DOE/CE/15612--T7

Quarterly Report

COMBUSTION OF MUNICIPAL SOLID WASTES WITH OIL SHALE IN A CIRCULATING FLUIDIZED BED

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

RECEIVED
APR 24 1996
OSTI

Grant NO.
DE-FG01-94CE15612

Prepared by:
Synfuels Engineering & Development Inc.,
11158 W. 68th Way
Arvada, CO 80004

Quarter Ending
31 March 1996

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED 83

MASTER

TECHNICAL PROGRESS REPORT
(QUARTERLY REPORT NO. 6)

This progress report refers to Project Description for Grant No. DE-FG01-94CE15612, "Develop a Combustion of Municipal Solid Waste with Oil Shale in Circulating Fluidized Bed," dated September 2, 1994. The Project Description lists and describes six tasks, four of which are complete, with two others nearing completion. A summary of progress on each task follows.

1. Task 1: Development of a Detailed Test Plan. This task is complete, and was documented in previous reports.

2. Task 2: Preparation of Test Equipment. This task is complete. Two test units (a six-inch internal diameter and a fifteen-inch internal diameter unit) were prepared and used as described under Task 4. The test units are described in a draft report from Hazen Research, Inc. (see Task 5), and the task description will be part of our final report.

3. Task 3: Obtain test materials. This task is complete. As described in previous reports, we obtained an adequate quantity of a pelletized "standard" MSW from BEPR/BFI, Eden Prairie, MN. For test purposes, we synthesized the desired "worst probable case" of MSW by the addition of sulfur and chlorine to reach the sulfur and chlorine levels characteristic of such waste. We also obtained an adequate quantity of representative oil shale to use as an additive as described in our test plan.

4. Task 4: Execute Feasibility Demonstration Program. This task is complete. The principal investigator for the ACERC subcontract has submitted his report, which we have reviewed. The report from our subcontractor Hazen Research, Inc. has been received. However, our review showed that one more leachability test was needed, and that test has now been completed, with satisfactory results. (Appendix A). As described in a previous report, the results demonstrate that the process is technically feasible. All findings will be documented fully in our final report (see the discussion of Task 6 below).

5. Task 5: Data Analysis. This task is 90% complete. We have completed further analysis of the results to ensure that we have as good a basis as possible under the constraints of the project for estimating the potential for scale-up to commercial size. We have obtained the most current federal regulations (and proposed regulations) for municipal waste disposal and municipal waste combustors and used these data in developing our conclusions and recommendations. We are using these data and standards to update the process requirements and improve our economic projections.

6. Task 6: Project Management, Reporting, and Necessary Liaison Activities. This task is 90% complete. However, it has been necessary to request a no-cost extension of the contract to complete the analysis of data and finalize our final report. Assuming that this extension is granted in timely fashion, the work is expected to be completed, within budget, by 30 April 1996.

Appendix A
ASH STABILIZATION AND TCLP TESTING RESULTS

A. Fluid-bed Ash Stabilization Testing Formulations

Sample No.	Fluid-bed Ash, g		Reagent Additives, g		Water Added
	Bed	Baghouse	Type II Cement	Blast Furnace Slag	
1	9	141	50	0	87
2	8.4	131.6	6	54	78
3	22.5	127.5	0	0	~80

B. Toxicity Characteristic Leaching Procedure (TCLP) Leachate Analysis Results

Criterion No.	RCRA Metal	Sample 1, mg/l	Sample 2, mg/l	Sample 3, mg/l	EPA Regulatory Limit, mg/l
1	Arsenic	<0.01	<0.01	<0.03	5
2	Barium	0.2	0.2	<0.5	100
3	Cadmium	0.03	0.04	0.03	1
4	Chromium	0.49	0.08	0.7	5
5	Lead	0.4	0.4	<0.5	5
6	Mercury	<0.0001	<0.0001	<0.001	0.2
7	Selenium	<0.01	<0.01	<0.03	1
8	Silver	0.03	0.03	0.05	5