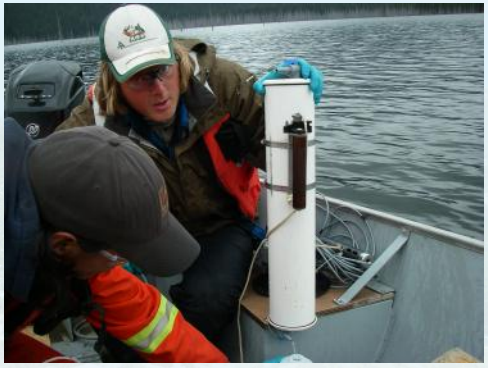
Environmental Effects Monitoring (EEM) under Proposed *CMER*



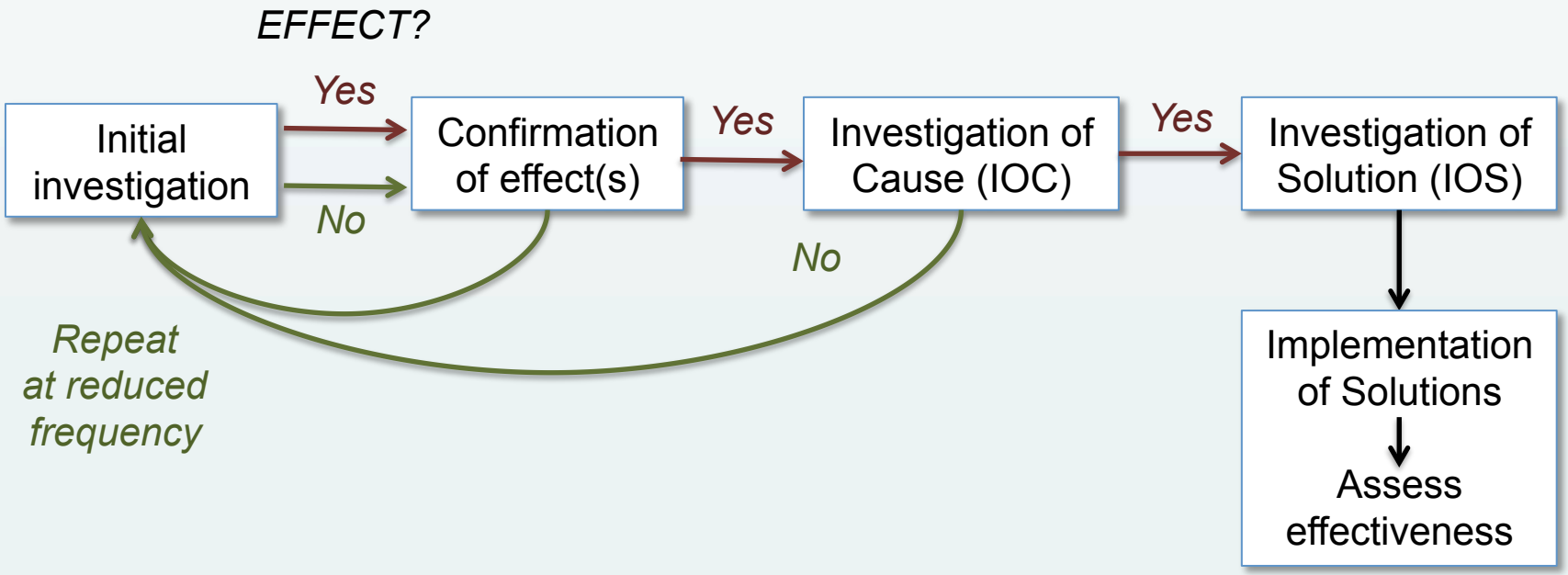
Federal EEM

- Created to verify effectiveness of new *PPER* (1992)
  - "Assess the overall adequacy" of effluent limits (are they protective?)
- Also applied to metal mines under *MMER* (2002)
- Objectives of program:
  - National consistency;
  - Site-specificity;
  - Scientific defensibility; and,
  - Cost-effectiveness.
- Supported by extensive, prescriptive Technical Guidance
- *Many coal mines already do EEM-style monitoring, under site-specific provincial permit requirements*

Federal EEM Components

- EEM is an effects-based program, focused on operating pulp mills and mines
- **Site Characterization→ Design→ Implementation→ Reporting**
- **Laboratory component:**
  - Sublethal effects of effluent on fish, invertebrates, algae.
- **Field components:**
  - Effects on fish health (reproduction and condition);
  - Effects on use of fish tissues (bioaccumulative contaminants);
  - Effects on fish habitat (benthic invertebrate surveys)
  - Monitoring of potential stressors (WQ, SQ) provides *supporting data* for effects assessment.
- EEM progresses through an step-wise framework…

EEM Investigative Framework



Proposed *CMER* EEM Components

- Effluent characterization (quarterly: metals, nutrients);
- Water quality monitoring (quarterly & during EEM field studies);
- Sublethal (chronic) toxicity testing of effluent:
  - On Final Discharge Point with “most potential environmental adverse impact”
  - Fish, invertebrate, algae, plus aquatic plant for freshwater discharges
  - 2x annually for first 3 years, then quarterly only for most sensitive test
- Biological monitoring studies, to determine any effect on:
  - Fish populations;
  - Fish habitat (benthic invertebrate communities); and
  - Fish tissue quality, specifically for mercury.
- Applies to mines with point-source and those with non-point-source (seepage) discharges

Proposed *CMER* EEM Components

- 3-year EEM cycles proposed under proposed *CMER*, extending to 6-year cycles with demonstrated proof of no effects
- Some exemptions from required biological monitoring for point-source discharges with rapid dilution in receiving environment
- Fish tissue monitoring can stop after 2 cycles of “no effect” on Se or Hg concentrations
- “Coal mines [must] consider all relevant data, analysis, scientific information, as well as Indigenous Knowledge for the purpose of meeting the EEM requirements.”