



OIL SHALE UPDATE

National Oil Shale Association

Volume II— Issue I

September 2009

Significant progress on R,D&D lease projects

The developers of oil shale projects in Colorado and Utah are continuing to make substantial progress in spite of erratic and lower oil prices, political uncertainty, technical risks and regulatory issues. This is particularly true for the research, development and demonstration of innovative technologies destined for testing on BLM R,D&D leases in both states.

AMSO

American Shale Oil, LLC conducted numerous field activities on its R,D&D site in Colorado including the drilling of a number of site characterization exploration wells. They have received permits from BLM and the State of Colorado to conduct a one well pilot test of their CCR (Conduction, Convection & Refluxing) technology beginning in 2010. TOTAL is now a partner with IDT Corp. on the project.

Shell Mahogany

R,D&D activities continue on Shell's private property in the Piceance Basin. The main currently active project in Colorado is the Freeze Wall Test (FWT). The FWT became fully operational in late 2007, and will continue for 3-4 years as more is learned about how best to manage and protect groundwater in proximity to insitu retorting operations. It has been reported that the ice wall has completely closed and now experiments can begin to test its engineering properties. In the next phase of testing, "Shell intends to propose a pilot project on one of its BLM RD&D leases to demonstrate its ICP technology in a manner that will lead to future commercialization."

Chevron

Chevron drilled a number of exploratory geologic and hydro-logic wells on its R,D&D lease in

Colorado to characterize the site. It also continued its technology development work at its labs and at the Los Alamos National Laboratory.

OSEC

Oil Shale Exploration Company continued its field and R,D&D activities. Permitting the first phase of the project, to open the White River Mine, is ongoing. Mitsui and Petrobras are now partners in the project. Petrobras has run tests on Utah oil shale at its pilot plant in Brazil. Spent shale from the plant is being tested for byproduct uses. Mitsui is conducting a commercial feasibility study. During the next R,D&D phases OSEC plans to build and operate a 250 ton/hr retort and upgrading facility.

Other Developers

Significant progress was made on other projects not based on the BLM R,D&D program They are discussed later in this report.

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Special points of interest:

- Oil Shale can play an important role in transitioning to a secure and sustainable source of domestic transportation fuels for the nation.
- New water use figures released by NOSA based upon developers input.
- Many organizations seeking to have BLM offer a second round of oil shale R,D&D leases.

Politics obscure oil shale progress

At the end of 2008, BLM completed two significant accomplishments: issuance of a Programmatic Environmental Impact Statement (PEIS) and regulations for the commercial leasing of oil shale. Although not all parties were pleased with the content of the documents, they had been produced with extensive public input and thoughtful deliberation by BLM and MMS. In addition BLM sought proposals for a second round of R,D&D oil shale leasing in January 2009.

The new Administration in Washington DC rescinded the 2nd round of R,D&D leasing, received comments on the future of the leasing program, and as of the date of this report had not decided upon a future course of action. Both the PEIS and regulations are under review by Interior and both are the subject of litigation brought by environmental organizations.



AMSO R,D&D Lease

EnShale/EcoShale project updates

EnShale Project

EnShale, Inc., an 80% owned subsidiary of Bullion Monarch Mining, has completed the construction of its oil shale demonstration plant, a scaled down embodiment of its proprietary process, which has both U.S. and International patents pending. The Company is now testing components before proceeding to full scale plant operations.

According to the Company, process heat for the demonstration plant is being provided by propane, a clean burning fuel source. Water is consumed only in cooling and will be minimized as the system is a closed loop process. EnShale will be conducting various tests with its demonstration plant to prove out its proprietary process and complete its design of a commercial plant. The Company has acquired 5,000 tons of oil shale for processing in its demonstration plant.

EnShale's demonstration plant computer modeling of a commercial sized process was completed in

2008 by Emery Energy Company of Salt Lake City and DOE's Idaho National Laboratories of Idaho Falls, ID using ASPEN Plus Process Model (Contract DE-AC07-05ID14517). The commercial process is estimated to produce 17,454 barrels of liquid fuels per day from 21,600 ton of oil shale ore.

EcoShale Project

EcoShale is a proprietary technology owned by Red Leaf Resources Incorporated. According to information on its Web Site, Red Leaf Resources owns leases of roughly 17,000 acres on Utah School and Institutional Trust Lands containing approximately 1.5 billion barrels of oil beneath an average of .45 to 1 overburden ratio.

Red Leaf Resources has recently completed a demonstration scale test of its technology. This successful test reportedly started in October 2008. In a presentation by Tony Dammer given at

the International Oil Shale Symposium in Tallinn, Estonia – June 8 & 9, 2009, the company gave the following report on the test. First condensate (39 °API) and oil (29 °API) was produced December 2, 2008. Production was completed in 90 days. The convective heating was uniform. One barrel of oil energy equivalent was used to produce ten barrels of oil. The company has not officially reported the quantity of oil produced. Red Leaf also reported that there are technology licensing opportunities, and opportunities for two projects on Red Leaf controlled leases in Utah.

The company also reported that the process has low emissions, can be rapidly reclaimed, uses less than 1 barrel of water per barrel of oil produced, and uses an impermeable clay liner to protect ground water.



EnShale pilot plant Sep 09



EcoShale lined pit under construction

COSTAR Status

The Center for Oil Shale Technology and Research (COSTAR) at the Colorado School of Mines is fully operational.

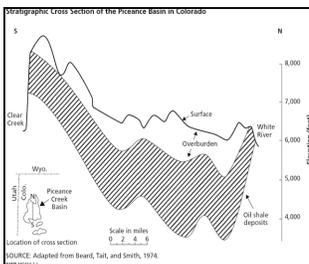
The primary objective of COSTAR is to conduct research on oil shale deposits, technological approaches to *in-situ* and *ex-situ* production, and effects and consequences of the production of shale oil, including carbon management.

The current corporate sponsors of COSTAR are TOTAL, Shell, and ExxonMobil. The current

research agreements run through June of 2010. COSTAR is seeking new partners to enable it to continue the current research areas, and expand especially in the environmental arena, but remains committed to doing the research that is relevant to sponsors needs. In the future, COSTAR plans to apply the geologic and stratigraphic framework it is developing for the Green River Formation to understand other oil shale deposits around the world.

COSTAR includes an oil shale information office, located in the CSM Library. A geographically referenced database of oil shale information, at CSM, including the Tell Ertl collection is being developed. COSTAR is coordinating with data repositories at the USGS, the University of Utah, the National Energy Technology Laboratory, and at international repositories.

COSTAR is actively seeking sponsorship contributions for this global repository of oil shale information.



Piceance Basin cross-section



NOSA evaluates oil shale water usage

The National Oil Shale Association (NOSA) has conducted an evaluation of the estimated water usage for current oil shale projects. NOSA requested information from developers and received confidential input from several. The input was summarized by insitu and surface technologies and averaged in each of the two categories.

This is a very complicated subject because there are so many variables to consider. The future is uncertain as to which technologies that will be employed as most are in the R,D&D phase and do not have

data from commercial scale demonstration facilities. The water estimated to be used by the technologies being developed varies widely. Many other uncertainties further complicate the evaluation.

Therefore, the results of this analysis are preliminary, but considered better than rules of thumb that have come down from past estimates, and are considered appropriate for water planning purposes.

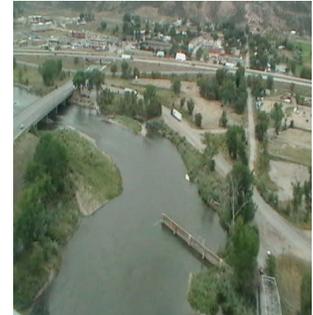
Surface Retorting - 2.0 Bbls water/Bbl of shale oil (B/B), or 14 gallons of water/MMBTU of

energy produced*

Insitu Retorting - 1.7 Bbls water Bbl of shale oil (B/B), or 12 gallons of water/MMBTU of energy produced*

*Figures are based upon shale oil upgrading off site. If upgrading is included on-site add 0.6 to 1.6 B/B depending upon the degree of upgrading, and the nature of the shale oil produced from different technologies.

Most developers reported they are not anticipating on-site shale oil upgrading for initial plants.



Colorado River at Rifle, Colorado

Exxon Electrofrac™ technology update

Michele M. Thomas, ExxonMobil Upstream Research Company recently reported the progress on ExxonMobil's Electrofrac™ Process for *In Situ* Oil Shale Conversion. Oil shale is heated *in situ* by a hydraulic fracture filled with an electrically conductive material. Electricity is conducted from one end of the heating element. Heat is conducted into the formation, converting the kerogen into oil and gas. Oil and gas are produced by conventional methods.

Preliminary estimates of Electrofrac energy efficiency indicate an energy ratio of at least 3 to 1 with greater than 3 barrels of oil equivalent (BOE) energy produced for each BOE fuel input to a power plant producing energy for the process. Produced gas will fuel an energy-efficient combined-cycle gas power plant, and point source CO2 emissions are amenable to carbon capture and sequestration (CCS) mitigation technologies.

Field tests are underway to test the Electrofrac™ process elements on a larger than laboratory scale at ExxonMobil's Colony site in Colorado. Results to date support technical feasibility. The Colony site is appropriate for initial testing, but it is not likely to be a suitable candidate for *in situ* oil shale development. Several years of research are required to demonstrate technical, environmental, and economic feasibility, according to Ms. Thomas.



ExxonMobil Colony Site

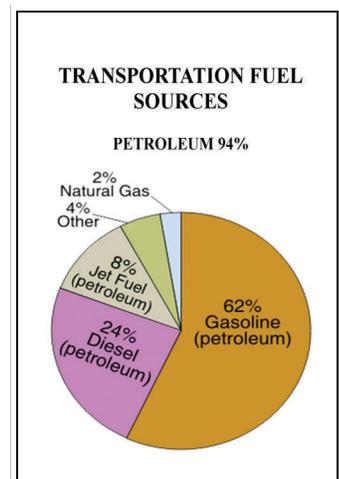
Transportation fuels key to oil shale strategy

94% of transportation fuels consumed in the United States come from petroleum. Over 60% of our petroleum comes from outside our borders. The cost of imported petroleum is out of our control, and the cost to our society for importing so much of it is having a material effect upon the cost of almost everything we consume - not just the price of gasoline. The cost of the food we eat has an

energy cost component along with essentially all the commodities we need to enjoy the life style we take for granted.

Most agree that we need to move away from a society based upon petroleum, and that all domestic sources of energy and conservation will be needed. But it will take decades to transition to that new energy vision.

Oil Shale can play a significant role in the transition away from the high cost of importing foreign petroleum. Oil shale or any other single domestic energy source will not be a silver bullet, but oil shale, electrification, bio-fuels, natural gas, and other domestic energy sources can together solve our long term transportation fuel problem.

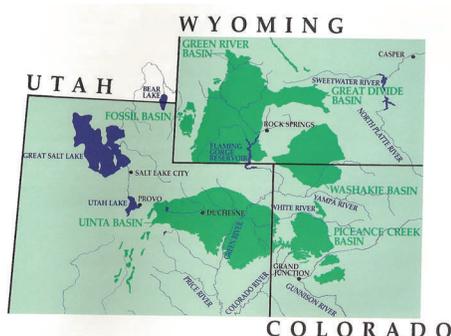




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Western U.S. Oil Shale Basins

NOSA Celebrated Two Year Anniversary

- The mission of the National Oil Shale Association (NOSA) is to educate the public about oil shale.
- NOSA is a not-for-profit 501(c)(6) corporation.
- The Association was formed in the 1970's when it actively engaged in oil shale education.
- NOSA was reinstated in response to a renewed interest in oil shale. The organizers of NOSA have extensive experience in oil shale and energy development.
- There are two classes of membership: Sustaining and Associate Members. Sustaining Members are profit making firms and Associate Members are individuals and not-for-profit groups.
- NOSA's Web Site at www.oilshaleassoc.org provides copies of the Bylaws and a membership application form.

NOSA SET TO RELEASE EDUCATIONAL VIDEO October 2009

See web site for details

29th Annual Oil Shale Symposium to be held in Golden, CO October 20 –21, 2009. For details log on to

http://outreach.mines.edu/cont_ed/oilshale/?CMSPAGE=Outreach/cont_ed/oilshale/

The information presented in this document has been prepared by the staff of NOSA and is intended to give a snapshot of the status of oil shale technology and projects, and is not endorsed by the principals of those technologies or projects. NOSA has drawn upon publicly available information.

Innovative technologies and projects

In the last year there have been a number of oil shale patents filed and many firms and individuals are generating innovative ideas on how to process oil shale and other unconventional hydrocarbon resources. Many are urging BLM to offer a second round of R,D&D oil leases. Some are seeking corporate partners. Others are advancing projects outside the United States.

PK Clean

Percy Kean Clean Technologies, is an Australian company that has developed a process for "recovering hydrocarbons from a carbon containing material" and obtained related US Patent No. 6,936,159 B1. The process uses sulfuric acid to extract oil from the kerogen at under 200°C. According to its developer, based upon laboratory experiments, the process produces a good quality oil by improving the carbon to hydrogen

ratio, produces very little carbon dioxide, recovers over 90% of the acid, and requires low energy input.

The company is seeking funding for conducting a continuous scale pilot project in the United States.

Quasar Energy

Quasar Energy LLC is an entrepreneurial organization that has a patented process for the in-situ electromagnetic heating of oil shale and other non-conventional reservoirs. Quasar's president Dwight Kinzer indicated the firm is seeking a place for field testing of their technology and would like to see the BLM offer more oil shale R,D&D leases.

Shale Technology International (Paraho)

In 2004, Brisbane-based com-

pany Queensland Energy Resources (QER) assessed more than 60 oil shale technologies before identifying Shale Tech International's (STI) Paraho II™ as the most suitable for the processing of its extensive oil shale deposits, citing availability, efficiency, safety and environmental performance as key reasons for the decision. QER has shipped 8,000 tonnes of oil shale from its Australian deposits to STI's Rifle plant, which has conducted more than 5,000 hours of specifically planned operations, resulting in the completion of 226 full yield windows.

Today, STI continues to advance the Paraho II™ technology and support QER in its development efforts.

For more information see links page on www.oilshaleassoc.org and individual project web sites.

MEETING ANNOUNCEMENT

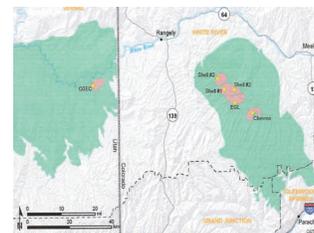
Unconventional Oil

October 14-15, 2009

Crowne Plaza St. James Hotel
 London, U.K.,

www.smi-online.co.uk/unconoil.asp

NOSA presenting paper titled
U.S. Oil Shale—Opportunities
 and Challenges



BLM oil shale R,D&D leases
 in Colorado and Utah