

Memorandum of Understanding

between

**The Regents of the University of California, as Management and Operating
Contractor for
Lawrence Berkeley National Laboratory**

and

The Bureau de Recherches Géologiques et Minières, France

Concerning Collaboration in the Field of Earth Sciences

This Memorandum of Understanding ("MOU") is between The Regents of the University of California ("The Regents"), in its capacity as the manager and operator of the Lawrence Berkeley National Laboratory ("LBNL") and the Bureau de Recherches Géologiques et Minières ("BRGM" or "French Geological Survey"), France.

LBNL is a U.S. Department of Energy ("DOE") National Laboratory managed and operated by The Regents pursuant to DOE Contract No. DE-AC02-05CH11231. The Energy Geosciences Division ("EGD") is a division of LBNL and is engaged in applied and basic research activities in support of the DOE's missions in energy resource recovery and environmental protection.

The BRGM is a state-owned company with a commercial and industrial purpose organized and existing under the laws of France, registered on the Company and Commercial Registry of Paris, under number 582 056 149, having its registered office at 3 avenue Claude-Guillemin, BP 36009, 45060 Orléans Cedex 02, France, and hereby represented by Michele Rousseau, CEO of BRGM, who is duly authorized to that effect. The BRGM is France's leading public institution involved in geoscientific research. Its five key roles are: scientific research focused on furthering geological knowledge and understanding surface and subsurface phenomena; support to public policy development; international cooperation on projects that promote protection for people and resources; responsibility in France for all mine safety engineering; and training in higher education in the geosciences.

The Regents and BRGM are collectively herein referred to as the "Participants" or individually as a "Participant."

1. Objective

The Participants intend to explore potential future collaboration in the field of Earth Sciences, including energy resource recovery and environmental protection.

2. Proposed Areas of Collaboration

The Participants intend to collaborate in one or more of the following areas:

- A) Reactive Transport Modelling For Georesources and Environmental Issues
- B) Geophysical Modelling For Environmental Monitoring and Risks
- C) Water Management and Aquifer Recharge
- D) Geothermal Energy
- E) Carbon Capture and Sequestration
- F) Environmental Big Data
- G) Induced Seismicity
- H) Nuclear Waste Storage

The scope of above activities and cooperation may be changed or extended to other areas by mutual written consent of the Participants.

3. Proposed Forms of Collaboration

The Participants expect to collaborate through mutual visits, the exchange of publicly available information, exchanges of researchers and experts, training and planning for potential future joint research, with any future collaborative research to be undertaken only pursuant to an appropriate written agreement therefor.

4. Proposed Mechanisms of Collaboration

- a. To administer the implementation of this MOU, each Participant should designate one or more principal coordinators to be in charge of the collaboration, through whom all requests and plans of that Participant should be made.
- b. The principal coordinators may hold meetings when necessary to discuss matters related to collaboration under this MOU.
- c. The principal coordinator for The Regents is Dr. Nicolas Spycher, or, in the alternative, Dr. Jens Birkholzer (EGD Director). The principal coordinator for BRGM is Dr. Mohamed Azaroual, or, in the alternative, Dr. Philippe Freyssinet (Research Director).

For BRGM :

Dr. Mohamed AZAROUAL
BRGM, 3, avenue Claude
Guillemin

For the Regents (EGD):

Dr. Nicolas SPYCHER
Lawrence Berkeley National
Laboratory

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- d. If a Participant wishes to change its designated principal coordinator, the Participant should provide written notice to the other Participant.

5. Commencement, Modification and Discontinuation

- a. Cooperative activities under this MOU may commence upon signature by the Participants and continue for a four (4) year period, unless discontinued in accordance with paragraph b of this Section, or extended in accordance with Paragraph c. of this Section.
- b. The Participants may discontinue this MOU at any time by mutual written consent. Alternatively, a Participant that wishes to discontinue its participation in this MOU should endeavor to provide at least thirty (30) days prior written notice to the other Participant(s).
- c. This MOU may be modified or cooperative activities hereunder extended for additional periods by mutual written consent of the Participants.

6. Exchange of Information

The Participants do not anticipate the exchange of business-confidential information or the creation of intellectual property. If the Participants determine that a particular activity may lead to the exchange of business-confidential information or the creation of intellectual property, they should consult with each other and enter into an appropriate written agreement therefor.

7. General Provisions

- a. This MOU does not create any legally binding obligations between the Participants.
- b. Each Participant should conduct the activities contemplated by this MOU in accordance with all applicable laws, regulations and other requirements to which it is subject, including by way of illustration and not by way of limitation: export control laws; environmental, health and safety laws and regulations; and international agreements to which its Government is party.
- c. The conduct of cooperative activities contemplated by this MOU is subject to the availability of funding, personnel, and other resources.
- d. Each Participant is to be responsible for the costs it incurs in participating in cooperative activities under this MOU.

Signed in duplicate:

FOR THE REGENTS OF THE
UNIVERSITY OF CALIFORNIA:

By: Michael Witherell

Name: Michael Witherell
Director, Lawrence Berkeley

Title: National Laboratory

Date: 9 Apr. 2018

Place: Berkeley, CA, USA

FOR THE BRGM:

By: Michele Rousseau

Name: Michele Rousseau

Title: CEO of BRGM

Date: April 10, 2018

Place: Orleans, FRANCE