Water Quality Protection Initiatives in the Agricultural Operation Practices Act and Regulations

Peter Woloshyn

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About the NRCB

- NRCB is under the jurisdiction of the Minister of Sustainable Resource Development
- Responsible for administering two Acts:
  - **Natural Resources Conservation Act**
    - Ensure projects affecting Alberta's natural resources are in the "public interest"
    - Decisions attempt to balance economic prosperity, environmental protection and social acceptability
  - **Agricultural Operation Practices Act**

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NRCB Staff

- 4 Board Members
- Approximately 50 staff in 6 offices throughout Alberta
  - Board Members and corporate support
    - Edmonton and Calgary
  - Regional/field offices (Approval Officers and Inspectors
    - Lethbridge
    - Red Deer
    - Morinville
    - Fairview

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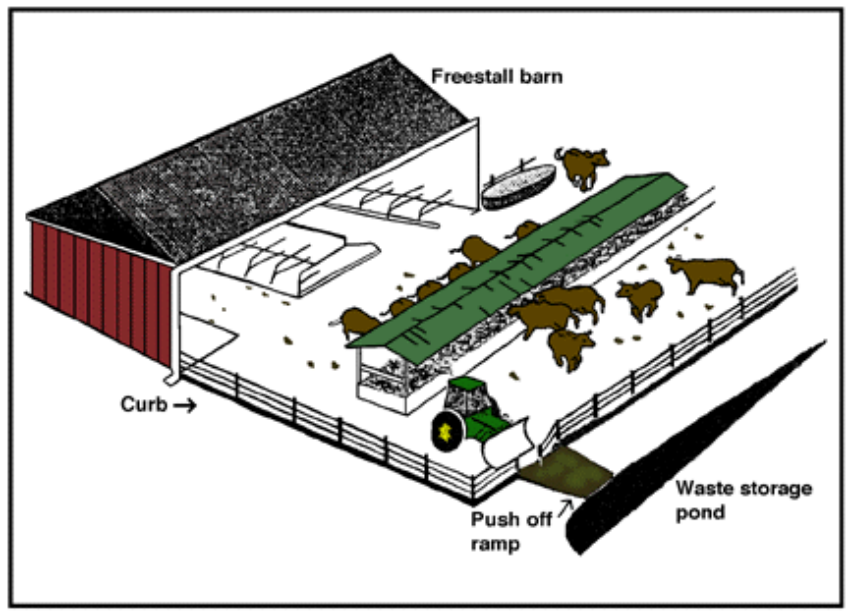
Confined Feeding Operation

- Fenced or enclosed areas where livestock are confined for purpose of growing, finishing or breeding by means other than grazing
- Livestock includes cattle, horses, swine, poultry, etc.



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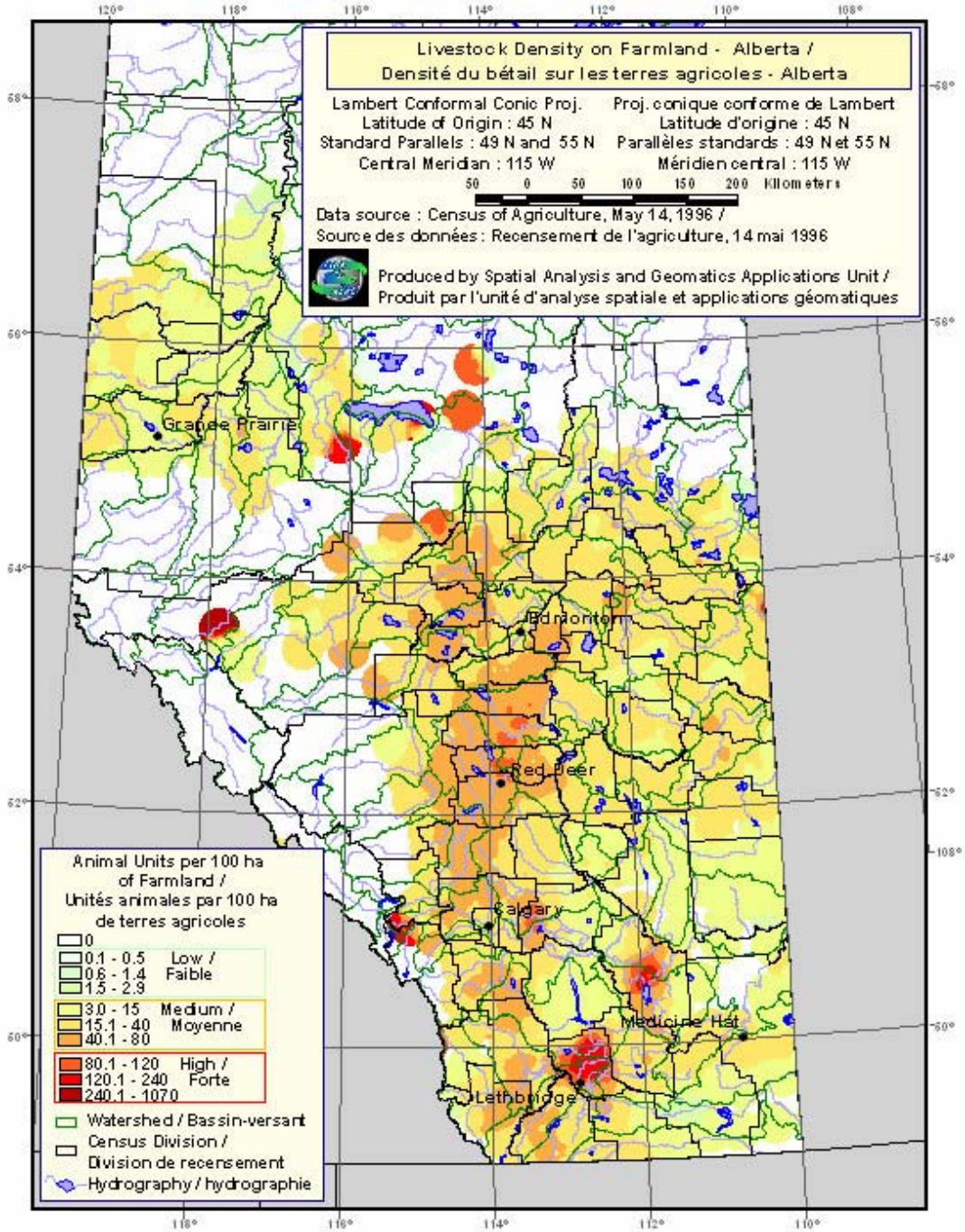
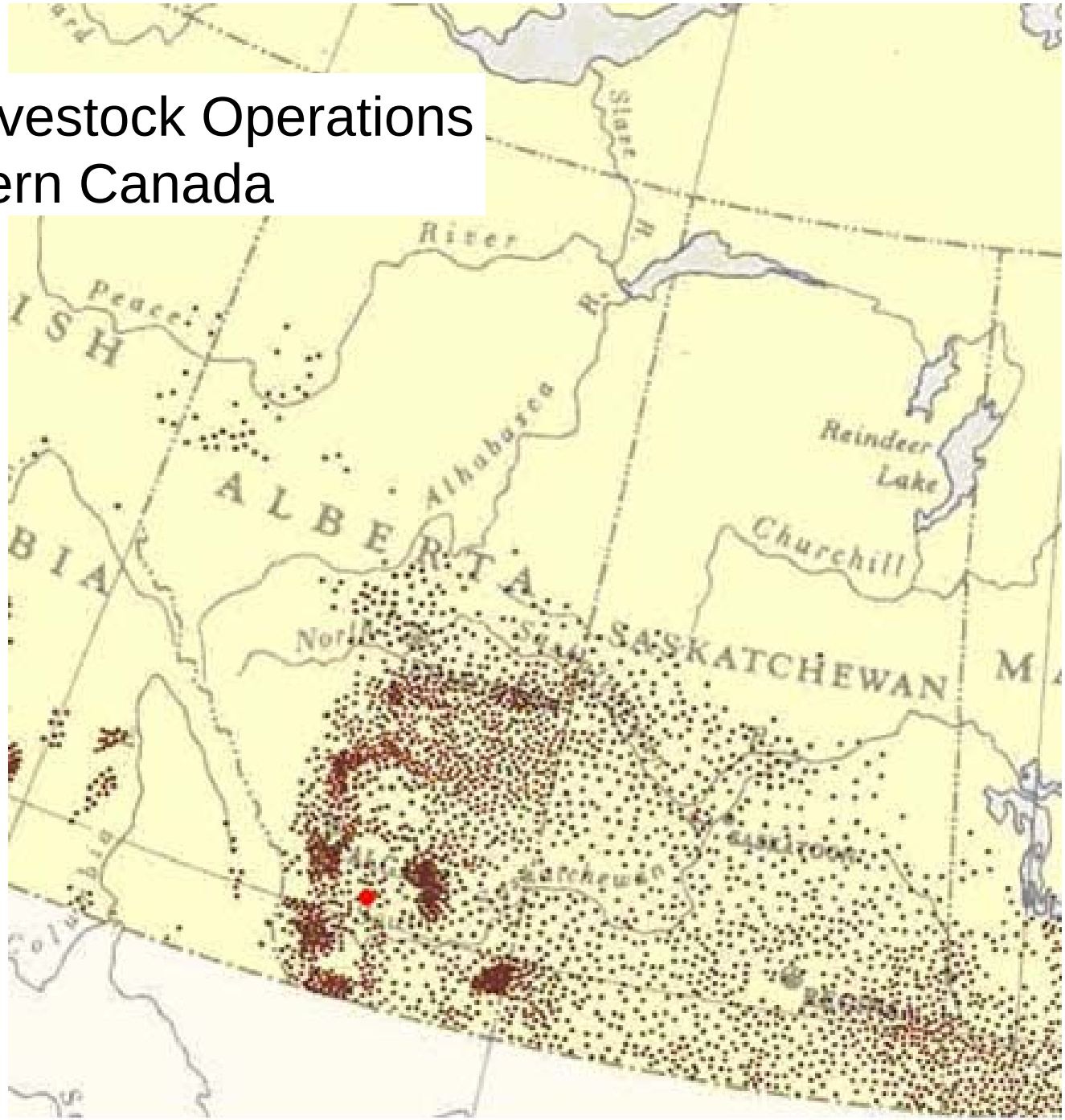
Seasonal Feeding and Bedding Sites

- Not considered CFOs
- Must be constructed, maintained and operated in accordance with AOPA
- Must locate >30m from a common body of water or:
  - Construct interceptor to divert water, or
  - Remove manure before runoff occurs
- Manure must be applied in accordance with regulations

Distribution of Livestock Operations



Distribution of Livestock Operations in Western Canada



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CFO Impact on Groundwater Quality Study (2007)

The objective was to complete a comprehensive literature review that:

- Assesses the current impact that manure collection and storage facilities used at **CFOs** have on groundwater quality within the major livestock producing regions of North America, and
- Identifies protocols to monitor the impacts that manure stored at manure collection and storage facilities may be having on groundwater quality.

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Study Highlights

- Soil and groundwater contamination can occur from CFOs

- GW contaminant plumes from CFOs are characterized predominantly by elevated concentrations of NH_4-N, Ca, Mg, K and Cl

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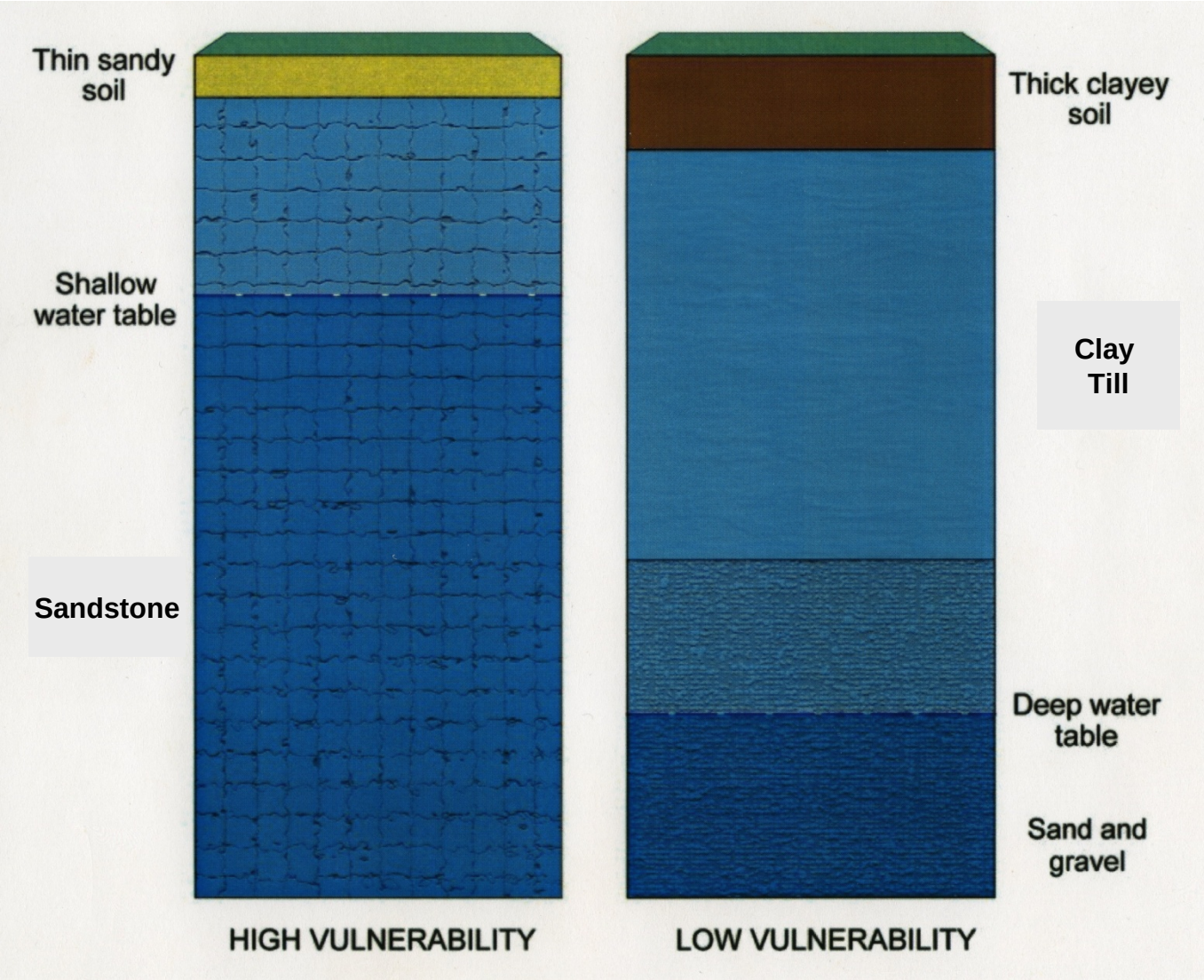
Study Highlights



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Study Highlights

- “Hydrogeologically suitable” sites should be common in Alberta
  - Clay till blanket
  - Lack of extensive shallow aquifer systems

- Evidence suggests that seepage rates from EMS sites decrease with time if soil clogging or presence of a permanent manure seal develops on the soil surface

- Limited literature review in Alberta supports lack of contaminant migration in fine grained deposits – contamination localized even after 60 years of operation

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Agricultural Operation Practices Act (AOPA)

- Government commenced public consultation regarding confined feeding operations (CFOs) in 1997
- AOPA was amended in 2001
- AOPA is under jurisdiction of Alberta Agriculture and Food
- Under AOPA, the NRCB has the authority to be the regulatory body for CFOs
- Policy Advisory Group (PAG) established by GOA in 2006
  - Multi-stakeholder
  - Provides advice to NRCB on AOPA delivery

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Primary Objectives of AOPA

- To ensure the province's livestock industry can grow in an environmentally sustainable manner

- Promotes surface water and groundwater protection, e.g,
  - Liners for manure containment structures
  - Leak detection
  - Diversion structures
  - Setbacks
- Minimize nuisance impacts of CFOs (MDS)
  - Receptor land zoning
  - Municipal development plans

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AOPA Permits

- The NRCB issues three kinds of permits:
  - Approvals – for larger operations
  - Registrations – for smaller operations
  - Authorizations – for manure storage facilities or manure collection areas

- NRCB approval officer considerations for permit applications:
  - Meets requirements of AOPA and regulations
  - Consistency with land use provisions in municipal development plan

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Manure Handling Requirements

- Anyone who applies or transfers more than 500 tonnes of manure or compost per year must:
  - Conduct soil tests every year
  - Keep records for five years

- Irrespective of the amount, must:
  - Follow the soil nitrate-nitrogen and salinity limits
  - Manure incorporations requirements
  - Setback distances

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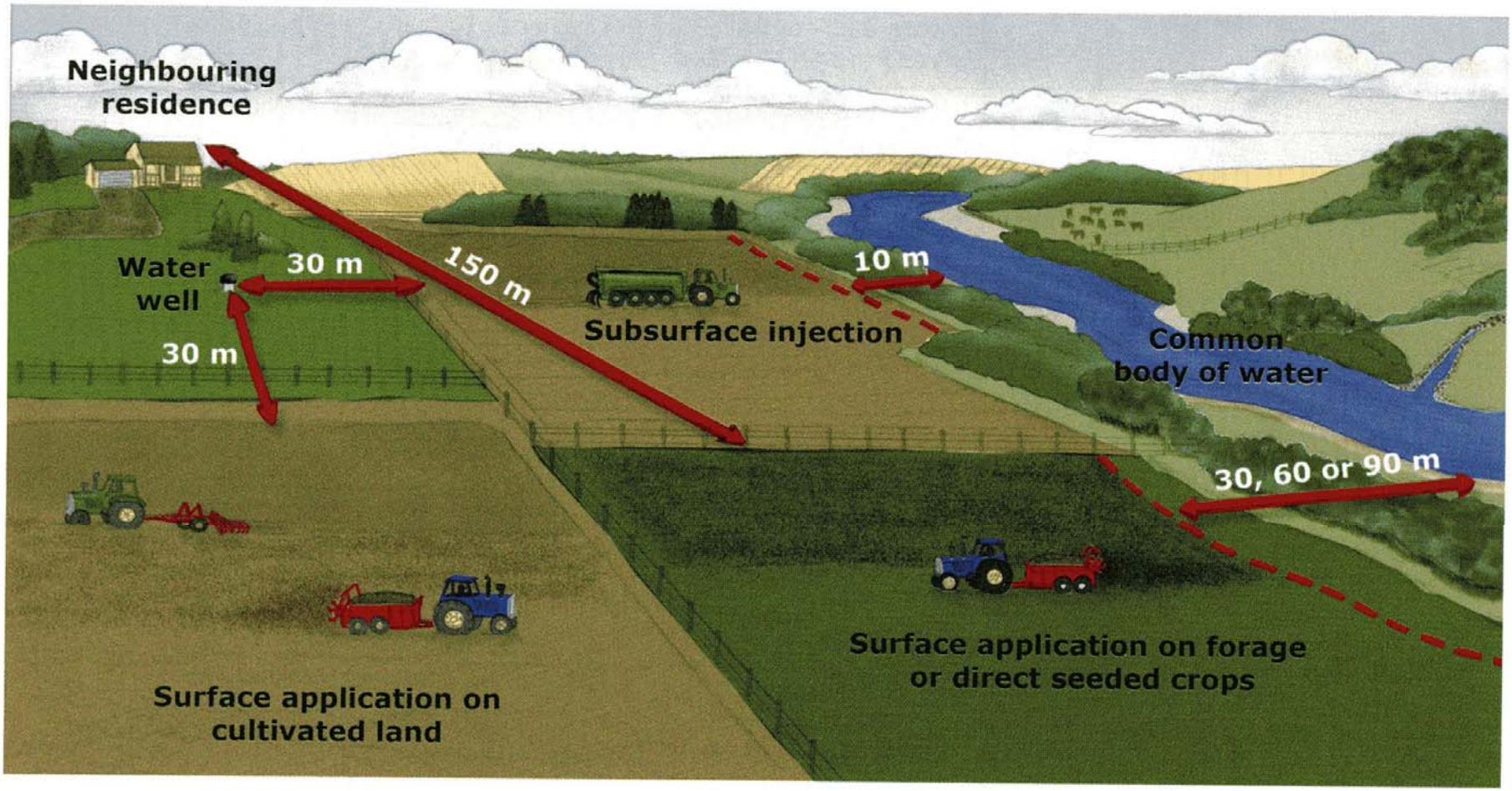
Manure Application

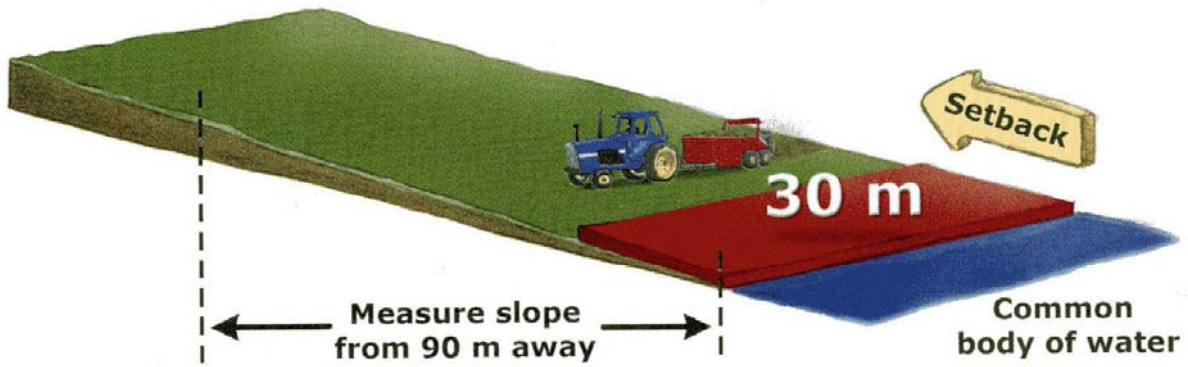


Setbacks for manure application

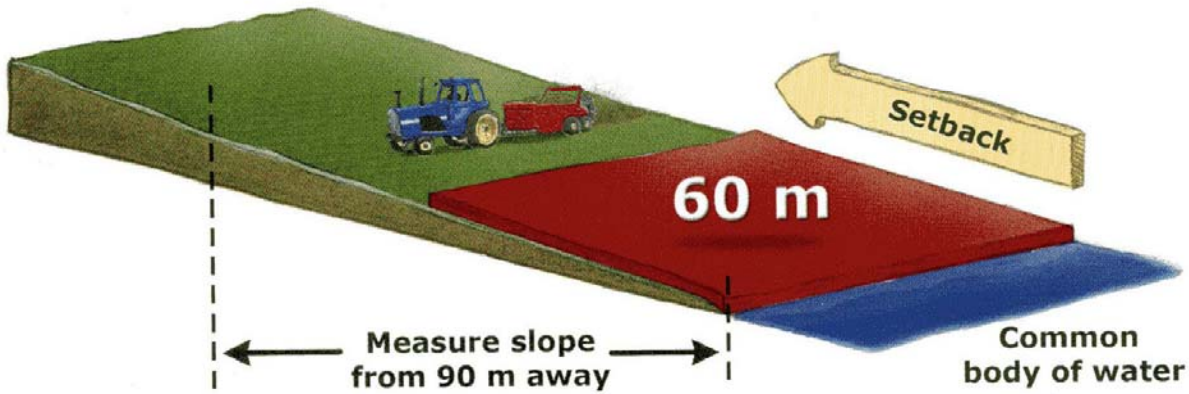
(on forage, direct-seed crops, frozen or snow-covered land)

- **Not allowed**
- **Exceptional circumstances**

4% slope or less



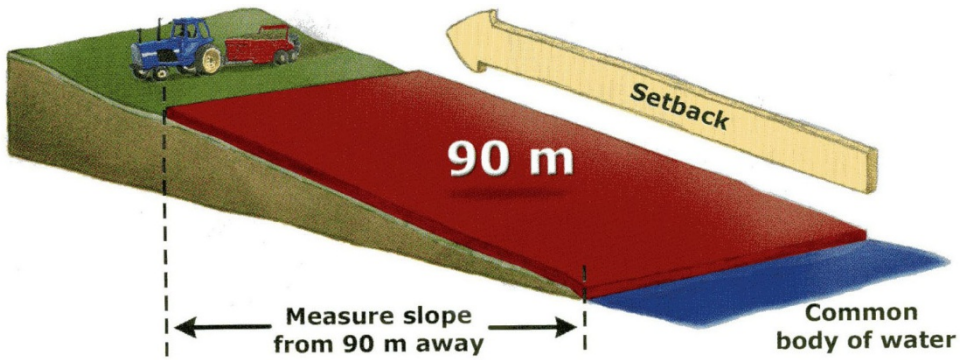
4 - 6% slope



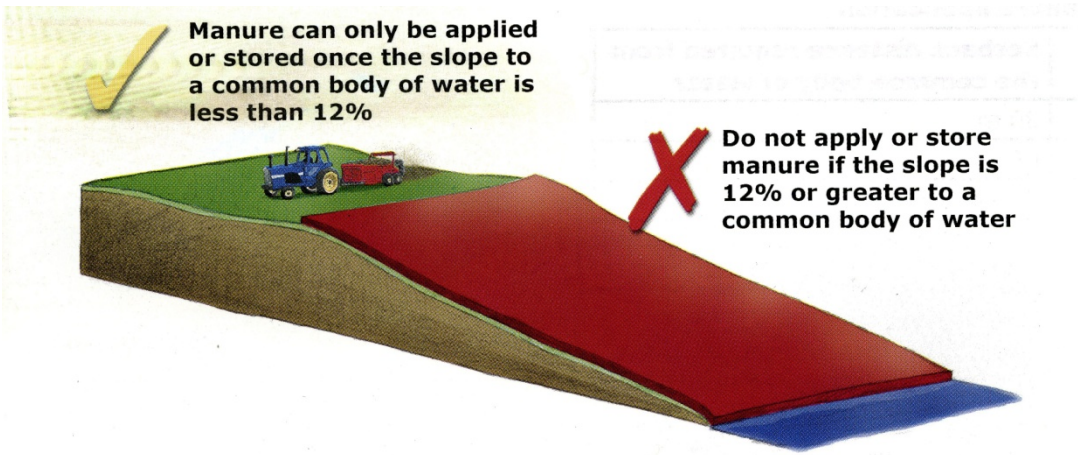
Setbacks for manure application

(on forage, direct-seed crops, frozen or snow-covered land)

6 - 12% slope



>12% slope



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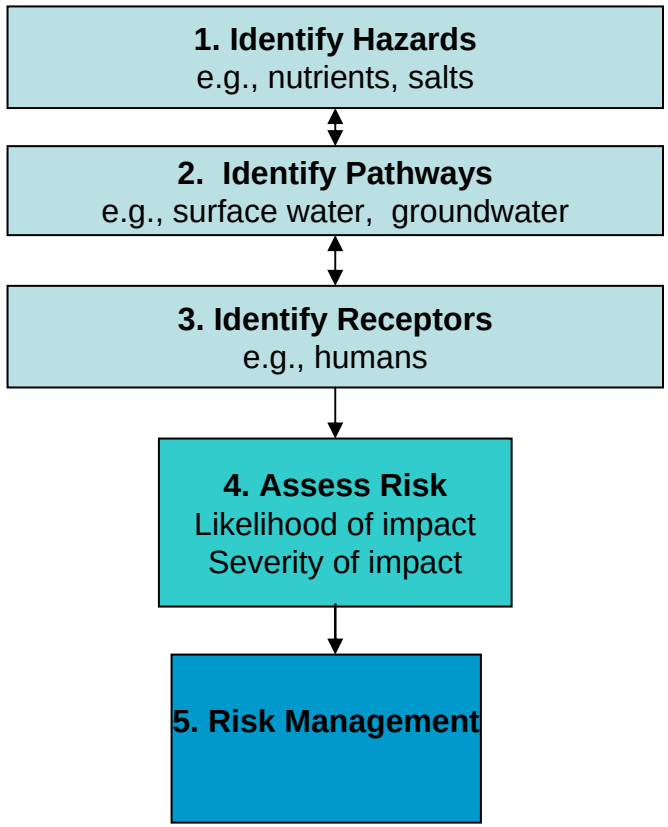
RISK SCREENING TOOL

- PAG advised that a risk screening tool is required to assess “risk to the environment”
- The focus of the tool should be on water quality protection (groundwater and surface water)
- Tools should be dynamic and evolve with changing science and practice

Risk Management Framework

Risk tool should be:

- Consistent with the risk management framework
- Developed in consultation with stakeholders using a phased approach
- Clear and flexible



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Benefits of a Risk Screening Tool

- Transparency
- Consistency
- Promotes due diligence
- Scientifically based
- Credibility
- Consistent with GOA policy (e.g., Water for Life Strategy)

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Risk Tool Working Group

- PAG supported establishment of the Group to:
  - Establish how a risk tool would be used
  - What the tool would look like
    - What data are required, data collection, analysis
    - Weighting assigned to risk factors
    - How to deal with data uncertainty
    - Appropriate risk ranking

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Features of the Numeric Risk Tool

- A **screening tool** only – not a quantitative risk assessment
- Numeric value assigned to factors based on risk / latest science
- To the extent possible factors reflect terminology in AOPA
- Consistent with existing environmental risk tools in the province
- “Special considerations” to allow for some flexibility
- Intended to be a “living” document

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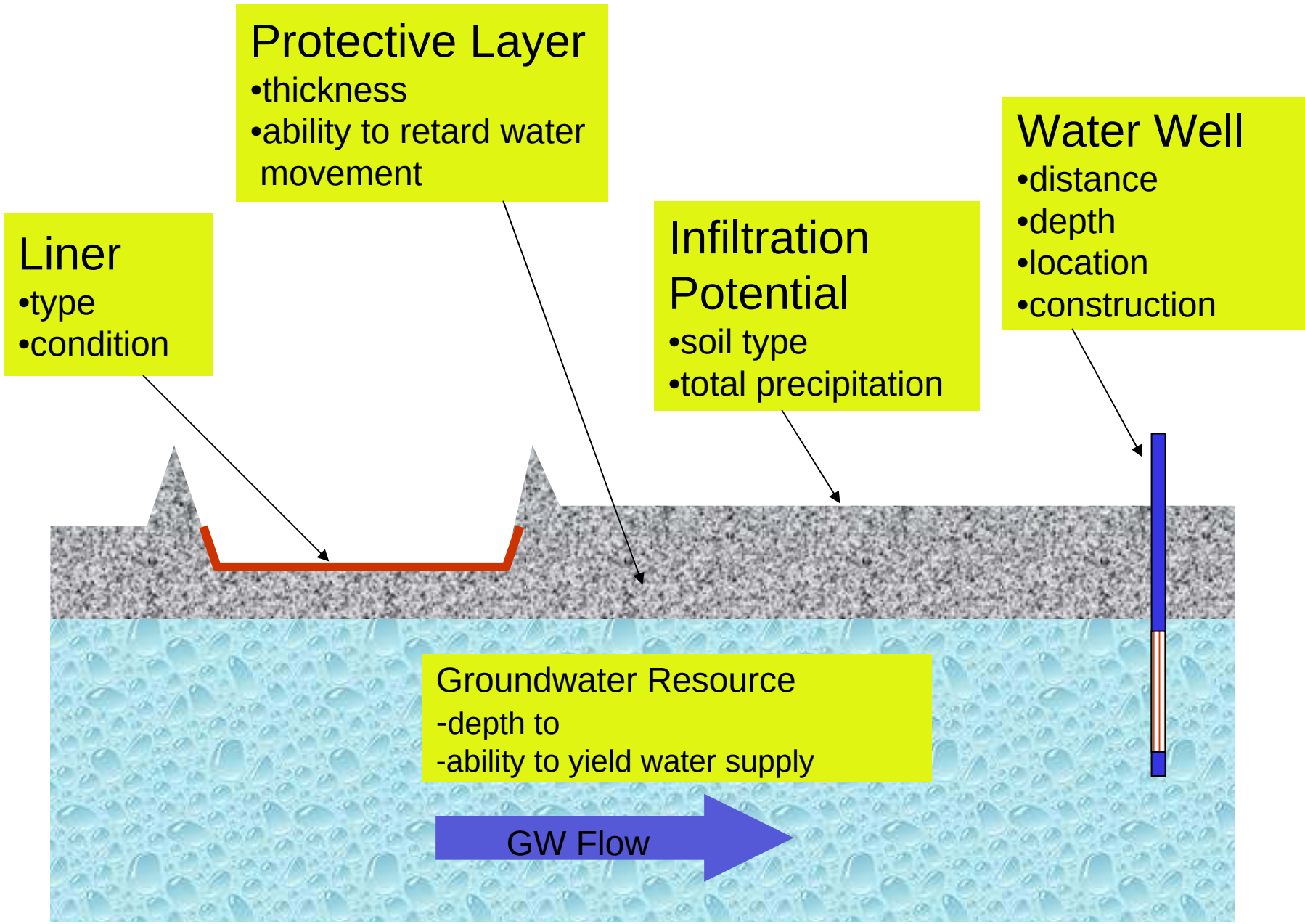
Numeric Risk Tool
Hazard Potential

- Manure source
  - Solid
  - Runoff water with manure constituents
  - Liquid manure
- Manure volume

Groundwater Pathway Factors



Surface Water Pathway Factors

Run-off Water Control

Flood Plain?

CFO

Common Water Body
- distance
- up slope/down slope
- vegetation type

Run-on Water Control

Runoff Potential

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Exposure Potential

- Three levels of risk identified for groundwater and surface water
  - High risk to the environment
  - Moderate risk to the environment
  - Low risk to the environment

- Multipliers are used to reflect likelihood and consequence of exposure

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Conclusions

- Intent of AOPA is to promote growth of industry in an environmentally sustainable manner
- Risk screening tool formalizes existing approach used by NRCB officers
- Tool is consistent with AOPA and existing risk tools
- Stakeholder consultation important in policy development

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