

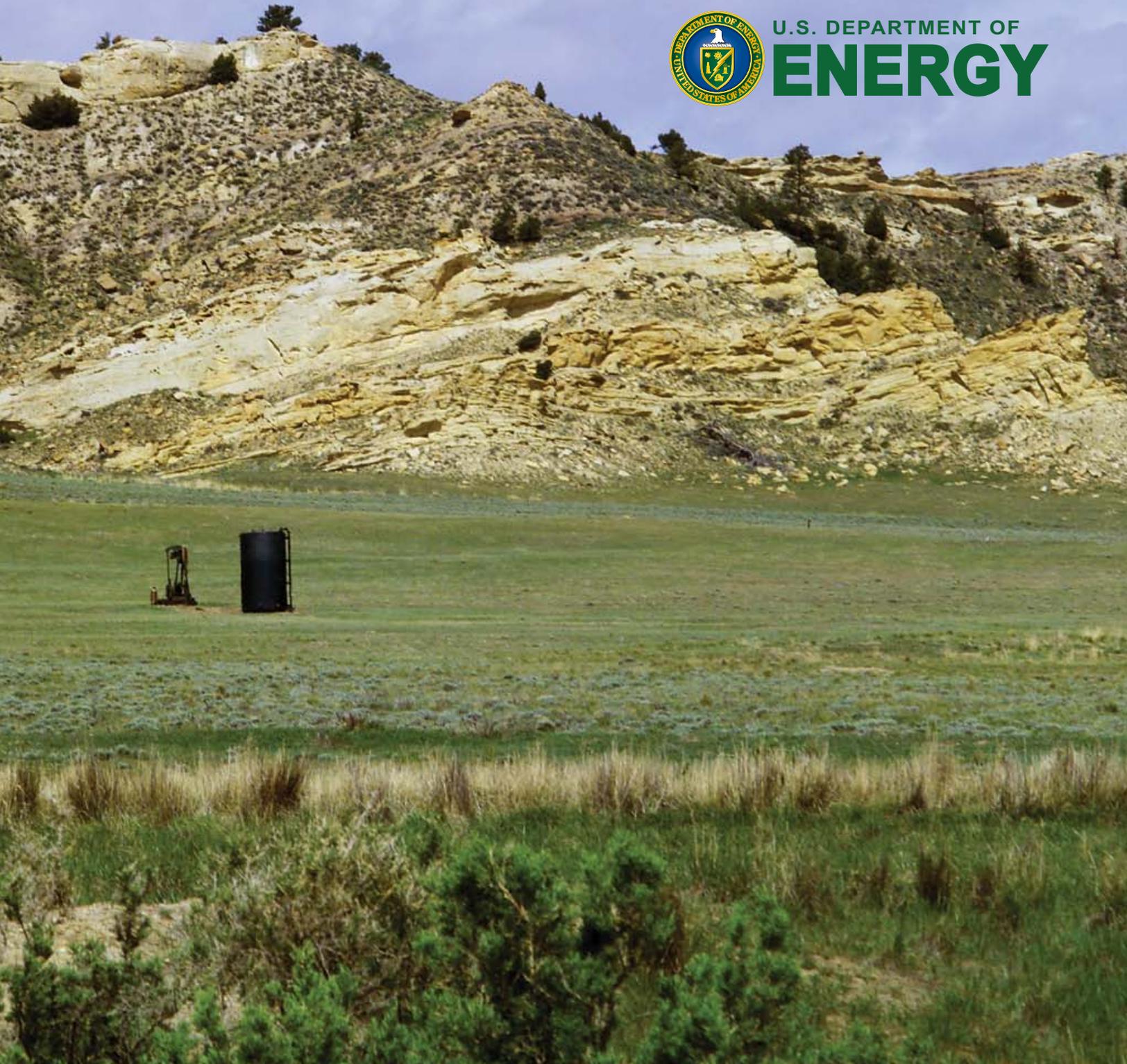
OFFICE OF FOSSIL ENERGY

RMOTC NEWSLETTER

FALL 2010



U.S. DEPARTMENT OF
ENERGY



IN BRIEF

TIDBITS FROM ACROSS RMOTC

RMOTC brand transitions with changing energy needs

The Rocky Mountain Oilfield Testing Center was formed in the early 1990s



to address the needs of industry, academia, and other government agencies for a place to field

test new tools and technologies for oil and gas exploration and production. As America's energy resources diversify, RMOTC strives to fulfill the testing and demonstration needs of both traditional and non-traditional energy providers.

Recent projects have included directional drilling, enhanced and improved oil recovery, and advanced well logging, as well as low-temperature geothermal, solar, and wind power generation. Our acronym, RMOTC, represents our broader based energy testing mission, including our petroleum origins. In the coming year, you will see a phased approach to RMOTC's transition.

RMOTC compiles list of test wells for partners

RMOTC has compiled a partial list of wells available for testing at its field test site near Casper, Wyoming. Partners may test in RMOTC's large inventory of cased, uncased, vertical, high-angle, and horizontal wells under a variety of scenarios. Cased and openhole wells are

available for testing at depths of 300 feet to 6,000 feet and casing diameters range from 4.5 inches to 20 inches. For more information on well specifications and other testing opportunities, go to www.rmotc.doe.gov/factsheets.html.

On the fall trade show circuit

- Turbomachinery Symposium
Houston, Texas
October 4-7, 2010
- Oklahoma Oil & Gas Trade Expo
Oklahoma City, Oklahoma
October 7, 2010
- Society of Exploration Geophysicists Annual Meeting
Denver, Colorado
October 17-20, 2010
- Geothermal Resource Council Annual Meeting
Sacramento, California
October 24-27, 2010
- Geological Society of America Annual Meeting
Denver, Colorado
October 31-November 3, 2010

Check out www.rmotc.doe.gov/conferences.html for more details on RMOTC's conference plans.

White paper compares RMOTC formations to others in U.S.

RMOTC recently released a white paper comparing geologic formations at its test site, Teapot Dome Oil Field in Wyoming, to other formations in the United States. Operations at Teapot Dome provide an excellent natural laboratory in which to conduct research in

Enhanced Oil Recovery (EOR) and carbon sequestration in geologic reservoirs. In addition, RMOTC provides a testing center environment ideal for testing and/or demonstrating new technologies for EOR and sequestration. Find the entire white paper at www.rmotc.doe.gov/techpapers.html.

Join RMOTC's social networks

Keep up with the latest RMOTC news by joining the Office of Fossil Energy social networks on Facebook and Twitter. In addition to the latest happenings at RMOTC, you'll receive updates from Washington, D.C., and other Fossil Energy sites. Go to www.rmotc.doe.gov for links to join.

DOE-sponsored Science Bowl date set for February

RMOTC and the U.S. Department of Energy will once again sponsor the Wyoming Regional Science Bowl in 2011. The annual event will be held Feb. 5 in Casper.

High school students from across the state will participate in the quiz event. Students answer questions related to biology, physics, and other math and science related topics.

If you're interested in supporting the Science Bowl through volunteering or a monetary donation to get the event off the ground, call (888) 599-2200 or e-mail sbcoordinator@rmotc.doe.gov.

OPENHOLE LOGGING WELL

5,400-FOOT WELL SPECIFICALLY DESIGNED FOR TESTING LOGGING TOOLS

RMOTC has drilled a mostly vertical well that is specifically designed for openhole logging tests. It was drilled to 5,400 feet and has approximately 2,350 feet of open hole to test a variety of openhole logging tools. The wellbore is drilled with an 8-1/2" drill bit.

The well was originally drilled with a 3% KCL Polymer mud system that seems to work

RMOTC provides:

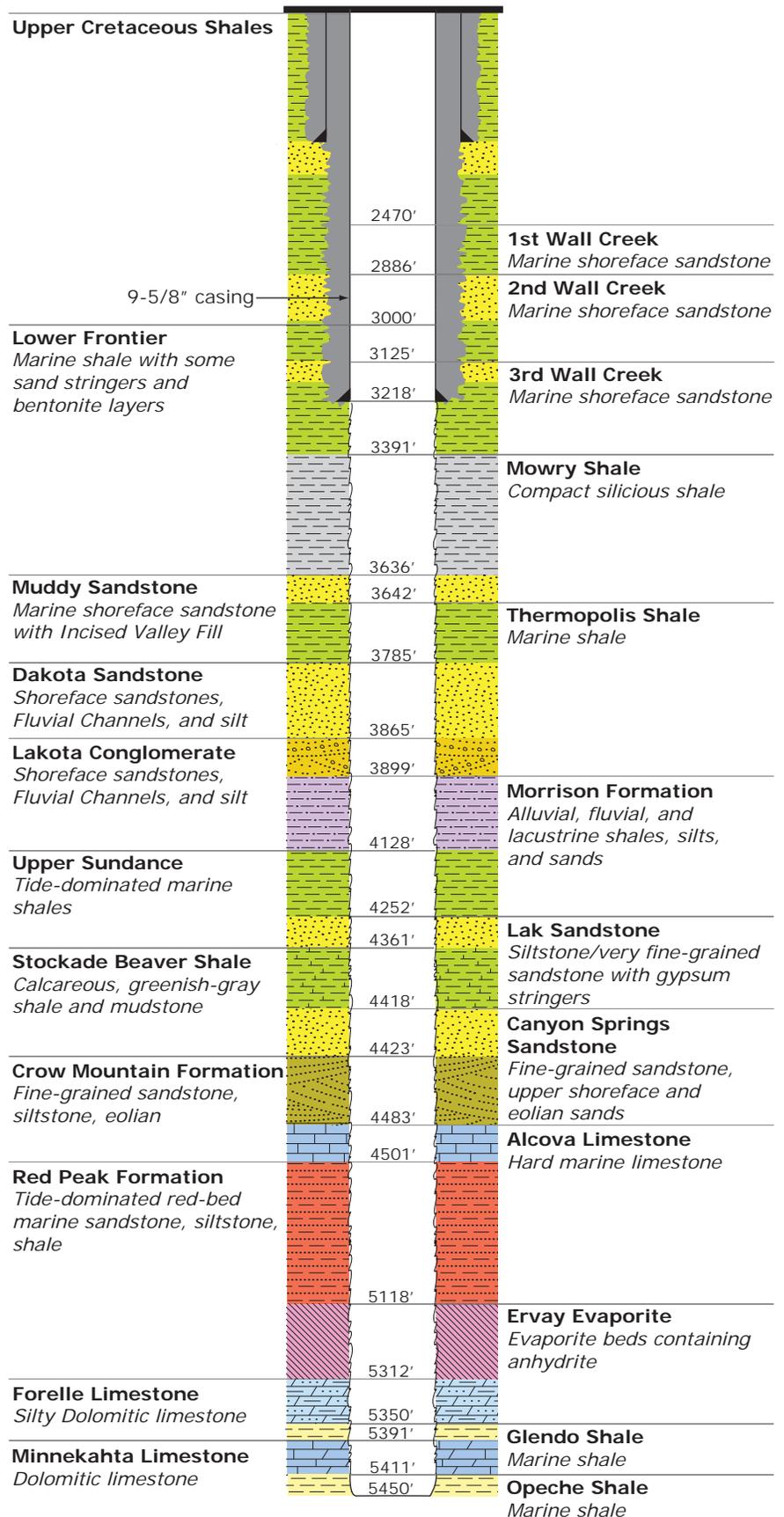
- A 10,000-acre facility to field test, demonstrate, and document technology
- Neutrality — no vested interest in any specific technology
- Acceptance of the shared risks of your test
- A well-characterized reservoir and extensive geologic database

well for stabilizing sensitive shale zones. The lower formations are very compact and should be able to stay open without significant caving. RMOTC has the capability to recondition this wellbore with a

variety of mud types if needed.

The openhole section will pass through a variety of ages, formations, and lithologies common to the Rocky Mountain geologic province. The rocks encountered by the wellbore include sandstone, siltstone, shale, conglomerate, limestone, dolomite, and evaporite bearing formations.

For more information about these opportunities or to discuss your testing needs, contact RMOTC toll-free at (888) 599-2200, or visit the website at www.rmotc.doe.gov



GEOHERMAL SYMPOSIUM

RMOTC'S FIRST HOSTED EVENT MET WITH GREAT SUCCESS



A tour of RMOTC's field test site, including a trip to the low-temperature 250 kW Organic Rankine Cycle generator currently running, was part of the Geothermal in the Oil Field symposium held in August.

On August 18-19, RMOTC hosted its first Geothermal in the Oil Filed Symposium in conjunction with the Department of Energy's Geothermal Technologies Program (GTP) and the National Renewable Energy Laboratory (NREL) and Southern Methodist University (SMU). The focus of the symposium was on the application of low-temperature geothermal power production in oil and gas operations, including co-produced and geo-pressured reservoirs and other related technologies and settings in the western United States. Attendance for this inaugural event exceeded expectations with many low-temperature geothermal stakeholders represented: university geoscientists and engineers engaged in research, geoscientists from the state surveys, representatives of several companies producing low-temperature geothermal conversion equipment, government agencies engaged in low-temperature programs, and a number of producing companies.

On the first day, over 80 people participated in an extended guided field trip. The morning was spent visiting nearby geologic formations at Alcova Lake, about 30 miles southwest of Casper. In the afternoon, the trip shifted about 35 miles north of Casper, to RMOTC's field test site on Naval Petroleum Reserve No. 3 (NPR-3), also known as Teapot Dome Oil Field. The primary



Symposium participants took a geologic field tour to formations near Alcova Lake, about 30 miles from Casper.

producing units at NPR-3 are now mostly depleted of oil, but there is significant water production in the Tensleep and the deeper Madison formations. The group visited the Tensleep battery, which produces up to 60,000 barrels of water/day at 195 degrees F. A low-temperature 250 kW Organic Rankine Cycle technology is currently in place at this location.

The tour also included a visit to two more units that are slated to be installed this fall and will use water from two Madison wells, which produce 25,000 and 6,000 barrels/day at about 210 degrees F.

Individuals from all over the United States and from various industries, utilities, academia, and companies learned about current and future activities using

Download symposium presentations:

■ www.rmotc.doe.gov/symposium.html

hot water from oil and gas fields to produce electricity.

Several people from across the industry presented to over 100 attendees on various topics on the second and final day of the symposium. GTP showed the dramatic increase in geothermal spending in general, and low-temperature application in particular, over the last five years. NREL described the efforts and progress of a multi-state project to quantify oil and gas well bottomhole temperatures in order to prepare an accurate database of temperature versus

depth for the western United States.

Representatives from many western states with low-temperature geothermal potential also presented current activities, tests, and operations and generally scoped the long-term potential for oil and gas geothermal potential as well as some conventional geothermal. States represented at the symposium included Wyoming, Colorado, Montana, Utah, North Dakota, Texas, and Oregon. All of the states identified a number of geothermal projects to be investigated and possibly exploited.

For more information on geothermal testing capability at RMOTC, or to download speaker presentations from the symposium, visit the RMOTC website at www.rmotc.doe.gov.

COALBED METHANE GAS SEPARATOR

WYOMING COMPANY FIELD TESTS ITS TECHNOLOGY AT NPR-3

Last November, a Gillette, Wyoming, businessman contacted U.S. Sen. Mike Enzi's (R-Wyo.) office looking for advice and assistance on field testing and eventually marketing his coalbed methane (CBM) gas separator. Enzi's staff pointed him to RMOTC.

Bret Wolz, owner of HyCap Energy, contacted RMOTC to initiate testing plans and a few months later, in April, his separator was set up for a two-day test at NPR-3. The technology was designed to capture entrained natural gas in flowing or pumped groundwater, thereby preventing fugitive emissions of natural gas. The technology was specifically designed for use on CBM wells, natural gas wells, and water-supply wells. While there are no coals present in the stratigraphic column at NPR-3, prior visits established two candidate wells with similar gas ratios to CBM wells currently in production for evaluating the system.



To prevent methane from escaping after exposure to air, medical “vacuum vials” normally used to take blood samples were used to take samples from the well.

The testing equipment consisted of the HyCap Separator equipment constructed with water and gas discharges to measure quantity and quality of gas and water flow rates. Ports were supplied to take samples of the water for concentration (measured ml/l) of volatile or entrained

RMOTC is a shining example of how government and private business should work together for the betterment of all.

BRET WOLZ,
HyCap Energy
(in a letter of thanks to U.S. Sen. Mike Enzi)

gas measured upstream and downstream of the separator.

Significant removal of hydrocarbons from the fluid stream was noted during testing. Although this was not planned into the design, there was an apparent 70 percent recovery of liquid hydrocarbons. Additional testing is being conducted to determine the full effectiveness of the HyCap Separator in removal of heavy hydrocarbons.

The laboratory test results indicate that the HyCap Separator safely separated and captured between 97 and 98 percent of the natural gas that was entrained in the flow of groundwater from the two test wells at RMOTC. Gas quality monitoring during the tests showed the methane concentration was about 95 percent by gas volume. In addition, 70 percent of the liquid hydrocarbons were also separated from the water stream.

For methane separation, the HyCap Separator unit requires no external power or chemical input and is virtually maintenance free, allowing the user to concentrate on resource production. The unit is fully scalable for water flows ranging from 34 bpd (1 gpm) to 141,450 bpd (5,000 gpm) and natural gas flows ranging from 1 Mcf/day to over 1 MMcf/day. Research is ongoing to allow larger flows with economical designs.

The full CBM Gas Separator report, including copies of the laboratory test results, is available on the RMOTC website, www.rmotc.doe.gov.

Available RMOTC Test Reports:

■ www.rmotc.doe.gov/reports.html

MICKEY LELAND ENERGY FELLOWSHIP

TWO KU STUDENTS STUDY AT RMOTC FOR THE SUMMER

Aimee Scheffer and Jose Velez Gonzalez, both students at the University of Kansas in Lawrence, joined the RMOTC team this summer as 2010's Mickey Leland Energy Fellowship (MLEF) interns.

Vicki Stamp, a RMOTC project manager, and Tom Anderson, RMOTC's chief scientist, mentored the students, who are both studying geology. Scheffer is a Ph.D. candidate in geology and Velez Gonzalez is finishing his M.S. in geology and starting a Ph.D. in geology.

Scheffer, Velez Gonzalez, and Jim Nations, RMOTC's public relations program manager and MLEF coordinator, attended the 2010 MLEF Technical Forum held in

Pittsburgh, Pennsylvania, August 2-6. Scheffer and Velez Gonzalez, along with the 28 other MLEF interns, delivered 15-min-

For more information:

■ www.rmotc.doe.gov/mléf.html

ute presentations summarizing their 10 weeks of research and its implications. Each presenter was then asked two questions on the presentation and correct answers were rewarded with MLEF logoed items such as planners, mugs, key chains, and paperweights. Scheffer's presentation was on "Shallow Injection of CO₂ into a Sandstone Reservoir with High Potential for Seepage from Point - Sources and Consequent Monitoring." Velez Gonzalez presented his paper on "Evaluation of the Teapot Dome Deep Granite Basement as Potential Resource for Enhanced Geothermal Systems."

Additionally, the forum included field trips for the interns, one being a visit to the National Energy Technology Laboratory facility in Pittsburgh. The Technical Forum ended with an Awards Banquet for the interns, mentors, and MLEF sponsors to recognize everyone's contributions and work.

While attending, Nations also served as emcee, intro-



Aimee Scheffer (left) and Jose Velez Gonzalez (right) presented at this year's MLEF Technical Forum after spending the summer studying at RMOTC. Jim Nations (center), RMOTC's public relations program manager and MLEF coordinator, joined Scheffer and Gonzalez for their presentations in Pittsburgh in August.

ducing the interns and numerous speakers and keeping the event running smoothly with student presenters and a long list of DOE guest presenters.

For more information on the MLEF internship program, visit our website at www.rmotc.doe.gov/mléf.html.



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RMOTC PRESS ROOM

RMOTC's activities have seen some attention from the media in the last several months. Many of the articles are listed here, but for the latest, check out www.rmotc.doe.gov.

- Industry Icons:
Clarke Turner, RMOTC Director
Oil & Gas Investor, September 2010
- Geothermal energy an untapped bonus for oil fields
Wyoming Business Report, September 1, 2010
- Using geothermal energy in oil field picking up steam
Wyoming Business Report, August 20, 2010
- A way to get that gas out of water
Greeningofoil.com, July 28, 2010
- Field test a success for methane separation from well water
Wyoming Energy News, July 12, 2010
- Oil and gas coproduction expands geothermal power possibilities
Renewable Energy World, July 9, 2010
- Geothermal slow to take off in Wyoming, Colorado
KUNC Radio, July 7, 2010
- A new energy convergence: Wyoming explores renewable energy
Clean Energy Pioneers, June 2010
- Oil industry waste could be geothermal treasure
Land Letter - Natural Resources Weekly Report, May 20, 2010
- Testing a multistage fluid treatment
World Oil, April 2010

