

**LRC –XII –43**  
**MULTIPLE-USE MARKETING OF LIGNITE**

**CONTRACTORS:** Energy & Environmental Research Center

**PRINCIPAL INVESTIGATOR:** Curtis L. Knudson  
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**PARTICIPANTS**

<u>Sponsor</u>	<u>Cost Share</u>
Knife River Coal Mining Company	\$5,000
J.R. Simplot Company	5,000
U.S. DOE/EERC JSR Program	20,000
ND Industrial Commission	<u>10,000</u>
Total	\$40,000

**Project Schedule – 7 Months**

Contract Date – 12/22/92  
Start Date – 12/1/92  
Completed – 9/30/93

**Project Deliverables**

Status Report – 2/1/93 ✓  
Final Report–9/30/93 ✓

**OBJECTIVE / STATEMENT OF WORK**

The objective of this program was a marketing study of multiple uses of lignite. Multiple-use marketing in this study involved using lignite and sulfur-capturing additives to clean agriculture wastewater followed by steam and power co-generation or briquetting to produce a higher Btu compliance fuel.

**STATUS**

Preliminary laboratory tests treating potato-processing plant wastewater with lignite and lime sludge resulted in clarification and decreased tendencies to produce odor. When the process was scaled up to pilot-size, it was found that centrifugation was ineffective in removal of coal fines and clarification was not achieved. Addition of Fe<sup>3</sup> was found to cause copious flocculation of starch and clarification without centrifugation. Lignite could not be used to replace iron in the precipitation step. Briquette prepared from the flocculated materials was found to have good resistance to water reabsorption and good strength. Binder less coal briquetting costs were estimated at \$3.18 ton.

In addition, the study identified potential markets for compliance within the Grand Forks, North Dakota area. Four potential industrial markets, quantities and estimated fuel costs are:

<u>Potential Industrial Market</u>	<u>Quantity</u>	<u>Fuel Cost</u>
American Crystal Sugar Company	170,000 t/yr.	\$1.86/Mbtu
University of North Dakota	70,000 t/yr.	\$1.46Mbtu
J.R.Simplot Company	70,000?t/yr.	\$1.51/Mbtu
Miscellaneous Small Users	1,000?t/yr.	\$43/ton

The study concluded that multiple-use marketing of lignite in this application was not economically viable.