Confederated Tribes and Bands
of the Yakama Indian Nation

Established by the
Treaty of June 9, 1855

March 15, 1995

Mr. John Wagoner, Manager
Richland Field Office
Department of Energy
P.O. Box 550 A7-50
Richland, WA 99352

Dear Mr. Wagoner:

Subject: CHROMIUM CONTAMINATION IN GROUND WATER PLUMES CURRENTLY POISONING FISH SPAWNING IN THE COLUMBIA RIVER'S HANFORD REACH; REQUEST FOR IMMEDIATE ACTION TO REMEDIATE CONDITION AND ELIMINATE SOURCE OF CHROMIUM--

BACKGROUND:

It was recently revealed by river bed sampling sponsored by DOE/RL at the H-Reactor area that elevated levels of a hexavalent chromium chemical species are contaminating fish spawning areas in the rocky river bottom. The levels of hexavalent chromium reported in a conversation between DOE/RL (M. Thompson) and the Yakama Nation (F. Cook) on March 14, 1995 ranged from none observable to 130 ppb in ground water entering the river bottom at locations 100 feet from shore. Toxic levels for small developing salmon is reported to be 11 ppb. However, it is not apparent that the limit of 11 ppb considers mutagenic effects on salmon eggs and developing fish embryos, this effect being an ecological concern of the Yakama Nation.

Chromium contamination is entering the river bed at several locations related to the disposal of sodium dichromate in the past in cribs and ditches at the old reactors. D-Reactor and H-Reactor have significant plumes. However, any location where water with the dichromate species was discharged may be a potential source for river contamination, even if current data reveals no actively moving plume. Chrome remaining in the vadose zone at disposal sites can be mobilized in the future either by river flooding and/ use scenarios that introduce water at the surface, for example irrigations scenarios.

RECOMMENDATION/REQUEST FOR ACTION--

In light of the current contamination entering the river at H-Reactor, the Yakama Nation requests that DOE/RL take immediate action to mitigate this problem. Specifically the following actions should be taken:

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1. Pump and treat operations which have been demonstrated to adequately remove Chromium from ground water at testing at the D-Reactor should be initiated at the H-Reactor to protect fish spawning this spring. We consider that initial capacity should allow treating 500 gallons a minute. Existing wells should be used first. New wells should be planned considering hydrologic characteristics of the site and the location of plumes as they enter the river to allow more effective remediation of the ground water and to more effectively control the flows. Preparations for each site that is contributing chromium contamination to the river should anticipate the need for 500 gallon per minute capacity to start operations.

2. Use of river level control should be evaluated to control the bank storage of water and the concentration of chromium entering the river. Such river control may be considerably more effective than pump and treat actions.

3. Design work should be immediately started to find, characterize and remediate sources of chromium at the H-Reactor and other reactor sites along the river. This should be accomplished in conjunction with characterization of the vadose zone with respect to other contaminants besides chromium. Our comments with respect to remediation of N-Reactor cribs and ditches contain alternative actions for source remediation that should be considered at the other reactor sites.

4. Evaluation of the hydrology at the sites should include detailed information on the physical dimensions of the unconfined aquifer which is contaminated, small discrete high-conductivity pathways that may exist and be conduits for much of the contaminated groundwater to the river. Knowledge of these conditions should make the remediation by pump and treat more effective through effective pump placement and river water level control.

5. The detailed characterization of the river shore with respect to the extent of contaminant pathways and the actual chemical species carrying the chromium should be accomplished. In addition, action to understand the total chromium in the ground water and its chemistry should be accomplished. For example, does the oxidizing environment found at the surface of the aquifer carrying the chromium effect its speciation or mobility.

6. Differential temperatures between the ground water and the river water may substantially effect the ground water flow during periods of changing river stages. Warm river water bank storage may effect the release of chromium differently than cold river water bank storage. These effects should be modeled so as to determine the effects of changing river stages at different times of the year.

7. Actions should be coordinated with known spawning times of the salmon to avoid unnecessary impacts.

The Yakama Nation considers that actions outlined here are essential to address the unacceptable conditions noted above. It is requested that a course of action to accomplish these actions be incorporated into an integrated plan to mitigate river chromium contamination. Current planning should be revised to reflect the urgency with respect to rapid mitigation of the problem. We request that planning be accomplished with concurrence of the Yakama Nation ER/WM Program. Initiation of robust treatment actions should be initiated promptly, for example, within two months.

Sincerely,

Russell Jim, Manager
Environmental Restoration/Waste Management Program
Yakama Indian Nation

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