Drey 6-answer

Response to issues raised by Kay Drey and Murray Underwood
Regarding the Quarry Water Treatment Plant

Comment 1

The treated water is to be dumped into the Missouri River about nine miles upstream from our major St. Louis drinking water intakes.

Response 1

The water treated at the Quarry Water Treatment Plant will be released to the Missouri River. Prior to release, each batch of treated water will be tested to ensure compliance with the NPDES permit issued by the State of Missouri.

Comment 2

The Department of Energy has done no laboratory, bench-scale, or pilot-scale testing of the proposed treatment process, using actual quarry water.

Response 2

Laboratory bench-scale testing of the proposed treatment system was conducted using water collected from the Quarry. The results of the bench-scale tests confirmed that the proposed water treatment system effectively removed the contaminants of concern from the quarry water. Activated alumina was not tested at bench scale because the chemical precipitation step removed arsenic to below a detectable concentr tion. We chose, however to include activated alumina in the system as a arsenic polishing unit. Activated alumina has been used many times to remove arsenic from water. Ion exchange was not bench tested because uranium had been successfully removed upstream of the ion exchange step. Again, we still chose to include ion exchange in the system as a polishing unit for uranium. DOWEX 21 is one of the most widely used resins for uranium removal in water.

Comment 3

The quarry water contains not only radioactive wastes, but toxic wastes, as well--such as, arsenic and manganese.

Response 3

The Quarry Water Treatment Plant was specifically designed to remove hazardous and radiological components to very low levels. These constituents were successfully removed from the quarry water during bench-scale testing of the water treatment system.

Comment 4

The treatment process includes an ion-exchange resin to remove uranium. However, we are informed that the resin will not remove other radioactive materials, such as thorium, and that it won't work in the presence of organic materials such as those present in the quarry. (Please note the enclosed letter from Professor Underwood).

Response 4

DOWEX 21 was selected as the ion-exchange resin because of its ability to remove uranium, not thorium. Bench-scale testing demonstrated that thorium is effectively removed during the lime precipitation step.

Organics such as TNT, DNT, and chlorinated solvents do diminish the effectiveness of DOWEX 21. However, the activated carbon process which is upstream of the ion-exchange unit will remove any organics which could otherwise damage the resin.

As stated previously, each batch of treated water will be tested to ensure compliance with the discharge requirements of the NPDES permit.

Comment 5

Because the Department of Energy has no pilot plant, it also has no effluent on which to test monitoring equipment and procedures. The DOE has announced it will not dump any batch of treated water into the river unless the monitors indicate the level of contamination is "permissable". However, ordinary water testing procedures will not detect many of the radioactive substances known to be present in the quarry water. We have no assurance that adequate test methods will be used, and no assurance that whatever tests are done will be monitored for accuracy.

Response 5

Quarry Water Treatment Plant start-up includes a 30-day performance testing period. During the performance testing period, all of the process and monitoring equipment will be tested, as will the operation, maintenance, and monitoring procedures. Although the performance period is currently scheduled for 30 days, the QWTP will not be certified as operational until all of the performance requirements are satisfied, and the 30-day period will be extended if necessary.

Each batch of treated water is chemically analyzed to confirm compliance with the discharge requirements of the NPDES permit.

The water testing procedures at the QWTP will comply with both EPA and state regulations. These analytical procedures include an extensive data verification and validation program to ensure that the results of laboratory analyses are accurate. Representatives of the state of Missouri, and possibly St. Charles and St. Louis Counties will collect split samples of treated water. That is, they will collect duplicate samples for submittal to independent laboratories to verify that the water is clean.

Comment 6

Even if elaborate precautions are taken, an explosion of the old TNT contents in the quarry is possible. St. Louis is not only downriver; we're downwind. To quote from a June 1990 report prepared for the DOE: "Observers should not be near the face where the excavator is working. Observation should be performed from a safe distance with viewing equipment such as binoculars or remote TV cameras....The most likely scenario for a serious event is probably increased atmospheric radioactive contamination due to a fire that occurs because TNT is allowed to dry and somehow is initiated.

Response 6

The report from which the above quote is taken states that in a dry state, nitroaromatic compounds, such as TNT, cannot generally be ignited at concentrations less than 15%. The sampling and analysis of quarry sediments and Water Treatment Plant sludges detected maximum concentrations of nitroaromatics to be approximately 2%. In addition, the sediments and sludges have a high moisture content. Under these conditions, it is highly unlikely that any of the compounds could ignite. The potential explosives risks are therefore manageable, and excavation can be performed without undue risk. The commentor has taken the quotes from the referenced DOE report out of context. The report is suggesting conservative ways to further improve worker safety. Conservatism in protecting human health and the environment is our standard mode of operation.