

**FY99-XXXIII-90**  
**COMMERCIAL DEMONSTRATION OF MDU CONTROLLED**  
**DENSITY FILL**

**CONTRACTOR:** Montana-Dakota Utilities (MDU)  
Western Research Institute (WRI)

**PRINCIPAL INVESTIGATOR:**

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**PARTICIPANTS**

<u>Sponsor</u>	<u>Cost Share</u>
Montana-Dakota Utilities	\$171,680
Western Research Institute (U.S. DOE JSRP)	\$89,580
ND Industrial Commission	<u>\$97,115</u>
Total Project Costs	\$358,375

**Project Schedule - 31 Months**

Contract Date – 5/13/99  
Start Date – 5/13/99  
Completion Date – 12/31/01

**Project Deliverables**

Status Report – 9/1/99 ✓  
Status Report – 12/15/01 ✓  
Draft Final Report – 12/15/01 ✓  
Final Report – 12/15/01 ✓

**OBJECTIVE / STATEMENT OF WORK**

The objective of this project is to bring to commercial status both excavatable and structural grade flowable fill material produced using Fluidized Bed Combustion (FBC) waste from the MDU Heskett FBC plant. The specific objectives include the assessment of product variability as a function of feedstock variability; verify the economics of flowable fill production; and document the performance and range of applications through commercial-scale demonstrations and the monitoring of these demonstrations.

## STATUS

The results of the testing and demonstration activities proved the following:

- Ready-Fill can be produced in commercial - scale facilities using low-cost materials (sand and ash) that have geotechnical and environmental properties that meet industry needs.
- The geotechnical properties of the ash-based flowable fill (Ready-Fill) can be modified to meet the needs of a range of applications from structural fill applications to excavatable applications, such as utility trench fill.
- The environmental properties of the fill materials are compatible with numerous construction applications and do not pose a threat to either adjacent groundwater or soils.
- The demonstrations at a commercial scale of Ready-Fill were successful for excavatable structural, as well as niche applications.

The Ready-Fill Product appears to be a commercially viable option for the use of MDU ash in the Bismarck and Mandan area.