

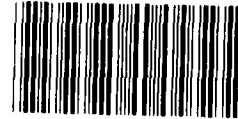
REPORT BY THE

Comptroller General

OF THE UNITED STATES

Further Analysis Of Issues At Western New York Nuclear Service Center

In June 1980, GAO issued a report on the status of efforts to clean up the shut down nuclear plant at West Valley, New York, to the Chairman, Subcommittee on Energy and Power, House Committee on Interstate and Foreign Commerce. The report presented what GAO believes to be the most practical solution for dealing with all the nuclear issues at the site.



113627

The Chairman, Subcommittee on Energy Development and Application, House Committee on Science and Technology asked GAO to evaluate critical comments from the Sierra Club on the report. This report presents that evaluation.



512581

EMD-81-5

OCTOBER 23, 1980

Request for copies of GAO reports should be sent to:

**U.S. General Accounting Office
Document Handling and Information
Services Facility
P.O. Box 6015
Gaithersburg, Md. 20760**

Telephone (202) 275-6241

The first five copies of individual reports are free of charge. Additional copies of bound audit reports are \$3.25 each. Additional copies of unbound report (i.e., letter reports) and most other publications are \$1.00 each. There will be a 25% discount on all orders for 100 or more copies mailed to a single address. Sales orders must be prepaid on a cash, check, or money order basis. Check should be made out to the "Superintendent of Documents".



COMPTROLLER GENERAL OF THE UNITED STATES

WASHINGTON, D.C. 20548

B-200798

The Honorable Richard L. Ottinger
Chairman, Subcommittee on Energy
Development and Applications
Committee on Science and Technology
House of Representatives

R
XISE03514

Dear Mr. Chairman:

Your letter of August 8, 1980, asked us to address critical comments made by the Sierra Club on our June 6, 1980, report, "Status of Efforts to Clean Up the Shut-Down Western New York Service Center" (EMD-80-69). A point-by-point analysis of the Sierra Club's comments is presented in appendix I, and the comments themselves are reproduced in appendix II. JCG 05383

The Sierra Club criticized our report for (1) being flawed by inaccurate information, inadequate data, and imperfect logic; (2) underestimating the hazards of the West Valley site; (3) minimizing the Federal role in establishing West Valley; (4) failing to consider the financial liability of corporate entities responsible for the site; and (5) showing reduced concern for the safety of the high-level waste system at West Valley. Furthermore, the Sierra Club maintained that the West Valley site is a poor location for low-level waste disposal and that the spent-fuel pool is structurally inadequate for more fuel storage.

In summary, we believe that the Sierra Club's criticism is not warranted and that our report was based on the best and most current information available. To obtain information we reviewed numerous reports and studies and held extensive discussions with a number of experts, including State and Federal officials knowledgeable about West Valley and the problems associated with high- and low-level waste disposal. Furthermore, the Nuclear Regulatory Commission (NRC) and the Department of Energy (DOE) reviewed our report and concluded that the facts were accurate and that the safety-related conclusions were fairly drawn. In addition, we as an agency have studied and reported on both the West Valley problem and the national low- and high-level waste problems on numerous occasions over the past 5 years.

HGC 00912
AGC 00067
CNG 00895

As a result, we have gained considerable expertise in these areas and stand behind the accuracy and logic supporting our conclusions. The enclosed point-by-point analysis, in our view, clearly shows that (1) we have fairly dealt with the site hazards, and the Federal and corporate responsibilities at West Valley, and that (2) our concern for the high-level waste, contrary to the Sierra Club's comments, has not decreased since our 1977 report.

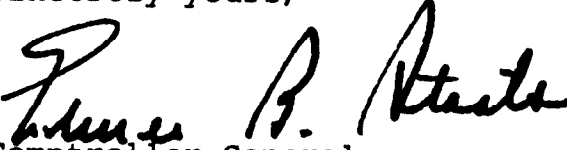
In considering the Sierra Club's comments and our report, one should recognize the different points of view involved. The Sierra Club approached the West Valley situation primarily from a State or local perspective. We carefully considered this local perspective, but we also evaluated the issues from a national perspective and attempted to offer a comprehensive alternative for dealing with the West Valley site. Our alternative recognizes local concerns as well as national high- and low-level waste and spent-fuel storage requirements.

After considering our alternative and others, the Congress recently authorized DOE to conduct a demonstration program to solidify the high-level liquid waste. This demonstration program provides for 90 percent Federal funding and postpones a decision on the future of the low-level waste and spent-fuel storage facilities. This is contrary to our alternative, which would have dealt with all the waste issues through a Federal/State partnership.

As arranged with your office, we will make copies of this report publicly available 1 day after we make it available to you.

Should you require any clarification of our analysis or have further questions, we would be glad to meet with you or your staff.

Sincerely yours,


Comptroller General
of the United States

GAO EVALUATION OF SIERRA CLUB'S COMMENTS

This appendix provides a detailed analysis of the Sierra Club's comments on our West Valley report. The Club's comments are quoted in sequence, with our evaluation following each comment. Each of the Club's comments is referenced so that it can be easily located in the full text of comments presented in appendix II.

IS IT POSSIBLE TO SAY THAT "HIGH-LEVEL NUCLEAR LIQUID WASTE CAN BE SAFELY STORED FOR THE NEXT SEVERAL DECADES?" (p. 4, GAO rpt.)

Comment

"The GAO assertion that the West Valley waste tanks will be safe 'for the next several decades' contradicts an earlier GAO 1977 report where the agency expressed concerns that a flotation incident during construction of the tanks may have caused structural damage to the tanks." (p. 31, par. 1)

GAO evaluation

Our 1980 report does not contradict our 1977 report. ^{1/} A main objective of the 1977 report was to identify areas in which problems could occur and which should be investigated in greater detail. Rather than being contradictory, the 1980 report identifies activities undertaken in response to recommendations contained in the earlier report.

Our 1977 report pointed out on page 10 that, because of the tank and vault system flotation incident, NRC should assess the present condition of the vaults and the characteristics of the soil surrounding the vault system to determine whether they would contain the waste in the event of a break in the tank system.

In relation to the tank/vault system, our 1980 report points out on page 5 that, subsequent to our 1977 report,

^{1/}"Issues Related to the Closing of the Nuclear Fuel Services, Incorporated, Reprocessing Plant at West Valley, New York," EMD-77-27, Mar. 8, 1977.

NRC used two separate consultants to analyze the earthquake resistance of the tanks and vaults. Based on these analyses, NRC has concluded that the tanks will not rupture and the vaults will maintain their structural integrity.

Regarding the soil characteristics, our 1980 report points out on page 5 that the New York Geological Survey and others have been and are conducting numerous soil studies at the plant site. The studies have characterized the soil as having features, such as low permeability and high ion-exchange capability, which would act to contain radioactivity in the event of a leak and prevent it from reaching man's accessible environment in dangerous concentrations.

Thus, rather than being contradictory, the results of work for our 1980 report provide added assurance, above what we had in 1977, that the tanks can continue to safely store the high-level liquid waste. However, we also expressed concern on page 6 of our 1980 report over continuing to store high-level nuclear waste in liquid form. Storage in solid form offers improved safety advantages and we recommended that a solidification program begin now.

Comment

"The GAO assertion that the West Valley waste tanks will be safe 'for the next several decades' also contradicts the NRC position, contained in a June 26, 1980, letter from W. J. Dircks of NRC to Nuclear Fuel Services that 'without the best information available to describe the condition of the high-level liquid waste storage system at West Valley, the NRC has certain reservations concerning that condition.'" (p. 31, par. 2)

GAO evaluation

Again, we do not agree. Although the subject letter was written after our report was issued, we met with NRC officials and determined that no inconsistency exists between GAO and NRC.

NRC's position, as explained in the letter, is that newly developed tank inspection and evaluation techniques should be used at West Valley to verify the integrity of the carbon steel tank. The letter points out that the

pan defect ^{1/} makes it more important that these new techniques be used at West Valley.

NRC officials told us that no new information has developed which causes the agency to alter its prior conclusion that the tanks are safe. They pointed out, however, that NRC will continue to assess the tanks' condition as new technologies develop, to improve the level of confidence that they are safe.

Comment

"The GAO offers no explanation of what additional data has caused the agency to revise its 1977 concerns regarding tank integrity." (p. 31, par. 3)

GAO evaluation

In 1977 we determined that work was needed in several areas to confirm that the West Valley high-level waste tanks are in good condition and can store the waste over the next several decades without threat to public health and safety. The work we considered necessary dealt with (1) seismic integrity of the tanks, (2) stress corrosion cracking, (3) characteristics of the surrounding soil, and (4) the condition of the vault system.

During work for our 1980 report we reviewed a large quantity of information related to establishing the safety of the tanks. For example, concerning seismic integrity, our 1980 report pointed out on page 4 that DOE's Lawrence Livermore Laboratory studied the condition of the tanks for NRC and concluded in May 1978 that they can withstand the most severe earthquake reasonably expected to occur in the area. Furthermore, NRC hired an engineering consulting firm which reviewed and concurred in the results of the Livermore study.

Regarding stress corrosion cracking, our 1980 report points out on page 5 that in response to our 1977

^{1/}The waste tank sits in a pan which, in turn, sits within the concrete vault. The pan, which was designed to contain a tank leak, should one occur, has holes in it and will not serve its intended purpose.

recommendation, NRC sponsored stress studies, some of which have been completed while others are still in progress. The information developed to date has shown that waste chemical compositions and tank steel characteristics are such that the waste tank system is operating under conditions where stress corrosion cracking will not be a potential problem. NRC is conducting other tank studies which it considers very important to fully corroborate these findings.

A discussion of the additional information we reviewed on soil characteristics and the condition of the vault system appears on pages 1, 2, and 7 of this enclosure.

Comment

"The 1980 GAO report downplays the flotation incident describing it (p. 5) as merely a 'flooding in the area of the vault' and omitting the information that the giant (75' diameter, 25' high) waste tanks plus concrete vaults floated 3 to 4 feet upwards during construction." (p.31, par. 3)

GAO evaluation

We clearly identified the floating incident as an area of concern on pages 9 and 10 of our 1977 report. We only briefly mentioned it on page 5 of our 1980 report because our primary purpose was to update our knowledge of the vault's condition and not to reiterate the entire 1977 report.

Despite the flotation incident, NRC has concluded that the vault is structurally sound and can continue to function safely as a component of the high-level liquid nuclear waste containment system. It based this conclusion on a review of (1) corrective actions taken after the floating incident and (2) analyses of earthquake resistance performed by two separate consultants subsequent to our 1977 report.

Comment

"We are also concerned that the GAO, in reassuring Congress that the West Valley tanks will be safe for 10 to 20 additional years, fails to mention the history of leaks that have plagued other tank farms that were supposed to last for decades. At Savannah River, South Carolina, for example, seven of the original

16 tanks have leaked with four of those seven leaking in 1 to 4 years." (p. 31, par. 3)

GAO evaluation

We expressed concern on pages 8 and 9 of our 1977 report that the West Valley tanks could leak based on the history of tank leaks experienced both at Hanford, Washington, and Savannah River, South Carolina. While we referred to this concern on page 5 of our 1980 report, we also concluded that it was very unlikely that the West Valley tanks would develop cracks and begin leaking. The main reason for this belief is that the West Valley tanks were stress-relieved following construction while the Hanford and Savannah River tanks originally were not.

DOE determined that the most likely cause of tank leaks was cracking from stress forces on areas of localized corrosion. It also determined, however, that relieving the stresses through a heat treatment process would eliminate the cracking. Therefore, in 1970 DOE began constructing and placing in operation 13 stress-relieved tanks at each of the Savannah River and Hanford locations. Some of these tanks have been in service for periods of up to 10 years and no leaks have been detected in any of them.

Furthermore, an outside consultant has reviewed the West Valley waste tank data for NRC and concluded that

"* * * on the basis of the information available, there is no reason to believe at the moment that stress corrosion has impaired the integrity of the tank."

In addition to stress-relieving, DOE found that certain concentrations of three chemical constituents in stored liquid waste can lessen the likelihood that stress corrosion cracking will occur. Based on the results of regular sampling and analyses of the stored liquid at West Valley, one of these chemicals was found in a favorable concentration while the other two are thought to be in favorable concentrations.

Thus, based on the fact that the West Valley tanks were stress-relieved, DOE's favorable experience with stress-relieved tanks, the outside consultant's work, and the existence of favorable concentrations of certain chemical

constituents, we concluded that it is unlikely that the West Valley tanks will leak during the next several decades.

Comment

"Seismic Integrity. The GAO uncritically accepts an NRC seismic analysis. The NRC, in a 1978 study, chose to employ less conservative methods of structural response to earthquake accelerations than used for reactor or other fuel cycle facilities. Despite this less conservative analysis, they concluded that the vault could crack (though the tank would not) under the maximum earthquake which could occur on the site. This conclusion was reached without factoring in the effects of the flotation incident. If the NRC analysis were consistent with the methods recommended by the NRC Regulatory Guides, we believe the conclusions would have been more dire." (p. 31, par. 4)

GAO evaluation

We did not "uncritically" accept the seismic analysis. Because we do not have the capabilities in-house to perform a detailed seismic analysis of the tank/vault containment system, we must rely on the analysis and conclusions of outside experts. In this case, our 1980 report noted on page 4 that DOE's Lawrence Livermore Laboratory performed such an analysis which was independently reviewed by another consultant. We examined both the analysis and the independent review by the consultant.

Both the study group and the consultant agree that the tank could withstand the maximum earthquake which would be expected to occur at the site. However, they disagree as to the extent to which the concrete vault would crack. The study group feels it would experience significant cracking, but would not collapse. The consultant feels the extent of cracking would be moderate. The consultant further indicates that he feels the study group's conclusion is based on conservative methodology.

Contrary to the Club's assertion, the study group used the methodology and criteria presented in NRC Regulatory Guide 1.60, "Design Response for Seismic Design of Nuclear Power Plants," for the tank analysis. However, for the vault analysis, the group had to develop a synthetic time history for the particular analytical technique it selected. Once this

time history had been generated, the group used it to more realistically analyze the soil structure interaction affecting the vault. For that reason the study group employed different methodology and criteria based on methods which it developed for analyzing the seismic response of buried structures. The group also employed other analytical procedures to check their results. The results of these procedures compared favorably with results from the chosen technique. The consultant who reviewed the study group's report feels that it employed conservative methodology and criteria in the seismic analysis of the vault.

Finally, in performing its seismic analysis the study group considered the effects of the flotation incident. NRC states in its interim safety evaluation:

"* * * We have asked our consultants at Lawrence Livermore Laboratories (LLL) to investigate the effect of earthquake on the waste tank/vault system. The 'floating' incident is included in this analysis."

Comment

"Stress-relieving Data: The GAO announces that 'stress corrosion cracking would not be a potential problem.' However, the NRC has not yet analyzed the tank for stress corrosion cracking. The Rockwell Hanford studies, using sonar and visual techniques, will provide solid data on this matter. No scientifically valid conclusion is yet possible." (p. 32, par. 1)

GAO evaluation

On page 5 above we have presented the reasons why we believe that stress corrosion cracking is not likely to be a problem. In summary, the Nuclear Fuel Services tanks were heat-treated to relieve stress, DOE has had good experience with heat-treated tanks, a consultant reported favorably on his analysis of the tanks, and concentrations of chemicals in the tanks appear favorable.

Although we believe stress corrosion cracking is not a problem, based on available information, we also state on page 5 of our 1980 report that "NRC is conducting other tank studies which it considers very important to fully corroborate the earlier findings of satisfactory safety." The

Hanford studies, which the Club mentions, are the NRC-sponsored studies to which we referred.

Comment

"Soil Characteristics * * * While the soil seems to be generally impermeable, there exist sand strata or sand lenses along which the wastes could move much more rapidly * * * Once again GAO has not specified the data that substantiates their conclusion that 'the soil would act to contain radioactivity.'" (p. 32, par. 2)

GAO evaluation

In our report, on page 5, we stated that the New York Geological Survey and others have completed and have ongoing numerous soil studies at the plant site. We have reviewed a number of these studies and have interviewed geologists from both the New York State Geological Survey and the U.S. Geological Survey concerning their results. The basic conclusion of these studies and discussions, relative to the movement of radioactive substances, is that the soils would contain these radioactive substances.

The soil has two important characteristics which contribute to containing radioactivity, low permeability and high ion-exchange capacity. Low permeability acts to impede the flow of liquid through the soil. Thus, the movement of radioactive substances contained in the liquid wastes would be impeded. High ion-exchange capacity acts to chemically bind the radioactive substances to other chemicals in the soil. This effectively prevents further movement, or migration, of the radioactive substances through the soil.

We are aware of the sand lenses in the soil. However, geological experts concluded in 1979 that these sand lenses are randomly distributed, occur relatively infrequently, and are not interconnected. Based on work performed to date it does not appear that the occurrence of these sand lenses significantly reduces the soil's ability to contain radioactive waste.

Comment

"One cannot conclude, as GAO has done, that the present situation is safe. The 8 million Ci of Sr-90 and 11 million Ci of Cs-137 in the tank should lead a responsible agency to a more cautious conclusion on this issue." (p. 32, par. 3)

GAO evaluation

We are aware of the highly radioactive nature of the neutralized waste contained in the West Valley tank. Our main concern, therefore, was to determine whether these wastes could be safely contained. Based on evaluations of the structural integrity and earthquake resistance of the tank/vault system, and the ability of the surrounding soil to contain the radioactive waste, as discussed previously, we have accepted NRC's conclusion, cited on page 4 of our 1980 report, that the high-level liquid waste can continue to be safely stored over the next several decades in the existing tank/vault system.

Comment

"GAO has inexplicably downplayed the need for urgent action, as the DOE Task Force on Decontamination and Decommissioning the West Valley High Level Waste Tanks has called for." (p. 32, par. 3)

GAO evaluation

We did not downplay the need for urgent action. We stated on page 6 of our report that while the high-level waste can be safely stored for some time, a program to solidify these wastes should begin now. There is nothing to be gained from delay and much to be gained in the way of improved safety from prompt solidification.

IS THE HIGH-LEVEL WASTE SOLIDIFICATION PROJECT A DEMONSTRATION OR REMEDIAL ACTION?Comment

"The technology for removing and solidifying the high-level liquid waste is not state-of-the-art and is not 'highly-developed.'" (p. 32, par. 4)

GAO evaluation

On page 22 of our report, we stated the process for converting high-level liquid waste to a solid form for permanent disposal "to a large extent" is highly developed. Because borosilicate glass, a waste solid, is in an "advanced stage of development," DOE uses it as the reference waste form in its environmental impact analysis for the West Valley project. "Glass is a ready-to-go waste form," according to the Battelle Memorial Institute which operated DOE's Pacific Northwest Laboratory. A spokesman for Battelle testified in March 1979 to the Subcommittee on Energy, Nuclear Proliferation and Federal Services, Senate Committee on Governmental Affairs, that (1) development of processes to convert high-level liquid waste to a solid glass form began over 20 years ago, (2) England, France, and the United States conducted radioactive pilot plant demonstrations of the glass process during the 1960s, and (3) the French have been converting their high-level liquid waste to glass since July 1978.

Discussions with DOE officials and with DOE's contractor at Savannah River, and a review of DOE's progress in developing the process for converting high-level liquid waste to a solid form also lead us to conclude that the process for converting high-level liquid waste to glass is highly developed. At Savannah River, DOE has converted high-level liquid waste to a solid glass form on a laboratory scale. At its Pacific Northwest Laboratory, Battelle, a DOE contractor, converted high-level liquid waste to glass using equipment similar in size to that which may be used at West Valley. The project's objective was to demonstrate that high-level liquid waste from spent commercial reactor fuel could be converted to a solid in borosilicate glass. DOE's Acting Assistant Secretary for Energy Technology pointed out in testimony in March 1979 that DOE did not plan a further demonstration of the process for converting high-level liquid waste to glass because it had just completed the demonstration at the Pacific Northwest Laboratory.

Furthermore, DOE officials told us they have been ready for 3 to 5 years to begin converting into glass the 22 million gallons of high-level liquid waste at Savannah River. In this regard, DOE's budget request for fiscal year 1981 points out that DOE has completed the preliminary design work on an operational system for converting the Savannah River liquid waste to glass.

The process for removing high-level liquid waste from tanks is also highly developed. Techniques for removing both the high-level liquid waste and the sludge (a mud-like radioactive substance which settles to the bottom of tanks containing waste such as that at West Valley and Savannah River) have been developed and used at DOE's Hanford and Savannah River installations since the early 1950s.

Comment

"Regarding the removal of the high-level liquid wastes, the tanks at West Valley cannot be strictly compared to the Savannah River tanks. The West Valley tank has 42 internal columns and a complicated lattice work at the bottom which would make removal of waste extremely difficult. New openings would have to be made in the tank." (p. 32, par. 4)

GAO evaluation

The structural supports on the floor inside the tank and the mud-like radioactive material which settled around the supports create a condition which is different from that which exists anywhere or will exist anywhere. Characterizing such a unique situation as a demonstration does not seem to make sense. Neither the project results nor the process for achieving them will have direct applicability elsewhere. Furthermore, while the situation is unique, DOE officials feel confident that they can extract the waste. DOE officials responsible for programs to extract waste from tanks said that the extraction techniques developed at Savannah River, with some modifications, will be fully able to deal with West Valley's waste.

Comment

"Regarding the waste form itself, the high-level wastes would be ten times as 'hot' as those at Savannah River or Hanford. This is because the burnup of the reprocessed fuel was so much greater and because 9 million gallons of high-level waste were condensed to 560,000 gallons with an internal heater." (p. 32, par. 4)

GAO evaluation

While, as the Club asserts, the West Valley waste is hotter (more radioactive) than the Savannah River waste, the vast majority of it is less than 4--not 10--times hotter. Documents from DOE show that the waste at Savannah River has a radioactivity level of 15 curies per gallon, while the 560,000 gallons of alkaline waste at West Valley have an activity of 58 curies per gallon. The 12,000 gallons of acid waste in a separate tank at West Valley have a level of 200 curies per gallon.

Nevertheless, the higher radioactivity of the West Valley waste poses no unique problem that would justify another demonstration project. According to DOE, the radioactivity difference requires only minor changes in the solidification process that has already been demonstrated at the Pacific Northwest Laboratory.

Comment

"The Savannah River solidification operation was but laboratory scale in size. The West Valley project would have much larger equipment, and the wastes would have much higher specific activity. If the NFS reprocessing operation has shown nothing else, it is that there is a great deal of difference between managing low and high burnup fuels."
(p. 32, par. 4)

GAO evaluation

In its comment on equipment size, the Sierra Club has neither mentioned DOE's related work at Pacific Northwest Laboratory nor at Savannah River. Our report points out on page 22 that DOE officials told us the equipment used in the Pacific Northwest demonstration, which used high burnup commercial fuel, was similar in size to that which is likely to be used at West Valley. Furthermore, at Savannah River the DOE contractor has already constructed equipment for nonradioactive testing that is twice as large as what will likely be used at West Valley.

Comment

"The Hanford operation involved solidification of simulated wastes and not actual high-level wastes." (p. 32, par. 4)

GAC evaluation

Contrary to this assertion by the Club, the waste that was solidified at Hanford was actual high-level waste, not simulated. The objective of the Hanford Nuclear Waste Vitrification Project was to demonstrate that high-level liquid waste from spent light water (commercial) reactor fuel could be converted to a solid form called borosilicate glass. The technical summary of the project pointed out that, for public acceptance, the high-level liquid waste, to be converted into glass, must not be a synthetic solution, but must be typical of the high-level liquid waste produced by existing or potential fuel reprocessing plants.

To provide this typical waste, Pacific Northwest Laboratory used six reactor fuel assemblies from the Point Beach reactor, which had been in temporary storage at West Valley. The lab reprocessed the assemblies using the conventional Purex-type process which was also used at West Valley. This process produced high-level waste, real in every sense, that was converted to powder (calcine) and solidified into glass. This process produced two canisters of waste in glass that were 8 feet high and 8 inches in diameter.

Comment

"The occupational exposures and environmental releases at Hanford and Savannah River are unknown." (p. 32, par. 4)

GAO evaluation

The Sierra Club's point is not clear. Interpreted literally, the statement appears incorrect. The Battelle Memorial Institute report on the Hanford project lists the environmental releases that occurred during waste solidification operations. Furthermore, DOE said in an environmental impact statement on defense waste management that it had developed relevant data at Savannah River on both occupational exposures and exposures to the general public.

The Club might also mean, however, that the exposure and release data for the Savannah River and Hanford projects do not tell the exact exposures and releases that would occur at West Valley and future commercial waste solidification projects. While this is true, DOE has a large amount of experience with every step of the extraction/solidification process which it can use to project the exposures and

releases at West Valley. For instance, DOE has

- developed and used techniques to extract sludge from radioactive waste tanks at Hanford and Savannah River since the 1950s,
- transferred high-level liquid waste from old to new tanks at Savannah River,
- converted a large amount of its defense-generated high-level liquid waste to a powder called calcine at Idaho since 1963, and
- converted commercial high-level liquid waste to a solid glass form.

In addition, the French experience of converting their commercial waste to glass should be helpful.

While all of these experiences will help predict exposure and release data at West Valley, it is obviously true that it will not provide the exact data. Furthermore, since West Valley is unique, it will provide useful but not exact data on exposures and releases for any future solidification project.

Comment

"It is important to point out that the Hanford solidification experiment removed the cesium and strontium, solidified these materials separately, and they are presently being stored in a water pool. The West Valley spent-fuel pool may be needed for storage of solidified cesium and strontium, in addition to storage of the remaining solidified waste." (p. 33, par. 1)

GAO evaluation

DOE officials told us that in the Hanford solidification demonstration the cesium and strontium were not removed. Likewise, at West Valley the cesium and strontium will likely be solidified along with the rest of the waste and thus should not present separate storage problems.

Nevertheless, it may be true that West Valley's spent-fuel storage pool may be needed to store the solidified high-level waste. After this waste is solidified, it will have

to be temporarily stored because a permanent geological disposal site is not expected (under current projections) to be ready until the late 1990s. Thus, the pool may have to be used for this purpose rather than for the temporary storage of spent fuel.

If DOE determines this to be true, we would not object. Our major concern is that the spent-fuel storage pool not be discarded if it can be safely used to meet important State, regional, or national needs.

Comment

"The project also has a remedial character. If the tank were to open the high-level waste material to reach Buttermilk Creek, this would be a major disaster, costing many times the hundreds of millions of dollars to immobilize these materials, not to speak of the effect on public health and safety." (p. 33, par.2)

GAO evaluation

The Club fails to mention that there are several elements of protection to prevent a tank leak from reaching the creek. Our report points out on page 6 that leak detection equipment located between the tank and vault in which it rests is designed to detect a tank leak and activate the plan for transferring waste from the leaking tank to a spare maintained for such occurrences. During the transfer the leaking waste should be contained within the concrete vault. Furthermore, the soil will absorb radioactivity from any liquid that might escape the vault and impede liquid flow through the soil.

The New York State Geological Survey official told us that if radioactive waste penetrated the vault it would move through the soil at a vertical speed of less than 1/4 inch per year and at a horizontal speed of less than 7 inches per year. At these rates there would be ample time to take remedial action before the waste reached the creek. Thus, three levels of protection would have to fail before the waste could reach the soil, and those responsible would have to ignore the leak for many years before the waste could reach the creek.

Comment

"Clearly, back in 1963 when licensing was under consideration, the Federal government did not make the proper findings regarding the plant not being 'inimical to the health and safety of the public,' as required by the Atomic Energy Act of 1954, as amended. The Federal government therefore has a responsibility to rectify this ill-advised situation it approved and licensed." (p. 33, par. 2)

GAO evaluation

While we are not sure what the Sierra Club has in mind, it is probably referring to the change in Federal high-level liquid waste storage criteria. When the Atomic Energy Commission (AEC) approved the facility, it envisioned that the high-level liquid waste would be stored over the long-term in tanks as had been done at Savannah River. In 1972 AEC changed its position, however, and concluded that high-level liquid waste must be converted to a solid form for permanent disposal. Now all parties involved with West Valley agree that the high-level liquid waste at the site must be converted to a solid form. The tank storage of high-level liquid waste is the "ill-advised situation" which we believe the Club wants the Federal Government to deal with.

The Sierra Club's conclusion, however, is inconsistent with the regulatory history of nuclear power. Nuclear safety requirements have increased and nuclear licensees, not the Government, have been responsible for the increased cost for meeting them. The Nuclear Regulatory Commission's regulation of nuclear powerplants is a primary example. As NRC increased the safety requirements reactors must meet, the utility operators, rather than the Commission, paid to meet the new requirements. Thus, we do not think the upgraded safety requirement for high-level liquid waste storage, by itself, provides a basis for requiring the Federal Government to accept full responsibility for dealing with the waste. We noted on page 18 of our report, however, that a reasonable basis exists for the Federal Government to assume a share of the responsibility with the State.

IS IT RESPONSIBLE TO SAY "NEW YORK
COULD REOPEN THE WEST VALLEY
STORAGE POOL"? (p. 20)

Comment

"GAO blithely states that New York could reopen the West Valley storage pool. NRC analysis, which GAO fails to cite, has shown that the pool could crack under the maximum earthquake which could occur on the site. This analysis was not carried out employing the type of conservative methods the NRC uses for reactors or other fuel cycle facilities. By ignoring the NRC analysis, GAO is not being scientifically honest." (p. 33, par. 3)

GAO evaluation

During our evaluation we spoke with many people and reviewed numerous reports, including the NRC report which the Club cites. The Club is correct in pointing out the report's conclusion that under the maximum earthquake which could occur on the site the pool could crack. However, the Club cited the NRC report somewhat out of context. For example, in the unlikely event that the maximum earthquake occurs, the NRC report points out that the cracking would be confined to the upper east corner of the north wall of the spent-fuel storage pool. It estimates that the leakage would be above the soil and into the building enclosing the pool and that public health and safety would not be endangered.

The NRC report further points out that in its analysis NRC relied on Regulatory Guide 1.60, "Design Response Spectra for Seismic Design of Nuclear Power Plants." Furthermore, the authors, and an independent consulting firm which NRC hired to review their report, pointed out that the report is based on conservative assumptions and that the results are therefore somewhat conservative.

DOE has done additional analyses of the spent-fuel pool as part of its consideration of the pool for away-from-reactor storage. Its analyses suggest that, by using racks that are attached to the pool floor rather than the walls, the stress that might cause the cracking in an earthquake could be relieved and the cracking problem eliminated.

Comment

"Further, GAO has ignored the substantial tornado threat at the site which could damage the spent fuel roof and cause structural elements to drop into the pool." (p. 33, par. 3)

GAO evaluation

NRC's "Interim Safety Evaluation of the West Valley Site," a report which we reviewed during our study, has much to say about the tornado threat to the storage pool. The most important points are that no off-site impact would be expected from the effect of a tornado on the spent-fuel stored in the pool, even if the tornado was the largest imaginable. NRC defines the largest imaginable tornado as one that could be expected to occur once in 10 million years.

The report makes other important observations on the character and consequences of a tornado.

"The only tornado effect of interest is the missiles it could generate. In an almost identical review situation for the Midwest Fuel Recovery Plant the staff's analysis showed that there was no off-site risk from missile strikes of the pool. First, the probability of a missile of potential harm striking the pool is very remote (and superimposed on the already low chance of a tornado strike). Second, the fuel contains very little radioactive gas to be released even if all the fuel pins were somehow ruptured. Third, the missile damage is selective, i.e., only a canister or two of fuel would actually be affected. Fourth, a critical excursion would be unlikely even if a tornado struck, since the fuel would still be restrained from close spacing and there would be insufficient fuel to sustain a chain reaction. Lastly, the staff has calculated a maximum dose of only 1 millirem per hour at the surface of the pool, even if a critical excursion did occur."

Comment

"These factors call into serious question GAO's characterization of West Valley as an 'ideal candidate' for an AFR." (p. 24) (p. 33, par. 3)

GAO evaluation

Studies to date indicate that the West Valley spent-fuel storage pool appears to be an ideal candidate for an away-from-reactor storage facility for a variety of reasons. As discussed above, available evidence suggests that the facility can be safely used. It would be cheaper to use an existing storage facility than to build a new one. DOE's March 31, 1980, report on spent-fuel needs concluded that away-from-reactor storage would be needed by about 1983 and that new facilities could not be built in time to meet that need. It noted that West Valley was one of only three existing facilities that could meet that need. West Valley is located near several States that DOE believes will need away-from-reactor storage in the early 1980s. Finally, the DOE report points out that West Valley, used with the sites in South Carolina and Illinois, could provide a regional approach to spent-fuel storage.

IS IT RESPONSIBLE TO SAY "NEW YORK COULD ALSO REOPEN ITS LOW-LEVEL WASTE BURIAL GROUNDS?"

(p. 21)

Comment

"The GAO seriously underestimates the problems at the West Valley waste dump ground. The GAO states that there has been 'some water seepage' into the trenches. 'Some seepage' implies a small quantity of water, not the millions of liters that have had to be pumped out. Furthermore, GAO states that 'indications are that the seepage can be controlled without endangering public health and safety.' Quite the contrary, experience with the Southern trenches indicated that the 'seepage' cannot currently be controlled. To say that the situation will not harm the public is to ignore the large inventory of high-level radioactive materials in these trenches --such as 12 pounds of Pu-238 and 15,000 Ci of Sr-90 * * * the older Northern trenches of the State

burial ground filled with water, broke through its cover, and overflowed in 1975. Now these trenches must be continuously maintained by pumping out and cleansing the water and reburying certain of the radionuclides while allowing others to enter Cattaraugus Creek, a stream that feeds Lake Erie and the Buffalo water supply." (p. 34, par. 2 and p. 33, par. 4)

GAO evaluation

We did not underestimate the problems at the West Valley low-level waste burial ground, and believe we accurately presented the conditions which exist there. Our main concern is whether there exists any danger to public health and safety. Based on our investigations we do not believe any danger exists.

We are aware of the quantities of water which have collected in the trenches and the quantities which have had to be pumped out. We also understand the mechanism which most experts believe explains how water seeps into the trenches and how it is treated to remove radioactive substances before being released into Cattaraugus Creek.

Water, primarily from rain, has been seeping into and accumulating in the West Valley burial trenches since the mid-1960s. A broad range of technical agencies including the New York State Department of Health and the United States Environmental Protection Agency agree with the conclusion of our 1980 report that the seepage is being controlled and is not endangering public health and safety.

The rainwater collecting in the trenches enters through two types of cracks which develop in the trench cover. Surface cracks develop from soil drying during hot summer months and subsurface cracks develop from the trench cover settling.

The low-level waste burial site, however, was not designed or approved on the basis that the wastes could be buried and left unattended. To monitor trench water accumulation, the trenches were constructed with a sloping floor with a sump at one end. A pipe is permanently located in the sump and extends above the trench surface. Through this pipe water levels inside the trench are continuously monitored and water pumped out as needed.

When water is pumped from the trenches it is temporarily placed in a holding lagoon. From there it is pumped through a low-level waste treatment facility onsite. The treatment facility removes virtually all radioactive substances except tritium. These substances are packaged and reburied. The water is once again transferred to a holding lagoon from which it is released into Cattaraugus Creek at a controlled rate.

A few words about the plutonium-238 and strontium-90 buried in the low-level waste burial area. Both substances are easily removed from water by standard chemical methods. The result is that virtually no quantity of either substance remains in the water after it has been treated.

A 1976 study by the New York Department of Health puts the health effect of the pumping operation in perspective. It concluded that "the discharge of untreated trenchwater from the low-level radioactive waste burial site at the WNYNSC would not present a statistically significant radiological health effect." NRC, in a March 1977 letter, further noted that:

"Since the trench water is processed through the low-level waste treatment system the estimated doses are even lower than those resulting from releases of untreated trench water."

In 1975, water accumulated in part of the burial area to the point where water broke through the trench cover. In a 1977 letter, NRC said the overflow, which was estimated to be about 1 gallon per day, released small quantities of radiation. NRC further noted that no significant increase in radioactivity in local streams which drain the site was detected as a result of the overflow.

A brief background on the 1975 overflow might be helpful to further understand what happened. The operator was originally permitted to pump water from the trenches simply by notifying the State of its intention to do so. Around 1969 the State notified NFS that it could no longer pump out the trenches without permission. In about 1972, NFS notified the State that water was accumulating in the northern trenches and requested permission to pump the water out. The State did not act on the request because it claimed the pump-out procedures NFS suggested were inadequate. The State asked NFS to propose new procedures for pumping out

the trenches. According to a State official NFS never resubmitted a request which outlined different procedures. It was not until 1975, when water contaminated with radioactivity leaked through the trench cover, that the State allowed NFS to begin pumping operations. The incident was not due to a failure of the monitoring activities or the pumping system.

The Sierra Club's statement that "Now, these trenches must be continuously maintained, etc." suggests that they must be continuously maintained because water broke through the cover in 1975. This is not true. As we stated earlier, it was expected from the beginning that water would likely collect in the trenches, although not to the extent that it has. Consequently, they were designed and constructed from the beginning to provide for continuous monitoring and to allow accumulated seepage to be pumped out. Even now, NRC expects that new low-level waste sites will require active maintenance over an extended period of time. An NRC performance objective guiding establishment of low-level waste site criteria recognizes the need for extended active maintenance and requires that the period of such maintenance not exceed 100 years. The NFS burial facility is only about 17 years old.

Comment

"Furthermore, the GAO fails to mention that the burial ground has serious erosion problems at the Northern end. According to the EPA, this area has 'significant soil erosion' and 'needs to be protected from further gullyng.' If the GAO has new data indicating that soil erosion for some reason is no longer a problem, this evidence should be cited." (p. 34, par. 3)

GAO evaluation

We do not agree that a serious erosion problem currently exists at the north end of the low-level waste burial area. The Sierra Club's statement is from a report that was issued more than 3 years ago. The serious erosion problems no longer exist.

During our work for the 1980 report we became aware that soil erosion had been identified as a problem at the north end of the burial area. At that time we spoke with a geologist from the New York Geological Survey to determine the status of the situation. He said that erosion is a natural weathering process. While, practically speaking, it cannot be prevented, actions can be taken to control, and even greatly slow, the rate of erosion.

At the north end of the low-level waste burial area, there were two steep slopes which experienced significant soil erosion during periods of heavy rainfall. Once this condition was identified, steps were taken to divert the rainwater away from the steep slopes toward an area with a gentler slope. In this way the rate of erosion of the steep slopes has been greatly reduced. While erosion will continue, it will not pose a problem for the foreseeable future.

Comment

"Finally, GAO fails to mention the limited number of core drillings (3-5) done in the area of the burial ground prior to its opening in order to determine permeability of the soil." (p. 34, par.3)

GAO evaluation

The information obtained from numerous studies performed prior to construction at West Valley confirmed the site's suitability for a nuclear fuel reprocessing plant with associated waste burial and storage facilities. The studies made for the overall site were considered to be rather extensive at the time. Included in the studies was information obtained from core samples.

While only a relatively few core samples may have been obtained from any one specific area, such as the proposed low-level waste burial site, numerous samples were obtained over the entire area. Some extrapolations were made from information about the overall site to the low-level waste burial site. These suggested the suitability of the site for low-level waste burial. Two of the more favorable characteristics of the burial site were the soil's low permeability and high ion-exchange capacity.

While studies performed prior to opening the low-level waste burial area may have only suggested its suitability, numerous subsequent studies by both the New York and U.S. Geological Surveys have adequately confirmed this.

Comment

"The GAO fails to cite the EPA's concern that the extent and location of sand lenses should be fully investigated. Clearly, until such an investigation has been conducted, it cannot be stated that the burial ground can be operated safely." (p. 34, par. 3)

GAO evaluation

The study of sand lenses of which the Sierra Club speaks has been done and its results further suggest that the site can be operated safely. Furthermore, it should be clearly noted that while evidence strongly suggests that the site can be safely operated, neither NRC nor we have definitively concluded that it can be.

The New York and U.S. Geological Surveys decided jointly that new geologic mapping of the site was required because so many new geological features, such as sand lenses, had been discovered in the area since the original site investigations. The first major site investigation of this study was performed in 1975 by USGS.

The New York State Geological Survey, in a draft final report issued in 1979, concluded that the sand lenses are randomly distributed, disconnected, and separated by low-permeability soil. It further concluded that these zones do not appear to be special routes where water, and radioactive substances, will move faster than by flow through the low-permeability soil.

Comment

"We are also disturbed that GAO fails to make a distinction between volume and Curie content as regards medical wastes. Most of the wastes generated at hospitals can be held at the hospitals until the short-lived isotopes have decayed to safe levels. A strong national program in the efficient storage and handling of these wastes at hospital sites

should be instituted promptly and would reduce the burial ground requirements." (p. 34, par. 5)

GAO evaluation

Although the specific issues related to hospital-generated low-level waste and its impact on burial ground requirements were beyond the scope of our West Valley report, we dealt with the issue in another report. That report, "The Problem Of Disposing Of Nuclear Low-Level Waste: Where Do We Go From Here?" (EMD-80-68, Mar. 31, 1980), dealt with a broad range of low-level waste issues, including opportunities for volume reduction. One such opportunity which it mentioned was separate handling for short half-life hospital waste (which rapidly loses radioactivity).

The low-level waste report made numerous recommendations, but two are particularly relevant to the Sierra Club's concern for waste reduction. It recommended that low-level waste be defined so that waste disposal could be based upon safe disposal requirements for various types of waste. With a proper definition for low-level waste, some waste now buried in radioactive waste burial grounds could be buried in non-radioactive disposal sites. The report also recommended establishing a low-level waste volume reduction program that would use both administrative and technological reduction methods that have been proven as alternatives.

CORPORATE ACCOUNTABILITY

Comment

"We are disturbed by the failure of GAO to address the issue of the financial liability of Getty Oil or NFS, the Getty-owned subsidiary that ran the West Valley operation. * * *" (p. 34, par. 6)

GAO evaluation

While we did not assess the liability of NFS, neither did we absolve them from liability. Our 1977 report on West Valley viewed the matter as one in which New York, under the terms of the lease, has residual responsibility for waste storage. We pointed out on page 14 of our report that the State's responsibility under the contract is tempered by two factors:

- The need for NRC to approve a license transfer.
- Nuclear Fuel Services' contractual responsibility to render West Valley acceptable for the State to assume the facility's operation or ultimate disposition.

Thus, we agree that NFS has financial liability to meet the terms of its license and lease.

We did not attempt to assess NFS's liability because it is not our practice to assess the liability of private parties in contracts to which the Government is not a party. At West Valley the contract is between NFS and the State. Furthermore, the State asserts the NFS's liability would derive from factors beyond the contract. As our report points out on page 5, the question of legal responsibility, particularly outside the terms of the contract, can only be conclusively determined by the courts.

The report's objective was to propose an overall solution for West Valley to which the State and Federal Governments could agree. The State's agreement is important because it has residual responsibility for the wastes and because it controls decisions on the future of West Valley. The Federal Government's agreement is important, because the State has asked it to take primary responsibility for West Valley. We believe that once the State and Federal Governments reach an agreement on West Valley, progress toward a solution could begin. They could then work out the financial liability of NFS in the courts in what would likely be a protracted litigation. The points which the Club made in its report, about the air purge in the waste tank, the leak in the saucer, and the condition of the low-level waste burial area, are just a few of the many points such litigation could cover.

Comment

"In addition, we feel that GAO, in allocating responsibility for the cleanup of the site, downplays the Federal role in establishing the facility in the first place. * * *" (p. 35, par. 3)

GAO evaluation

While we did not present a detailed history showing the Federal role in establishing West Valley, we also did not present a history showing New York State's active involvement in establishing the reprocessing venture at the Western New York Nuclear Service Center. We did, however, point out on page 18 of our 1980 report the range of Federal involvement at West Valley which led us to conclude that a basis exists for the Federal Government to accept some responsibility for the site.

Specifically addressing the Club's point that 60 percent of the fuel reprocessed at West Valley came from Federal defense programs, during the facility's early years of operation the Federal Government provided the fuel to make the reprocessing venture economically feasible. When the project began, commercial reactors were just coming on line and little commercial spent-fuel was available. In 1966, when NFS began reprocessing, only eight reactors were licensed to operate. NFS needed a greater supply of fuel to reprocess than those reactors could provide. It asked the Federal Government to supply the additional needed quantities of fuel until sufficient quantities could be obtained from commercial reactors.

CONCLUSIONComment

"The Sierra Club has serious concerns about the safety of the high level waste tank. Since 1974 we have advocated solidifying those materials and believe that the waste solidification project should begin as soon as possible. The cost accountability can be settled later by the U.S. Attorney General as was done in the Uranium Mill Tailings Act. We believe that an equitable sharing of the costs must take place with a much greater share of the costs being assumed by the corporate polluter. We believe that the Federal Government has a clear obligation to share a portion of the costs. The GAO report does not shine an even light on these questions. It downplays the Federal role, and the corporate polluter's role, leading the GAO to the conclusion that if the State of New York is to be bailed out, the Federal Government must get something in return. The GAO advocates the re-opening of the solid waste dump and the

spent fuel pool while downplaying the reasons why the West Valley site would be a bad choice for either. The site is ill-suited for waste 'storage' and a trade-off is not scientifically responsible. We are led to the question whether this GAO report has scientific integrity or whether it is political hackwork." (p. 35, par. 3)

GAO evaluation

Since the early 1970s we have been reporting on national high-level waste management issues with particular attention to safety concerns. Consistent with our longstanding safety concern, our 1980 report stated our belief on page 6 that a program to solidify the high-level liquid waste should begin now to take advantage of the greater safety inherent in a solid waste form. We also agree (see p. 18 of the 1980 report) that Federal actions initially encouraging the reprocessing venture, raising its costs through increased safety requirements, and then postponing reprocessing indefinitely provide a basis for the Federal Government to assume some financial responsibility for the high-level waste.

Concerning accountability, we believe, as summarized in the report's cover summary, that the Federal Government and the State of New York should share responsibility for implementing a comprehensive West Valley cleanup program which recognizes legitimate State and national interests. This arrangement would involve Federal financial and technical resources. At the same time, New York would make available the spent-fuel and low-level waste burial facilities to help solve its own and national waste management problems.

We disagree with the Club's assertion that our proposal for dealing with all the issues at the site results from downplaying reasons why the site would be a bad choice, and downplaying the Federal and corporate roles at West Valley. We based our solution for shared Federal/State responsibility on the preponderance of evidence which shows that the spent-fuel and low-level waste facilities can probably be safely used and are needed in New York and the surrounding area. We also noted on page 20 of the 1980 report that these facilities would have to be technically adequate before they could be used. Furthermore, past Federal actions and the limited demonstration value of the solidification project

justify partial, but not full, Federal funding. We left NFS's liability to be decided by the courts, the only place where such a decision can be made.

The overall character of the Club's comments suggests that it is looking at the problem from a narrow, or regional, viewpoint, whereas we also looked at it from a national perspective.

- - - -

After we issued our report, the Congress authorized DOE to conduct a demonstration program to solidify the West Valley high-level liquid waste. This demonstration program provides for 90 percent Federal funding and postpones a decision on the future of the low-level waste and spent-fuel storage facilities. This is contrary to our alternative, which would have dealt with all the waste issues through a Federal/State partnership.

3164 Main Street Buffalo, New York 14214 (716) 832-9100

**THE 1980 GAO REPORT ON WEST VALLEY*
SCIENTIFIC INTEGRITY OR POLITICAL HACKWORK?**

On June 6, 1980, the General Accounting Office released the report EMD-80-69, "Status of Efforts to Clean Up the Shut-down Western New York Nuclear Service Center". The study, commissioned by Representative John Dingell, Chairman of the Subcommittee on Energy and Power of the House Committee on Interstate and Foreign Commerce, concludes that the Federal government should not authorize funds for solidification of the high level liquid radioactive wastes at West Valley unless the site is re-opened as a low level waste dump ground and as a storage pool for spent fuel (away-from-reactor storage pool = AFR).

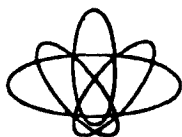
The GAO study is flawed by inaccurate information, an inadequate data base and imperfect logic. The report has seriously underestimated the hazards of the West Valley site and has minimized the Federal role in establishing West Valley, including the initial inadequate AEC findings regarding the public health and safety. GAO does not even consider the financial liability of Getty Oil and other corporate entities responsible for the contaminated site. It is interesting to compare GAO's 1977 report** with this one. There is a marked decline in GAO's concern about the safety of the high level waste system at West Valley despite the fact there has been no additional on-site data during this 3 year period supporting increased safety confidence.

Had GAO done its homework correctly, it would have found the West Valley site to be a poor one for low level waste disposal and the present spent fuel pool to be structurally inadequate for more storage. The pool may even be needed for the storage of solidified high level waste. We have serious reservations regarding GAO's competence to evaluate a project of this technical complexity.

Unlike GAO, we conclude that the proposed high level waste solidification project is truly a demonstration project because DOE has never before removed HLW from a tank of this complexity and has not previously sol-

*"Status of Efforts to Clean Up the Shut-down Western New York Nuclear Service Center", General Accounting Office, EMD-80-69, June 6, 1980.

**"Issues Related to the Closing of the Nuclear Fuel Services, Incorporated Reprocessing Plant at West Valley, New York", General Accounting Office, EMD-77-27, March 8, 1977.



**sierra club
radioactive waste
campaign**

identified HLW materials of this form. In addition to its being a demonstration project, it is also remedial in the truest sense; it could prevent a major disaster, potentially costing many times the several hundred million dollars, from occurring.

SPECIFIC COMMENTS:

IS IT POSSIBLE TO SAY THAT THE "HIGH-LEVEL NUCLEAR LIQUID WASTE CAN BE STORED SAFELY FOR THE NEXT SEVERAL DECADES"? (p.4, GAO rpt.)

The GAO assertion that the West Valley waste tanks will be safe "for the next several decades" (p.4) contradicts an earlier GAO 1977 report where the agency expressed concerns that a flotation incident during construction of the tanks may have caused structural damage to the tanks. It also contradicts the NRC position that "without the best information available to describe the condition of the high level liquid waste storage system at West Valley, the NRC has certain reservations concerning that condition."*

The GAO offers no explanation of what additional data has caused the agency to revise its 1977 concerns regarding tank integrity. The 1980 GAO report downplays the flotation incident describing it (p.5) as merely a "flooding in the area of the vault" and omitting the information that the giant (75' diameter, 25' high) waste tanks plus concrete vaults floated 3 to 4 feet upwards during construction. We are also concerned that the GAO, in reassuring Congress that the West Valley tanks will be safe for 10 to 20 additional years, fails to mention the history of leaks that have plagued other tank farms that were supposed to last for decades. At Savannah River, South Carolina, for example, seven of the original 16 tanks have leaked, with four of those seven leaking in 1 to 4 years. Clearly, the experience with predicting tank lifetimes is not encouraging. Surely to make pronouncements about tank lifetimes before current NRC investigations on the integrity of the tanks are completed, is premature. The NRC contractor's studies** are important, but even their conclusions will never encompass the entire high level waste system because the entire system cannot be observed. A residual uncertainty will always exist. Some details of tank integrity are discussed below.

Seismic Integrity. The GAO uncritically accepts an NRC seismic analysis.*** The NRC, in a 1978 study, chose to employ less conservative methods of structural response to earthquake accelerations than used for reactor or other fuel cycle facilities. Despite this less conservative analysis, they concluded that the vault could crack (though the tank would not) under the maximum earthquake which could occur on the site. This conclusion was reached without factoring in the effects of the flotation incident. If the NRC analysis were consistent with the methods recommended by the NRC Regulatory Guides, we believe the conclusions would have been more dire.

*Letter from Wm. J Dircks, NRC to Ralph Deuster, NFS, dated June 26, 1980.

***"Inspection and Evaluation of Nuclear Fuel Services High-Level Waste Storage System", RHO-LD-130, Rockwell Hanford Operations

*** "Seismic Analysis of High Level Neutralized Liquid Waste Tanks at the Western New York State Nuclear Service Center, West Valley, New York", A.H. Davito, et al, UCRL-52485, Lawrence Livermore Laboratory, May, 1978.

Stress-relieving Data. The GAO announces that "stress corrosion cracking would not be a potential problem". (p.5) However, the NRC has not yet analyzed the tank for stress corrosion cracking. The Rockwell Hanford studies, using sonar and visual techniques, will provide solid data on this matter. No scientifically valid conclusion is yet possible.

Soil Characteristics. The NRC contractor, Rockwell Hanford, will also be performing soil studies to determine what would occur if the tank leaked. This study is important because while the soil seems to be generally impermeable, there exist sand strata or sand lenses along which the wastes could move much more rapidly. The exact location of these sand strata would be determined by Rockwell Hanford. Once again GAO has not specified the data that substantiates their conclusion that "the soil would act to contain radioactivity".

One cannot conclude, as GAO has done, that the present situation is safe. Much critical data is missing. The 8 million Ci of Sr-90 and 11 million Ci of Cs-137 in the tank should lead a responsible agency to a more cautious conclusion on this issue. GAO has inexplicably downplayed the need for urgent action, as the DOE Task Force on Decontamination and Decommissioning the West Valley High Level Waste Tanks has called for.* It would be interesting to know if this downplay was simply because of sloppy research or because political pressure was brought to bear to lead the agency in the direction of this conclusion.

IS THE HIGH LEVEL WASTE SOLIDIFICATION PROJECT A DEMONSTRATION OR REMEDIAL ACTION?

The technology for removing and solidifying the high level liquid waste is not state-of-the-art, and is not "highly-developed"(p.22). Regarding the removal of the high level wastes, the tanks at West Valley cannot be strictly compared to the Savannah River tanks. The West Valley tank has 42 internal columns and a complicated lattice work at the bottom which would make removal of waste extremely difficult. New openings would have to be made in the tank. Regarding the waste form itself, the high level wastes would be ten times as "hot" as those at Savannah River or Hanford. This is because the burnup of the reprocessed fuel was so much greater and because 9 million gallons of high level waste were condensed to 560,000 gallons with an internal heater. The Savannah River solidification operation was but laboratory scale in size. The West Valley project would have much larger equipment, and the wastes would have much higher specific activity. If the NFS reprocessing operation has shown nothing else, it is that there is a great deal of difference between managing low and high burnup fuels. The Hanford operation involved solidification of simulated wastes and not actual high level wastes. The occupational exposures and environmental releases at Hanford and Savannah River are unknown. These projects are experimental; the technology is not at hand. We consider the West Valley solidification project a demonstration project, not a necessary one.

* Report of the West Valley Decontamination and Decommissioning Task Group, contained as an Appendix to "Western New York Nuclear Service Center Study, Companion Report", TID-28905-2, U.S. Department of Energy, Dec., 1978.

It is important to point out that the Hanford solidification experiment removed the cesium and strontium, solidified these materials separately, and they are presently being stored in a water pool. The West Valley spent fuel pool may be needed for storage of solidified cesium and strontium, in addition to storage of the remaining solidified waste.

The project also has a remedial character. If the tank were to open and the high level waste material to reach Buttermilk Creek, this would be a major disaster, costing many times the hundreds of millions of dollars to immobilize these materials, not to speak of the effect on public health and safety. Clearly, back in 1963 when licensing was under consideration, the Federal government did not make the proper findings regarding the plant not being "inimical to the health and safety of the public", as required by the Atomic Energy Act of 1954, as amended. The Federal government therefore has a responsibility to rectify this ill-advised situation it approved and licensed.

IS IT RESPONSIBLE TO SAY "NEW YORK COULD REOPEN THE WEST VALLEY STORAGE POOL"? (p.20)

GAO blithely states that New York could reopen the West Valley storage pool. NRC analysis*, which GAO fails to cite, has shown that the pool could crack under the maximum earthquake which could occur on the site. This analysis was not carried out employing the type of conservative methods the NRC uses for reactors or other fuel cycle facilities. By ignoring the NRC analysis, GAO is not being scientifically honest. Further, GAO has ignored the substantial tornado threat at the site which could damage the spent fuel roof and cause structural elements to drop into the pool. In April, 1974, there was a severe tornado that ripped the roof off a motel only 4 miles from the spent fuel pool. These factors call into serious question GAO's characterization of West Valley as an "ideal candidate" for an AFR. (p.24)

IS IT RESPONSIBLE TO SAY "NEW YORK COULD ALSO REOPEN ITS LOW-LEVEL WASTE BURIAL GROUND"? (p.21)

The Getty Oil solid waste dump ground (not "low-level", and not "burial", which implies permanence) is composed of a state and Federal licensed burial ground. The older Northern trenches of the State burial ground filled with water, broke through its cover, and overflowed in 1975. Now, these trenches must be continuously maintained by pumping out and cleansing the water and reburying certain of the radionuclides while allowing others to enter Cattaraugus Creek, a stream that feeds Lake Erie and the Buffalo water supply. The 1978 DOE report** expressed optimism that the newer Southern trenches, some filled as recently as 1975, with a thicker cover (8' of clay v. 4' on the older trenches), greater distance between trenches and contouring to aid water run-off, would not fill with

* "Structural Analyses of the Fuel Receiving Station Pool at the Nuclear Fuel Service Reprocessing Plant, West Valley, New York", R.G. Dong and S.L. Ha, UCRL-52575, Lawrence Livermore Laboratory, May, 1978.

** "Western New York Nuclear Service Center Study, Companion Report", YID-28905-2, U.S. Department of Energy, Dec., 1978.

water. That DOE optimism was short-lived because in the fall of 1979, it was announced that the newer southern trenches were also filling with water and would have to be pumped on a regular basis.

The GAO seriously underestimates the problems at the West Valley waste dump ground. The GAO states (p.21) that there has been "some water seepage" into the trenches. "Some seepage" implies a small quantity of water, not the millions of liters that have had to be pumped out. Furthermore, GAO states (p.21) that "indications are that the seepage can be controlled without endangering public health and safety". Quite the contrary, experience with the Southern trenches indicates that the "seepage" cannot currently be controlled. To say that the situation will not harm the public is to ignore the large inventory of high-level radioactive materials in these trenches -- such as 12 pounds of Pu-238 and 15,000 Ci of Sr-90.

Furthermore, the GAO fails to mention that the burial ground has serious erosion problems at the Northern end. According to the EPA*, this area has "significant soil erosion" and "needs to be protected from further gullying". If the GAO has new data indicating that soil erosion for some reason is no longer a problem, this evidence should be cited. Finally, GAO fails to mention the limited number of core drillings (3-5) done in the area of the burial ground prior to its opening in order to determine permeability of the soil. The GAO fails to cite the EPA's concern that "the extent and location of sand lenses should be fully investigated"**. Clearly, until such an investigation has been conducted, it cannot be stated that the burial ground can be "operated safely".

If the GAO had properly researched conditions at the burial ground, we believe that the agency would not define "leaking, eroding burial ground" as "acceptable". It clearly is not. It is our belief that the large amount of hazardous isotopes present should be exhumed and stored in above ground containers.

We are also disturbed that the GAO fails to make a distinction between volume and Curie content as regards medical wastes. Most of the wastes generated at hospitals can be held at the hospitals until the short-lived isotopes have decayed to safe levels. A strong national program in the efficient storage and handling of these wastes at hospital sites should be instituted promptly and would reduce the burial ground requirements.

CORPORATE ACCOUNTABILITY

We are disturbed by the failure of the GAO to address the issue of the financial liability of Getty Oil or NFS, the Getty-owned subsidiary that ran the West Valley operation. The GAO apparently accepts at face value the theory that the corporate polluter has no responsibility for

* "Summary Report on the Low Level Radioactive Waste Burial Site, West Valley, New York, 1963-1975", Environmental Protection Agency, EPA-902/4-77-010, p.23.

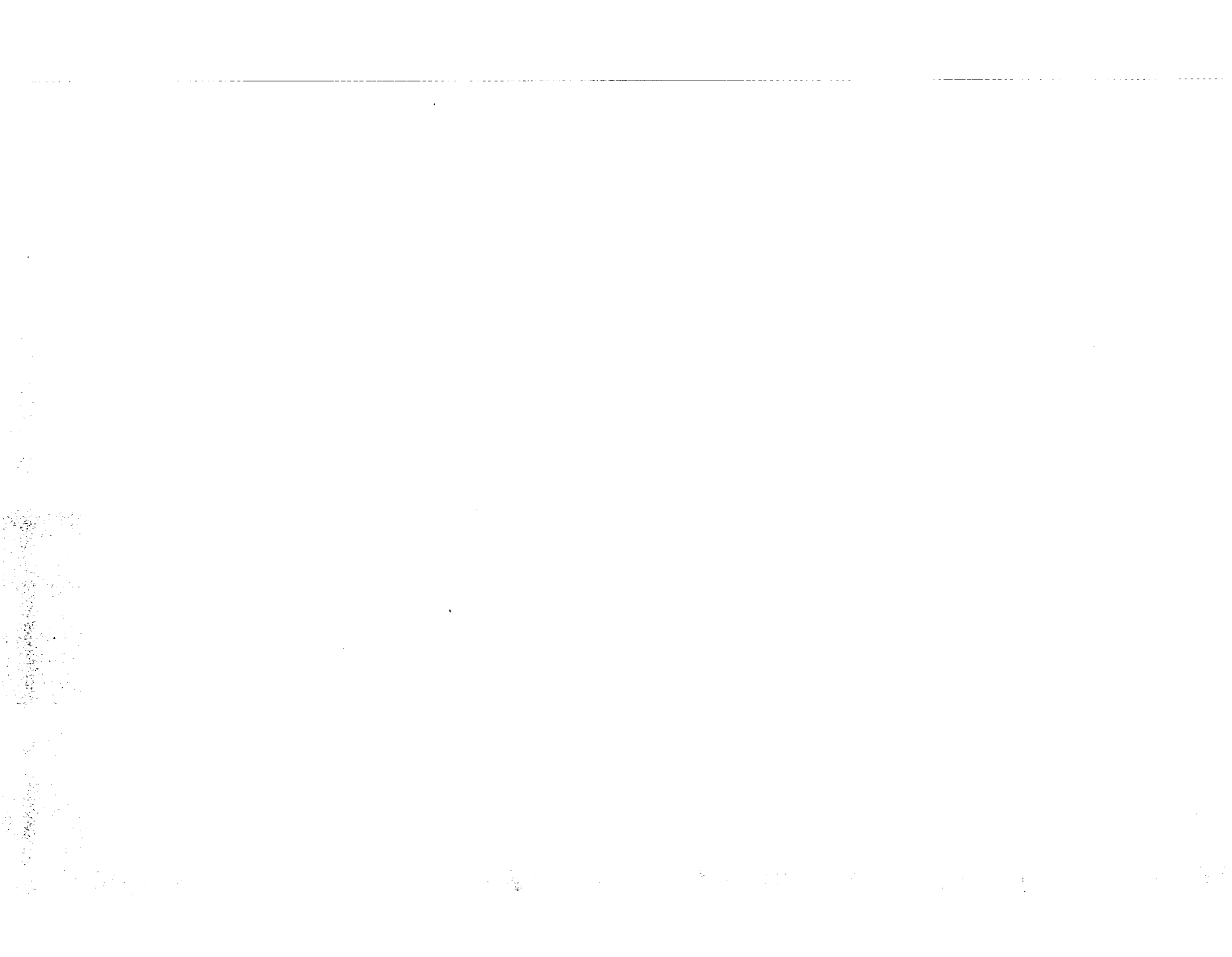
** Ibid, p.64.

the costs of cleaning up or maintaining the West Valley site. This failure stems in part from the GAO's acceptance of DOE's conclusions regarding Getty Oil responsibility for clean up expenses and GAO's faulty representation of the NRC position that the high level waste tanks are in good condition. It is our position that the high level waste system is not in "good condition" and that NFS has financial responsibility under the waste storage agreement with the State of New York. The defect in the saucer is one example of a "bad condition". Another concerns the sludge which has formed in the bottom of the tank. Because the storage parameters of the waste storage agreement have not been met regarding the air purge which was to keep the contents of the tank mixed, the costs in cleaning out the tank will undoubtedly be greater than had no sludge formed. Concerning the burial ground, which requires continual maintenance, this again is a situation where Getty Oil has a clear financial responsibility. A burial ground which is eroding, which has leaked in 1975, cannot be said to be in "good condition".

In addition, we feel that GAO, in allocating responsibility for the clean up of the site, downplays the Federal role in establishing the facility in the first place. This has been the position of the State of New York in all its statements before Congress and it has been lightly tossed off by the GAO. It was the Federal government that made the initial findings regarding the facility's not being "inimical to the health and safety of the public". A waste tank with a projected useful life of forty years holding contents that may be toxic for several hundred thousand years is not a proper finding under the Atomic Energy Act of 1954, as amended. Further, it was the Federal government that supplied 60% of the irradiated fuel to the West Valley facility.

CONCLUSION

The Sierra Club has serious concerns about the safety of the high level waste tank. Since 1974 we have advocated solidifying those materials and believe that the waste solidification project should begin as soon as possible. The cost accountability can be settled later by the U.S. Attorney General as was done in the Uranium Mill Tailings Act. We believe that an equitable sharing of the costs must take place with a much greater share of the costs being assumed by the corporate polluter. We believe that the Federal government has a clear obligation to share a portion of the costs. The GAO report does not shine an even light on these questions. It downplays the Federal role, and the corporate polluters role, leading the GAO to the conclusion that if the State of New York is to be bailed out, the Federal government must get something in return. The GAO advocates the re-opening of the solid waste dump and the spent fuel pool while downplaying the reasons why the West Valley site would be a bad choice for either. The site is ill-suited for waste "storage" and a trade-off is not scientifically responsible. We are led to the question whether this GAO report has scientific integrity or whether it is political hackwork.





AN EQUAL OPPORTUNITY EMPLOYER

**UNITED STATES
GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548**

**OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300**

**POSTAGE AND FEES PAID
U. S. GENERAL ACCOUNTING OFFICE**



THIRD CLASS