



State of Idaho

DEPARTMENT OF WATER RESOURCES

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C. L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Interim Director

August 19, 2009

Arrowhead Water District
C/O Robert Kramer, Chairman
54 Oliver Drive
Salmon, ID 83467

COPY

RE: Chipps Creek Dam
AKA Arrowhead Reservoir

IDWR File 75-14465

Dear Mr. Kramer:

At the request of Mr. Gary Leuzinger, I revisited the referenced dam and reservoir on 8/5/09 to meet with Gary and Mr. Ben Jones to examine features of the project that were not noticed during the previous site visit. The purpose of this letter is to correct earlier statements regarding physical features that were assigned to the dam and reservoir, and to advise the District about requirements needed to upgrade the dam to meet basic safety standards for a project of this size and hazard rating.

The source of water is not a developed well as previously imagined; I was shown the diversion works located in Chipps Creek that provides water to the reservoir via a buried pipeline in the hillside above the reservoir. At the time of this site visit, the reservoir's water surface was approximately four (4) feet below the crest of the dam, thus revealing on the upstream slope of the embankment the upper portion of the operating works for the low-level outlet conduit that previously were submerged and not visible. We cleared away grass and weeds from the downstream toe of the embankment in order to view the exposed 10-inch diameter plastic (PVC) pipe through the bottom of the dam. Reportedly, the pipeline consists of steel/ductile iron for most of its length, with a plastic pipe extension only at its downstream terminus. Based on this recent evidence, it is clear that the dam has existing operable outlet works, which contradicts the prior statement that the project did not have a mechanism for adjusting the level of the reservoir.

The apparent size of the dam and reservoir and its location in close proximity to downstream development has not changed. Neither has the dam's lack of an emergency overflow spillway. Although the height and storage capacity are estimated values, the height and hazard classification qualify this structure as a jurisdictional dam per Idaho Code §42-1711 and Idaho Department of Water Resources dam safety rules. The construction of an emergency spillway is a basic requirement for any hydraulic structure of this size and hazard classification. Because the dam is off-channel and the source of water to fill the reservoir

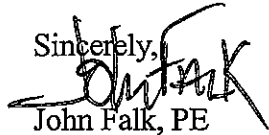
largely can be controlled, the minimum discharge capacity of the emergency spillway must be no less than the inflow capacity of the pipeline that diverts water out of Chipps Creek for delivery to the reservoir. As discussed at the site with Gary and Ben, IDWR strongly recommends that an emergency spillway be installed to meet the following standards:

Emergency Spillway Requirements

- The base elevation of the spillway must be at least two (2) feet below the lowest point anywhere along the top of the dam. This minimum vertical distance (freeboard) will help prevent a dam failure by maintaining the reservoir at a constant pool level far enough below the top of the dam to avoid an accidental overtopping failure.
- Due to the off-channel configuration of the reservoir, either an open channel or an enclosed culvert may be installed to serve as the emergency spillway.
- An open-channel spillway should resemble a trapezoidal shape, with a base width perpendicular to the flow direction no less than four (4) feet, and a depth no less than two (2) feet below the top of the dam.
- Alternately, a culvert spillway must have an inside diameter at least 24-inches. The culvert must be composed of steel, concrete or plastic pipe, and must be buried no less than two (2) feet below the top of the dam. Any pipe must be securely anchored to prevent it from "floating" due to buoyancy. Plastic pipe must be UV resistant, and also strength-rated for crushing if motor vehicles will pass across/over it.
- Ideally, the spillway should be installed in natural ground, and not in the embankment fill materials. If options are limited for its ideal location, the spillway should be installed furthest from the maximum dam height and its channel out of the reservoir must be properly armored to prevent erosion of the fill materials.

Please submit an Application for Construction of a Small Dam, and begin work to complete the construction of an emergency overflow spillway before the start of the next storage season. We remain available to answer any questions you may have regarding the necessary safety improvements or the procedural steps needed to bring this structure into compliance with existing state water law. Should you disagree with the minimum spillway dimensions quoted herein, a licensed professional engineer of your choosing may submit design alternatives for our review and approval prior to construction.

If you have any questions, please do not hesitate to call me at the number listed above. You may also contact Lyle Swank in the Eastern Region Office, (208) 525-7161.

Sincerely,

John Falk, PE
Dam Safety Manager

cc: Jerry Rigby – Rigby, Andrus & Moeller
Lyle Swank – Eastern Region Manager
Don Shaff – IDWR Adjudication
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