



OIL SHALE UPDATE

National Oil Shale Association

Volume I, Issue I
April 2008

Steady Progress made on Oil Shale Projects

During the first quarter of 2008 a number of oil shale projects reported progress in a steady and measured manner with the goal of completing research and development on technologies that hold promise for becoming economic, sustainable and environmentally acceptable. This research and development is needed before any oil shale projects are expected to be commercialized.

The projects included those on BLM RD&D leases, state leases, and on private oil shale lands. Work is being conducted on the oil shale project sites and in laboratories around the country. Essentially all of the current oil shale development work is being conducted with private funds. There are currently no major government grants or incentive programs for oil shale.

The principal firms involved in oil shale development in

the United States are Shell Unconventional Resources, American Shale Oil (formerly EGL Resources), Red Leaf Resources, Oil Shale Exploration (OSEC), Chevron, ExxonMobil, ConocoPhillips, ERTL Inc., Sage Geotech, and Shale Technologies International. A number of other firms are actively engaged in oil shale technology and project development in the United States.

Significant non-U.S. commercial oil shale programs are being carried out in China, Estonia and Brazil. Exploratory work and technology development is moving forward in Jordan, Israel, Morocco and Australia. Many other countries in the world have oil shale deposits that has been investigated and/or developed in past decades.

The federal government through the U.S. Department of Energy Office of

Fossil Energy has completed a number of studies that indicate the value of oil shale for reducing dependence on foreign and expensive supplies of petroleum. A task force report can be found at

<http://fossil.energy.gov/programs/reserves/npr/publications/>

Challenges to successful oil shale commercialization are significant, expensive and time consuming.

- Technology must be demonstrated to be economic.
- Environmental issues must be solved.
- Political differences must be mediated.
- Both the public and government officials needs to be convinced of the potential for oil shale to help meet domestic energy demand.

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Special points of interest:

- IDT buys into EGL project and renames it American Shale Oil Project (AMSO)
- Schlumberger buys Raytheon technology
- Oil shale leasing PEIS comments submitted to BLM
- Several new oil shale technologies surface

U.S. Oil Shale Resources are Immense

"The largest known oil shale deposits in the world are in the Green River Formation, which covers portions of Colorado, Utah, and Wyoming. Estimates of the oil resource in place within the Green River Formation range from 1.5 to 1.8 trillion barrels. Not all resources are recoverable. For potentially recoverable oil shale resources, we roughly derive an upper bound of 1.1 trillion barrels of oil to a lower bound of about 500 billion barrels." [Bartis, James T. et al, Rand Corporation, Oil shale Development in the United States, ISBN: 0-8330-3848-6, 2005]



“You’re talking about tremendous reserves—if we can recover up to one trillion barrels of oil, that’s more proven reserves than all of the proven reserves in the Middle East put together.”

US Senator Orrin Hatch

New Entrants in the Oil Shale Arena

This period saw the entrance of several new businesses and leaders in the oil shale arena.

American Shale Oil Co

EGL Oil Shale, LLC reportedly closed a deal to sell 75% of its assets to IDT Corporation. The new firm is called American Shale Oil Company, or AMSO. The President of the firm is Howard Jonas, Chairman of IDT and author of books on management. Alan Burnham, (PhD), Roger Day and Claude Pupkin are the key managers of the project on

EGL’s Oil Shale RD&D Lease in Rio Blanco County, Colorado.

Howard Jonas is quoted as saying “We intend to pursue, and are urging the other participants in the industry to join us in, an open collaboration approach to solving the challenges that have stymied shale oil extraction for decades.”

Schlumberger

Raytheon announced that it was selling its oil shale technology to Schlumberger, a well known oil field

service company. The technology developed by Raytheon uses microwaves to generate heat underground to release shale oil from the resource. Raytheon reportedly developed the technology with CF Technologies of Massachusetts. Earlier the Illinois Institute of Technology and other firms experimented with the use of micro waves to retort oil shale.

Frank Smith—Western Colorado Congress

Frank Smith was named oil shale coordinator for the Western Colorado Congress.

Red Leaf— EcoShale Oil Shale Project in Utah

According to its web site, the mission of Red Leaf Resources Inc. is to develop the EcoShale In-Capsule Process to bring economical liquid hydrocarbon transportation fuels to the market from unconventional hydrocarbons (oil shale, tar sands, coal, lignite) soon enough, and in sufficient quantity, to significantly impact economic and political dependence on conventional oil.

The Great Basin of the

western United States holds some of the world’s richest deposits of oil shale. The states of Wyoming, Colorado, and Utah together represent more than a third of the earth’s supply.

Red Leaf Resources, Inc owns School Institutional Trust Lands leases in Utah containing approximately 1.5 billion barrels of oil. The hydrocarbon resource is world class and lies beneath an average of 0.45 to 1.0 overburden ratio.

The property can sustain a multi-billion dollar mining project which could produce up to 50,000 barrels per day -- more oil than all of Utah’s other conventional output combined.

Red Leaf is currently planning for field testing of its technology in Utah.



Oil Shale Exploration Company (OSEC) Project

OSEC has reported that it has a three phase research, development and demonstration (RD&D) program to mine and process oil shale from the Green River Formation in Utah.

Phase 1 began with the signing of the BLM lease, effective July 1, 2007, on the 160-acre RD&D site of

the White River Mine. Oil shale samples have been sent to three independent laboratories for testing. In September 2007 OSEC processed 300-tons of crushed shale through the Alberta Taciuk Process (ATP) pilot plant in Calgary, Canada.

During Phase 2, the Com-

pany plans to construct a 250-ton-per-hour processing facility at the White River Mine near Bonanza, Utah. The facility would include an on-site shale oil upgrading plant and shale oil product storage tanks.

During Phase 3, OSEC will seek to secure the Preferential Lease Property so that commercial operations can be initiated.



Shell Mahogany Research Project

Research and development activities continue on Shell's private property in the northern Piceance Basin. Field activities have been ongoing since 1996, with the last heating test successfully recovering oil and confirming the viability of Shell's In-situ Conversion Process (ICP) technology. The main currently active project in Colorado is the Freeze Wall Test (FWT) where Shell is testing the ability to isolate an area to be heated, while protecting the adjacent water-bearing formations, by surrounding the perimeter of the area to

be heated with a subsurface curtain of ice. This is being done in a novel application of conventional engineering technology typically used in places such as construction sites where soil moisture is an issue. The FWT was constructed in 2006 and 2007, became fully operational in late 2007, and will continue for 3-4 years as we learn more about how best to manage and protect groundwater in proximity to our operations.

In the next phase of testing, Shell intends to propose a pilot project on federal research leases to demon-

strate a fully integrated application of combined heating and freeze wall technology.

The ultimate objective is to make a decision about commercial scale development in the middle of the next decade, depending on the timing and results of ongoing research and on the timely development of a supporting federal and state regulatory scheme that facilitates its implementation.

For more information, see web site

www.shell.com/us/mahogany.



Shell's Office in Rio Blanco County, Colorado

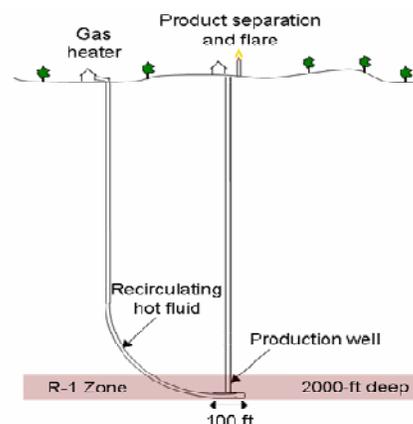
American Shale Oil Project (AMSO)

AMSO's reported strategy is to produce shale oil and gas from the illite-rich oil shale 2000-ft below the surface of its RD&D lease in order to prevent contamination of drinking water aquifers. They are exploring how to prove and best implement EGL's patented Conduction, Convection, Reflux (CCR™) retort concept.

Upon completion of the RD&D program and ap-

proval, commercial operations employing these techniques could start sometime in the 2015 to 2020 time frame. Production could expand to the 100,000 bbl/day rate over the course of several years given favorable economics and acceptable impacts.

The figure at the right is a diagram of the initial field test envisioned by AMSO.



Programmatic EIS for Oil Shale Leasing

In December 2006 the Bureau of Land Management (BLM) issued a Draft Oil Shale and Tar Sands Programmatic Environmental Impact Statement (PEIS).

The purpose was to identify those areas where oil shale and tar sands resources are present, decide which of those areas will be open to application for commercial leasing, exploration and

development, and amend the BLM's applicable land use plans.

Comments were encouraged from the public into April of 2008.

The PEIS offered three options for oil shale development, including a no-leasing option. The BLM expects several thousand com-

ments. The issuance of a Final PEIS and Record of Decision is anticipated by the end of 2008 if funding is made available to BLM to complete its work.

NOSA submitted comments to BLM that focused upon the factual content of the document and can be found on the NOSA web site: www.oilshaleassoc.org.

"If commercial oil shale leasing occurs, it will not occur for a number of years."

Kent Walter, Field Manager, BLM White River Office, Meeker, CO—3/20/08



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Unocal Oil Shale Plant circa 1982

NOSA Welcomes New Members

- 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.
- Now NOSA has been 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.

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 publically available information.

Innovative Technologies and Ideas

The resurgent interest in oil shale has resulted in new technologies and proposed research and development projects. A partial list of projects receiving attention during this period follows:

Shell Mahogany Project

Electric heated in-situ process pilot tested in the field. Freeze wall test in progress. Tests planned on three RD&D leases in Colorado.

Chevron

CO₂ injected in-situ process planned for testing at its RD&D lease in Colorado.

AMSO

Indirect heated in-situ process planned for testing at its RD&D lease in Colorado.

OSEC

Surface retorting and under-

ground mining project in Utah with mine opening planned in the near term.

ExxonMobil

In-situ Electrofrac process under development with field tests planned in the future.

Phoenix WY

Microwave in-situ oil shale process planned for testing in the future.

Raytheon/Schlumberger

Microwave in-situ technology tested at laboratory scale with field tests in the planning stage.

CRE Energy

Surface retorting process combined with coal gasification with pilot testing planned in the future.

Mountain West Energy

In-situ process that includes

hot gas injection and in-situ vapor extraction.

Independent Energy Partners

In-situ process using geothermic fuel cells with plans for testing in the field.

Blue Ensign Technologies

Surface retorting process using liquid extraction tested at laboratory scale. Funding being sought for test in Australia.

Shale Technology International

Paraho surface retorting technology with pilot plant in Colorado where tests have been conducted on oil shales from around the world.

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



Shale Technology International pilot plant near Rifle, Colorado