

FEDERAL AND STATE CCUS/CO₂-EOR OVERVIEW

10TH ANNUAL CARBON MANAGEMENT
WORKSHOP

DECEMBER 4, 2012

CO₂-EOR Overview

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▣ U.S. EPA

- *UIC Class VI Implementation: Federalization of UIC Class II?*
- *RCRA CO₂ Rulemaking: Is CO₂ a hazardous waste?*
- *Clean Air Act Permitting: Treatment of CO₂-EOR as BACT*
- *GHG Reporting Rule*
- *Relevance of EPA's Scrutiny of Hydraulic Fracturing (HF) to CO₂-EOR*

▣ U.S. Treasury

- *Section 45Q CCS Credit Guidance*

▣ Congress

- *Carbon Taxes, the Energy Policy Act of 2013 & Related Matters*

▣ State Activity

U.S. EPA

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- ▣ Further Implementation of UIC Class VI Rule
- ▣ Completion of CO₂ rulemaking under the Resource Conservation & Recovery Act
- ▣ Clean Air Act Implementation
- ▣ GHG Reporting Rule: Subparts PP and RR/UU
- ▣ Hydraulic Fracturing

U.S. EPA: Further Implementation of the UIC Class VI Rule

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■ Guidance Documents

- *Class V/Experimental (final: March 2007)*
- *Financial Responsibility (final: July 2011)*
- *Well Construction (final: May 2012)*
- *Project Plan Development (final: August 2012)*
- *Area of Review of Corrective Action (closed for comment: May 2011)*
- *Well Site Characterization (closed for comment: May 2011)*
- *Primary Application (closed for comment: August 2011)*
- *Testing & Monitoring (closed for comment: March 2012)*
- **Class II to VI (draft release imminent)**
- *Well Plugging, Post-Injection Site Care, and Well Closure (soon)*
- *Recording Keeping and Reporting (2013)*
- *Injection Depth Waivers (2013)*

■ State Primacy

- *UIC Class VI is federal program effective September 2011*
- *Following States engaged in some level of activity related to primacy for UIC Class VI –*
 - *Kansas*
 - *Louisiana*
 - *Mississippi*
 - *Nebraska*
 - *North Dakota*
 - *Texas*
 - *Wyoming*

U.S. EPA: Pending Guidance on Transitioning from Class II to Class VI

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▣ 40 CFR § 144.19

- (a) “Owners or operators that are injecting [CO₂] for the primary purpose of long-term storage into an oil and gas reservoir must ... obtain a Class VI ... permit when there is an increased risk to USDWs compared to Class II operations.”
 - Two fundamental considerations:
 - What is the meaning of “primary purpose of long-term storage”?
 - Who assesses potential increased risk, and what factors are to be considered?

U.S. EPA: Assessing Potential Increased Risk

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- “The Director shall determine when there is an increased risk to USDWs compared to Class II operations and a Class VI permit is required.” (40 CFR § 144.19(b))
- “The Director must consider the following (id):
 - “Increase in reservoir pressure within the injection zone(s);
 - “Increase in [CO₂] injection rates;
 - “Decrease in reservoir production rates;
 - “Distance between the injection zone(s) and USDWs;
 - “Suitability of the Class II area of review delineation;
 - “Quality of abandoned well plugs within the area of review;
 - “The ... plan for recovery of [CO₂] at the cessation of injection;
 - “The source and properties of injected [CO₂];
 - “Any additional site-specific factors as determined by the Director.”

U.S. EPA: Commercial Considerations of 40CFR § 144.19

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□ Uncertainties

- Open-ended inquiry
 - “Any additional site-specific factors”
- When is the determination made? Can it be made retroactively?
 - “Decrease in reservoir production rates”
- Commercial differences between upstream source and EOR operator
 - “Increase in [CO₂] injection rates”
- If the upstream source is engaged in “sequestration,” then ...
 - “[S]ource and properties of injected [CO₂]”
- What happens when injections cease?
 - “[Plan for recovery of [CO₂] at the cessation of injection”
- Proceed with caution when negotiating deal documents, including CO₂ offtake agreement
 - Lessons learned from early years of the Clean Development Mechanism

U.S. EPA: Completion of CO₂ Rulemaking under the Resource Conservation & Recovery Act (RCRA)

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- On August 8, 2011, EPA proposed to “conditionally exclude” CO₂ streams that are hazardous from the definition of “hazardous waste,” provided certain conditions are met (76 Fed. Reg. 48073)

U.S. EPA: CO₂ Under RCRA and the Importance of the Pending Rulemaking

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- Even if non-hazardous, a “supercritical CO₂ stream injected into a permitted UIC Class VI well for purposes of GS is a RCRA solid waste” as it is a “discarded material” (76 Fed. Reg. 48078, 48079)
- Generators of solid wastes are required to determine whether their wastes are hazardous (76 Fed. Reg. 48077)
 - *Under the UIC Class VI rule, if a CO₂ stream is hazardous it must be injected into a Class I hazardous well*
 - *Similarly, no hazardous wastes may be injected into a Class VI well*
- A solid waste is hazardous if it is specifically listed or exhibits any of four characteristics: ignitability, corrosivity, reactivity or toxicity (76 Fed. Reg. 48077)
 - *CO₂ streams are not listed*
 - *Some argue CO₂, in presence of water could satisfy RCRA’s corrosivity test*
 - *Is it even possible to test supercritical CO₂ streams?*

U.S. EPA: An Aside --Why It Matters That EPA Has Said That CO₂ Is A “Solid Waste” Under RCRA

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- RCRA’s citizen suit provision applies to both solid and hazardous wastes (42 U.S.C. § 6972(a)(1)(B)) --
 - Any “person may commence a civil action ... against any person ... including any past or present generator, past or present transporter, or past or present owner or operator of a treatment, storage, or disposal facility, who has contributed, or who is contributing to the past or present handling, storage, treatment or disposal of any solid or hazardous waste which may present an imminent and substantial endangerment to health or the environment”
- Relief is injunctive, but claims for monetary damages can be asserted as separate counts in some circumstances

U.S. EPA: Importance of the Proposed Rule; Conditions for Conditional Exclusion to Apply

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- Would allow CO₂ streams that are deemed “hazardous” to be managed in Class VI wells
- Four conditions for conditional exclusion to apply (proposed 40 CFR § 261.4(h)) --
 - *Transportation must be in accordance with applicable DOT requirements*
 - *Injection must be in accordance with UIC Class VI requirements*
 - *No other hazardous wastes may be mixed with, or otherwise co-injected with, the CO₂ stream*
 - *Signed certification must be filed and kept on-site*

U.S. EPA: Clean Air Act Implementation: Impacts on CO₂-EOR

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- EPA's authority to regulate GHG emissions remains intact
 - *Massachusetts v. EPA, 549 U.S. 497 (2007) (GHGs are "air pollutants" that are subject to regulation)*
 - *Congress has repeatedly failed to overturn*
 - *However, if Congress were to enact a carbon tax, EPA's climate authority could be limited as part of the deal*
 - *The U.S. Court of Appeals for the D.C. Circuit has upheld EPA's climate actions (Coalition for Responsible Regulation v. EPA, No. 09-1322 (D.C. Cir., June 26, 2012)); petitions for rehearing pending*
 - *Could wind up back before the U.S. Supreme Court in 2013 or 2014*
- EPA has broad authority to regulate GHG emissions under the Clean Air Act
 - *New Source Performance Standards (NSPS)*
 - *Prevention of Significant Deterioration (PSD) Permitting*
 - *Title V Permitting*

U.S. EPA: Clean Air Act Implementation – Proposed NSPS for CO₂ from New EGUs

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- On April 13, 2012, EPA published proposed New Source Performance Standards for CO₂ from new affected fossil fuel-fired electric generating units (77 Fed. Reg. 22392)
 - *EPA expected to finalize in near future*
- Output-based standard of 1,000 lbs CO₂/MW-hr
- New coal- or petcoke fired units could meet the standard by employing CCS for approximately 50% of the CO₂ in exhaust gas at startup, or through later application of more effective CCS on average over a 30-year period
- Nothing in the proposal suggests that CO₂-EOR would not constitute sequestration
 - *CO₂-EOR projects referenced throughout*
 - *Proposal uses the terms “sequestration” and “storage” interchangeably*

U.S. EPA: Clean Air Act Implementation – PSD/Title V Permitting for GHGs

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- Applies to new sources and certain modifications to existing sources
- Emissions-based applicability thresholds
 - *Complex methodologies but basically, under Step 3 of the Tailoring Rule (effective August 13, 2012), a threshold of 100,000/75,000 tpy CO₂e applies*
 - *Thresholds could be lowered in the future (i.e., even smaller sources will require permits): Step 4 of the Tailoring Rule to be completed by August 30, 2016*
- Unless grandfathered or some other unique situation applies, basically any potential aCO₂ source for CO₂-EOR is subject to GHG regulation

U.S. EPA: Clean Air Act Implementation – CO₂-EOR as BACT under the PSD Program

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- Major requirement of PSD is that source apply Best Available Control Technology (BACT)
- Case-by-case and pollutant specific
- Five-step process:
 - *Step 1: Identify All Available Control Technologies*
 - *CCS is an “available” technology, according to EPA guidance*
 - *Step 2: Eliminate Technically Infeasible Options*
 - *Cost irrelevant*
 - *Consider CO₂ capture, transportation and storage separately*
 - *Non-US projects are relevant*
 - *CO₂ capture may be relevant even if demonstrated on another source type*
 - *Step 3: Rank Remaining Control Technologies*
 - *Step 4: Evaluate Most-Effective Controls*
 - *Consider costs*
 - *Step 5: Select BACT*

U.S. EPA: Clean Air Act Implementation – The Indiana Gasification, LLC Permit

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- Coal/petcoke gasification to SNG with CO₂ for EOR.
- June 27, 2012: PSD/Title V permits issued by Indiana Department of Environmental Management (IDEM)
- IDEM
 - *CO₂ from coal gasification is not captured, but instead is a commodity; no Clean Air Act jurisdiction over CO₂ to EOR*
 - *No BACT analysis required; no downstream controls on CO₂ to EOR needed*
 - *NRDC and Sierra Club have requested a rehearing*

U.S. EPA: Clean Air Act Implementation – The Indiana Gasification, LLC Permit

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“By way of analogy, the AGR vented CO₂ is similar to gasoline fumes that may be emitted from a gasoline storage tank at a refinery. Had the gasoline been delivered for sale, it would be a product. Only because the gasoline was emitted into the ambient air did it lose its identity as a product, and become air pollution to which the Clean Air Act would apply. By way of further analogy, once delivered as a product to the fence line of the proposed facility, subsequent potential emissions of the product CO₂ are not the responsibility of the permit applicant any more than a carbonated beverage manufacturer is responsible for the ultimate release of CO₂ when the beverage container is opened. Or similarly, refineries producing gasoline as a product are not responsible for the air emissions from automobile refueling or the combustion of the gasoline in automobiles. The Clean Air Act places compliance obligations on the emitter of air pollution, not the manufacturer of products that may later through their use result in air pollution.”

Source: Indiana Gasification, LLC PSD/Title Permit, Response to Public Comments, p. 22 (June 27, 2012)

U.S. EPA: Clean Air Act Implementation – CO₂-EOR as BACT under the PSD Program

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- CCS/CO₂-EOR has not been deemed BACT to date, but is being evaluated in each permitting proceeding
- The commercial status of each project matters going forward (Kemper County, etc.)
- EPA has said that CO₂-EOR could make a BACT determination more likely in a specific case by helping project economics
- The significance of the Indiana Gasification, LLC permit
- Natural gas-based projects are not exempt
 - *The NSPS is a floor*
 - *CO₂ capture being examined as BACT for combined cycle natural gas projects*

U.S. EPA: Clean Air Act Implementation: What To Expect in 2013

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- Proposed NSPS for GHG Emissions from New and Modified Refineries
- Proposed GHG Emission Standards/Practices for Existing Power Plants
- Regulation of other source categories thereafter

U.S. EPA: GHG Reporting Rule – Subparts PP and RR/UU

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- Subpart PP – Suppliers of CO₂
 - *Finalized October 30, 2009 (74 Fed. Reg. 56373)*
 - *2010 Data Reported and Publicly Available (if not CBI)*
 - *Initial Reporting Year: 2010*
 - *Confidentiality Determinations Finalized May 26, 2011 (76 Fed. Reg. 30782)*
 - *CBI status of key data from industrial facilities deemed to be CBI*
- Subpart UU – Geologic Sequestration of CO₂
 - *Reporting Finalized December 1, 2010 (75 Fed. Reg. 75060)*
 - *Initial Reporting Year: 2011*
 - *Confidentiality Determinations Finalized August 13, 2012 (77 Fed. Reg. 48072)*
 - *CBI status of key data will be determined case-by-case*
- Subpart RR – Injection of CO₂
 - *Finalized December 1, 2010 (75 Fed. Reg. 75060)*
 - *Initial Reporting Year: 2011*
 - *Confidentiality Determinations Finalized August 13, 2012 (77 Fed. Reg. 48072)*
 - *CBI status of key data deemed to be CBI*

U.S. EPA: Relevance of Hydraulic Fracturing Regulation & CO₂-EOR

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- EPA engaged in multi-year, multi-statute process to examine appropriate level of HF regulation
- Adequacy of State implementation of UIC Class II at issue
- Overlap in EPA personnel
- Overlap in legislation
 - *The Hoeven/Murkowski bill*
- Risks of direct or collateral regulatory damage to CO₂-EOR

U.S. Treasury: 45Q CCS Tax Credit

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- ▣ IRS published interim guidance in 2009 (Notice 2009-83, Nov. 2, 2009)
- ▣ Meaning of “secure geological storage”
- ▣ IRS examining what is required

Congress: What to Expect in 2013

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- Reduced budgets for EPA, DOE
- Carbon tax discussions
- Senate Energy Committee White Paper – possible basis for a new energy bill
- HF-specific bills that could impact UIC Class II more broadly
- CCUS-specific bills – i.e., Rockefeller

State Activity

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- ▣ Clean Air Act permitting (as discussed)
- ▣ California cap and trade
 - *First auction held November 15, 2012 -- \$10/ton price*
 - *2013: Official compliance*
 - *CCS not yet recognized but situation is fluid*
- ▣ California Low Carbon Fuel Standard
 - *10% reduction in intensity of transportation fuels by 2020*
 - *CCS-based pathway for reducing carbon*
 - *December 29, 2011: Federal district struck down on grounds that program discriminated against interstate commerce*
 - *October 16, 2012: Oral arguments held before U.S. Court of Appeals for the Ninth Circuit*
- ▣ State CCS regulations
- ▣ UIC Primacy (as discussed)

THANK YOU

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