

# Sequestration

Enhanced Oil Recovery  
Acid Gas Injection – in progress

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# Enhanced Oil Recovery

- Seed Materials
  - *CO2-EOR Offset Quantification Protocol* dated September, 2006
  - Prepared by EnergyINet Inc. and ARC for Alberta Environment
- Other Good Practice Guidance
  - CDM protocols
  - Project evaluations
- Technical Review
  - Multi-stakeholder discussion
  - Alberta process with gov't and industry stakeholders

# Enhanced Oil Recovery

- Project Condition
  - Sequestration of gas streams containing GHGs as part of EOR schemes
  - Two source types
- Baseline Condition
  - Venting or flaring of the volume of gas to be sequestered
  - Operation of production system without EOR

# Enhanced Oil Recovery

- Functional Equivalence
  - Inputs and Outputs
- Emission Reduction Mechanisms
  - Avoidance of emissions due to sequestration

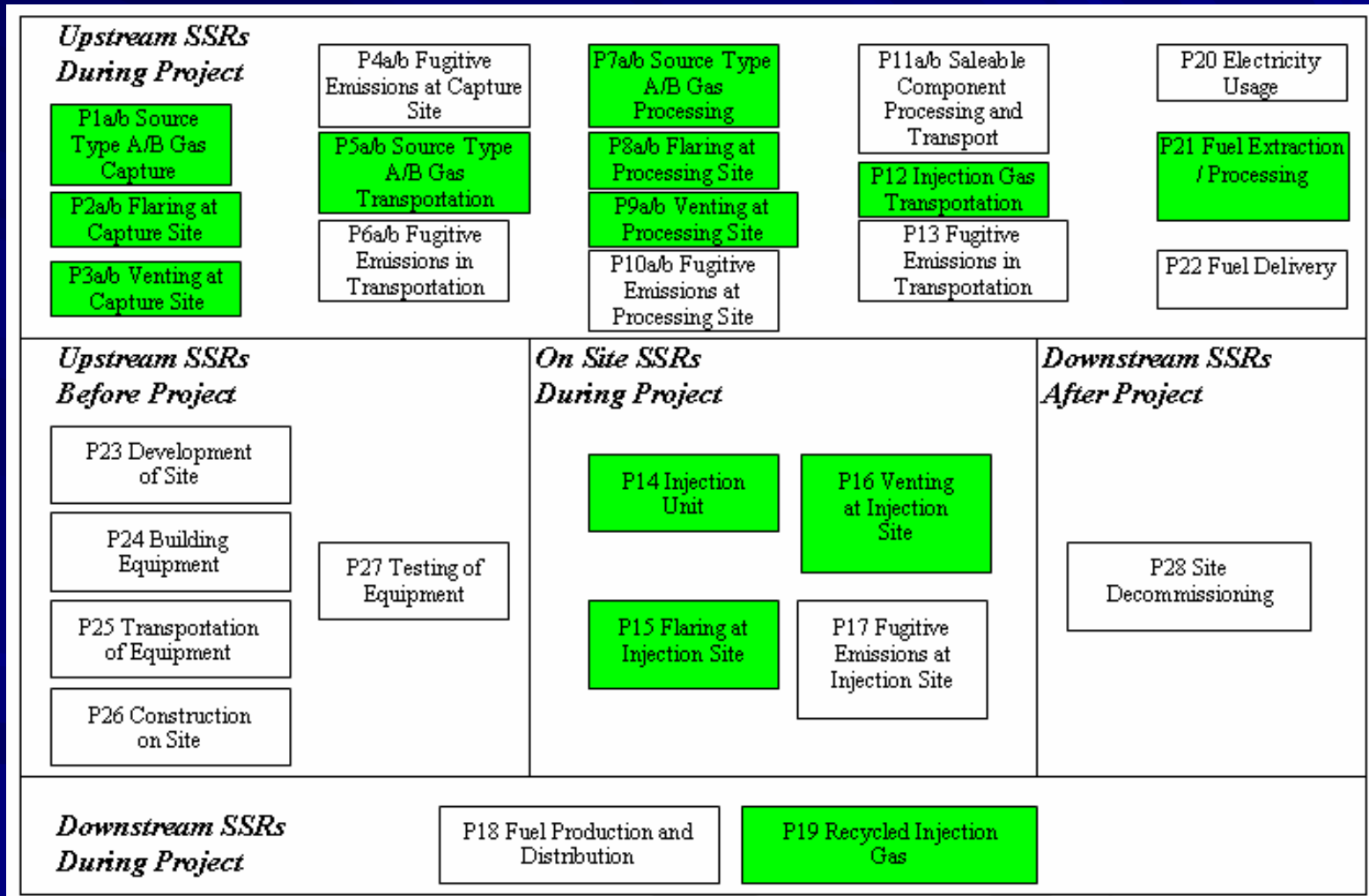
# Enhanced Oil Recovery

- Applicability criteria
  - Removal of emissions that would otherwise have been released to atmosphere
  - Geological assessment provides sufficient confidence that seepage will not occur
  - Management for zero leakage
  - Site monitoring systems to ensure containment
  - Metering of gas volumes is reasonably close to the injection point
    - Fugitive emissions
  - Post-abandonment monitoring plan
  - Based on actual measurement and monitoring

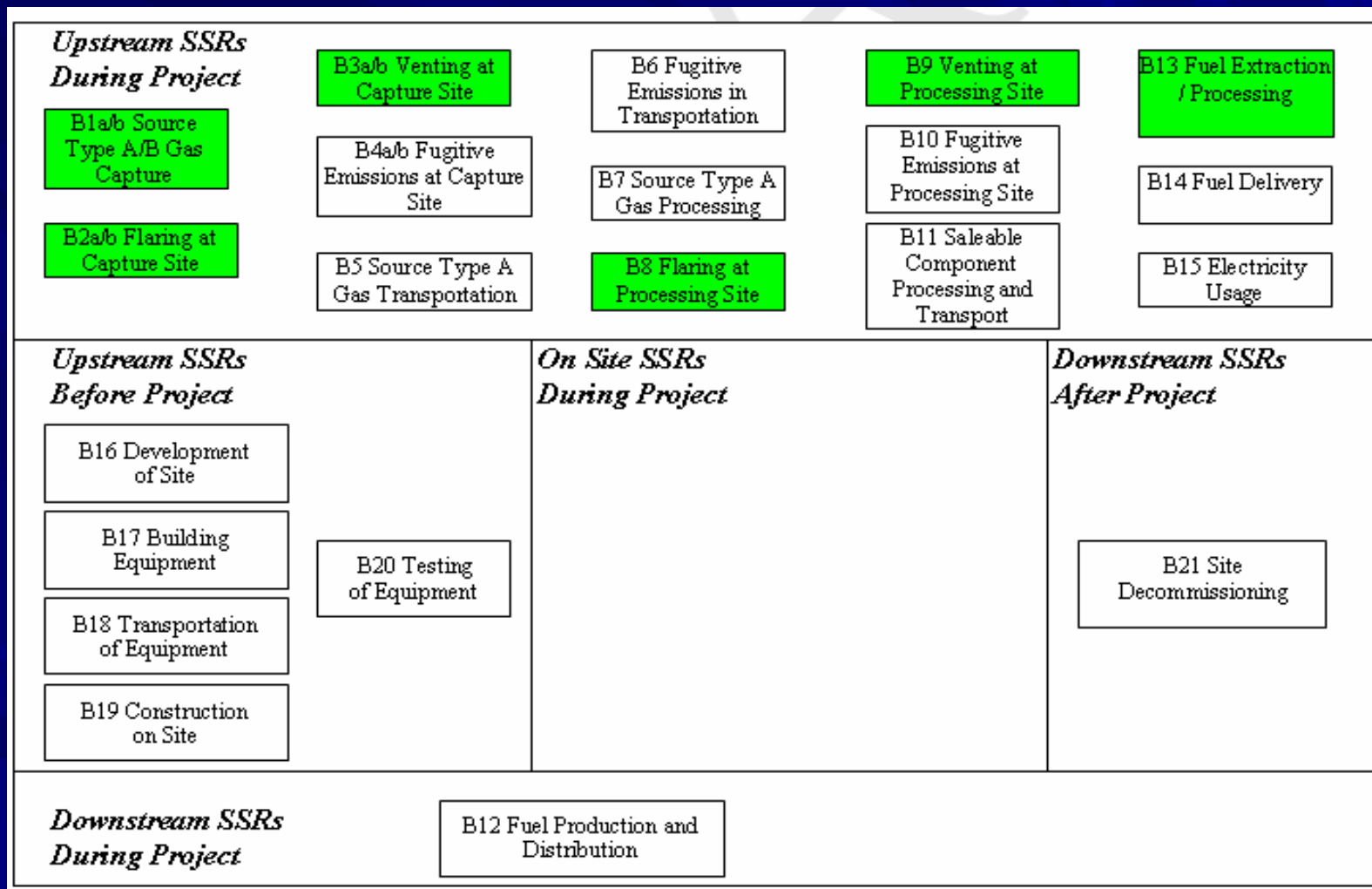
# Enhanced Oil Recovery

- Flexibility mechanisms
  - Sources and sinks can be excluded with justification
  - Expansion of existing injection programs
    - Expansion can be a new project
    - Pre-expansion becomes the baseline
  - Site monitoring on a case by case basis

# Enhanced Oil Recovery



# Enhanced Oil Recovery





# Enhanced Oil Recovery

$$\text{Emission Reduction} = \text{Emissions}_{\text{Baseline}} - \text{Emissions}_{\text{Project}}$$

$$\begin{aligned} \text{Emissions}_{\text{Baseline}} = & \text{Emissions}_{\text{Fuel Extraction / Processing}} + \text{Emissions}_{\text{Capture}} + \text{Emissions}_{\text{Capture Flare}} \\ & + \text{Emissions}_{\text{Capture Vent}} + \text{Emissions}_{\text{PG Transport}} + \text{Emissions}_{\text{Process}} \\ & + \text{Emissions}_{\text{Process Flare}} + \text{Emissions}_{\text{Process Vent}} \end{aligned}$$

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# Enhanced Oil Recovery

- Data Capture
  - Volumes of fossil fuel consumed
    - Capture
    - Processing
    - Transportation
    - Injection facility operation
  - Volumes of gas flared and vented
  - Composition of gas stream
  - Volume of injected gas recycled
    - Net: does not include volume re-injected

# Enhanced Oil Recovery

- Questions and Comments
  - Technical issues?
  - Policy concerns?
  - Customization questions?
  - Linkage issues?