Attachment A

By-Laws of
The MUDTOC Research Consortium

Purpose
The purpose of the MUDTOC Research Consortium at the Colorado School of Mines ("CSM") is to improve fundamental understanding of and develop new technology in areas relevant to mudrocks, tight oil and halo reservoirs. All terms not defined in the By Laws shall have the meaning ascribed to them in the Agreement.

Membership
1. With CSM’s consent, such consent not to be unreasonably withheld, membership in the Consortium is open to all interested parties who enter into a participation agreement ("Membership Agreement") with CSM. Each party shall execute a Membership Agreement with CSM, which shall define the contractual arrangements of such party with the Consortium. A party, upon entering into a Membership Agreement, shall be considered a Sponsoring Member.

2. Membership Agreements shall provide for Sponsoring Members to equally fund the MUDTOC Consortium's research activities through support payments ("Membership Fees"). Membership in the MUDTOC Consortium shall be for a one (1) year term, renewable for successive terms by CSM and the Sponsoring Member. New members must join the one-year term and Membership Agreement that is in force when they choose to become members, and pay the corresponding one-year Membership Fee. Membership Agreements will be bilateral agreements between CSM and a Sponsoring Member; however CSM shall ensure that Membership Agreements contain substantially similar terms and do not differ materially. All Sponsoring Members, including new members, are held to the same or substantially similar obligations via the Membership Agreement.

3. All Sponsoring Members shall have equal access to the technical output, research results, and intellectual property rights generated from the Shared Research activities of the MUDTOC Consortium for their industrial, research and scholarly purposes, as specified in and governed by the Membership Agreements.

Activities
4. The MUDTOC Consortium will coordinate Shared Research that will be conducted by MUDTOC Consortium Investigators. The Shared Research will be funded by the Membership Fees paid by Sponsoring Members. The subject matter of individual Shared Research projects included within a program of Shared Research ("Shared Research Program") will be decided by the Consortium Advisory Board.
5. The MUDTOC Consortium will disseminate results of Shared Research to Sponsoring Members who are in compliance with the terms of the Agreement.

Organization
6. The MUDTOC Consortium shall have a Director, appointed for a term corresponding to the duration of the Consortium Membership Agreements. The Director for the first year shall be Steve Sonnenberg, Professor of Geology and Geological Engineering. Unless otherwise changed by a vote of the CAB, Steve Sonnenberg shall remain the Director.

7. The CAB shall advise the Director and support management of the activities of the MUDTOC Consortium. Representation on the CAB shall consist of the Director, and one representative from each Sponsoring Member of the MUDTOC Consortium. Decisions of the CAB shall always be made by a majority of CAB representatives. Each representative of the CAB shall have one vote on board decisions. Decisions of the CAB shall require a simple majority.

8. The MUDTOC Consortium shall have investigators ("Investigators") consisting of academic and other public sector research personnel nominated by the Director and appointed by the CAB as part of the review process for the MUDTOC Consortium projects. Investigators may be removed by a majority vote of the CAB. Investigators remain employees of their respective institutions.

9. CSM, on behalf of the MUDTOC Consortium, shall employ professional and administrative staff as needed.

Operations
10. The Director is solely responsible for budgeting, day-to-day management, business transactions and the development and tracking of the research program of the MUDTOC Consortium. The Director is also responsible for issuing MUDTOC Consortium reports as required by the Membership Agreements, and for organizing meetings and educational programs of the MUDTOC Consortium.

11. The CAB shall provide review and recommendations for the programs of the MUDTOC Consortium and shall vote on each new Shared Research Program. The CAB shall define the process for selecting new projects and revising existing projects for the Shared Research Program.

12. Investigators are responsible for execution of the research funded by the MUDTOC Consortium, and for financial and scientific prudence in all activities of the MUDTOC Consortium. Investigators are responsible for preparing reports on their own activities.

13. CSM may develop separate research agreements with Members or other parties to conduct independent research projects ("Sponsored Research") through the Consortium. Such Sponsored Research projects will be governed by separate respective agreements. CSM and Member(s), if applicable, agree that the provisions of such agreements will not be in conflict with the obligations of the Membership Agreements. The Consortium shall ensure that any Sponsored Research does not affect timely completion of Shared Research.
14. Members are free to conduct their own separate research activities within the same subject matter areas being researched by the MUDTOC Consortium. Members have no obligation to make any such separate research activities available to the MUDTOC Consortium or other Sponsoring Members.

**Funding, Budget and Costs**

15. MUDTOC Consortium activities, as approved by the CAB, shall be funded from Membership Fees. Once approved, such activities shall be approved for the duration of the Membership Agreements, unless otherwise specified.

16. The MUDTOC Consortium’s administrative budget is the responsibility of the Director with appropriate guidance from the CAB. Financial transactions for the MUCTOC Consortium’s administrative budget shall be carried out in accordance with the policies and procedures of CSM.

**Changes to the By-Laws**

17. Changes to these By-Laws must be approved by a majority vote of the CAB, and ratified by the appropriate authorized representatives of CSM and each of the Sponsoring Members. Once ratified, such changes shall be incorporated into the Membership Agreements as appropriate.

18. These By-Laws may only cover the purpose, activities, organization, and operation of the MUDTOC Consortium. All material obligations of CSM and material obligations and rights to results of Sponsoring Members are contained within and governed by the Membership and Sponsored Research Agreements, and may not be altered by changes or amendments to these By-Laws.