

PUBLIC COMMENT ON THE WASTE TREATMENT PLANT

Richard I Smith, P.E.

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We are faced with the very real probability that the WTP will never successfully vitrify all of the stored tank wastes as long as DOE insists on using the borosilicate (BSi) glass matrix in the HLW and LAW melters. BSi glass has quite low solubilities for three problem waste constituents, sulfate, aluminum, and chromium. Attempts to overcome these solubility problems has led to the insertion of caustic and permanganate leaching, and water washing functions into the Pretreatment Facility (PTF) processes. These added processes in the PTF have resulted in increasing the total system sodium volume by about 50%. The total sodium volume to be vitrified in the LAW facility will require a total of about eight LAW melters. Congress may be unwilling to accept the massive funding increases (and schedule delays) that would be necessary to build and operate an additional 6 LAW melters.

The caustic/permanganate leaching and water washing functions are at the center of the current safety concerns about pulse jet mixers (PJM), criticality in tanks, and hydrogen explosions in the PTF. The leaching and water washing functions must perform as proposed. Otherwise, the High Level Waste facility will have to seriously dilute the waste stream in order to vitrify the HLW in BSi glass. As a result, significantly larger numbers of HLW canisters will be produced, and several additional HLW melters will need to be constructed and operated to complete the ORP mission on schedule.

For the past six or seven years, DOE/ORP has spent large sums of money tinkering with formulations of BSi glass, attempting to improve the poor solubility of that material for the critical waste constituents, with essentially no success. DOE now seems intent on substituting some non-vitrified processes for LAW glass. The products of those proposed non-glass processes currently fail to meet the required performance standards for disposal in near-surface disposal sites like IDF.

So, how can these problems be resolved? The key is to markedly increase the solubilities of the glass matrix material for the problem waste constituents.

It has been demonstrated experimentally over the past decade that FeP glass has much higher solubilities for the problem waste constituents (sulfate, aluminum, and chromium) than does BSi glass. FeP glass also provides higher total waste loadings in the glass matrix. The higher waste solubilities, and the higher waste loadings possible with FeP glass could avoid the construction and operation of six additional LAW melters and several additional HLW melters, and could make it possible to complete the ORP mission on schedule.

DOE/ORP must abandon their tunnel-vision focus on BSi glass for vitrification of Hanford tank wastes. They must thoroughly and honestly evaluate the use of FeP glass as the vitrifying matrix in the WTP system. Otherwise, there is no real hope of completing the ORP mission without incurring massive unbudgeted expenditures for additional LAW and HLW treatment processes and facilities. Congress may well refuse to fund such massive additional expenditures, leaving us with the waste in the tanks!