



FIRST MEETING OF CONTRACTING  
PARTIES TO THE 1996 PROTOCOL TO  
THE CONVENTION ON THE  
PREVENTION OF MARINE POLLUTION  
BY DUMPING OF WASTES AND OTHER  
MATTER 1972  
30 October – 3 November 2006  
Agenda item 6

LP 1/WP.3  
2 November 2006  
Original: ENGLISH

**CO<sub>2</sub> SEQUESTRATION IN SUB-SEABED FORMATIONS:  
CONSIDERATION OF PROPOSALS TO AMEND ANNEX 1  
TO THE LONDON PROTOCOL**

**Report of the Working Group on CO<sub>2</sub> sequestration**

1 The Working Group on CO<sub>2</sub> sequestration in sub-seabed geological formations met from 31 October to 2 November 2006 under the chairmanship of Mr. Ian Matheson (Canada).

2 The Working Group was attended by delegates from:

ARGENTINA	JAPAN
AUSTRALIA	NETHERLANDS
BELGIUM	NORWAY
BRAZIL	REPUBLIC OF KOREA
CANADA	SAUDI ARABIA
CHINA	SPAIN
DENMARK	SWEDEN
FRANCE	UNITED KINGDOM
GERMANY	UNITED STATES
ITALY	VANUATU

by an observer from the following intergovernmental organization:

ORGANIZATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT  
(OECD)/INTERNATIONAL ENERGY AGENCY (IEA)

and by an observer from the following non-governmental organization:

GREENPEACE INTERNATIONAL  
WORLD CONSERVATION UNION (IUCN)

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## Terms of Reference

- 3 The Working Group was instructed to:
- .1 develop draft terms of reference for the Scientific Group (SG) to assist them in developing Waste Assessment Guidelines (WAG) for CO<sub>2</sub> Sequestration in Sub-Seabed Geological Formations under the framework of the London Protocol (LP);
  - .2 propose amendments to the draft resolution proposed by Australia in annex 2 to LP 1/6, taking into account comments given during the debate in plenary;
  - .3 if necessary, consider the amendment as proposed by Australia in LP 1/6; and
  - .4 submit a written report to plenary for consideration on Thursday, 2 November 2006.
- 4 As instructed, the Working Group on CO<sub>2</sub> sequestration developed terms of reference for the SG for consideration by Contracting Parties (CP) of the LP as set out in annex 1 to this report. In their discussion, the Group members clarified what further guidance to provide the SG beyond that provided in Annex 2 to LP. It was noted that CO<sub>2</sub> is a different substance from those typically considered for ocean disposal and that the SG should not feel limited in determining an appropriate structure for the WAG they will develop with respect to CO<sub>2</sub> sequestration.
- 5 The Group considered different approaches on how to address the concern expressed by its members without restricting the SG in its work and at the same time give precise instructions and guidance needed.
- 6 The Group had a lengthy debate on the need for the provision of a sound scientific basis by the SG needed for clarification, the expression “overwhelmingly” in respect of the purity of the CO<sub>2</sub> streams and how to address the site-specific interaction between any incidental associated substances and the geological formation considered for storage.
- 7 The Working Group recognized the possible boundary issues and the inevitable interaction with other international instruments such as the UNFCCC and the IPCC and ongoing processes in other international or regional organizations. The Working Group agreed that the SG should take into account the work and outcomes of other international organizations such as the IPCC’s Special Report on Carbon Capture and Storage.
- 8 As instructed, the Working Group also discussed the draft resolution (annex 2 to LP 1/6) and developed a revised version (attached as annex 2 to this report). Subjects of discussion that occupied the Working Group included:
- .1 the relationship between carbon dioxide sequestration and the reduction of greenhouse gases and ocean acidification;
  - .2 the importance of timely completion of Waste Assessment Guidelines by the Scientific Group; and
  - .3 the importance of Waste Assessment Guidelines to the regulatory process.

9 During the discussion of the draft resolution, Working Group members agreed to propose in plenary that Parties follow through on Article 15 to the London Protocol, recommending that the development of procedures regarding liability arising from the dumping or incineration at sea of wastes or other matter should be considered. It was understood that liability questions relating to carbon dioxide sequestration should be explored in this broader context.

**Action requested of the Meetings**

10 The Meetings are invited to approve the report in general and, in particular:

- .1 approve the terms of reference for the Scientific Group to develop specific Guidelines for the assessment of carbon dioxide streams for disposal into sub-seabed geological formations (paragraphs 4 to 7 and annex 1);
- .2 adopt the draft resolution to adopt the amendment to Annex 1 of LP to include carbon dioxide sequestration in sub-seabed geological formations (paragraph 8 and annex 2);
- .3 note the debate in the Working Group on the need for the provision of a sound scientific basis by the SG needed for clarification, the purity of the CO<sub>2</sub> streams and how to address the site-specific interaction between any incidental associated substances and the geological formation considered for storage (paragraph 6); and
- .4 note the recommendations of the Working Group that the Contracting Parties should follow through on Article 15 to the London Protocol, recommending that the development of procedures regarding liability arising from the dumping or incineration at sea of wastes or other matter should be considered and that liability questions relating to carbon dioxide sequestration should be explored in this broader context (paragraph 9).

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**ANNEX 1****DRAFT TERMS OF REFERENCE FOR THE SCIENTIFIC GROUP TO DEVELOP SPECIFIC GUIDELINES FOR THE ASSESSMENT OF CARBON DIOXIDE STREAMS FOR DISPOSAL INTO SUB-SEABED GEOLOGICAL FORMATIONS**

- 1 The Scientific Group should develop Specific Guidelines for the Assessment of Carbon Dioxide Streams for Disposal into Sub-seabed Geological Formations compatible with Annex 2 to the Protocol.
- 2 These Guidelines should address, but not be limited to:
  - (a) Introduction - reflect understanding that this document will be updated to accommodate the best available scientific information and the growth of knowledge gained through further experience with CS-SSGF projects;
  - (b) Waste Prevention Audit;
  - (c) Consideration of Waste Management Options - including consideration of the hierarchy of waste management options;
  - (d) Chemical, Physical and Biological Properties - including characterization of the carbon dioxide stream and detailed information on concentrations of incidental associated substances, appropriate for carbon sequestration in sub-seabed geological formations;
  - (e) Action List - the Scientific Group should consider in what section of the WAG the following should be incorporated: scientific information on site-specific characteristics and processes, and the implications of varying concentrations of the incidental associated substances in the carbon dioxide stream for storage safety;
  - (f) Site Selection and Characterization – including:
    - characterization of the sub-seabed geological formation and surrounding area;
    - scientific information on varying site-specific characteristics and processes and the implications of varying concentrations of the incidental associated substances in the carbon dioxide stream for storage safety;
    - capacity of the sub-seabed geological formation;
    - characterization of the area under consideration including the marine environment, amenities, values and other uses of the sea; and
    - evaluation of potential impacts, including potential leakage pathways.

- (g) Assessment of Potential Effects, including potential risks and impacts to the local marine environment of varying rates of potential leakage (i.e., exposure assessment, effects assessment, risk characterization, and risk management). Zero leakage is the goal, but information should be provided about theoretical consequences of varying leakage rates and the consequences for ocean acidification.
- (h) Monitoring, including long-term monitoring, and mitigation and remediation for potential leakage to address potential impacts to the marine environment.
- (i) Permit and Permit Conditions.

3 The Scientific Group should use the Risk Assessment and Management Framework as endorsed by the 1<sup>st</sup> Meeting of Contracting Parties / 28<sup>th</sup> Consultative Meeting as an important element in the development of the Specific Guidelines for the Assessment of Carbon Dioxide Streams for Disposal into Sub-seabed Geological Formations. The Scientific Group also should take into account the best available science, including the IPCC Special Report on Carbon Dioxide Capture and Storage, in the development of these Specific Guidelines, and note gaps in knowledge within the text of the guidelines as appropriate.

4 The Scientific Group should continue the work of its intersessional correspondence group, welcoming any new members, and may choose to hold an intersessional meeting, with the aim of completing the draft Specific Guidelines for the Assessment of Carbon Dioxide Streams for Disposal into Sub-seabed Geological Formations during the 30<sup>th</sup> meeting of the LC Scientific Group and the first meeting of the LP Scientific Group and forwarding these Specific Guidelines to the 2<sup>nd</sup> Meeting of Contracting Parties and the 29<sup>th</sup> Consultative Meeting in 2007 with a view to their adoption.

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## ANNEX 2

**DRAFT RESOLUTION LP 1(1)  
ON THE AMENDMENT TO INCLUDE CO<sub>2</sub> SEQUESTRATION IN SUB-SEABED  
GEOLOGICAL FORMATIONS IN ANNEX 1 TO THE LONDON PROTOCOL  
[adopted on 2 November 2006]**

**THE FIRST MEETING OF CONTRACTING PARTIES TO THE 1996 PROTOCOL TO THE LONDON CONVENTION 1972,**

**RECALLING** the objectives of the 1996 Protocol to the London Convention (“London Protocol”) that include the protection and preservation of the marine environment from all sources of pollution;

**BEING SERIOUSLY CONCERNED** by the implications for the marine environment of climate change and ocean acidification due to elevated concentrations of carbon dioxide in the atmosphere;

**CONSIDERING** that carbon dioxide capture and sequestration is one of a portfolio of options to reduce levels of atmospheric carbon dioxide;

**RECOGNIZING** that carbon dioxide capture and sequestration represents an important interim solution;

**LOOKING FORWARD** to the further development of low carbon forms of energy;

**RECOGNIZING** that carbon dioxide capture and sequestration should not be considered as a substitute to other measures to reduce carbon dioxide emissions;

**NOTING** that regulating such action is within the scope of the London Protocol;

**NOTING ALSO** that, since the adoption of the London Protocol, developments in technology have made it possible to capture carbon dioxide from industrial and energy-related sources, transport it and inject it into sub-seabed geological formations for long-term isolation from the atmosphere;

**NOTING FURTHER** that this resolution is restricted solely to carbon dioxide sequestration in sub-seabed geological formations;

**WELCOMING** the work of the Consultative Meetings’ Intersessional Legal and Related Issues Working Group on CO<sub>2</sub> Sequestration and its conclusions, as set out in its report LC/CM-CO<sub>2</sub> 1/5;

**WELCOMING ALSO** the work of the Scientific Group Intersessional Technical Working Group on CO<sub>2</sub> Sequestration and its conclusions, as set out in its report LC/SG-CO<sub>2</sub> 1/7;

**WELCOMING FURTHER** the work of the Intergovernmental Panel on Climate Change and in particular its Special Report on Carbon Capture and Storage;

**DESIRING** to regulate the sequestration of captured carbon dioxide streams into sub-seabed geological formations to seek to ensure protection of the marine environment;

**DESIRING ALSO**, to update the London Protocol in light of these objectives;

**STRESSING** that this amendment may not be interpreted as legitimizing the disposal of any other waste or other matter for the purpose of disposing of those other wastes or other matter;

**RECOGNIZING** that guidance informing Parties on the means by which sub-seabed geological sequestration of carbon dioxide can be conducted in a manner that is safe for the marine environment, over the long and short term, should be developed as soon as possible, and will, when finalized form an important part of the regulation of sub-seabed geological sequestration of carbon dioxide.

- 1 **ADOPTS** the following amendment to Annex 1 to the London Protocol in accordance with Article 22 of the Protocol as set out in the Annex to this resolution;
- 2 **REQUESTS** the Scientific Group of the London Protocol to develop specific guidance on the application of Annex 2 to the Protocol to carbon dioxide sequestration in sub-seabed geological formations for consideration, with view to adopting it, at the 2<sup>nd</sup> Meeting of Contracting Parties, and to collaborate with the Scientific Group of the London Convention; and
- 3 **INVITES** Parties that issue permits to use, until specific guidance is completed, the best available guidance relevant to carbon dioxide sequestration in sub-seabed geological formations to ensure the protection of the marine environment, while also recognizing the requirements of Annex 2 to the London Protocol.

ANNEX

**PROPOSED AMENDMENT TO ANNEX 1 TO THE LONDON PROTOCOL**

1.8 Carbon dioxide streams from carbon dioxide capture processes for sequestration

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- 4 Carbon dioxide streams referred to in paragraph 1.8 may only be considered for dumping, if:
- .1 disposal is into a sub-seabed geological formation; and
  - .2 they consist overwhelmingly of carbon dioxide. They may contain incidental associated substances derived from the source material and the capture and sequestration processes used; and
  - .3 no wastes or other matter are added for the purpose of disposing of those wastes or other matter.

In paragraph 3, replace “1.7” with “1.8”, to take account of the new paragraph 1.8.

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