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Michael A. Wilson, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
Post Office Box 47600
Olympia, Washington 98504

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Dear Mr. Wilson:

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY (ECOLOGY) REQUEST FOR INFORMATION ON TREATMENT OPTIONS FOR MIXED WASTE

This letter is in response to the Ecology letter, dated March 7, 2002, signed by Fred C. Jamison, Program Manager. Ecology requested information on treatment options for mixed waste related to Milestone M-91-12A, "Complete Thermal Treatment of At Least 240 Cubic Meters of Contact Handled Low-Level Mixed Waste by December 31, 2002." This information is provided in the enclosed attachment. Please note that the information is formatted to the five criteria listed in the referenced Ecology letter. If you have questions or need further information, please contact me or Ellen B. Dagan, of my staff on (509) 376-3811.

Sincerely,

Joel Hebdon

Joel Hebdon, Director
Regulatory Compliance and Analysis Division

RCA:EBD

Attachment

cc w/attach:
L. J. Cusack, Ecology
R. Gay, CTUIR
J. S. Hertzel, FHI
F. Jamison, Ecology
R. Jim, YN
O. S. Kramer, FHI
T. M. Martin, HAB
R. E. Piippo, FHI
K. Niles, Oregon Energy
M. L. Goldstein, EPA
P. Sobotta, NPT
Administrative Record

ATTACHMENT

THERMAL TREATMENT OPTIONS FOR MIXED LOW LEVEL WASTE

1.0 A full set of treatment options being considered.

1.1 Allied Technology Group, Inc

Allied Technology Group, Inc (ATG) of Richland, Washington has been the planned facility for performing thermal treatment of Hanford MLLW since a thermal treatment contract was issued in 1995. Treatment was to be accomplished using a combination gasification/vitrification in ATG's GASVIT™ technology.

During 2000 and 2001, ATG encountered system reliability problems during the commissioning operations of the GASVIT™ facility. The unit operated sporadically during CY2001 with only a minimal amount of waste treated. ATG successfully thermally treated approximately 11.4 m^3 of Hanford's waste. In November 2001, ATG declared bankruptcy and shut down all of their operations. Current information suggests that ATG's thermal treatment capability will not be operational again for at least one year (some time in CY2003) while they manage issues related to the bankruptcy and modifications to address the system inadequacies associated with operation of the GASVIT™ unit.

1.2 Perma-Fix

Perma-Fix Environmental Services operates three facilities that can treat MLLW, the Perma-Fix/M&EC facility in Oak Ridge, TN; the Perma-Fix/DSSI facility in Kingston, TN; and the Perma-Fix of Florida facility located in Gainesville, FL.

- The M&EC facility is designed to handle a broad range of waste types, including waste that contains Resource Conservation and Recovery Act (RCRA) organics and/or Toxic Substances Control Act (TSCA) PCBs. Perma-Fix utilizes direct chemical oxidation to treat waste with organic hazardous constituents. The unit uses a combination of low-temperature thermal desorption and chemical oxidation to achieve effective treatment. This facility is available through the Broad Spectrum suite of contracts that are sponsored out of the U.S. Department of Energy (DOE), Oak Ridge Office.

- The DSSI facility is an industrial boiler licensed to treat liquid high Total Organic Carbon (TOC) mixed or low-level wastes (e.g., solvents, used oils, hydraulic fluids, etc.). This facility is not permitted to treat TSCA PCB-containing wastes.

- The Gainesville facility employs the Perma-Fix II treatment system, which can accept liquids, solids, sludges, debris, and soil wastes. The treatment system includes separating the organic fraction of a waste from the remainder of the waste so that the organic can be appropriately treated. These separation processes include decanting (free liquids), physical extraction (filter press), chemical extraction (solvent washing), and thermal separation (desorption). The organic fraction is shipped to one of Perma-Fix's other treatment units for destruction.

Radioactive materials licenses for the Perma-Fix facilities are somewhat restrictive and much of the Hanford waste could not be sent without changes to the licenses.

1.3 TSCA Incinerator

The TSCA incinerator at DOE's Oak Ridge Reservation is the only incinerator currently operated by the DOE. The incinerator accepts RCRA waste that requires thermal treatment, as well as TSCA-regulated waste. Although designed for liquid waste streams, the facility can also process small volumes of solid waste. The facility capacity for solid waste streams is roughly 300 m^3 per year. This capacity must be allocated to the entire DOE complex. To be able to treat waste at the TSCA incinerator requires that a generator be on the "Burn Plan" approved annually by the State of Tennessee. This is typically a two-year process. In addition, the TSCA incinerator authorization basis is somewhat restrictive on the amount of radionuclides, and would not be able to accept all of the Hanford waste.

1.4 Waste Control Specialists

Waste Control Specialists, LLC (WCS) is located in Andrews County, TX. They have a RCRA treatment and disposal permit and have installed stabilization equipment to treat mainly inorganic solids and debris. WCS is in the process of installing thermal treatment processing capability which would include thermal desorption and chemical oxidation processes. WCS would have TSCA PCB treatment authorization. WCS treatment services are available through the Broad Spectrum suite of contracts.

1.5 Envirocare of Utah

Envirocare of Utah is located outside Salt Lake City, UT. They are capable of macroencapsulation and stabilization treatment, but they do not currently have thermal treatment capabilities. They receive and dispose of MLLW from throughout the DOE complex. However, there are severe limitations for radionuclides that would make much of the Hanford Site's waste unacceptable.

1.6 AMEC Earth and Environmental, Inc.

AMEC Earth and Environmental, Inc. is an international company with a local office in Richland, WA. Their GeoMelt In-Container Vitrification (ICV) holds potential for treating many of the Hanford Site waste types that are slated for thermal treatment. Their process uses electrodes inserted into a box of waste mixed with glass formers. The waste is vitrified in the waste box and the organic constituents are destroyed. GeoMelt is permitted to treat TSCA waste, however they do not currently have a RCRA permit or RCRA permitted facility, and have no immediate plans to obtain one. AMEC does not have a fixed facility, and as such apparently does not have a corresponding radioactive materials license. Limitations on radionuclides would be provided by the host facility.

1.7 Onsite Treatment

Although limited onsite treatment has and can be performed, this is typically macroencapsulation, microencapsulation, and/or stabilization. There is no onsite thermal treatment capacity at Hanford.

2.0 Criteria used in evaluating each treatment option.

There are at least three primary criteria used in evaluating each treatment option: 1) The treatment option supplier must possess the technical capability to perform thermal treatment and meet treatment standards for Hanford waste; 2) The treatment option supplier must possess a radioactive materials license that makes them capable of handling the Hanford waste; and 3) The treatment option supplier must have a RCRA permit and/or TSCA treatment authorization that enables them to perform thermal treatment of Hanford's waste.

Secondary criteria that were also considered include treatment costs, shipping and transportation issues, schedule requirements, contract availability, and disposal of the resultant treated waste.

3.0 Explanation for not selecting each treatment option.

3.1 ATG

ATG has been, and remains, the primary treatment option for Hanford MLLW requiring thermal treatment. If/when modifications are complete and the GASVIT™ unit has successfully passed the required demonstration tests, ATG will have the technical capability and capacity to perform thermal treatment. ATG's radioactive materials license was developed with Hanford waste as a primary contributor, as was their RCRA/TSCA permit. Unfortunately, they are unable to meet the schedule requirements of completing thermal treatment of 240 m^3 of waste by 12/31/02 in support of M-91-12A due to the current bankruptcy proceedings.

3.2 Perma-Fix

FH personnel began meeting with Perma-Fix in December 2001, soon after the ATG bankruptcy became apparent. Perma-Fix believes that its Perma-Fix II treatment technologies can treat much of the Hanford waste that would have otherwise been sent to ATG. However the technology is as yet unproven on Hanford waste streams, and review of the process is underway. FH has begun generating profiles with specifics on Hanford waste to allow Perma-Fix to make determinations as to what wastes would meet their waste acceptance criteria and associated radiological and permit limitations. It would appear that Perma-Fix's RCRA permits would allow for acceptance of a majority of Hanford waste. However, Perma-Fix has fairly restrictive radioactive materials license limitations that would appear to prevent them from accepting much of the Hanford waste without changes to the licenses.

Treatment costs cannot be fully defined until profiling of the Hanford waste is complete. Treatment would likely occur at the Gainesville, FL facility. This option is currently being pursued, but due to the impacts of developing waste profiles, developing treatment plans, obtaining approval to ship, and the associated transportation issues, FH concluded that sufficient quantity could not be treated in time to meet the schedule for M-91-12A.

3.3 TSCA Incinerator

TSCA Incinerator meets the two primary criteria of technology availability and RCRA permit. Their authorization basis is more restrictive of radionuclides than ATG's radioactive materials license, but would allow for acceptance of much of the Hanford wastes. However, the major focus of the TSCA Incinerator is PCB liquid wastes. The unit is extremely limited in capacity to treat solids and proves very difficult in fitting solids into the unit's burn plan. Hanford possesses very little in the way of liquid PCB wastes that would be readily suitable for the unit to process. The option continues to be pursued, but with these obstacles, it was felt that this option could not meet the schedule for M-91-12A

3.4 Waste Control Specialists

WCS does not currently have thermal treatment capacity for Hanford's MLLW.

3.5 Envirocare of Utah

Envirocare does not currently have thermal treatment technology.

3.6 AMEC

FH personnel met with AMEC representatives on several occasions to discuss their technology and applicability to Hanford wastes. While the AMEC GeoMelt technology looks promising, they do not have a RCRA permit to allow for treatment of Hanford wastes and are still exploring options to utilize facilities, or obtain facilities where they might have permits, or more readily obtain them.

3.7 Onsite Treatment

There is currently no onsite thermal treatment capability, or permitting in place to allow for the thermal treatment of MLLW.

4.0 Criteria USDOE has determined to use to select any viable option.

FH used the criteria described in Section 2.0 to evaluate each treatment option. ATG, Perma-Fix, and TSCA Incinerator are viable options to treat portions of the Hanford MLLW, when evaluated using the three primary criteria of treatment technology, RCRA permit, and radioactive materials license. However, none of these options, individually or collectively, is capable of meeting the waste volume that is mandated by M-91-12A.

5.0 Additional options still being considered.

Treatment of Hanford Site MLLW to meet Land Disposal Restrictions is a priority for the Waste Management Project. All of the options listed above are being considered for treatment of the waste inventory and will continue to be considered as changes occur. Any options capable of performing thermal treatment will be utilized as treatment facility conditions and funding levels allow.