Regulatory Issues Affecting Management of Produced Water from Coal Bed Methane Wells

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Acknowledgements

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and the

Topics for Discussion

- **U.S. national discharge requirements**
- **The permitting process**
- **Applicability to CBM water**

U.S. Requirements for Discharging

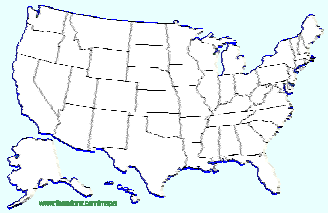
Laws

- Clean Water Act

Discharge Regulations

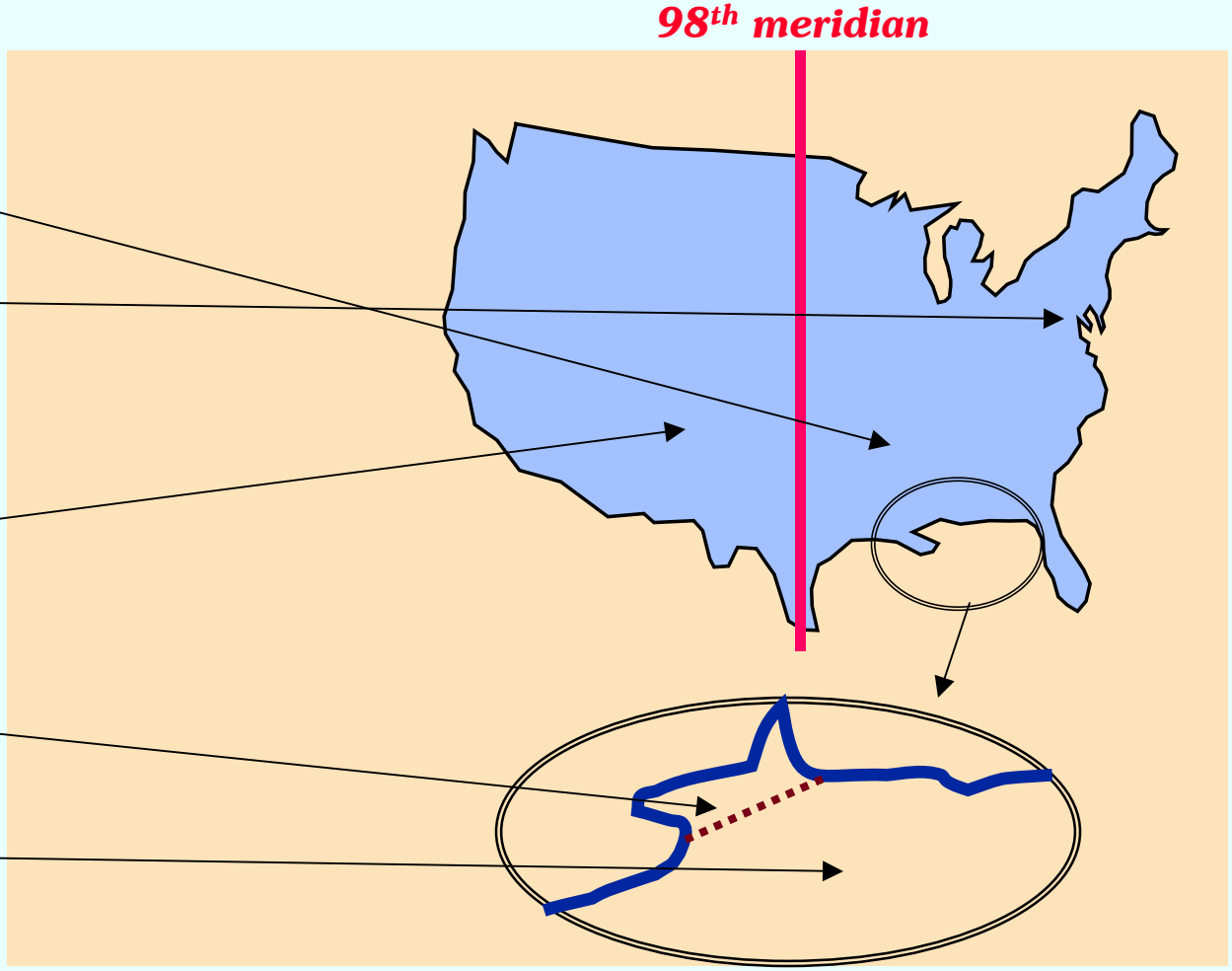
- National Pollutant Discharge Elimination System (NPDES) program
- Effluent limitations guidelines (ELGs)

Permits and Guidance



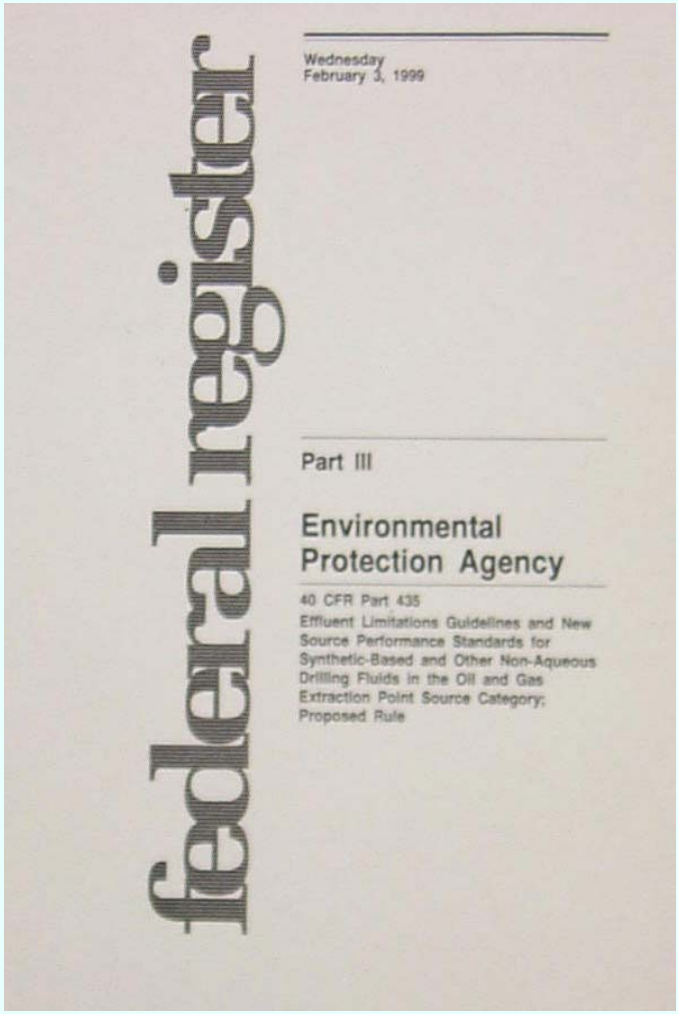
- Environmental Protection Agency (EPA) or delegated states issue NPDES permits for discharges

EPA Oil and Gas Effluent Limitations Guidelines (ELGs) [40 CFR 435]



Offshore and Coastal ELGs

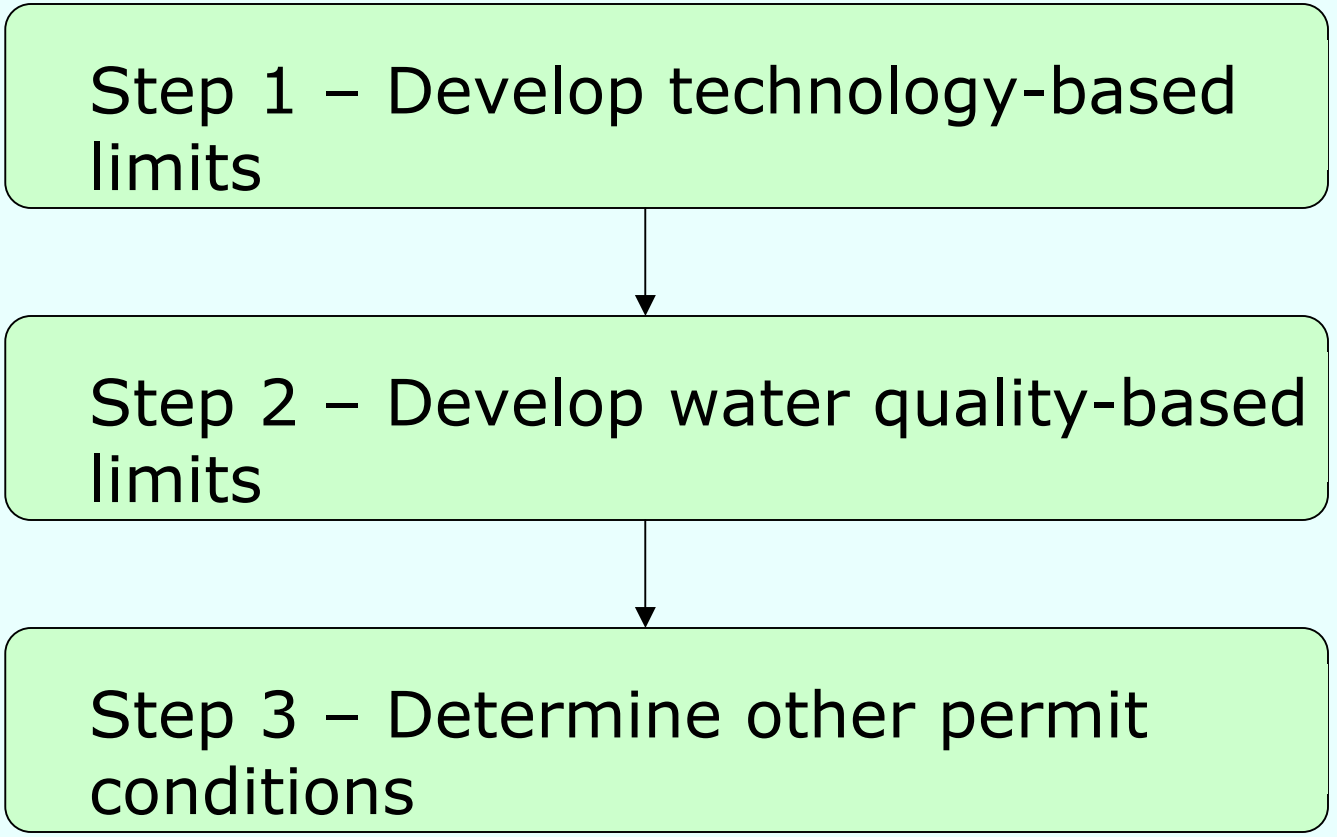
- **Best Available Technology (BAT) for offshore produced water:**
  - **Oil and grease limits before discharge**
    - ↗ **29 mg/l monthly average**
    - ↗ **42 mg/l daily maximum**
- **BAT for coastal produced water**
  - **zero discharge except in Cook Inlet, Alaska**
  - **Offshore limits are required there**



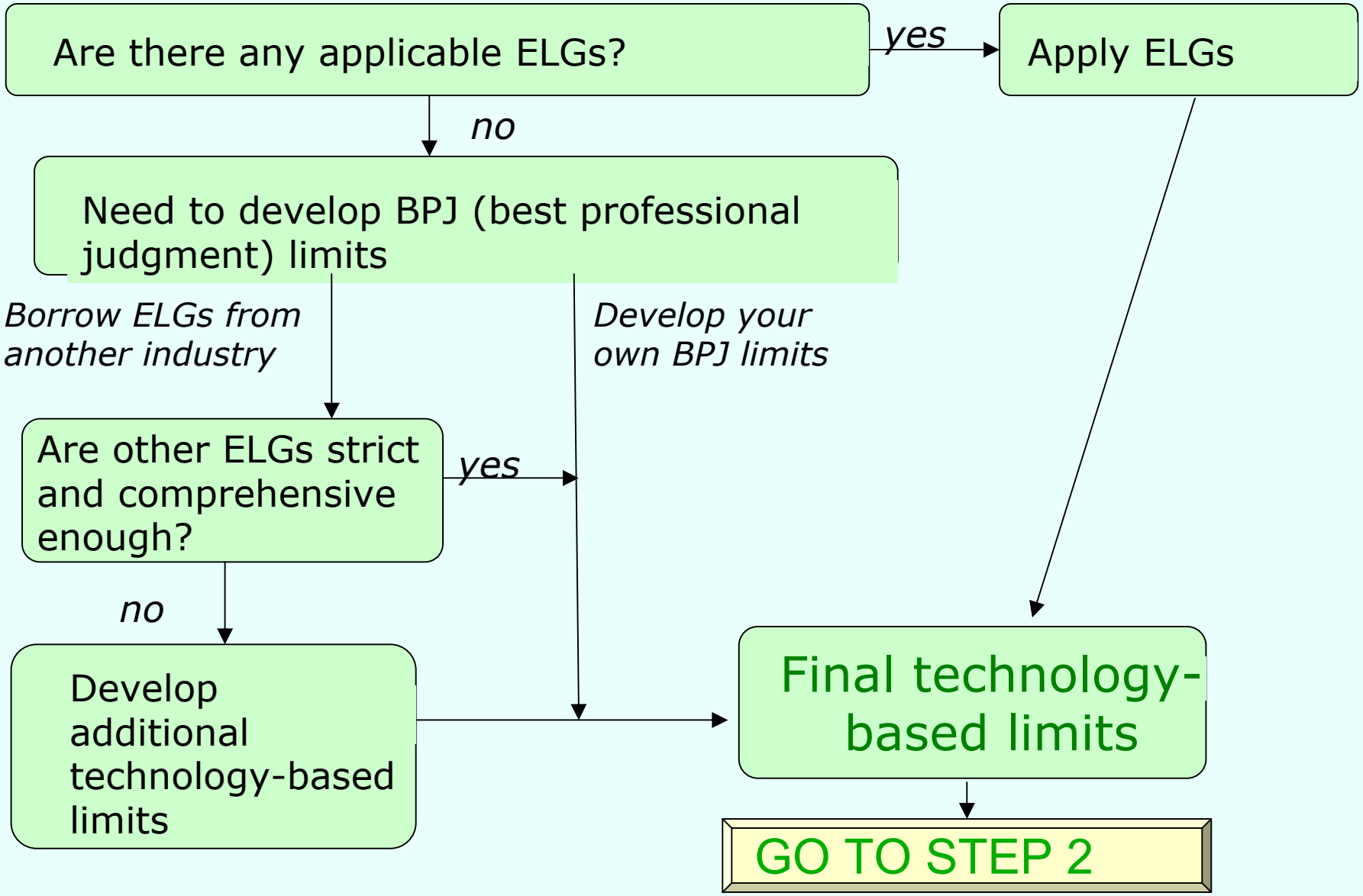
ELGs for Wells Located Onshore

- Onshore subcategory
  - zero discharge
- Stripper subcategory
  - No national requirements
  - Jurisdiction left to state or EPA region
- Agricultural and Wildlife Use subcategory
  - produced water must have a use
    - Water must be of good enough quality for wildlife, livestock, or other agricultural use
    - Produced water must actually be put to that use
  - Oil and grease limit of 35 mg/l maximum

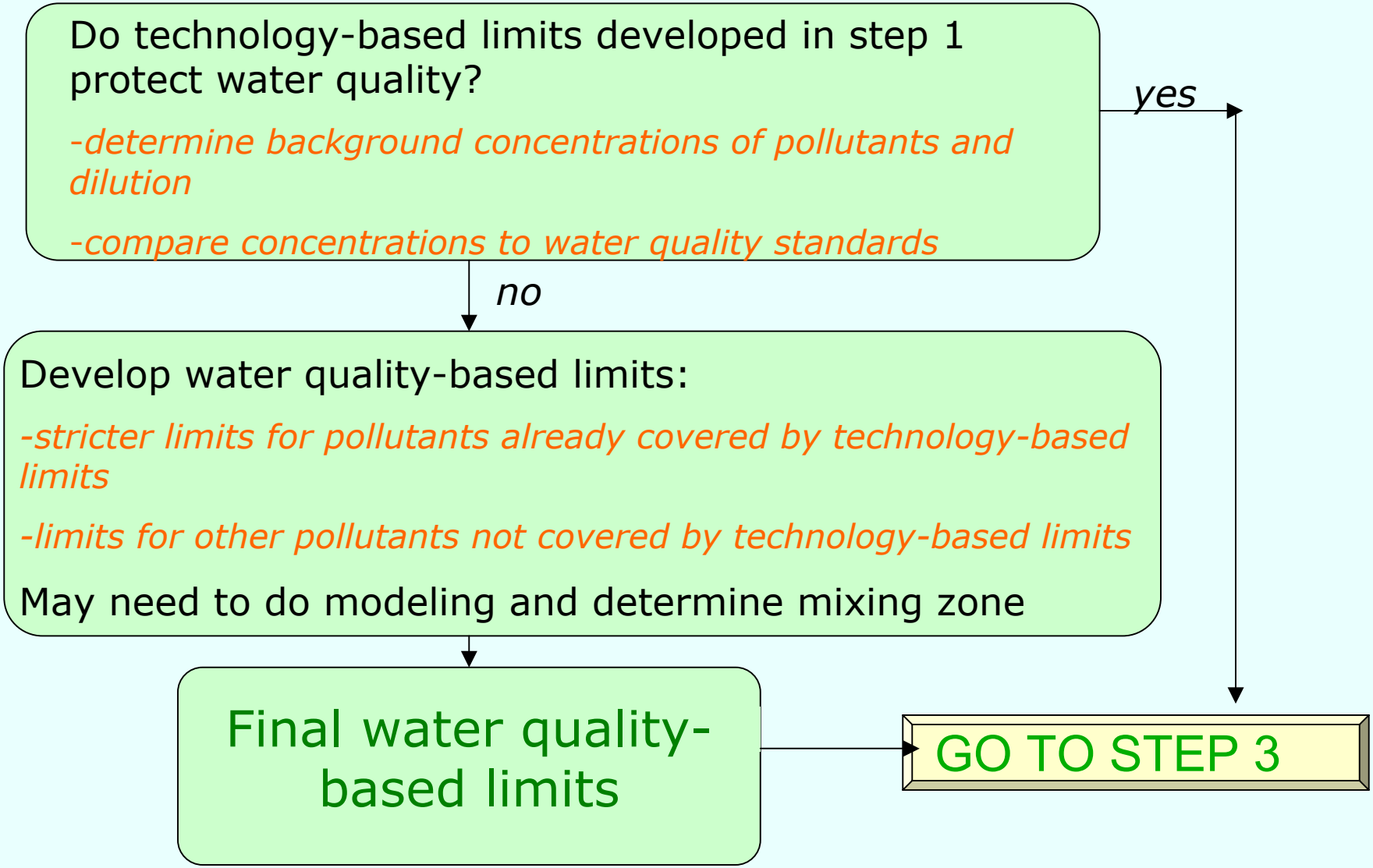
Establishing NPDES Permit Limits and Conditions – Simplified Overview



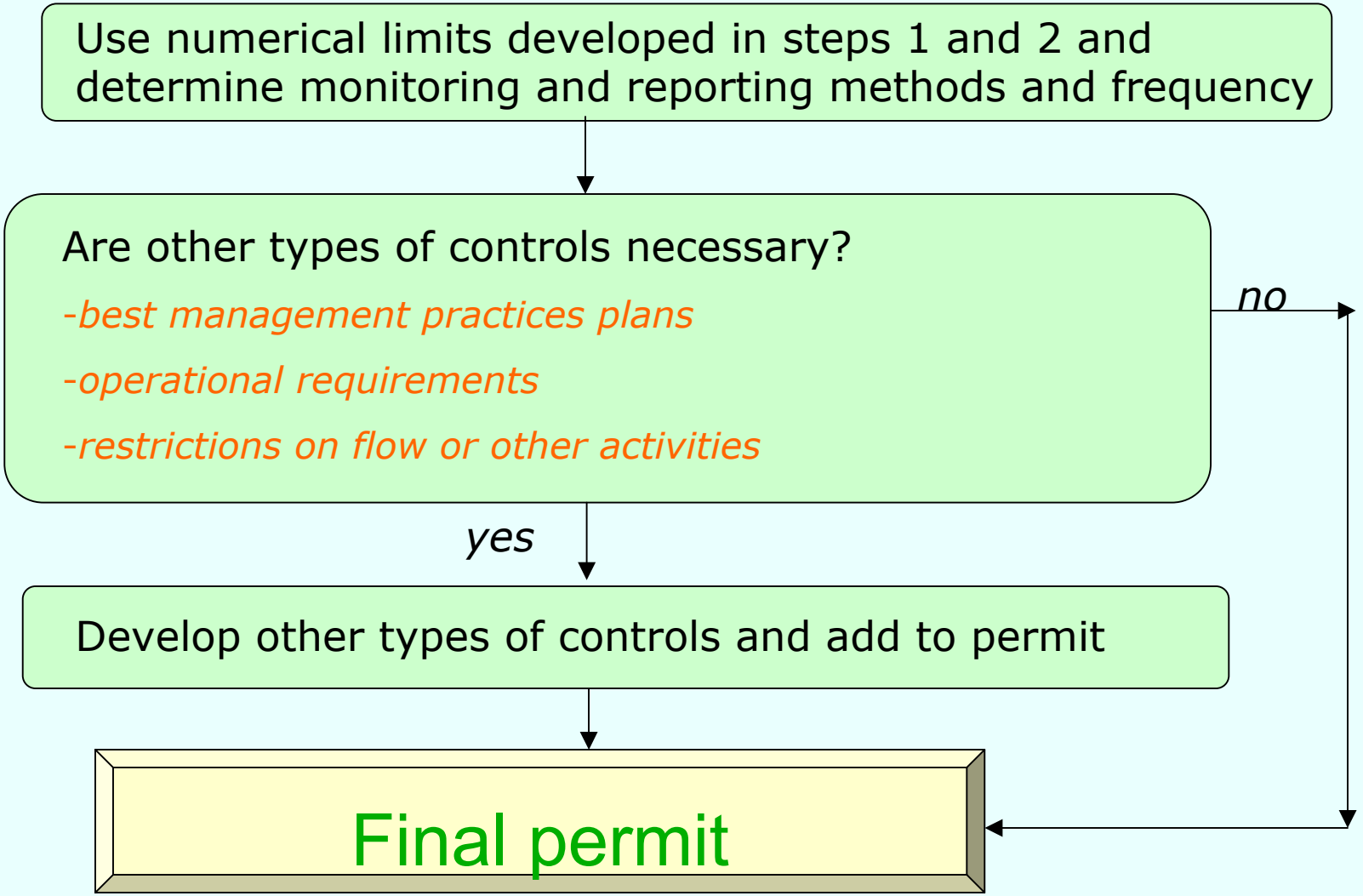
Establishing NPDES Permit Limits and Conditions
Step 1 - Develop Technology-based Limits



Establishing NPDES Permit Limits and Conditions
Step 2 - Develop Water Quality-based Limits



Establishing NPDES Permit Limits and Conditions
Step 3 – Determine Other Permit Conditions



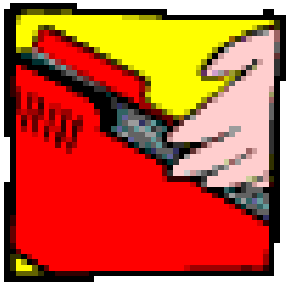
How Does This Relate to CBM Produced Water?

- During development of oil and gas industry ELGs, EPA did not envision or study CBM industry
- Some parties suggest that oil and gas industry ELGs are not relevant to CBM water
  - CBM water is more like drainage from coal mines (regulated by coal mining ELGs at 40 CFR 434) than produced water from conventional oil and gas production
  - CBM water could be regulated by BPJ

History of CBM Water Regulation

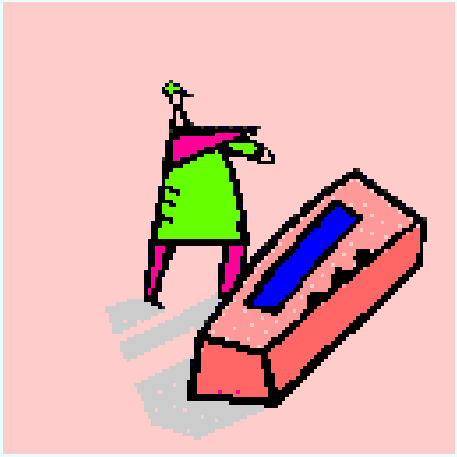
- **Alabama fought the early battles**
  - **In the mid-1970s, CBM was produced for mine safety, not as a product**
  - **During Arab oil embargo, natural gas prices rose, and coal companies tried to collect and sell the gas**
  - **In early 1980s, Alabama producers petitioned EPA Region 4 for relief from oil and gas ELGs**
    - **Being east of 98th meridian, Agricultural and Wildlife subcategory did not apply**
  - **EPA agreed that, at least in Alabama, CBM water was not regulated by oil and gas ELGs**

Permitting Practices in Alabama



- Alabama DEM originally issued NPDES permits based on coal ELGs and other water quality-based limits
- Currently, permits contain:
  - Limits on pH, Fe, Mn, BOD, oil and grease, DO
  - Monitoring for conductivity, chlorides, effluent toxicity
  - Install diffuser
  - BMP plan

Permitting Practices in Region 8



- **WY, MT, and CO have NPDES primacy except for:**
  - **Tribal lands in all 3 states**
  - **Federal facilities in CO**
- **Each state has elected to develop permits with limits based on BPJ and water quality protection**
  - **Did not use oil and gas/agricultural and wildlife use ELGs**

Related EPA Activities

- **Preparation of study assessing water management options, effectiveness and cost**
  - **Would help EPA write permits for tribal lands**
  - **Could be used by environmental advocacy groups to challenge permits issued by states**
  - **Draft study should be ready soon**
- **EPA headquarters, ELG office has been petitioned to develop new ELGs for CBM water**
  - **No decision made on this**

Discussion

- **For first few CBM discharges, states can carefully assess impacts**
- **When hundreds or thousands of new wells are drilled and huge volumes of water are produced in historically arid areas, situation becomes more complicated. Impacts on:**
  - **Surface water hydrology**
  - **Ground water elevation and water quality**
  - **Soils/crops**
  - **Western culture**

Other Water Management Options

- Types of options
  - Injection
    - Shallow – aquifer recharge
    - Deep – disposal
  - Land application
    - Irrigation
  - Storage and evaporation
  - Livestock and wildlife water supplies
- Considerations in selecting options
  - What do regulations allow?
  - Cost
  - Ease of regulatory approval
  - Technical feasibility

Final Thoughts

- National Energy Strategy counts on expansion of CBM production
- Need strategies to manage water with both environmental protection and affordable costs
- EPA study on water treatment options and costs should provide useful information
  - States may elect to but are not required to follow the findings and recommendations of the EPA study
- Communication between stakeholders is necessary to meet the dual concerns of environmental protection and energy supply

For More Information

Download a full report on this subject at:

http://www.ead.anl.gov/pub/dsp_detail.cfm?PubID=1477