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CARBON SEQUESTRATION LEADERSHIP FORUM

POLICY GROUP

LEGAL, REGULATORY & FINANCIAL ISSUES TASK FORCE GAP ANALYSIS RESPONSES

Note by the Secretariat

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LEGAL, REGULATORY & FINANCIAL ISSUES TASK FORCE GAP ANALYSIS RESPONSES

Note by the Secretariat

Background

A task force led by Australia was established at the inaugural CSLF Policy Group meeting, in June 2003, to examine Legal, Regulatory and Financial issues related to carbon dioxide capture, transportation and storage. A key priority for the task force was development of regulatory principles for carbon dioxide capture and storage. In November 2003, Australia hosted an international sequestration regulatory workshop with eight CSLF member countries participating; the purpose of the workshop was to share information on carbon dioxide capture and storage, particularly on regulation, and to discuss an approach and proposed timeframe to address regulatory issues. As a result of this workshop, Australia presented a discussion paper at the January 2004 CSLF Policy Group meeting in Rome, Italy, which proposed a gap analysis methodology to identify and prioritise key international regulatory processes and gaps. Prior to that meeting, CSLF Members were asked to provide Australia with a "gap analysis" that would highlight gaps in existing regulatory regimes and identify areas where information sharing and guidelines/ standards may be useful for countries in developing their own regulatory framework. Australia has drafted a second discussion paper, presented here, which summarizes gap analyses received in response to its request.

Action Requested

None.

CSLF-P-2004-14B
15 April 2004

CSLF
Carbon Sequestration Leadership Forum

LEGAL, REGULATORY & FINANCIAL ISSUES TASK FORCE

GAP ANALYSIS RESPONSES

Prepared by Australia
With input from other CSLF members
as a starting point in the development of regulatory considerations
for LRF Issues Task Force

INTRODUCTION

At the inaugural meeting of the CSLF in June 2003, it was agreed that a Legal, Regulatory and Financial Issues Task Force be established to look at these issues in more detail. In particular, one of the key priorities in the short term is the development of regulatory principles for CCS. Australia was nominated to take the lead on the Task Force and in November 2003 hosted an international sequestration regulatory workshop with 8 of the (then) 15 CSLF member countries participating. The purpose of the workshop was to share information on CCS, particularly on regulation and to discuss an approach and proposed timeframe to address regulatory issues.

Australia presented a discussion paper to the CSLF Policy Working Group in January 2004 in Italy, which proposed a gap analysis methodology to identify and prioritise key international regulatory processes and gaps. It was agreed that the approach proposed in the paper would form the basis of a work program on regulatory, legal and financial issues relating to CO2 capture and storage.

The next meeting for the Legal, Regulatory and Financial Issues will be held in London in July 2004. The overarching purpose of this meeting is to facilitate discussion and to further positions on these issues. In particular, draft guiding principles to be put up for Ministerial consideration in September will be discussed, with the aim to progress this work towards gaining consensus. The outcomes of this meeting will then be the foundation for proposals to be presented at the Melbourne Ministerial Level Forum in September 2004.

GAP ANALYSIS APPROACH

The regulatory workshop proposed a whole of project life approach to identifying regulatory mechanisms and issues. The following key stages in a CCS project's life cycle were identified: capture; transport; injection; and post-closure. Within each of these stages the following key considerations were identified: event/risk (eg. CO2 leakage); impact (eg. environmental damage); owner/responsible party (eg. operator/regulatory assessor); and the type of legislation/regulatory process in place, if any, to manage the risk in question. The structure of this analysis was in part selected to be consistent with other work being undertaken, such as by the Intergovernmental Panel on Climate Change (IPCC), Canada and the United Kingdom.

The gap analysis aims to identify and assess risks, evaluate consequences and attribute responsibilities at all stages of the project life. Analysis also aims to highlight gaps in existing regulatory regimes and identify areas where information sharing and guidelines/ standards may be useful for countries in developing their own regulatory framework.

The workshop proposed that each member country carry out a gap analysis in this form, and provided a simple matrix for that purpose. To fill out the gap analysis table, all relevant steps and considerations relating to each phase of the project life cycle should be identified.

The responses received to date are as follows:

- Australia (Attachment A)
- Canada (Attachment B)
- Japan (Attachment C)
- Norway (Attachment D)
- US (Attachment E)

ATTACHMENT A

AUSTRALIAN REGULATORY GAP ANALYSIS TABLE

EVENT/RISK	IMPACT	OWNER	EXISTING REGULATION (or potential scope for expansion)
CAPTURE			
• *Risk management* - *Leakage* - *Separation integrity* - *Engineering integrity* - *Plant safety* - *Site assessment and approvals* - *Environmental assessments*	*Safety* *Environment*	*Operator* *Assessor*	• *Occupational Health and Safety legislation* • *Environment Legislation* • *Petroleum legislation* • *Mineral resources legislation* • *Dangerous goods legislation* • *Coal mining safety and health legislation*
• *Standards:* - *Classification of CO2* - *Allowable concentrations of other materials* - *Permits and licensing* - *Conditions of access*	*Land access* *Ownership* *Third party access* *Environment*	*N/A*	• *Petroleum legislation* • *Environment legislation* • *Offshore activities legislation* • *Land lease legislation* • *Land administration legislation* • *Explosives and dangerous goods legislation* • *Mineral resources legislation*
• *Property rights and liability*	*Third parties* *Operator* *Contractor* *Community at large*	*N/A*	• *Pipeline legislation* • *Petroleum legislation* • *Mineral resources legislation* • *Occupational health and safety legislation* • *Environment legislation*
TRANSPORT			
• *Risk management* - *Leakage* - *Engineering integrity* - *Health and safety - transport* - *Environmental assessments*	*Safety* *Environment*	*Owner* *Contractor – if stipulated*	• *Pipelines legislation* • *Explosives and dangerous goods legislation*
• *Standards:* - *Allowance of transportation in pre-existing gas or fuel pipelines* - *Planning for new pipelines* - *Permits and licensing* - *Land access* - *Third party access* - *Pipeline integrity* - *Monitoring and verification*	*Safety* *Environment*	*N/A*	• *Pipelines legislation* • *Land administration legislation* • *Explosives and dangerous goods legislation* • *Environment legislation* • *Occupational health and safety legislation*
• *Property rights and liability* - *Cross-jurisdictional issues*	*Third parties* *Operator* *Contractor* *Community at large*	*N/A*	• *Pipeline legislation* • *Petroleum legislation* • *Mineral resources legislation* • *Occupational health and safety legislation* • *Environment legislation*

ATTACHMENT A

AUSTRALIAN REGULATORY GAP ANALYSIS TABLE

EVENT/RISK	IMPACT	OWNER	EXISTING REGULATION (or potential scope for expansion)
INJECTION			
• *Risk management* - *Leakage* - *Engineering integrity* - *Health and safety* - *Environmental assessments* - *Sub-surface integrity* - *Surface integrity*	*Safety* *Environment*	*Owner* *Operator* *Contractor*	• *Land administration legislation* • *Explosives and dangerous goods legislation* • *Petroleum safety legislation* • *Pipelines legislation* • *Mineral resources development legislation* • *Occupational health and safety legislation* • *Planning legislation* • *Coal mining safety legislation*
• *Standards:* - *Pipeline integrity* - *Planning for new pipelines* - *Permits and licensing* - *Land access* - *Third party access* - *Monitoring and verification* - *Site selection* - *Environmental assessment* - *Injection point* - *Location matching – source and sink* - *Storage system integrity*	*Safety* *Environment*	*N/A*	• *Land administration legislation* • *Land lease legislation* • *Explosives and dangerous goods legislation* • *Petroleum safety legislation* • *Pipelines legislation* • *Mineral resources development legislation* • *Occupational health and safety legislation* • *Planning legislation* • *Coal mining safety legislation*
• *Property rights and liability* - *Cross-jurisdictional issues* - *Surface rights* - *Sub-surface rights* - *Compensation rights* - *Long term-v-short term liability*	*Safety* *Environment*	*N/A*	• *Pipeline legislation* • *Petroleum legislation* • *Mineral resources legislation* • *Occupational health and safety legislation* • *Environment legislation*
POST-CLOSURE			
• *Risk management* - *Leakage* - *Engineering integrity* - *Health and safety* - *Environmental assessments* - *Sub-surface integrity* - *Surface integrity*	*Safety* *Environment*	*Owner* *Operator* *Contractor* *Public Liability issues*	• *Land administration legislation* • *Explosives and dangerous goods legislation* • *Petroleum safety legislation* • *Pipelines legislation* • *Mineral resources development legislation* • *Occupational health and safety legislation* • *Coal mining safety legislation*
• *Standards:* - *Permits and licensing* - *Land access* - *Third party access* - *Monitoring and verification* - *Environmental assessment* - *Storage system integrity*	*Safety* *Environment*	*N/A*	• *Land administration legislation* • *Explosives and dangerous goods legislation* • *Petroleum safety legislation* • *Pipelines legislation* • *Mineral resources development legislation* • *Occupational health and safety legislation* • *Coal mining safety legislation*
• *Property rights and liability* - *Cross-jurisdictional issues* - *Surface rights* - *Sub-surface rights* - *Compensation rights* - *Long term-v-short term liability*	*Safety* *Environment*	*N/A*	• *Pipeline legislation* • *Petroleum legislation* • *Mineral resources legislation* • *Occupational health and safety legislation* *Environment legislation*

ATTACHMENT B

CANADIAN REGULATORY GAP ANALYSIS TABLE

	EVENT/RISK	IMPACT	OWNER	EXISTING REGULATION
CAPTURE				
	· *Risk management* · *Leakage* · *Separation integrity* · *Engineering integrity* · *Plant safety* · *Site assessment and approvals* · *Environmental assessments*	*Safety* *Environment*	*Operator* *Assessor* *(Plant)*	· *Occupational Health and Safety legislation* · *Environment Legislation* · *Petroleum legislation (if gas plant, upgrader or refiner)* · *Mineral resources legislation* · *Dangerous goods legislation* · *Coal mining safety and health legislation (not that applicable for Canada in near-term)*
	Standards: · *Classification of CO2* · *Allowable concentrations of other materials* · *Permits and licensing* · *Conditions of access*	*Land access* *Ownership* *Third party access* *Environment*	*Plant/ operator owns CO2, government applies standards.* *Both federal and provincial governments would be involved. Municipal governments may also be involved with respect to permits and licensing*	· *Petroleum legislation* · *Environment legislation* · *Offshore activities legislation (not that applicable for Canada in near-term)* · *Land lease legislation* · *Land administration legislation* · *Explosives and dangerous goods legislation* · *Mineral resources legislation*
	Property rights and liability	*Third parties* *Operator* *Contractor* *Community at large* *Government, particularly if on Crown land*	*Ownership responsibilities may fall between the plant and the landowner, if different entities.*	· *Pipeline legislation* · *Petroleum legislation* · *Mineral resources legislation* · *Occupational health and safety legislation* · *Environment legislation*
TRANSPORT				
	· *Risk management* · *Leakage* · *Engineering integrity* · *Health and safety - transport* · *Environmental assessments*	*Safety* *Environment*	*Transporter responsible for CO2, government applies legislation/ regulations.* *Both federal and provincial governments may be involved, as would other national governments, CO2 crosses borders.*	· *Pipelines legislation* · *Explosives and dangerous goods legislation*
	Standards: · *Allowance of transportation in pre-existing gas or fuel pipelines* · *Planning for new pipelines* · *Permits and licensing* · *Land access* · *Third party access* · *Pipeline integrity* · *Monitoring and verification*	*Safety* *Environment*	*Governments apply standards to which operator(s) comply*	· *Pipelines legislation* · *Land administration legislation* · *Explosives and dangerous goods legislation* · *Environment legislation* · *Occupational health and safety legislation*
	· *Property rights and liability* · *Cross-jurisdictional issues*	*Third parties* *Operator* *Contractor* *Community at large*	*May apply to operator, landowner and governments*	· *Pipeline legislation* · *Petroleum legislation* · *Mineral resources legislation* · *Occupational health and safety legislation* · *Environment legislation*

ATTACHMENT B

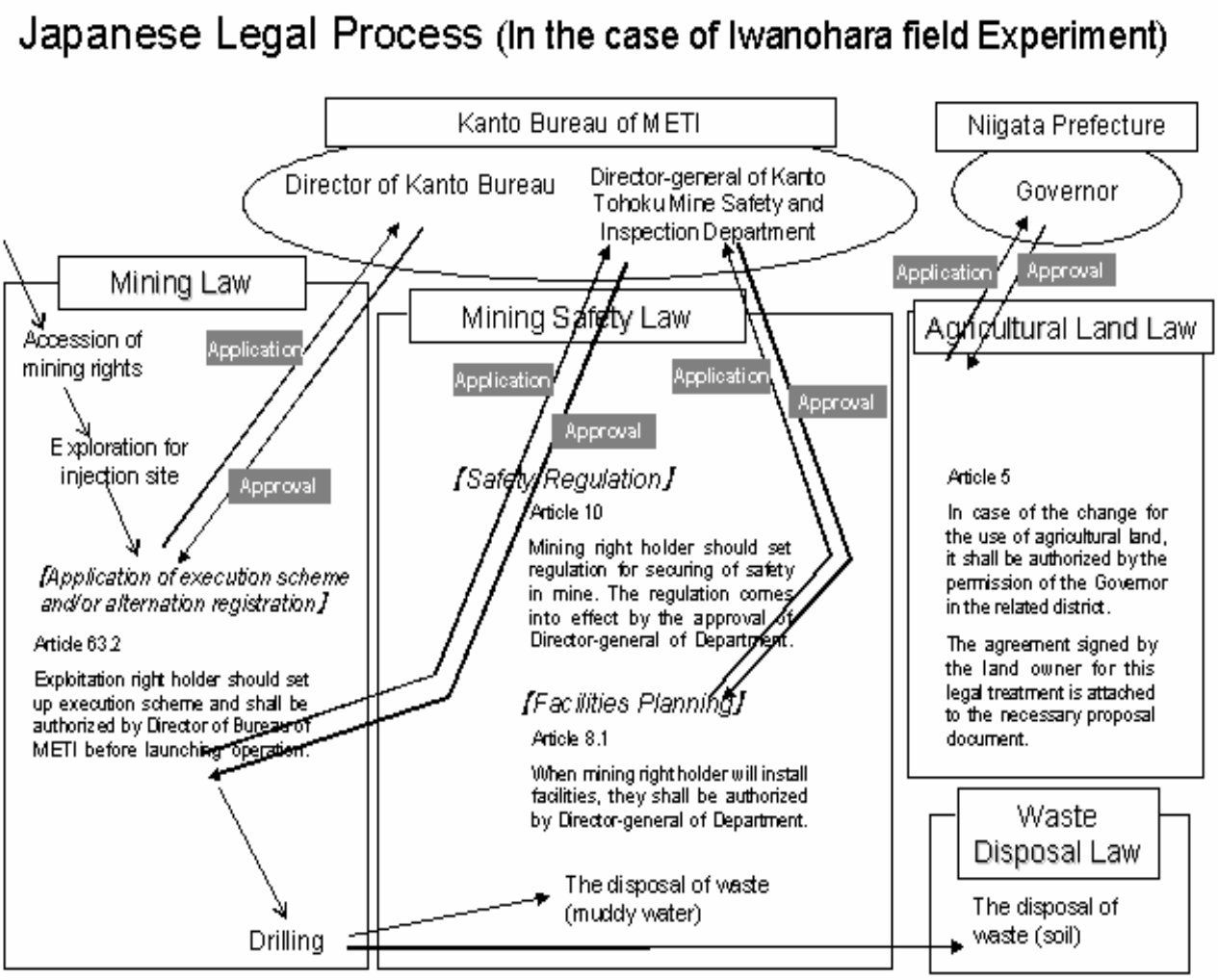
CANADIAN REGULATORY GAP ANALYSIS TABLE

INJECTION			
· Risk management *· Leakage* *· Engineering integrity* *· Health and safety* *· Environmental assessments* *· Sub-surface integrity* *· Surface integrity*	*Safety* *Environment*	*Land Owner* *Operator*	*· Land administration legislation* *· Explosives and dangerous goods legislation* *· Petroleum safety legislation* *· Pipelines legislation* *· Mineral resources development legislation* *· Occupational health and safety legislation* *· Planning legislation* *· Coal mining safety legislation*
Standards: *· Pipeline integrity* *· Planning for new pipelines* *· Permits and licensing* *· Land access* *· Third party access* *· Monitoring and verification* *· Site selection* *· Environmental assessment* *· Injection point* *· Location matching – source and sink* *· Storage system integrity*	*Safety* *Environment*	*Governments apply standards to which operator(s) and landowners comply*	*· Land administration legislation* *· Land lease legislation* *· Explosives and dangerous goods legislation* *· Petroleum safety legislation* *· Pipelines legislation* *· Mineral resources development legislation* *· Occupational health and safety legislation* *· Planning legislation* *· Coal mining safety legislation*
· Property rights and liability *· Cross-jurisdictional issues* *· Surface rights* *· Sub-surface rights* *· Compensation rights* *· Long term-v-short term liability*	*Safety* *Environment*	*Governments apply legislation to which operator(s) and landowners comply*	*· Pipeline legislation* *· Petroleum legislation* *· Mineral resources legislation* *· Occupational health and safety legislation* *· Environment legislation*
POST-CLOSURE			
· Risk management *· Leakage* *· Engineering integrity* *· Health and safety* *· Environmental assessments* *· Sub-surface integrity* *· Surface integrity*	*Safety* *Environment*	*Owner* *Operator transferred to government over time* *Public Liability issues*	*· Land administration legislation* *· Explosives and dangerous goods legislation* *· Petroleum safety legislation* *· Pipelines legislation* *· Mineral resources development legislation* *· Occupational health and safety legislation* *· Coal mining safety legislation*
Standards: *· Permits and licensing* *· Land access* *· Third party access* *· Monitoring and verification* *· Environmental assessment* *· Storage system integrity*	*Safety* *Environment*	*Applied to private and then public owner(s) over time*	*· Land administration legislation* *· Explosives and dangerous goods legislation* *· Petroleum safety legislation* *· Pipelines legislation* *· Mineral resources development legislation* *· Occupational health and safety legislation* *· Coal mining safety legislation*
· Property rights and liability *· Cross-jurisdictional issues* *· Surface rights* *· Sub-surface rights* *· Compensation rights* *· Long term-v-short term liability*	*Safety* *Environment*	*Governments apply legislation to which operator(s) and landowner(s) comply*	*· Pipeline legislation* *· Petroleum legislation* *· Mineral resources legislation* *· Occupational health and safety legislation* *Environment legislation*

ATTACHMENT C

JAPANESE REGULATORY GAP ANALYSIS TABLE

EVENT/RISK	IMPACT	OWNER	EXISTING REGULATION
INJECTION			
• *Permits and Licensing* *1) Accession of mining rights* *2) Exploration for injection sites* *3) Drilling* *4) Definition of safety regulation* *5) Application of facilities planning* *6) Conversion of farmland*	*1)-2) Mining rights* *3) Environment (Drainage of muddy water)* *4)-5) Safety* *6) Utilization of National Land*	*1)-2) Owner for mining* *3)Operator/Contractor* *4)-5) Owner* *6) Owner (with the permission of land owner)*	*1)-2) Mining Law (Kanto Bureau of METI)* *3) Waste Disposal Law[mucking out](MOE) and Water Control Pollution Law(MOE)* *4)-5) Mining Safety Law(METI)* *6) Agricultural Land Law (MAFF)*
• *Construction & Operation of Facilities* *1) CO2 reservoir Tank* *2) Pipeline of Injection Facility* *3) Pumps*	*1)-3) Safety*	*1)-3) Operator/Contractor*	*1)-3) High Pressure Gas Safety Law(METI)*
• *Transportation of liquid CO2* *1) Land access by tanker*	*1) Safety*	*1) Operator (Gas supplier)*	*1) High Pressure Gas Safety Law(METI) and Road Traffic Law(MLIT)*


Japanese Legal Process (In the case of Iwanohara field Experiment)
Kanto Bureau of METI
Director of Kanto Bureau
Director-general of Kanto Tohoku Mine Safety and Inspection Department
Niigata Prefecture
Governor
Application
Approval
Mining Law
Accession of mining rights
Application
Exploration for injection site
Approval
[Application of execution scheme and/or alternation registration]
Article 63.2
Exploitation right holder should set up execution scheme and shall be authorized by Director of Bureau of METI before launching operation.
Drilling
Mining Safety Law
Application
Application
Approval
Approval
[Safety Regulation]
Article 10
Mining right holder should set regulation for securing of safety in mine. The regulation comes into effect by the approval of Director-general of Department.
[Facilities Planning]
Article 8.1
When mining right holder will install facilities, they shall be authorized by Director-general of Department.
The disposal of waste (muddy water)
Agricultural Land Law
Article 5
In case of the change for the use of agricultural land, it shall be authorized by the permission of the Governor in the related district.
The agreement signed by the land owner for this legal treatment is attached to the necessary proposal document.
Waste Disposal Law
The disposal of waste (soil)

ATTACHMENT D

NORWEGIAN REGULATORY GAP ANALYSIS TABLE

EVENT/RISK	IMPACT	OWNER	EXISTING REGULATION
CAPTURE			
• *Risk management* - *Leakage* - *Separation integrity* - *Engineering integrity* - *Plant safety* - *Site assessment and approvals* - *Environmental assessments*	*Safety* *Environment*	*Operator* *Assessor*	• *The Petroleum Act* • *The Energy Act* • *The Pollution Control Act* • *The Planning and Building Act* • *Dangerous goods legislation* • *Health and safety legislation* • *Regulations to the Petroleum Act*
• *Standards:* - *Classification of CO2* - *Allowable concentrations of other materials* - *Permits and licensing* - *Conditions of access*	*Land access* *Ownership* *Third party access* *Environment*	*N/A*	
• *Property rights and liability*	*Third parties* *Operator* *Contractor* *Community at large*	*N/A*	
TRANSPORT			
• *Risk management* - *Leakage* - *Engineering integrity* - *Health and safety - transport* - *Environmental assessments*	*Safety* *Environment*	*Owner* *Contractor – if stipulated*	• *The Petroleum Act* • *The Pollution Control Act* • *The Planning and Building Act* • *Dangerous goods legislation* • *Health and safety legislation* • *Ship transport legislation* • *Regulations to the Petroleum Act*
• *Standards:* - *Allowance of transportation in pre-existing gas or fuel pipelines* - *Planning for new pipelines* - *Permits and licensing* - *Land access* - *Third party access* - *Pipeline integrity* - *Monitoring and verification*	*Safety* *Environment*	*N/A*	
• *Property rights and liability* - *Cross-jurisdictional issues*	*Third parties* *Operator* *Contractor* *Community at large*	*N/A*	

ATTACHMENT D

NORWEGIAN REGULATORY GAP ANALYSIS TABLE

EVENT/RISK	IMPACT	OWNER	EXISTING REGULATION (or potential scope for expansion)
INJECTION			
• *Risk management* - *Leakage* - *Engineering integrity* - *Health and safety* - *Environmental assessments* - *Sub-surface integrity* - *Surface integrity*	*Safety* *Environment*	*Owner* *Operator* *Contractor*	• *The Petroleum Act* • *The Pollution Control Act* • *The Planning and Building Act* • *Dangerous goods legislation* • *Health and safety legislation* • *Regulations to the Petroleum Act*
• *Standards:* - *Pipeline integrity* - *Planning for new pipelines* - *Permits and licensing* - *Land access* - *Third party access* - *Monitoring and verification* - *Site selection* - *Environmental assessment* - *Injection point* - *Location matching – source and sink* - *Storage system integrity*	*Safety* *Environment*	*N/A*	
• *Property rights and liability* - *Cross-jurisdictional issues* - *Surface rights* - *Sub-surface rights* - *Compensation rights* - *Long term-v-short term liability*	*Safety* *Environment*	*N/A*	
POST-CLOSURE			
• *Risk management* - *Leakage* - *Engineering integrity* - *Health and safety* - *Environmental assessments* - *Sub-surface integrity* - *Surface integrity*	*Safety* *Environment*	*Owner* *Operator* *Contractor* *Public Liability issues*	• *The Petroleum Act* • *The Pollution Control Act* • *The Planning and Building Act* • *Dangerous goods legislation* • *Health and safety legislation* • *Regulations to the Petroleum Act*
• *Standards:* - *Permits and licensing* - *Land access* - *Third party access* - *Monitoring and verification* - *Environmental assessment* - *Storage system integrity*	*Safety* *Environment*	*N/A*	
• *Property rights and liability* - *Cross-jurisdictional issues* - *Surface rights* - *Sub-surface rights* - *Compensation rights* - *Long term-v-short term liability*	*Safety* *Environment*	*N/A*	

ATTACHMENT E

US REGULATORY GAP ANALYSIS TABLE

EVENT/RISK	IMPACT	OWNER	EXISTING REGULATION OR REGULATORY HURDLE
CAPTURE			
Classification of CO_2	*Environmental, health, and safety (ES&H)*	*Owner Operator*	*Application of appropriate federal and state regulations based on classification of CO_2 for the specific application*
Capture While CO_2 capture will bring new technology, regulatory frameworks exist in most developed countries to deal with the associated facilities and hardware. Above ground separation and capture facilities and equipment address definitive processes and chemistry. The tools are at hand to assess any environmental, health, and safety (ES&H) issues (*i.e.*, regulatory issues) that may arise. However, legal issues may arise regarding how CO_2 is categorized (*e.g.*, hazardous waste, non-hazardous waste, or by-product) in order to determine the appropriate regulatory authority and applicable existing regulations.			
TRANSPORT			
Risk management	*ES&H*	*Owner Operator*	*Application of appropriate federal and state regulations based on classification of CO_2 and environment traversed*
Transport Transport of CO_2 may trigger regulatory review, but here also, there is precedent to enhanced oil recovery, especially with the projects that are currently underway. The ES&H concerns are straight forward, and regulatory frameworks exist in developed countries. There are numerous parallels between CO_2 transport and natural gas transport.			
INJECTION			
• *Development of criteria for the various geologic formations to mitigate investment and ES&H risk.* • *Developing Measuring, Monitoring & Validation (MM&V) protocols*	*ES&H*	*Operator*	*To be determined through development of MM&V protocols*
POST-CLOSURE			
Development of MM&V protocols	*ES&H*	*Ownership of liability for CO_2 injection post-closure is a major issue*	*To be determined through development of MM&V protocols*
Injection and Post-Closure The major gap in regulatory frameworks begins with analyzing target geologic formations to assess their storage potential, integrity relative to leakage, and ability to endure CO_2 storage over time without incurring reservoir damage, deterioration, and subsequent negative ecological and health effects. Criteria need to be developed for the various geologic formations to mitigate investment and ES&H risk. Another gap to be filled resides in the area of developing MM&V protocols for the various geologic formations to be applied during injection and post-closure. Essentially, the fate of CO_2, including chemical transformations induced, must be measured over time to satisfy ES&H issues. These protocols do not exist. The United States domestic Carbon Sequestration program is (1) addressing site criteria development for depleted oil reservoirs, unmineable coal seams, saline formations, and novel geologic formations; and (2) developing MM&V protocols for storing CO_2 in these formations. Other countries have similar programs. Again, historical experience in the underground storage of natural gas aids the address of injection and post-closure issues.			