CENTER FOR CLIMATE AND ENERGY SOLUTIONS

# MIKE McCORMICK

## $CO_2$ EOR & Storage Regulatory Update

Presented at the 17th Annual $CO_2$ Flooding Conference

December 8-9, 2011

Midland, Texas

# C2ES – THE *NEW* PEW CENTER ON GLOBAL CLIMATE CHANGE

- As of Nov 9, the Pew Center on Global Climate Change has a new name and refreshed mission

- C2ES will continue to be:
  - **a reliable source** of information and analysis
  - **a catalyst** for innovative solutions and concrete actions to address our climate and energy challenges
  - **a convener** of business, the environmental community, other stakeholders and policymakers

# NATIONAL EOR INITIATIVE

- **Mission:** Accelerate commercial deployment of enhanced oil recovery using $CO_2$ from fossil, renewable and industrial sources**.**
- **Collaborative stakeholders:** oil and gas companies, industries supplying $CO_2$; state officials, legislators and regulators; regional and national environmental NGOs.
- **Convening organizations:** Center for Climate and Energy Solutions and Great Plains Institute.

# EOR INITIATIVE – PARTICIPANTS

**Oil and Gas**

- Chaparral Energy
- Chevron Corporation
- Continental Resources
- Core Energy
- Denbury Resources
- Encana
- Occidental Petroleum

**Coal and Coal-Based Generation**

- Arch Coal
- Basin Electric Power Cooperative
- Leucadia
- Southern Company
- Summit Power Group
- Tenaska Energy

**Industrial Suppliers of CO2/Technology Vendors**

- Air Products
- Archer Daniels Midland
- GE Energy

**Environmental NGOs**

- Clean Air Task Force
- Natural Resources Defense Council
- Ohio Environmental Council
- Wyoming Outdoor Council

**Labor**

- AFL-CIO
- United Transportation Union

**Other Institutions**

- Enhanced Oil Recovery Institute (University of WY)
- Interstate Oil and Gas Compact Commission
- North American Carbon Capture and Storage Association
- Southern States Energy Board

**State Officials**

- California, Illinois, Indiana, Michigan, Mississippi, Montana, New Mexico, Texas and West Virginia

# EOR INITIATIVE – KEY ELEMENTS

- Prepare key analyses to inform and support incentive policies for anthropogenic $CO_2$-EOR
- Recommend and advocate for incentives and other policies to support commercial $CO_2$-EOR deployment that ensure net fiscal benefit and sustainability of incentives over time through revenues from additional incremental oil production
- Increase policy-maker, media and public awareness of the $CO_2$-EOR, its benefits and need for deployment incentives.

Timeline:

- Produce incentive recommendations and supporting material by early 2012

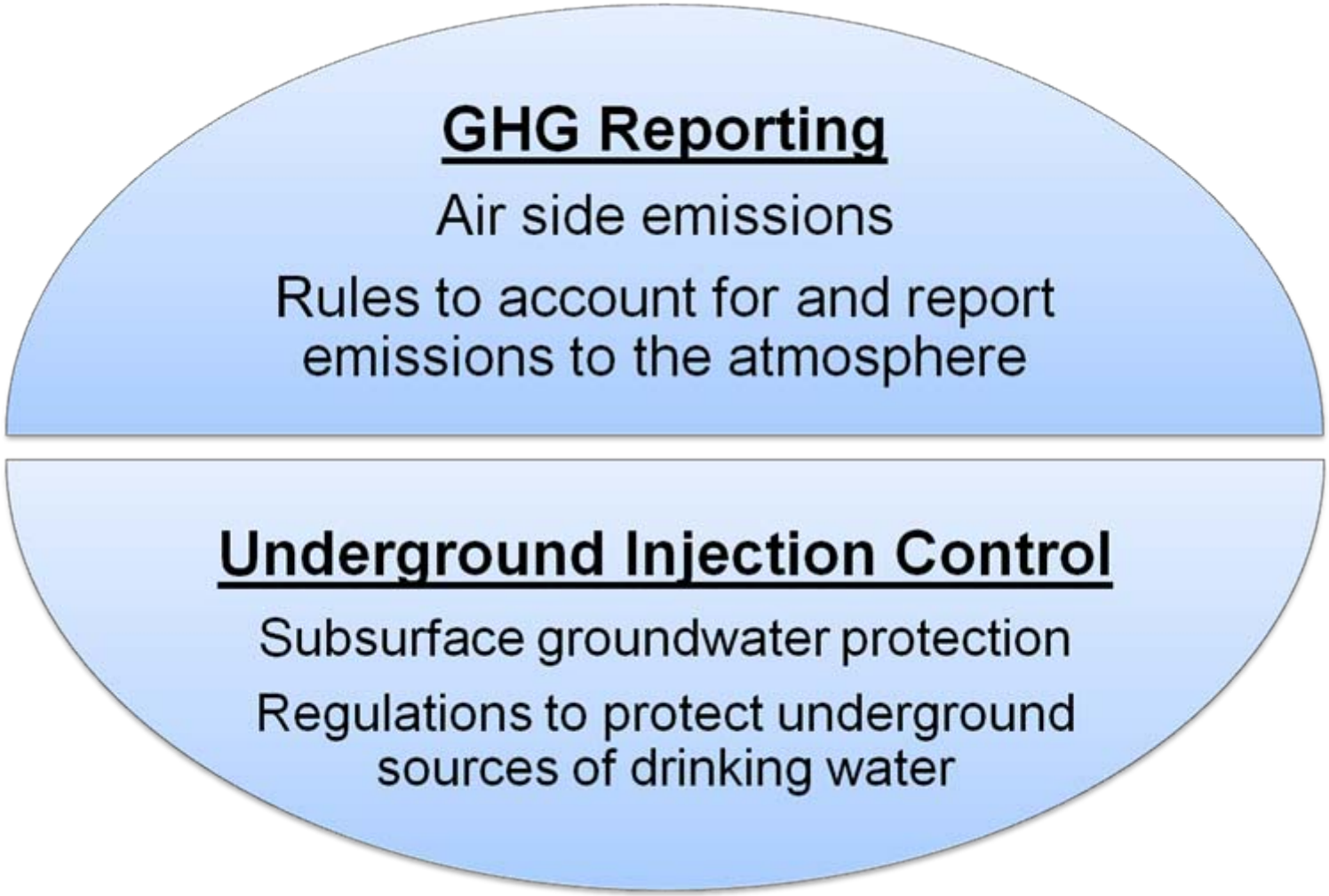
# $CO_2$ STORAGE PERMITTING & EMISSIONS REPORTING FRAMEWORK

Two main objectives of this presentation:

A. Distinguish *Underground Injection Control* (UIC) from *Greenhouse Gas Reporting Program* (GHGRP) regulations.

B. Comment on regulatory path forward

# DOMAIN OF GHG REPORTING AND UIC REGULATIONS



# $CO_2$-EOR REGULATORY PATHWAY OPTIONS

1. $CO_2$ Geologic Storage

   "The owner or operator injects the CO2 stream for long-term containment in subsurface geologic formations"

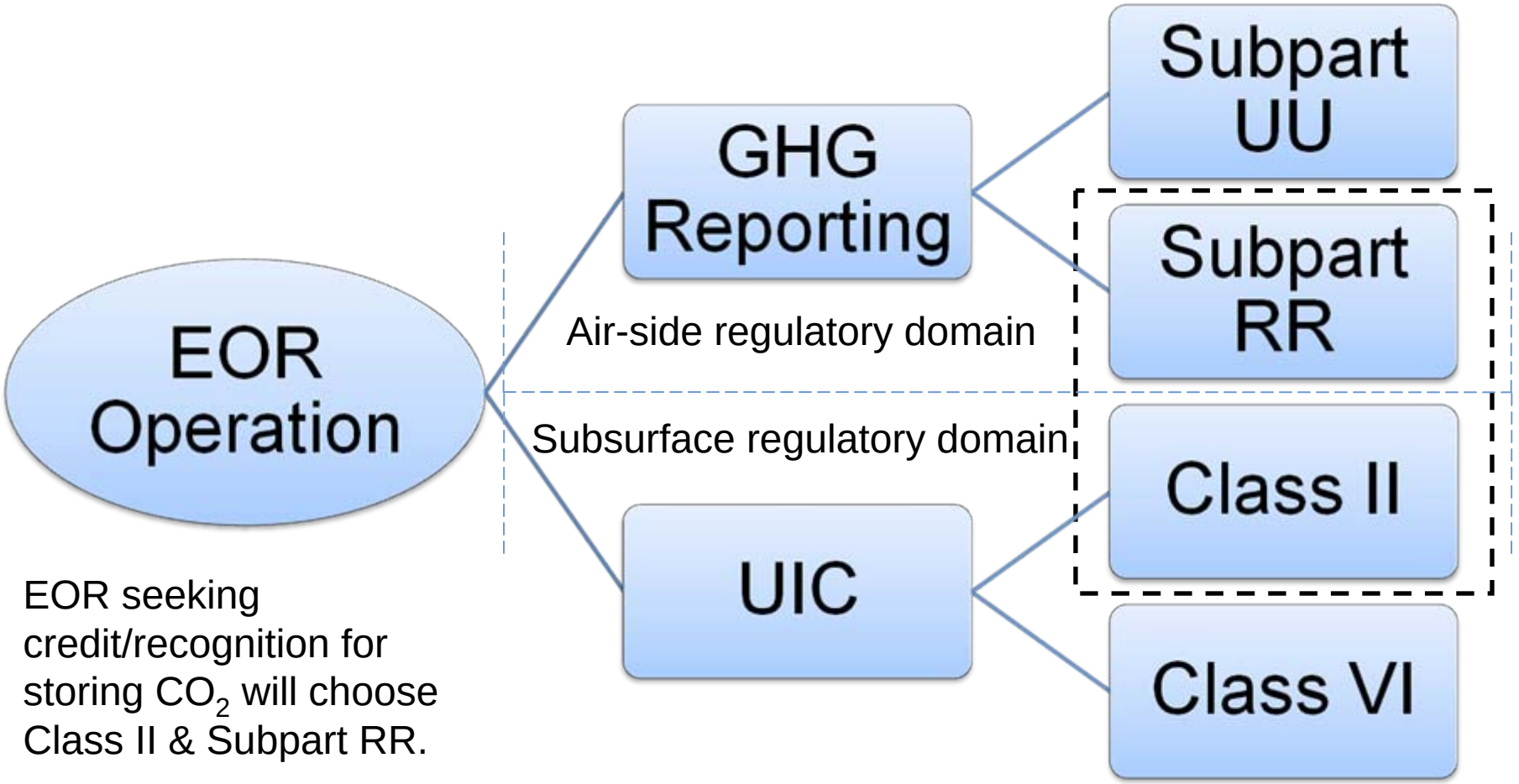
   (CFR §98.440(c)(1))

2. $CO_2$ "Incidental Storage"

   "…comprises any well or group of wells that inject a $CO_2$ stream into the subsurface."

   (CFR §98.470(a))

# REGULATORY PATHWAY – $CO_2$ GEOLOGIC STORAGE




EOR seeking credit/recognition for storing $CO_2$ will choose Class II & Subpart RR.

# SUBPART RR – GEOLOGIC SEQUESTRATION OF $CO_2$

## § 98.440 Definition of source category

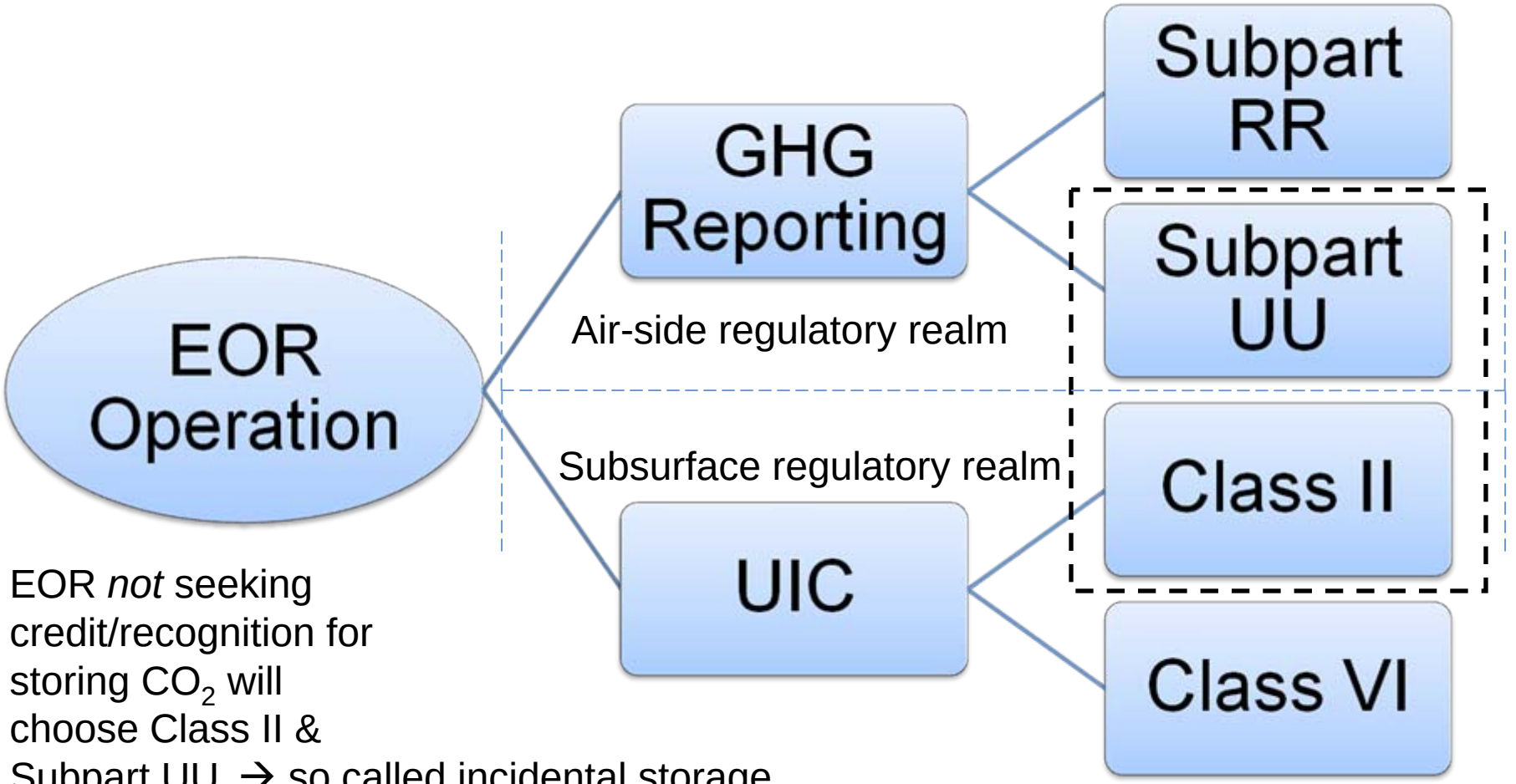
(a) …comprises any well or group of wells that inject a $CO_2$ stream *for long-term containment* in subsurface geologic formations.

(c) does not include …enhance[d] recovery of oil or natural gas unless one of the following applies:

(1) The owner or operator injects the $CO_2$ stream *for long-term containment* in subsurface geologic formations and *has chosen to submit a proposed monitoring, reporting, and verification (MRV) plan* to EPA and received an approved plan from EPA.

(2) The well is permitted as Class VI under the Underground Injection Control program.

# REGULATORY PATHWAY – $CO_2$ "INCIDENTAL STORAGE"




EOR *not* seeking credit/recognition for storing $CO_2$ will choose Class II & Subpart UU → so called incidental storage

# SUBPART UU – INJECTION OF $CO_2$

§ 98.470 Definition of the source category

(a) …comprises any well or group of wells that inject a $CO_2$ stream into the subsurface.

(b) If you report under subpart RR of this part for a well or group of wells, you are not required to report under this subpart for that well or group of wells.

# GHG REPORTING MRV

- Monitoring $CO_2$ injection and storage under Subpart RR to EPA's GHG reporting program requires the development of a monitoring, reporting, and verification (MRV) plan that includes, at a minimum the following components (§ 98.448):
  - Delineation of monitoring areas,
  - Identification and assessment of potential surface leakage pathways,
  - Strategy for detecting and quantifying surface leakage of $CO_2$ if leakage occurs,
  - Approach for establishing the expected baselines, and
  - Summary of considerations for calculating site-specific variables for the mass balance equation.

# FINAL THOUGHTS

- Current situation: No regulatory-based program to “credit” $CO_2$ storage.

- Looking forward: Substantiate that UIC-GHG Reporting framework (Class II + RR) is sufficient to provide confidence that CO2 will remain out of the atmosphere.

# Contact

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