Multi-beneficial Use of Produced Water Through High-pressure Membrane Treatment and Capacitive Deionization Technology

Funding Agency:

- **US Bureau of Reclamation**

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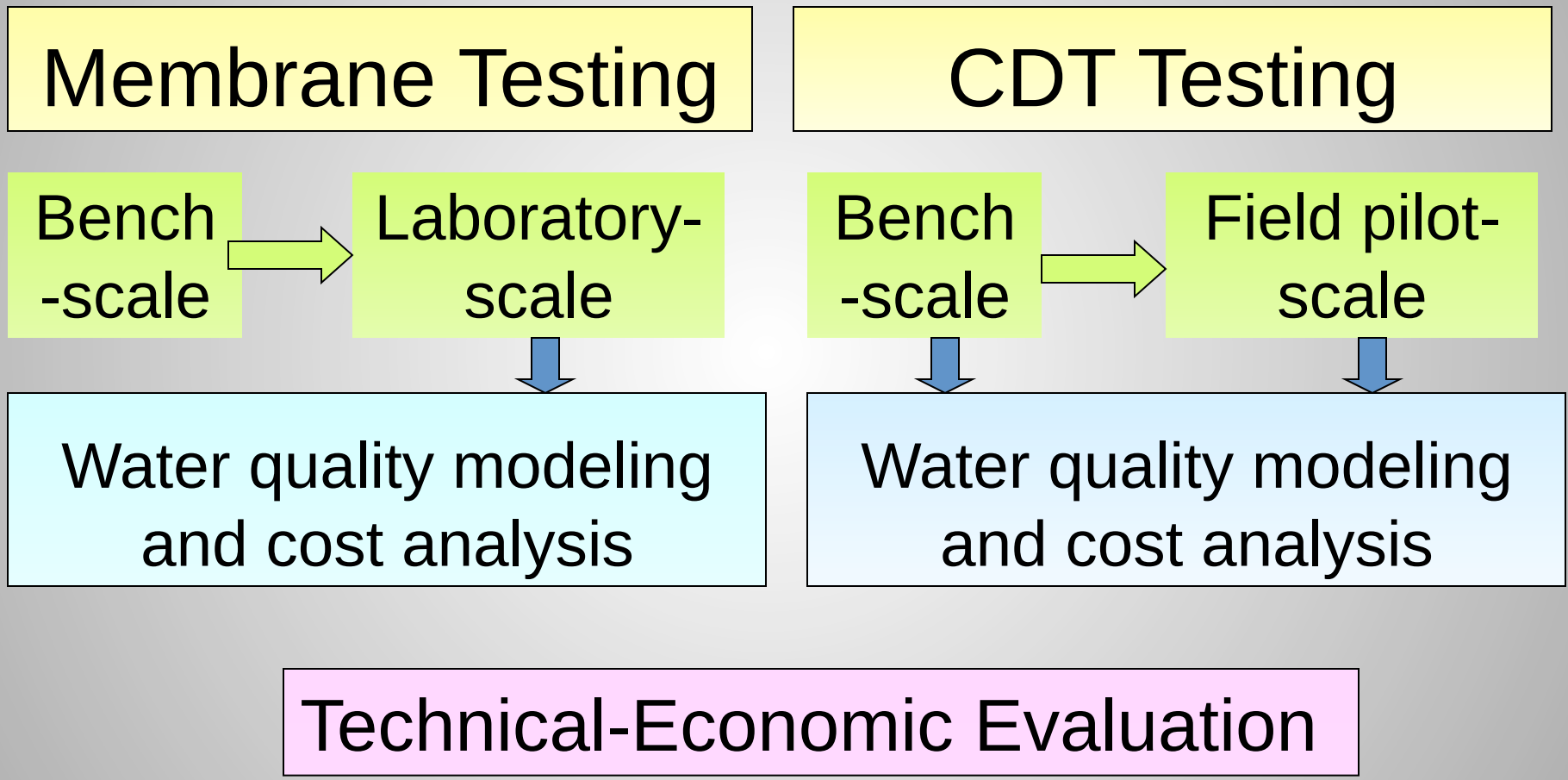
Project Objectives

- Investigate the viability of ultralow pressure RO and nanofiltration (ULPRO/NF) membranes and capacitive deionization (CDI) as potential techniques to treat produced water while meeting non-potable and potable water quality standards, and providing conditions which would allow an economical iodide recovery

Methodology



Major Conclusions

- Data collection
  - Literature Review
  - Targeted interviews and meetings
  - Expert workshop with stakeholders
- Case study analysis
- Development of Planning Issue Matrix

Major Conclusions

- Membrane technology was more cost-effective than CDT and provided a better overall performance in terms of product water quality and iodide recovery.
- Clean-in-place using caustic and anionic surfactant solutions can restore membrane permeability effectively.
- Field tests did not exhibit CDI electrode fouling or degradation during produced water treatment
- As a novel and emerging desalination technology, the system design and operation of CDI need further optimization