We put science to work.™

TechBriefs

Savannah River National Laboratory

U.S. DEPARTMENT OF ENERGY • SAVANNAH RIVER SITE • AIKEN • SC

srnl.doe.gov

At a glance

- Uses naturally occurring microorganisms
- Negligible toxicity
- Promotes rapid hydrocarbon breakdown
- Provides for oil recovery from existing waste products
- Minimizes environmental impact

Survives in harsh environments

- U. S. patent 7,472,747 B1
- U. S. patent 7,473,546 B2

Contact Information

E-mail: partnerships@srnl.doe.gov

BioTiger™: Biological Enhancement of Hydrocarbon Extraction

Scientists at the Savannah River National Laboratory (SRNL) have discovered a new environmental biocatalyst for improving the recovery of hydrocarbons entrained in sediments utilizing a patent pending consortium of microbes known as BioTiger™. The action of the BioTiger™ organisms on the oily portions of the sand increases the amount of recoverable bitumen. Tests have shown the microbial activity increases extraction efficiency by 50 percent after four hours and over 80 percent after 24 hours.

BioTiger™ increases oil yield from oil sands

Background - State of Development

SRNL has conducted testing with the BioTiger™ environmental biocatalyst on coarse tailings from an oil sands project. The tailings contained 14.5 percent bitumen and represented one of three process streams evaluated by SRNL. These tests demonstrated that the enzymes, surfactants and micelles produced by the BioTiger™ bacteria can mobilize trapped oil-sand deposits. Tests also confirmed BioTiger's™ production of biosurfactants using the hydrocarbons as a carbon source and showed survivability in the oil sands at temperatures from 20-65° C.

Additional Benefits

BioTiger™ exhibits properties that could be instrumental in the rapid reclamation of existing tailing ponds and potential recovery of significant amounts of bitumen currently discarded to the

Technology transfer

The Savannah River National Laboratory (SRNL) is the U.S. Department of Energy's (DOE) applied research and development laboratory at the Savannah River Site (SRS).

With its wide spectrum and expertise in areas such as homeland security, hydrogen technology, materials, sensors, and environmental science, SRNL's cutting edge technology delivers high dividends to its customers.

The management and operating contractor for SRNL is Batelle Savannah River Alliance, LLC. BSRA is responsible for transferring its technologies to the private sector so that these technologies may have the collateral benefit of enhancing U.S. economic competitiveness.

tailing ponds. The breakdown, recovery, and processing of these "waste" products, could provide the capability to recover an estimated equivalent of 30 million barrels of oil housed in the tailing ponds. Given the potential amount of oil entrapped within what is currently considered a waste product from the oil sands process, the successful recovery of a nominal 1 percent of useful product could produce an additional revenue stream of $15 million per year.

Partnering Opportunities

SRNL invites interested companies with proven capabilities in this area of expertise to develop commercial applications for this process under a cooperative research and development agreement or licensing agreement. Interested companies will be requested to submit a business plan setting forth company qualifications, strategies, activities, and milestones for commercializing this invention. Qualifications should include past experience in the commercial uses of similar processes, reasonable schedule for commercial process launch, an established customer base, and evidence of sufficient financial resources for product development and launch.

SRNL-L9100-2010-000700

May 2014 13CC00025