



26<sup>th</sup> Oil Shale Symposium  
October 16-20, 2006  
Colorado School of Mines  
Golden Colorado



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Monday afternoon, October 16, 2006

**Session 1: Welcoming Plenary**

*Jeremy Boak, Dag Nummedal, Session Co-Chairs*

- 13:00 Welcome and introductions *Jeremy Boak, Dag Nummedal*
- 13:20 Congressional perspectives on oil shale development  
*Richard Bouts, Senate Energy & Natural Resources Committee*
- 13:45 U. S. Department of Interior (DOI) perspectives on oil shale development  
*Kathleen Clarke, Director, Bureau of Land Management, USDOI*
- 14:10 U. S. Department of Energy (DOE) oil shale program  
*John Shages, Deputy Assistant Secretary for Petroleum Reserves, USDOE*

14:40 **Break**

**Session 2: National Programs Plenary**

*Jeremy Boak, Jim Gary, Session Co-Chairs*

- 15:10 A technical, legal, and economic assessment of the creation of an oil shale industry in the U.S  
*Philip J. Smith*
- 15:35 Oil Shale and the Colorado School of Mines  
*James H. Gary*
- 16:00 Chinese oil shale activities  
*Jialin Qian*
- 16:25 Mature oil shale processing technologies used in Estonia  
*Jaanus Purga*
- 16:50 **End of Monday program**

Lead author/presenter listed; see abstract text for full author list.

**26<sup>th</sup> Oil Shale Symposium Program**

<b>Tuesday morning, October 17, 2006</b>		
	<p><b>Session 3: Surface Processing</b> <i>Harold Vinegar, Anton Dammer, Session Co-Chairs</i></p>	<p><b>Session 4: Health &amp; Environmental Risk</b> <i>Arthur Hartstein, Ron Klusman, Session Co-Chairs</i></p>
8:00	New developments in oil shale technology <i>Eduard P. Volkov</i>	Health and environmental risk analysis for oil shale <i>Lawrence B. Gratt</i>
8:25	A road not traveled: Development of an improved oil shale retort <i>Larry M. Southwick</i>	Overview on combustion and retorting of Estonian oil shale, environmental concerns and solutions <i>Uuve Kirso</i>
8:50	The comparison of Estonian oil shale thermal treatment processes by BAT criteria <i>Jüri Soone</i>	Fate of environmentally sensitive elements during oil shale retorting, a review <i>Thomas R. Wildeman</i>
9:15	Heating rate effect on shale oil in a fixed bed reactor <i>Omar Salim Al-Ayed</i>	Lessons learned from the oil shale RD&D environmental assessments <i>Jack Sosebee</i>
9:40	<b>Break</b>	
	<p><b>Session 5: In-Situ Processing</b> <i>Harold Vinegar, Anton Dammer, Session Co-Chairs</i></p>	<p><b>Session 6: Groundwater Control &amp; Management</b> <i>Arthur Hartstein, Ron Klusman, Session Co-Chairs</i></p>
10:10	Shell's <i>in-situ</i> conversion process for oil shale <i>Harold J. Vinegar</i>	Groundwater control and management for oil shale recovery <i>Jerry Rowe</i>
10:35	ExxonMobil's Electrofrac Process for <i>in-situ</i> oil shale conversion <i>William A. Symington</i>	Piceance Basin water surface water resource assessment for oil shale development <i>Cathy J Wilson</i>
11:00	The EGL Oil Shale Process <i>Paul Lerwick</i>	Can shale oil and water mix? <i>Robert W. Vagnetti</i>
11:25	Geothermic fuel cells <i>Marshall T. Savage</i>	Clastic dikes in the Parachute Creek Member <i>Terry Gulliver</i>
11:50	<b>Lunch</b>	
<b>Tuesday afternoon, October 17, 2006</b>		
	<p><b>Session 7: Oil Shale Properties</b> <i>Alan Carroll, Thomas Wildeman, Session Co-Chairs</i></p>	<p><b>Session 8: Chemistry</b> <i>Milind Deo, Ron Pugmire, Session Co-Chairs</i></p>
13:10	Oil shales: Their shear story <i>Jyoti Behura</i>	Evaluating oil-shale product yields and compositions by hydrous pyrolysis <i>Michael D. Lewan</i>
13:35	Dielectric properties of oil shale <i>Jeffery J Roberts</i>	Direct characterization of kerogen: Part 1 - XPS and S-XANES Methods <i>Simon R. Kelemen</i>
14:00	Geochemical characterization of Moroccan Tarfaya oil shale <i>Abdelwahid Chakor Alami</i>	<i>In-situ</i> oil-shale recovery, carbon capture and storage, and the importance of large projects <i>Julio Friedman</i>
14:25	The origin of sulfur in shale oils, gases and spent matter as decoded by $\delta^{34}\text{S}$ monitoring and better knowledge gained on various pyrolysis driven processes <i>Zeev Aizenshtat</i>	Application of pyrolysis molecular beam mass spectrometer and multivariate analysis to characterize oil shales <i>Eun-Jae Shin</i>
14:50	<b>Break</b>	
	<p><b>Session 9: Stratigraphy</b> <i>Alan Carroll, Thomas Wildeman, Session Co-Chairs</i></p>	<p><b>Session 10: Modeling</b> <i>Milind Deo, Ron Pugmire, Session Co-Chairs</i></p>
15:20	The role of lake levels in oil shale distribution <i>Yuval Bartov</i>	Simulation of oil shale retorting using the iCON steady state model <i>Shahrul Azman Zainal Abidin</i>
15:45	The Idaho connection: Drainage capture origin of the Mahogany Zone, Green River Formation <i>Alan R. Carroll</i>	A simulation-based protocol for evaluating various shale processing options <i>Kyeongseok Oh</i>
16:10	The Colorado wedge of the Uinta Basin <i>Paul A. Petzrick</i>	Evaluation of different <i>in-situ</i> production strategy from oil shale using a general purpose thermal simulator <i>Chung-Kan Huang</i>
16:35	Sedimentary characteristics and origin of oil shales in DaLianhe Formation of Eocene in Dalianhe area, Heilongjiang Province, China <i>Jiangfeng Du</i>	Modeling <i>in-situ</i> shale oil retorting <i>Jack C Parker</i>
17:00	<b>End of Tuesday Program</b>	
<b>17:30-19:30</b>		<b>Symposium Reception</b>

**26<sup>th</sup> Oil Shale Symposium Program**

<b>Wednesday morning, October 18, 2006</b>		
	<b>Session 11: Socioeconomic Impact</b> <i>Jim Evans, Doug Jeavons, Session Co-Chairs</i>	<b>Session 12: Data Review and Assessment</b> <i>Ronald Johnson, Wendy Clark, Session Co-Chairs</i>
8:00	Results based management for energy in Jordan with reference to the use of oil shale <i>Musa Resheidat</i>	Oil shale activities at the U.S. Geological Survey <i>Ronald C. Johnson</i>
8:25	Technical and economic changes since Black Monday, 1982 – their impact upon the shale oil industry <i>Tom Bruington</i>	Oil shale development from the perspective of NETL's Unconventional Oil Resource Repository <i>Mark W. Smith</i>
8:50	U.S. D.O.E. Oil Shale Task Force <i>Willard R. Chappell</i>	Tell Ertl Oil Shale Repository Project, 2006 <i>Heather Whitehead</i>
9:15	Socioeconomic planning for oil shale - a second chance <i>Douglas Jeavons</i>	Oil shale occurrences in upper Assam Basin, India: An overview <i>Srinivasan V. Raju</i>
9:40	<b>Break</b>	
	<b>Session 13: Policy</b> <i>Jim Evans, Doug Jeavons Session Co-Chairs</i>	<b>Session 14: Evaluation of Oil Shale Options</b> <i>Ronald Johnson, Wendy Clark, Session Co-Chairs</i>
10:10	The Elusive Bonanza: oil shale in Colorado - is it possible to "pull the sword from the stone" <i>Steven Andrews</i>	Comparison of the acceptability of various oil shale processes <i>Alan K. Burnham</i>
10:35	Oil shale: History, incentives, and policy <i>Anthony Andrews</i>	The thermal solution route to pipelineable synthetic crude oil <i>Alexander H. Rintoul</i>
11:00	The changing legal landscape for leasing of Federal oil shale resources <i>Robert W. Randall</i>	Analysis of CO <sub>2</sub> sequestration in the southwestern U.S. <i>Brian MacPherson</i>
11:25	Socioeconomic tools for oil shale development <i>Jim Evans</i>	Integration of large scale retorting operations with laboratory testing and analyses <i>Mark T. Atwood</i>
11:50	<b>Lunch</b>	

<b>Wednesday afternoon, October 18, 2006 Poster Session 13:00-17:00</b>			
1	Carbon Storage and Resource Development Potential of the Piceance Basin <i>Genevieve Young</i>	14	Jordan's experience in oil shale studies employing different technologies <i>Eng. Munther S. Bsieso</i>
2	Evaluating oil-shale byproducts of environmental concern by hydrous pyrolysis <i>Ronald Hill</i>	15	Moroccan oil shale: research & development <i>M. Mohammed Bencherifa</i>
3	Environmental protection in oil Shale processing <i>Yuri Zhiryakov</i>	16	Overview of gas production from Estonian oil shale of kukersite <i>Vahur Oja</i>
4	Environmental heritage of oil shale mining in Brazil <i>Henrique Krahenbuhl Porto Alegre</i>	17	Value added products from oil shale <i>Olubunmi Ogunsola</i>
5	Potential environmental problems with oil shales <i>Thomas Barton</i>	18	PETROSIX oil shale technology learning curve <i>W. P. Martignoni</i>
6	Re-examination of Utah's oil shale resources: Historical database and new research <i>Michael D. Vanden Berg</i>	19	Reexamination of the Casali Institute multi-chamber fluidized-bed for oil & gas production from bituminous rock combustion <i>Zeev Aizenshtat</i>
7	Analytical homogenized approximation applied to two-phase immiscible flow <i>Rosangela F. Sviercoski</i>	20	Geological evaluation of the Beypazari oil shale (Miocene, Ankara, Turkey) <i>Iiker Senguler</i>
8	The forward and inverse problems in oil shale modeling <i>Ne-Zheng Sun</i>	21	Oil shale depositional mode in China <i>Rong Liu</i>
9	Fractional differentiation of silicate minerals during oil shale processing: A tool for the prediction of retort temperatures <i>Glenn M. Mason</i>	22	Geological characteristics and economic evaluation of oil shale deposits in Tigray, Ethiopia <i>Dagnew Girmay Nega</i>
10	Organic-rich rock conversion <i>Michele M. Thomas</i>	23	Oil shale distribution characters in China <i>Zhaojun Liu</i>
11	The oil shale exploration and development issues in China <i>Wang Shihui</i>	24	Indonesian oil shale prospect and resources as an alternative energy <i>Sukardjo</i>
12	Resource status and development application strategy of oil shale in Maoming Basin <i>Zhu Jianwei</i>	25	Oil Shales in Israel <i>Avihu Burg</i>
13	Direct characterization of kerogen: Part 2 - NMR methods <i>Ronald J. Pugmire</i>		

**Wednesday, October 18, 2006 Public Information Session 15:30-20:30**

*A free informational session for the general public which will begin with an opportunity for the public to view the poster session, and will include a panel discussion presenting summaries of the main technical sessions of the symposium, with an extensive question and answer period, followed by a buffet and opportunity to interaction between Symposium participants and the public.*

- 15:30 Poster Session open to public viewing and interaction with authors
- 17:00 Break to rearrange meeting room
- 17:30 Public forum on the Symposium and development of oil shale - The forum will begin with introductory remarks by the convenors, followed by brief reports of the technical content of the 26<sup>th</sup> Oil Shale Symposium from Session Chairs and others.
- 18:30 Question and answer period
- 19:15 Refreshments and interaction between Symposium participants and the public
- 20:30 Adjourn

**Thursday, October 19, 2006 Workshop on Environmental Issues and Related Research Needs 8:00-17:00**

**Arthur Hartstein, Carl Bauer, Workshop Co-Chairs**

- 8:00 Session I will consist of welcome and description of the workshop purpose structure, and intended products. It will include several perspectives on the the environmental issues as understood at the time, including insights from the symposium technical sessions. The session will define breakout groups for the latter part of the morning, and those groups will meet for the remainder of the morning.
- 11:30 **Lunch**
- 12:30 Session II will complete the work of the breakout groups and summarize results of each group. The Workshop leads will describe the path forward for the definition of issues and research needs.
- 17:00 Adjourn

**Thursday – Friday, October 19-20, 2006 Oil Shale Field Trip to the Piceance Creek and Uinta Basins, Colorado and Utah**

Field trip led by: **Y. Bartov**, Colorado Energy Research Institute, **G. Daub**, Doub & Associates, Inc., and **M. Picha**, Shell Exploration & Production

**Trip Objectives:** *A two-day field trip to western Colorado and eastern Utah will provide insights into the U.S. oil shale resource from geological and technological perspectives. We will visit key outcrop localities and ongoing oil shale test and production facilities.*

**Day 1**

- Stop 1 Rifle Frontage Road - Introduction to Piceance Creek Basin and Green River Formation. View of Roan Cliffs and Anvil Points.
- Stop 2 White River Outcrop - A view of oil shale outcrops (R8-R4) including the Mahogany Zone of the Parachute Creek Member and Anvil Points Sandy Member of the Green River Formation.
- Stop 3 Shell's Mahogany Oil Shale Research Project - view the latest technological advances in in-situ production of shale oil.

**Day 2**

- Stop 1 Ua-Ub Tract, near Bonanza, Utah.
- Stop 2 Evacuation Creek Section of Green River Formation, with walk to Hell's Hole Overlook.
- Stop 3 Douglas Creek Arch section, Piceance Creek Basin, illustrating marginal facies of the Green River Lake. Discussion of depositional history of Green River Formation, and implications for oil shale development
- Stop 4 Fruita Frontage Road - regional geology in the Colorado National Monument