic weeds (macrophytes), resulting in severe water quality problems. In the Snake River (of which the Boise River is a tributary), phosphorus has been identified as the primary nutrient causing water quality degradation. Phosphorus takes many forms in the aquatic environment, and phosphorus pollution is not readily attenuated by physical, chemical, and biological processes (i.e., phosphorus does not degrade in the aquatic environment). The persistence of phosphorus is particularly problematic in reservoirs. When a river enters a reservoir, the water velocity slows and the surface temperatures increase due to thermal stratification. This provides an ideal environment (abundant nutrients, warm temperatures) for rapid and excessive growth of floating and/or suspended algae. When algae die they sink, decaying and drawing oxygen from the middle and lower depths of the reservoir creating an environment that is harmful to aquatic life. In simple terms, phosphorus pollution is converted to oxygen demanding algae. In addition, when the dissolved oxygen at the bottom of the reservoir is very low (typically < 2 mg/L), chemical reactions in the sediments release the previously-sequestered phosphorus in a dissolved form. This dissolved phosphorus mixes into the overlying water column and becomes available for uptake by algae. This "internal loading" (recycling) process is a common, long-term problem in lakes and reservoirs impacted by human activities. Water quality problems associates with high nutrient levels (e.g., excessive algae levels, low DO) are often most severe during spring and summer conditions. However, due to the complex cycling processes between water column phosphorus, algae, macrophytes and reservoir sediments, it is important to consider the potential impacts of phosphorus discharge throughout the year:

1. While algae growth is greatest in the late spring and summer, algae can grow and even bloom (i.e., the rapid, excessive growth of algae) in winter and early spring, and fall blooms are common after reservoir turnover, when phosphorus released from sediments is mixed into the surface layer.
2. Travel time for upstream discharges and long residence times in a reservoir may result in a significant delay effect from the time of discharge to the time of effect. For example, winter discharges in a watershed can affect spring algae growth in a downstream reservoir.
3. Periphyton and macrophyte biomass from year-round growth can slough and float downstream to the reservoir in any season. Again, this may link a discharge in one season to an effect in another.
4. Phosphorus can bind to particulate matter in the water column. As a result, even when algae growth is low in the winter, some portion of the phosphorus discharged to the reservoir will settle to the bottom of the reservoir, either attached to sediment or as dead algal cells, and increase the mass available for re-cycling from the sediments to the water column.

The USGS recently released a report with new water quality data for the Boise River at Parma and Snake River at locations upstream and downstream of the Boise River confluence (Wood, M., and Etheridge, A. Water Quality Conditions near the Confluence of the Snake and Boise Rivers, Canyon County, Idaho. USGS Report 2011-5217). Several findings in this report indicate that October through April discharges of phosphorus to the Boise River affect dissolved oxygen conditions in Brownlee Reservoir, including:

1. Algae blooms have been observed in March in the Snake River.
2. The Boise River contributes 30% of the phosphorus to the Snake River at the confluence, and 72% of the orthophosphate, which is the form of phosphorus that directly fuels algae growth.
3. High chlorophyll-*a* concentrations were observed in both the Boise and Snake Rivers in the winter and spring. In the Boise River, it is likely that this chlorophyll-*a* spike is caused by sloughed periphytic algae from upstream river reaches.

With these facts in mind, EPA has reviewed the basis for the dissolved oxygen portion of the SR-HC TMDL, which is focused on conditions in Brownlee Reservoir. The reservoir analysis involved the use of a water quality model to evaluate whether phosphorus allocations and targets for the mainstem Snake River (and tributaries including the Boise River) would be sufficient to meet dissolved oxygen standards in the reservoir. The analysis found that upstream river controls would not be sufficient, and the TMDL required that the dam owner, Idaho Power, augment the oxygen levels in the reservoir. This responsibility was expressed as a required increase in oxygen tonnage per day in the middle depths (metalimnion) of the reservoir (See SN-HC TMDL, page 449).

The model analysis supporting the TMDL involved continuous, year-long simulations of dissolved oxygen in Brownlee Reservoir using the CE-QUAL-W2 model. Boundary inputs of phosphorus loading to the reservoir (i.e., inputs of phosphorus from the Snake River and its

tributaries and other external sources of phosphorus) were set to reduced levels (40-70 ug/L) consistent with the TMDL target level (<70 ug/L). Importantly, these reduced levels were assumed for the entire year, not just the months of May through September (see SR-HC TMDL, Appendix F, page 12). The allocations established in the SR-HC TMDL for the mainstem and tributaries did not align with these assumptions of the underlying modeling analysis. Instead, the TMDL established May-September allocations only, and included no allocations (reductions) for the October-April period, based on a qualitative view that only summer discharges of phosphorus contribute to water quality problems in the system. Given the discrepancy between the supporting modeling analysis which assumed year-around reductions, and the seasonal nature of the TMDL allocations, the adequacy of the oxygenation requirement established for Idaho Power and other components of the TMDL allocations are not supported.

Furthermore, as discussed above, October-April loadings have an effect on the long-term quality of the sediments in the reservoir. The TMDL assumptions for future sediment quality established an implicit and ambitious future goal of near-zero sediment enrichment. Specifically, the model simulation that established Idaho Powers oxygenation requirement assumed pristine sediment conditions in the reservoir in the future (0.1 mg O_2/m^2-day[1] in the lacustrine zone of the reservoir) compared to highly enriched sediments today (2-8 mg O_2/m^2-day in the lacustrine zone of the reservoir, see SR-HC TMDL, Appendix F, page 14). For the suite of allocations in the TMDL to meet water quality standards, this pristine sediment condition must be viewed as a target condition necessary to meet water quality standards (in conjunction with tributary allocations and Idaho Power's oxygenation requirement). In this light, it would be inconsistent to allow high phosphorus loadings from tributaries during October to April, which could contribute to enriched sediments either directly or via algal growth and die-off.

[1] 0.1 mg O_2/m^2-day means that for every square meter of bottom sediment there will be 0.1 mg/L of oxygen pulled from the overlying water each day.