**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 10**
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

April 14, 2008

Reply to
Attn Of: ETPA - 088

Ref.: 06-081-BOR

David Kaumheimer, Environmental Programs Manager
Upper Columbia Area Office
Bureau of Reclamation
1917 Marsh Road, Yakima, WA 98901

Dear Mr. Kaumheimer:

The U.S. Environmental Protection Agency (EPA) has reviewed the Bureau of Reclamation (Reclamation) and Washington State Department of Ecology (Ecology) draft Environmental Impact Statement (DEIS) for the proposed **Yakima River Basin Water Storage Feasibility Study** (CEQ No. 20080035) in Washington State in accordance with our authorities under Section 102(2)(C) of the National Environmental Policy Act (NEPA),42 U.S.C. Section 4332(2)(C), and Section 309 of the Clean Air Act, 42 U.S.C. Section 7609.

The draft EIS analyzes the environmental impacts of proposed methods to create additional water storage for the Yakima River Basin for the benefit of anadromous fish, irrigated agriculture, and future municipal water supply. Alternatives include a No Action Alternative that would continue implementation of the existing Yakima River Basin Water Enhancement Program, and six other alternatives grouped in two categories: three Joint Alternatives proposed by Reclamation and Ecology and three State Alternatives proposed by Ecology. The Joint Alternatives are Black Rock (including a dam and reservoir), Wymer Dam and Reservoir, and Wymer Dam Plus Yakima River Pump Exchange. The State Alternatives are Enhanced Water Conservation, Market-Based Reallocation of Water Resources, and Groundwater Storage. A preferred alternative has not been identified. EPA commends Reclamation for considering a broad range of alternatives in this feasibility study and DEIS. While we support the goals of this project, we have concerns about potential environmental impacts associated with some of the alternatives. The following discussion summarizes our concerns regarding the alternatives. A detailed discussion of these concerns is included in the enclosed detailed comments. (Enclosure 1)

**Black Rock Alternative**

At this time, based on potential adverse impacts to the Columbia River and cleanup operations at the Hanford Nuclear Reservation (Hanford Site), EPA objects to the proposed Black Rock Alternative. Seepage from the Black Rock Reservoir would have the potential to affect the magnitude and direction of groundwater flow, causing more rapid migration of radiological and chemical contaminants under the Hanford Site toward the Columbia River. Modeling indicates that groundwater levels could rise as much as 60 feet at the boundary of the Hanford Site and that the groundwater flow could double or triple in this area. Groundwater gradients on the Hanford Site area are very low, especially in the central plateau area, and any changes in heads (hydraulic pressure) could entirely change groundwater flow directions and

gradients. The seepage could also raise water tables beneath the Hanford site, mobilizing contaminants currently in the soil. Such conditions could seriously impede the ongoing, technically-challenging clean-up operations at the Hanford Site. One of the primary objectives of the cleanup is to remove and control pollutants in the groundwater so they do not migrate to the Columbia River. Much of the remediation technology currently implemented or under development at the Hanford Site is designed for current groundwater conditions that affect components such as containment plume shapes, travel times, and peak concentrations.

Proposed mitigation measures for seepage from Black Rock Reservoir include blanketing, cutoff walls, grout curtains, drainage tunnels and wells. The measures are intended to control the direction of groundwater flow and remove and transport groundwater away from the Hanford site. However, these measures have not been well-quantified or tested by either models or case histories. For example, cutoff walls are rarely constructed to depths of 400 feet as proposed and, without more specific information about wall materials and design; it is not possible to judge feasibility or effectiveness.

EPA is also concerned about potential adverse effects on water quality and stability of structures associated with the Black Rock Reservoir due to landslides and earthquakes in the area. The DEIS indicates that Black Rock is located in an active seismic zone with relatively high earthquake potentials. Seepage from the reservoirs may infiltrate currently stable areas and increase pore pressures such that slopes could become unstable and slide, especially during earthquakes.

**Wymer Dam and Reservoir**

EPA's concerns with this alternative are the potential adverse effects on wetlands, riparian areas, water quality, and habitat. Up to 83 acres of wetlands and associated riparian areas would be disturbed and inundated. Water quality may be affected by increases in summer temperature and sediment loads, potentially impacting fish in both Lmuma Creek and the Yakima River. Like Black Rock, Wymer Dam is located in an active seismic zone with relatively high earthquake potentials, so landslides would also be a concern for this alternative. In addition, more than 1,000 acres of sensitive shrub-steppe habitat would be lost.

**Wymer Dam Plus Yakima River Pump Exchange**

EPA's concerns about the potential impacts of Wymer Dam also apply to this alternative. In addition, there are concerns about potential impacts to water quality resulting from construction of pipes and pumps. For example, required instream work may cause local, temporary increases in turbidity during installation and removal of coffer dams.

Because a preferred alternative has not been identified, we have rated each joint alternative separately as follows: LO (Lack of Objections) for No Action; EO-2 (Environmental Objections – Insufficient Information) for Black Rock; EC-2 (Environmental Concerns – Insufficient Information) for Wymer Dam and Reservoir; and EC-2 for Wymer Dam Plus Yakima River Pump Exchange. A summary of our comments will be published in the *Federal*

*Register*. For your reference, a copy of our rating system used in conducting our review is enclosed. (Enclosure 2)

**State Alternatives**

EPA believes the State Alternatives have the potential to achieve significant increases in water availability with minimal environmental impact. We encourage Reclamation to continue fruitful partnership with Ecology and others to further develop combined approaches to achieve water supply goals. In particular, we believe that the Enhanced Water Conservation Alternative and Market-Based Reallocation of Water Resources merit support and further examination. We would also encourage further examination of the Groundwater Storage Alternative with the caution that we would be concerned about the quality of water that would be used to recharge the aquifers and potential pollution of ground and surface waters.

If you have questions or would like to discuss our comments in detail, please feel free to contact Theo Mbabaliye at (206) 553-6322, or Christine Reichgott, NEPA Review Unit Manager at (206) 553-1601, or myself at (206) 553-8574.

Sincerely,

/s/
Richard B. Parkin, Acting Director
Office of Ecosystems, Tribal and Public Affairs

Enclosure
cc: Yakama Nation
Washington State Department of Ecology
Department of Energy at Hanford

Enclosure 1

**EPA Detailed Comments on Yakima River Basin Water Storage Feasibility Study Draft EIS**

**Groundwater impacts**

Under the Black Rock Alternative, a reservoir would be constructed which would be capable of storing 1.3 million acre-feet of water in a basin 10 miles long and 1 mile wide. Associated facilities would include a core rockfill dam (structural height, 755 ft.), over 20 miles of tunnels through ridges, steel pipelines, pumping plant, and an outlet facility/powerhouse. The alternative would also involve construction of a 10-mile access road and relocation of 12 miles of SR-24, two transmission lines, and a buried fiber optic line. Water from the Columbia River would be used to fill the reservoir.

The Black Rock site is an area of basaltic rock, which underlies most of the Yakima River basin. Basalts hold water in the cracks of underground basalt rock and in thin sedimentary layers interbedded with the basalt. The interbeds serve as aquifers and in some areas may be characterized by high hydraulic conductivity.

The draft EIS indicates that a full Black Rock Reservoir would raise the hydraulic head directly beneath the reservoir, resulting in seepage that would affect the magnitude and direction of groundwater flow and rate of contaminant movement under the Hanford Nuclear Reservation (Hanford Site). Plutonium was produced at the Hanford Site from 1943 until the late 1980's and a large amount of radioactive and chemical waste from that process has leaked from tanks and trenches into the ground. The site is a major cleanup operation under the Resource Conservation and Recovery Act and Comprehensive Environmental Response Compensation and Liability Act. Although progress has been made in removing waste from some of the tanks, groundwater contamination is a major concern and focus of cleanup efforts, as many tanks are still leaking or in danger of leaking. Contaminants in soils could be mobilized if they come into contact with water. Seepage from Black Rock Reservoir has the potential to raise water tables beneath the Hanford Site, thus mobilizing contaminants currently in the soil. EPA is concerned that seepage from the Black Rock Reservoir could accelerate the migration of chemical and radiological contaminants from the soil at the Hanford site towards the Columbia River. Modeling estimates that as a result of seepage from Black Rock, groundwater flow at the western edge of the Hanford Site could increase 15,000 - 22,000 acre-feet per year above the current condition. Such conditions could seriously impede cleanup efforts. Much of the remediation technology currently implemented or under development at the Hanford Site is designed for current groundwater conditions that affect components such as containment plume shapes, travel times, and peak concentrations. Significant changes in groundwater hydrology could render current cleanup technology ineffective and create a situation in which more rapid cleanup would be necessary.

Although the draft EIS includes proposed mitigation measures for seepage from the Black Rock Reservoir, we are concerned that the measures have not yet been well-quantified or tested through either models or case histories. For example, cutoff walls are rarely constructed to depths of 400 feet as proposed.

*Recommendations:*

- *EPA recommends further analysis of potential seepage from the Black Rock Reservoir and resultant impacts on groundwater hydrology and cleanup operations at the Hanford Site. We also recommend that Reclamation and Ecology coordinate with the Department of Energy as impacts and mitigation measures are more fully analyzed. We would be happy to meet with Reclamation and other appropriate parties during the period of analysis or shortly thereafter to discuss issues in more detail if desired. The final EIS should include the results of DOE's analyses. The final EIS also should include more specific information about feasibility and effectiveness of the proposed mitigation measures to reduce contaminant mobilization. If further analysis indicates that high risks remain, we recommend that this alternative not be selected.*

**Surface Water Impacts and Wetlands**

The draft EIS identifies impaired waters in the Project area and provides information about applicable Total Maximum Daily Loads (TMDLs). The Columbia and Yakima Rivers are both on the State of Washington's most current 303(d) list of impaired water bodies for a variety of water quality parameters, including temperature, dissolved oxygen (DO), turbidity, nutrients, total suspended solids (TSS), and toxins such as pesticides and contaminants from the Hanford Site.

As described above, Columbia River could be impacted by seepage from the Black Rock Reservoir, increasing the loading of radioactive and chemical pollutants to the river.

Under the Wymer Dam and Reservoir alternative, there is a possibility that during dry years, releases of surface waters from the reservoir could result in warmer water temperatures in Yakima River, especially in August and September, and that releases of bottom waters may adversely affect dissolved oxygen (DO) and nutrient levels. The reservoir would inundate eighty-three acres of palustrine wetlands, resulting in permanent loss of habitat.

*Recommendations:*

- *We recommend that the final EIS include information regarding the status of the Clean Water Act Section 401 certification process and conditions, and more specifics about the Water Quality Monitoring Plan to address water quality problems.*
- *Project impacts to wetlands and riparian areas should be described in quantitative and functional terms and proposed mitigation should be discussed in similar terms. The final EIS should also include maps identifying the proposed locations of roads and staging areas, indicating whether or not they will intersect aquatic resources.*

**Seismicity**

Because the Yakima River basin lies within the Yakima Fold Belt that has experienced tectonic folding and faulting in the past, the potential for landslides and slope movement at both

the Black Rock and Wymer sites exists. Slopes can be inherently unstable due to weak underlying materials, or due to oversteepening or loading of existing stable slopes. Seepage from the reservoirs may infiltrate both stable and unstable areas. The resultant increased pore pressures could reactivate landslides or initiate new ones along the reservoir rim and abutments. According to the draft EIS, the combination of steeply dipping orientation and layering of low-strength sediments and the presence of the Horsethief Mountain Thrust Fault along the southern edge of the Black Rock Reservoir valley present the potential for particularly hazardous situation. Slope stability would also be an issue for the re-alignment of SR-24 along the south rim of the reservoir. A full Wymer Reservoir would also result in groundwater seepage, which is expected to involve substantial volumes and high hydraulic conductivity, all of which could cause a rise of pore pressures and instability of low strength materials in the reservoir basin. Similar to Black Rock, seepage from Wymer has the potential to infiltrate currently stable areas and may increase pore pressures such that slopes could become unstable and slide, particularly during earthquakes.

*Recommendations:*

- *The final EIS should include results of a seismic analysis for the Black Rock Valley, information about how seismicity was evaluated, and how it will be monitored and managed to minimize seismic impacts. A seismic map should either be referenced or included in the final EIS along with information about appropriate seismic design and construction standards and practices that would be used to reduce seismic risks.*
- *The final EIS should identify and map areas that are susceptible to landslides and slope movement in the Black Rock and Wymer project areas along with assessment of slope stability, and determination of factors of safety and appropriate mitigation measures.*

**Vegetation and Wildlife Impacts**

Each of the proposed Joint Alternatives would result in adverse impacts to shrub-steppe habitat, which has low resilience to further environmental disturbance. Under the Black Rock Alternative, an area of nearly 13.5 square miles would be inundated and over 3,500 acres of the shrub-steppe habitat would be lost. These direct impacts would result from construction and use of the dam, reservoir, access roads, SR 24 realignment, and recreational developments. Under the Wymer Dam and Reservoir Alternative, over 1,000 acres of shrub-steppe habitat would be disturbed and potentially lost.

Loss of the shrub-steppe vegetation would also affect wildlife habitat, especially for Greater sage-grouse, which is a State-threatened species and candidate for listing under the Endangered Species Act (ESA). Another species that would be affected is the Ferruginous Hawk, which is listed as State-threatened and as an ESA species of concern. Wildlife would also be affected due to increased noise and traffic during construction and maintenance of the dam and the reservoir. Access roads, pipelines, and utility corridors would serve as obstacles to animals migrating through the area such as deer or elk. Cleared corridors and roads deter terrestrial animals from crossing due to lack of cover, reduced forage and browsing

opportunities, changes in wildlife migrations patterns, and occasional human activity in these areas.

*Recommendation:*

- *The final EIS should discuss in greater detail the effect of corridors created as a result of construction of the dams, reservoirs, and pipelines on habitat fragmentation and the creation of edge effects favoring some species, including mitigation measures.*

**Tribal consultations**

Information in the draft EIS indicates that resources within the Yakima River Basin are associated with the Confederated Tribes and Bands of the Yakama Nation. It is possible that the proposed action would have impacts on this Tribe's resources, especially water resources, fisheries, and agriculture.

*Recommendation:*

- *We recommend that the final EIS include a discussion on issues raised by the Tribe during consultations with Reclamation and Ecology and how the issues were addressed, especially impacts to water resources – quantity and quality. Please note that the Yakama Nation has plans to develop its own water quality standards that may be particularly relevant when analyzing water quality impacts within the Yakama Reservation.*

**Increased Potential Development**

The draft EIS appropriately discusses the amount of available water and forecasts future needs. Because of increased water availability, the proposed project may affect the rate and pattern of growth. The indirect impacts of growth should be examined with respect to protection of water resources, such as conserving water and maximizing the ability to implement effective well head protection.

*Recommendation:*

- *The final EIS should further analyze potential indirect impacts of growth as a result of the project. If development is likely, we encourage consideration of Low Impact Development (LID) techniques because of their potential to reduce the volume of stormwater and mimic natural conditions as closely as possible. As an example, LID techniques would lessen the impacts of stormwater runoff from impervious surfaces such as paved parking lots, roads and roofs.*

Enclosure 2

**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 U.S. 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**

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**

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**

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.