



Acid Gas Injection

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Acid Gas Injection Protocol

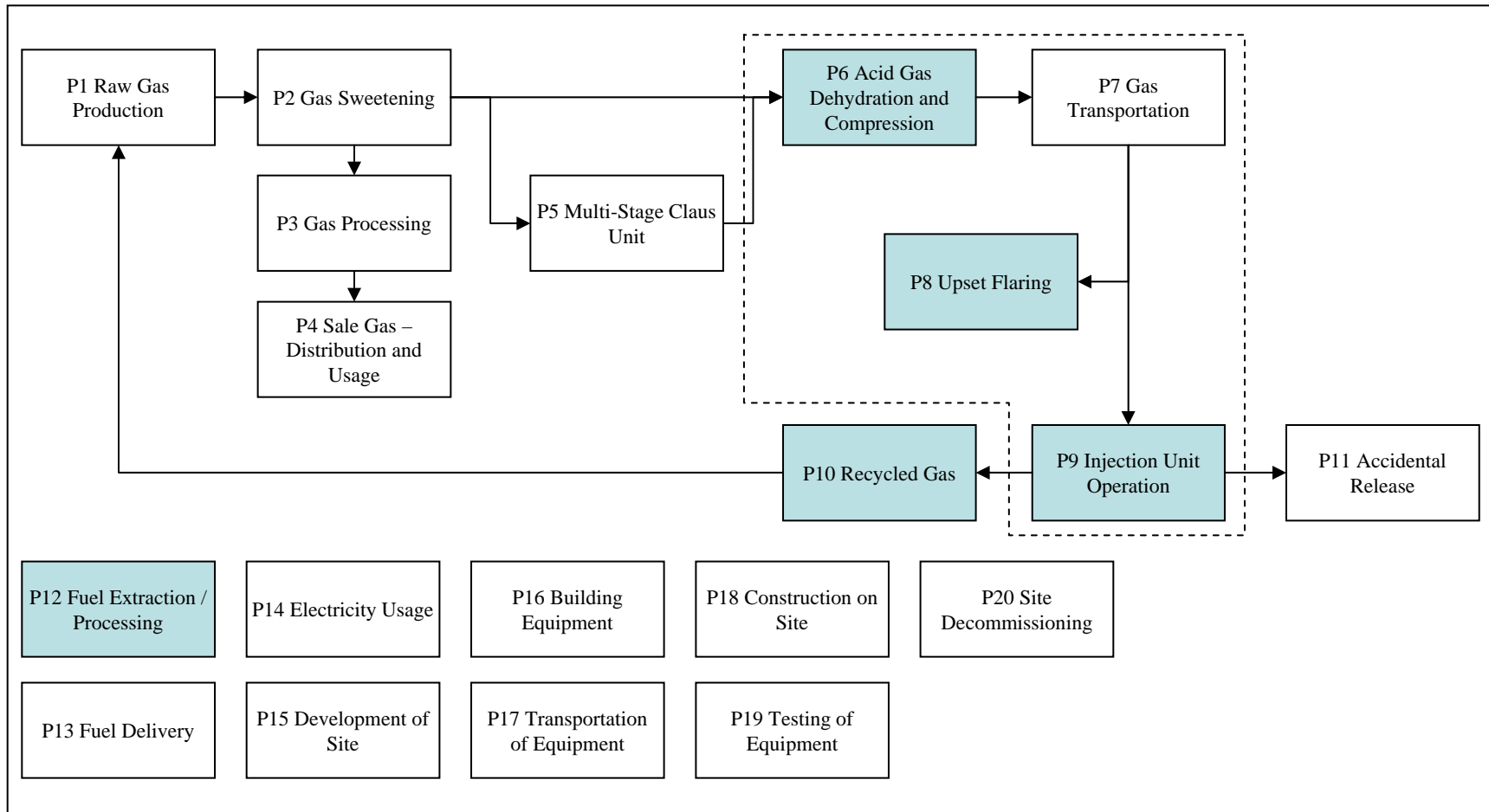
- Protocol Development
 - protocol initially developed for greenfield projects
 - seed documents
 - CDM PDD – geological sequestration projects
 - project documents for similar Alberta projects
 - Alberta protocol step 4 technical review with input from government and industry
 - flexibility added to protocol to include projects where pre-existing Claus process exists

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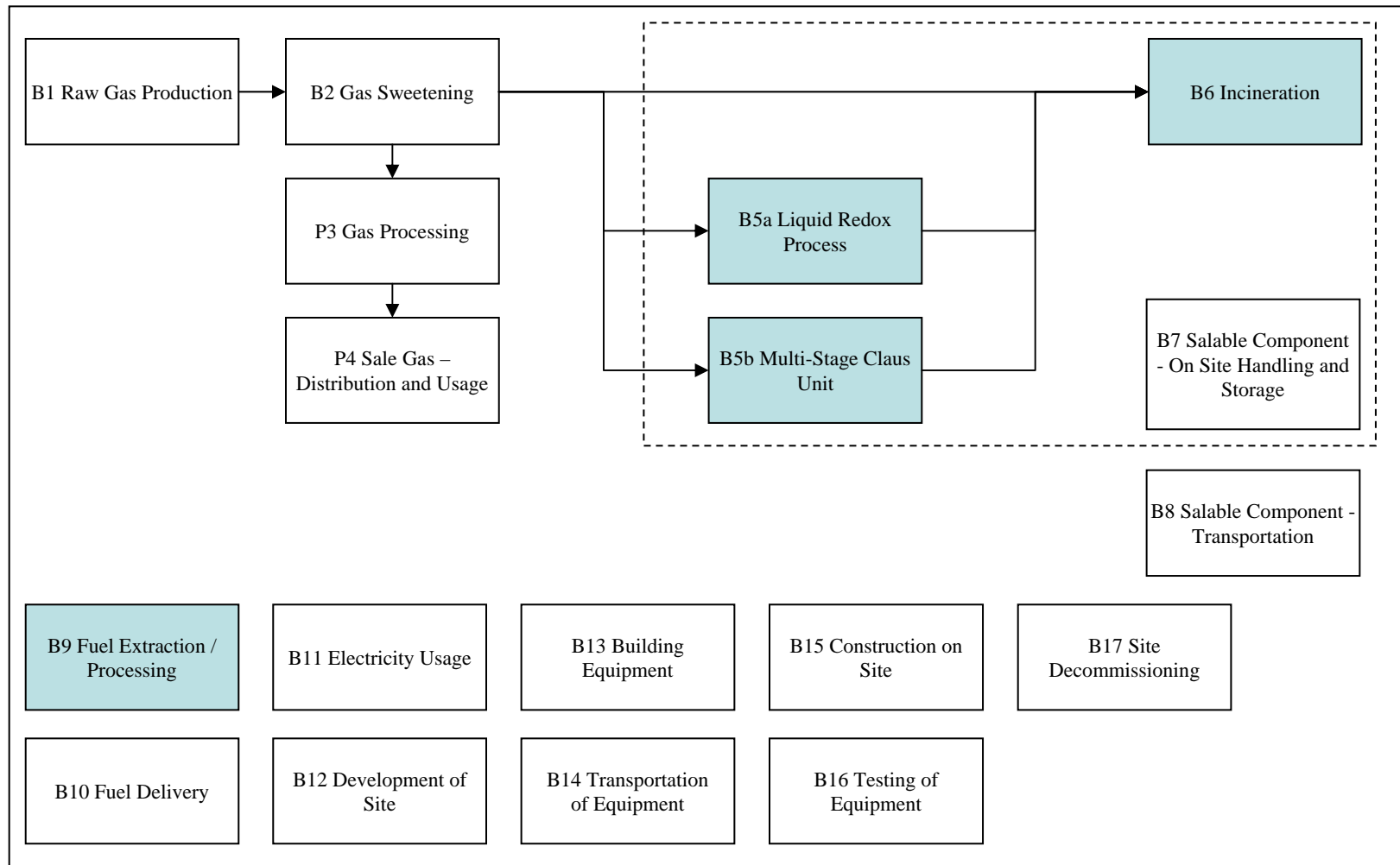
- Project Condition
 - Deep well injection and sequestration of acid gas
 - Tail gas from Multi-Stage Claus Unit; or
 - Acid gas stream from raw gas processing

- Baseline Condition
 - Incineration of acid gas / tail gas stream
 - Tail gas stream from Multi-Stage Claus unit;
 - Tail gas stream from Liquid Redox Process; or
 - Acid Gas stream directly from raw gas processing.

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

$$\text{Emissions}_{\text{Baseline}} = \text{Emissions}_{\text{Incineration}} + \text{Emissions}_{\text{Fuel Extraction and Processing}} + \text{Emissions}_{\text{Liquid Redox Process}} + \text{Emissions}_{\text{Multi-Stage Claus Unit}}$$

$$\text{Emissions}_{\text{Project}} = \text{Emissions}_{\text{Fuel Extraction and Processing}} + \text{Emissions}_{\text{Gas Compression}} + \text{Emissions}_{\text{Upset Flaring}} + \text{Emissions}_{\text{Injection Unit Operation}} + \text{Emissions}_{\text{Recycled Gas}}$$

Emission Reduction Mechanisms

- Avoided carbon dioxide emissions
- Avoided fossil fuel consumption

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- Applicability Criteria
 - sequestration project results in emissions that otherwise would have been released to the atmosphere
 - acid gas injection scheme has obtained EUB approval under directive 051
 - metering of injection gas takes place as close to the injection point as reasonably possible

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- Flexibility mechanisms
 - alternative monitoring methodologies and / or equipment
 - substitution of site specific emission factors for generic emission factors
 - alternative method for calculation of recycled gas
 - project condition developed where baseline Claus Unit remains in place

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- Additional issues raised during technical review
 - flexibility to allow use with existing facilities
 - addition of Liquid Redox process as most likely baseline technology
 - treatment of exothermic energy produced by the Claus process
 - recycling of Carbon Dioxide
 - permanence of sequestration



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Questions