

# **Water Policy Branch**

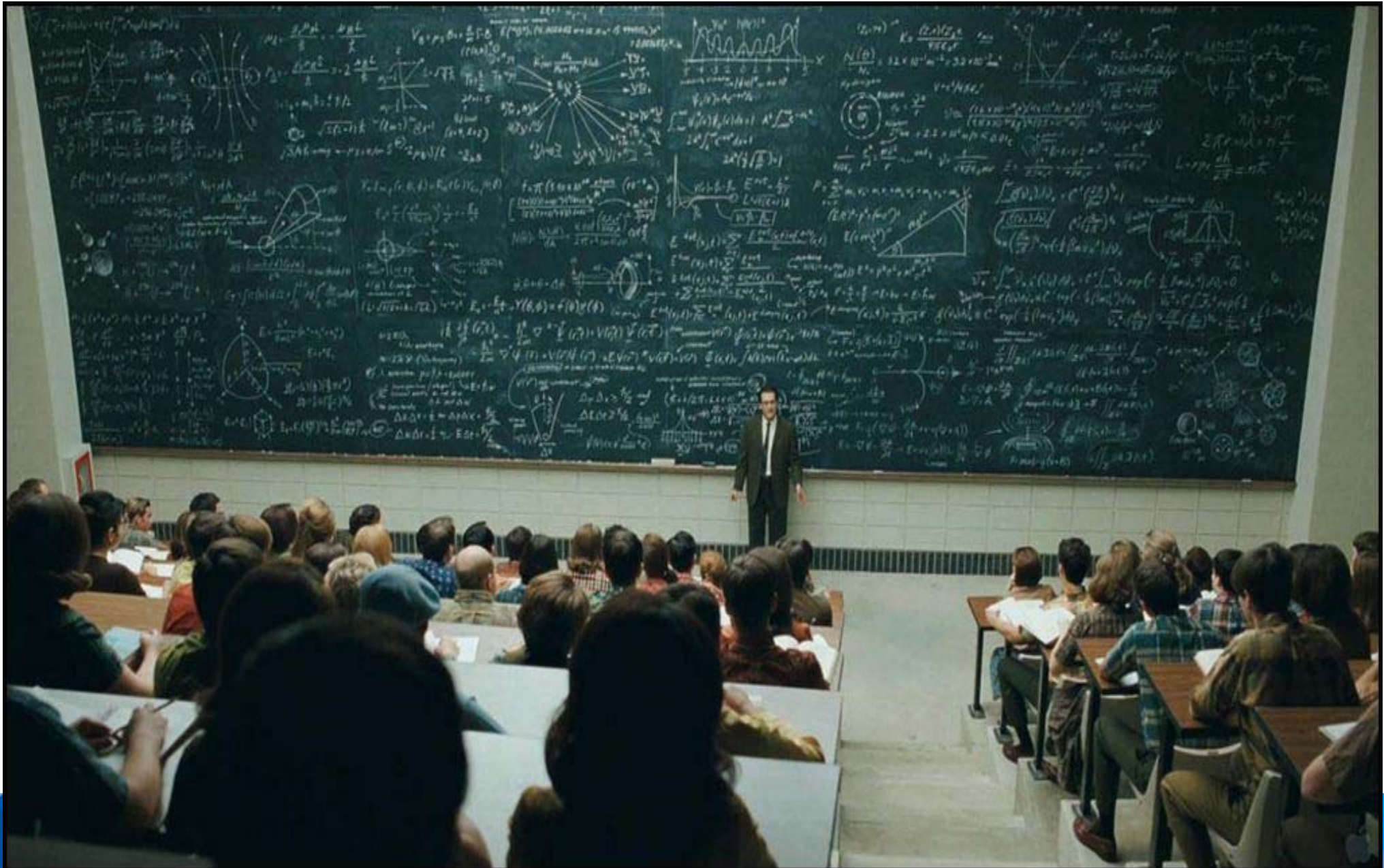
## **Groundwater Policy**

**Ross Nairne**

**Brief to Water Technologies Symposium 2011**

**April 14, 2011**

# Hydrogeology ...



# Agenda

- Provincial Context
- Water Allocation
- Policy Challenges
- Policy Updates 2010/11
- Ongoing/New 2011/12
- Question



Freedom To Create. Spirit To Achieve.

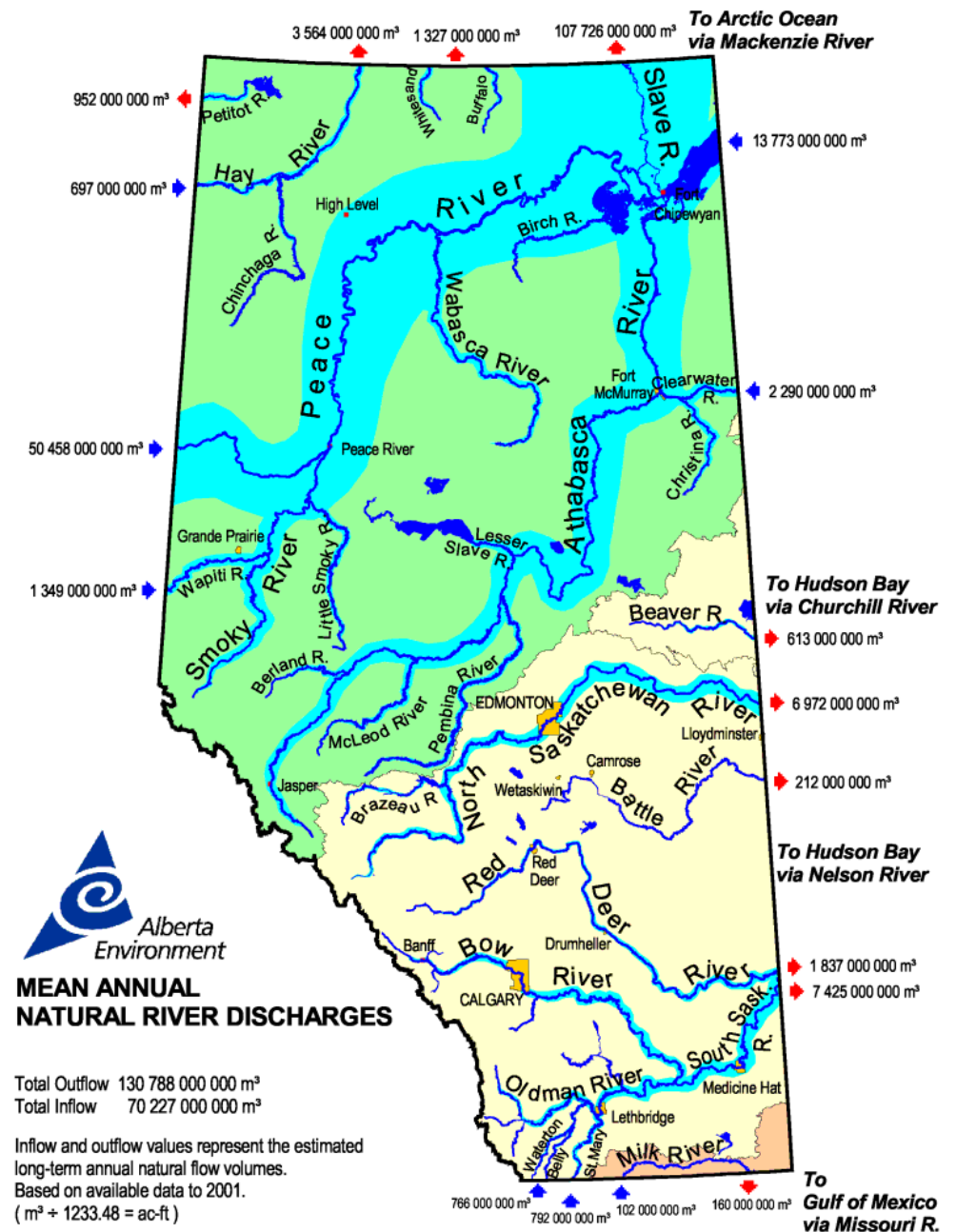
# Provincial Context

Government  
of Alberta ■

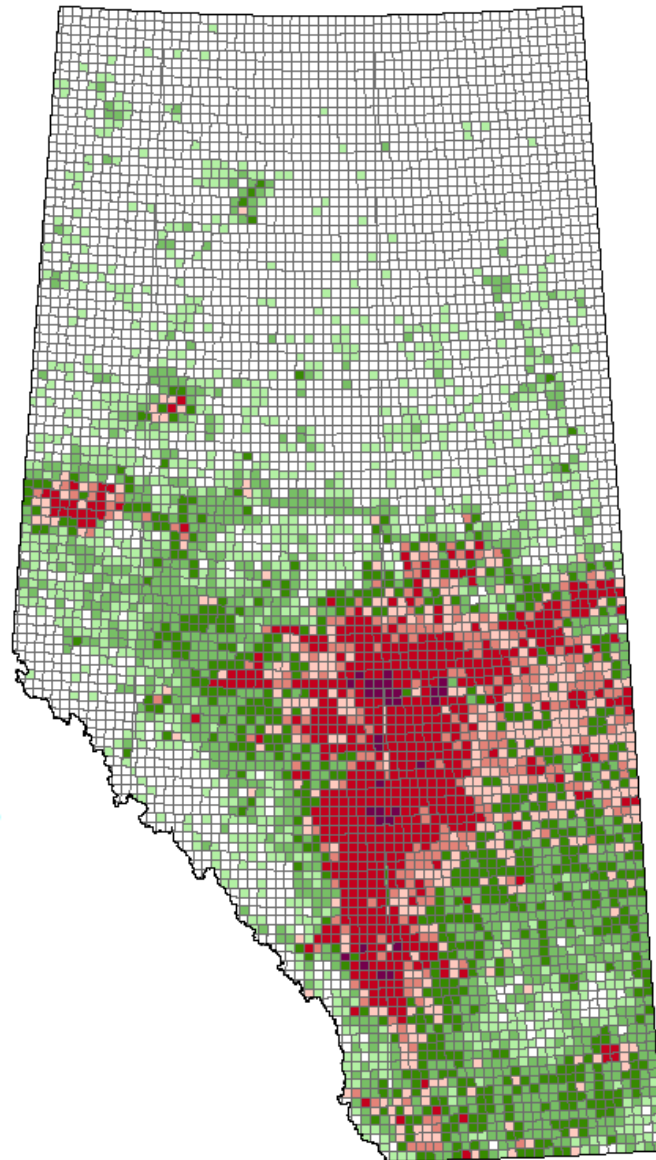


# Water In Alberta

- Where does Alberta's water go?
  - 87% flows north
  - 13% flows east
  - 0.1% flows south
- On average, Alberta "generates" about 60 billion m<sup>3</sup> of surface runoff annually
  - equivalent to 90 mm, if it were spread over the entire province



# Water well Distribution

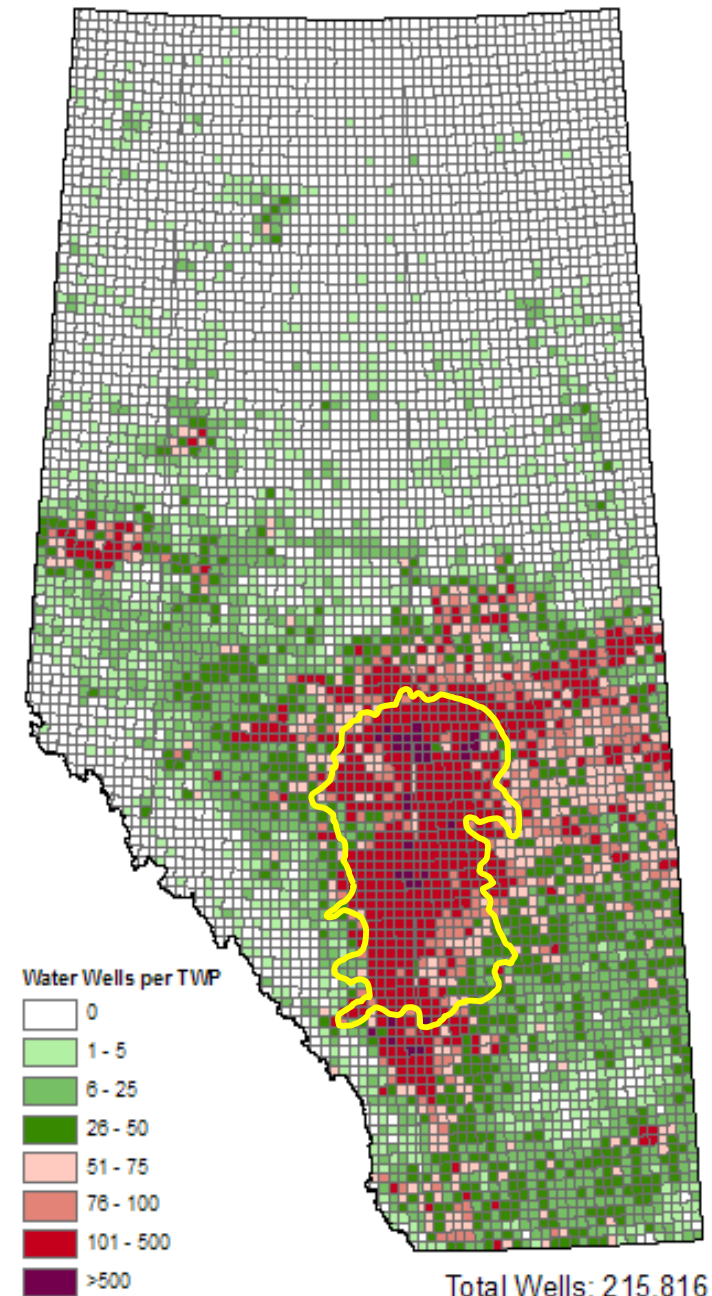


## Distribution of Groundwater Use

- Approx. 600,000 Albertans rely on groundwater
- Usage is greatest in central Alberta, and growing.

# Groundwater in Alberta

- Alberta Environment and Alberta Geological Survey currently working together to better develop our understanding of groundwater in Alberta
- Edmonton Calgary Corridor (ECC) is the first pilot project and recently completed its first phase – understanding the geology, hydrogeology and modeling the water resources
- Open File Reports and an education atlas to be released
- Work commencing on southern Alberta





Freedom To Create. Spirit To Achieve.

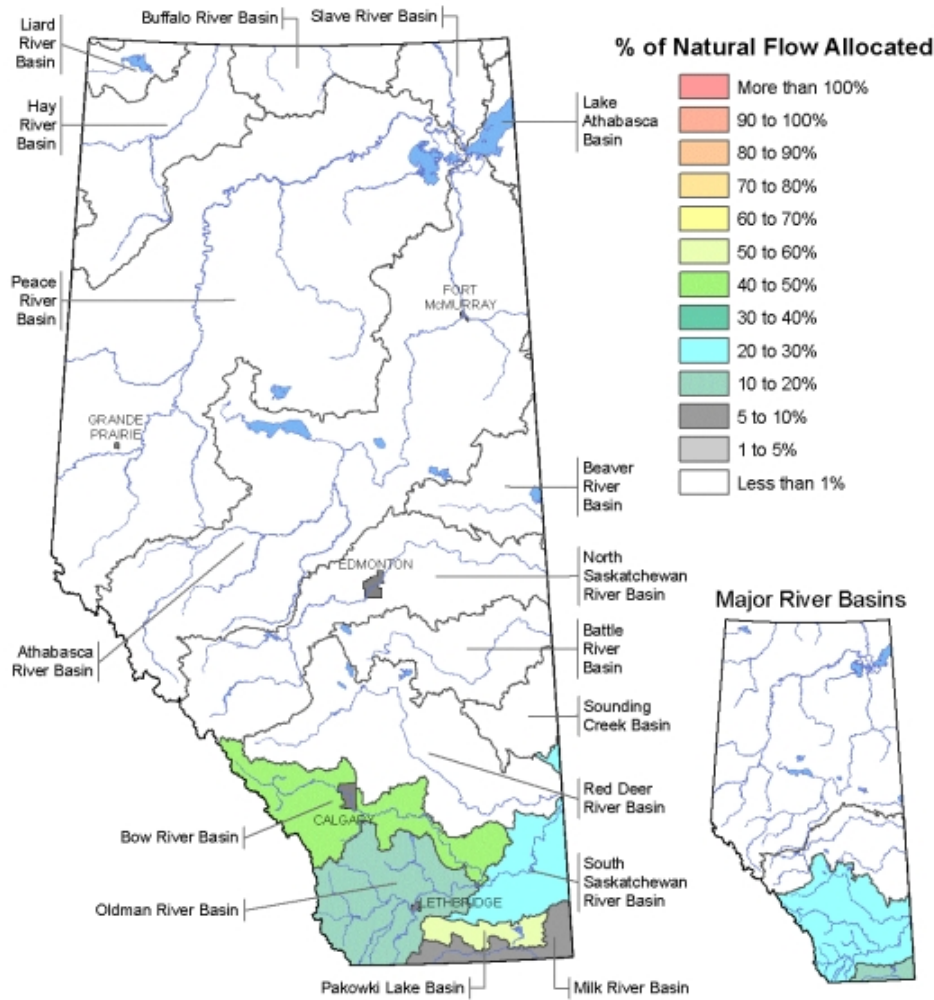
# Water Allocation

Government  
of Alberta ■



# Allocation History of Alberta – Water

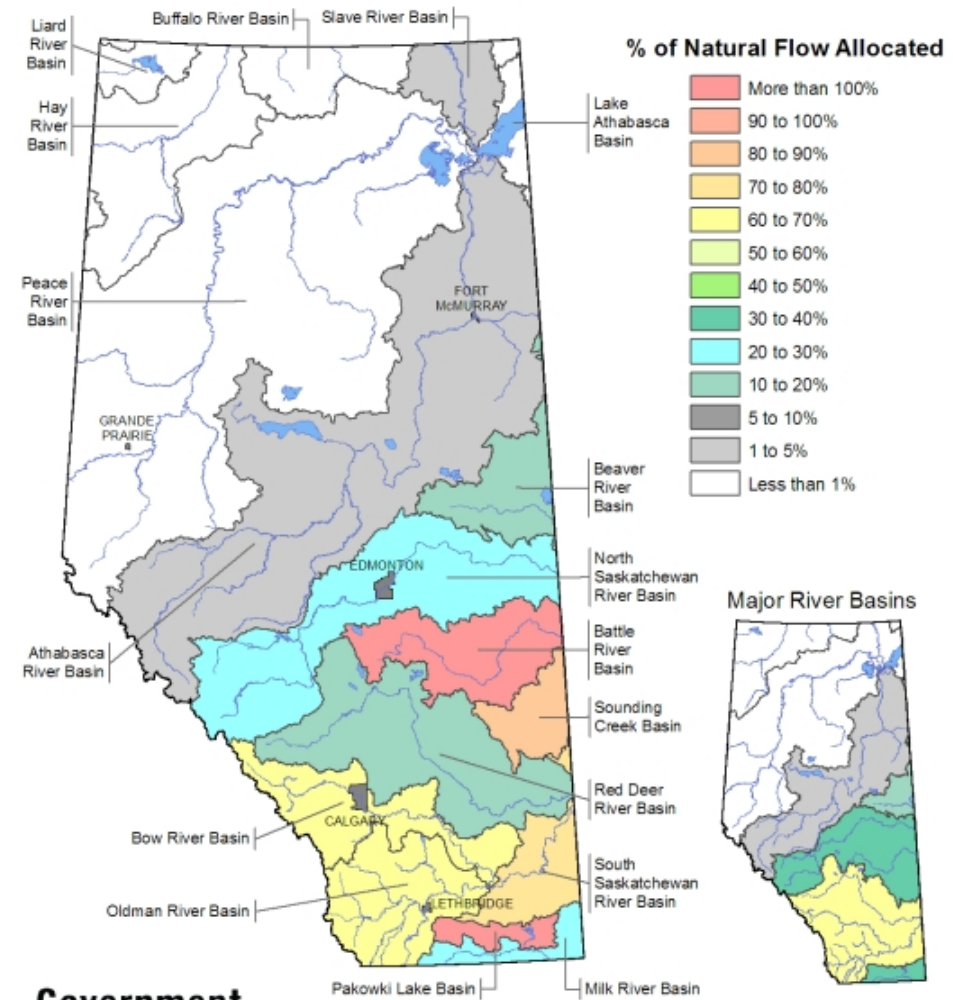
1930's



Alberta  
Environment

Note that allocations do not represent actual water use - only the maximum amount that can be used under the terms of a license. For further explanation please refer to the text in the section "Why is it important?"

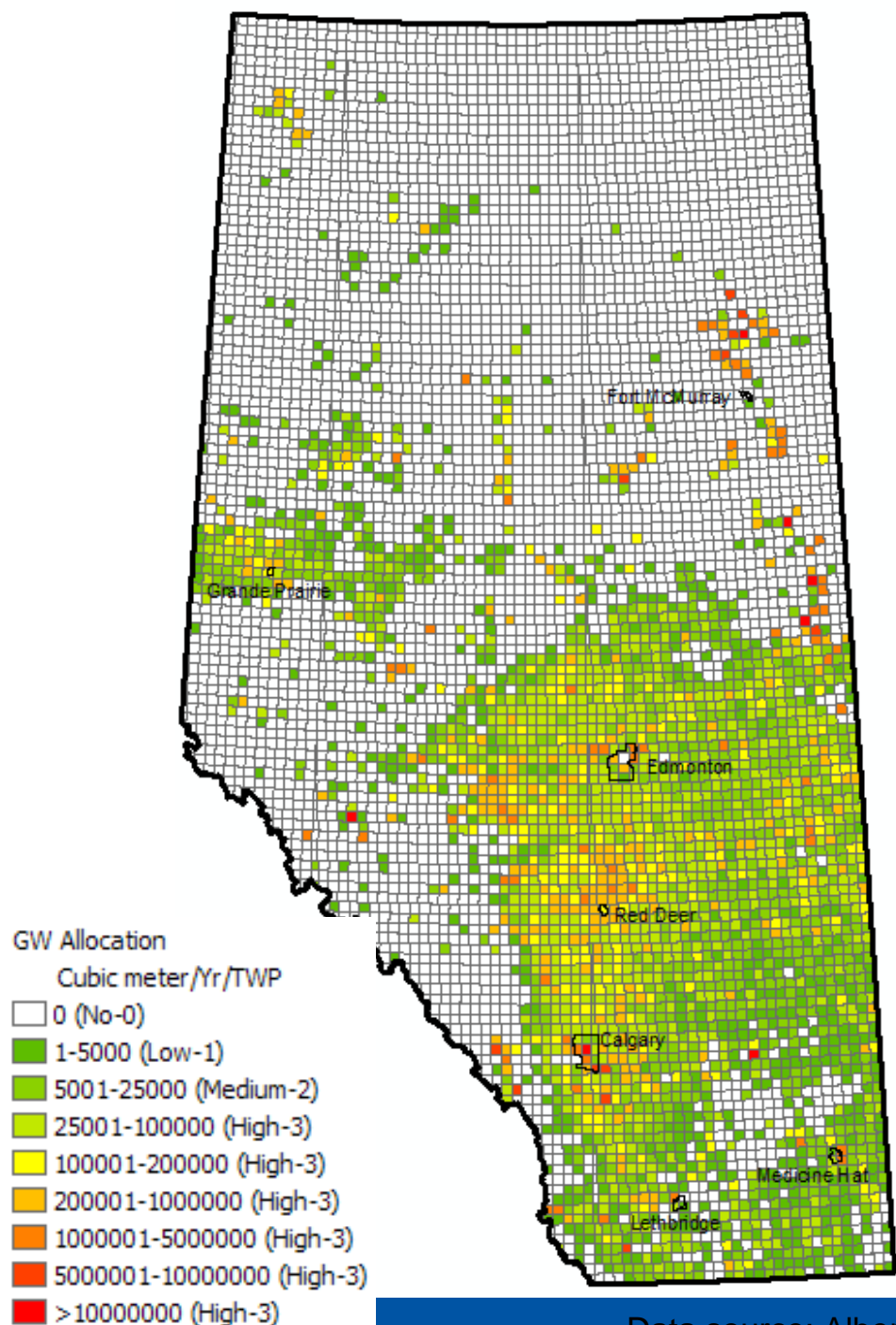
2008



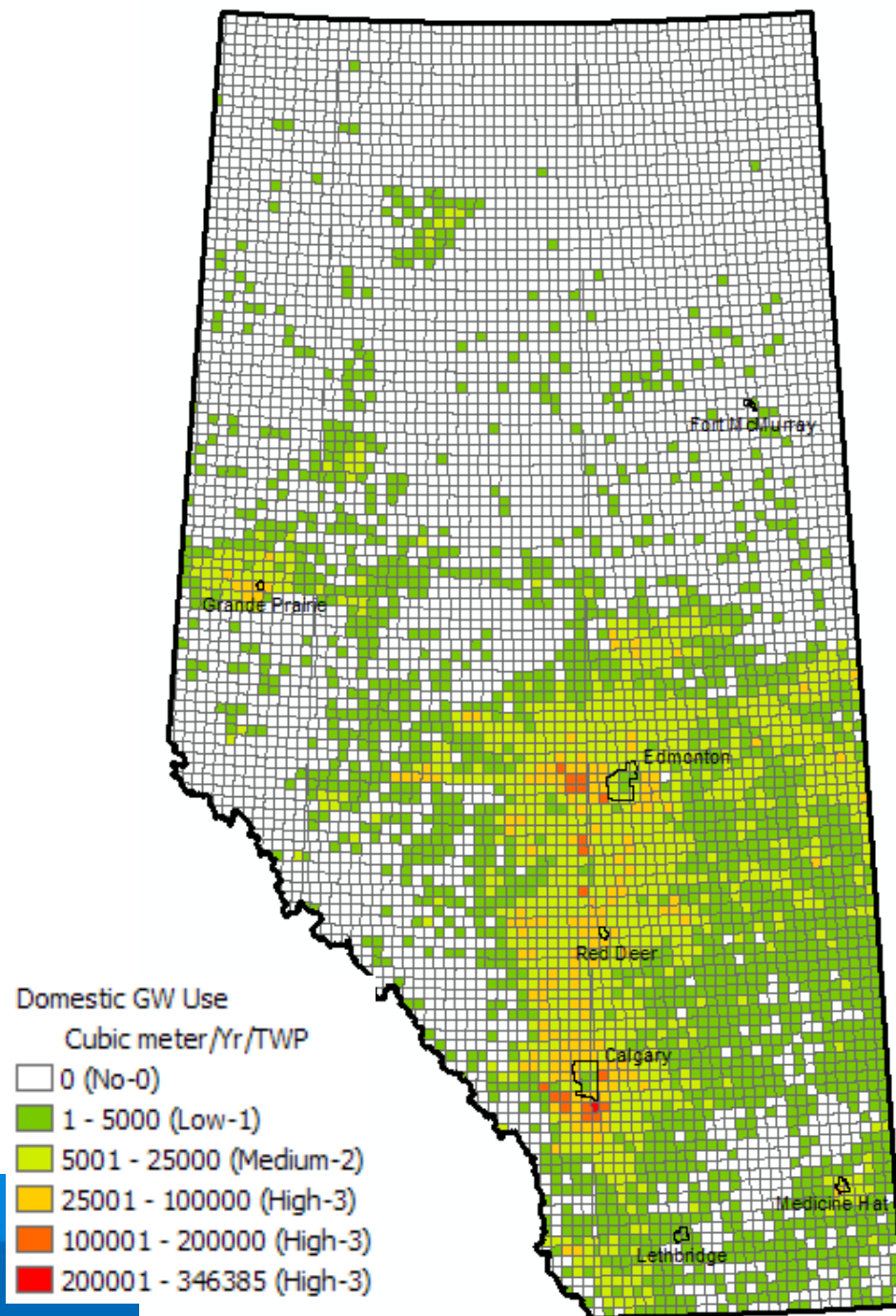
Government  
of Alberta  
Environment

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## Groundwater Diversion Allocations

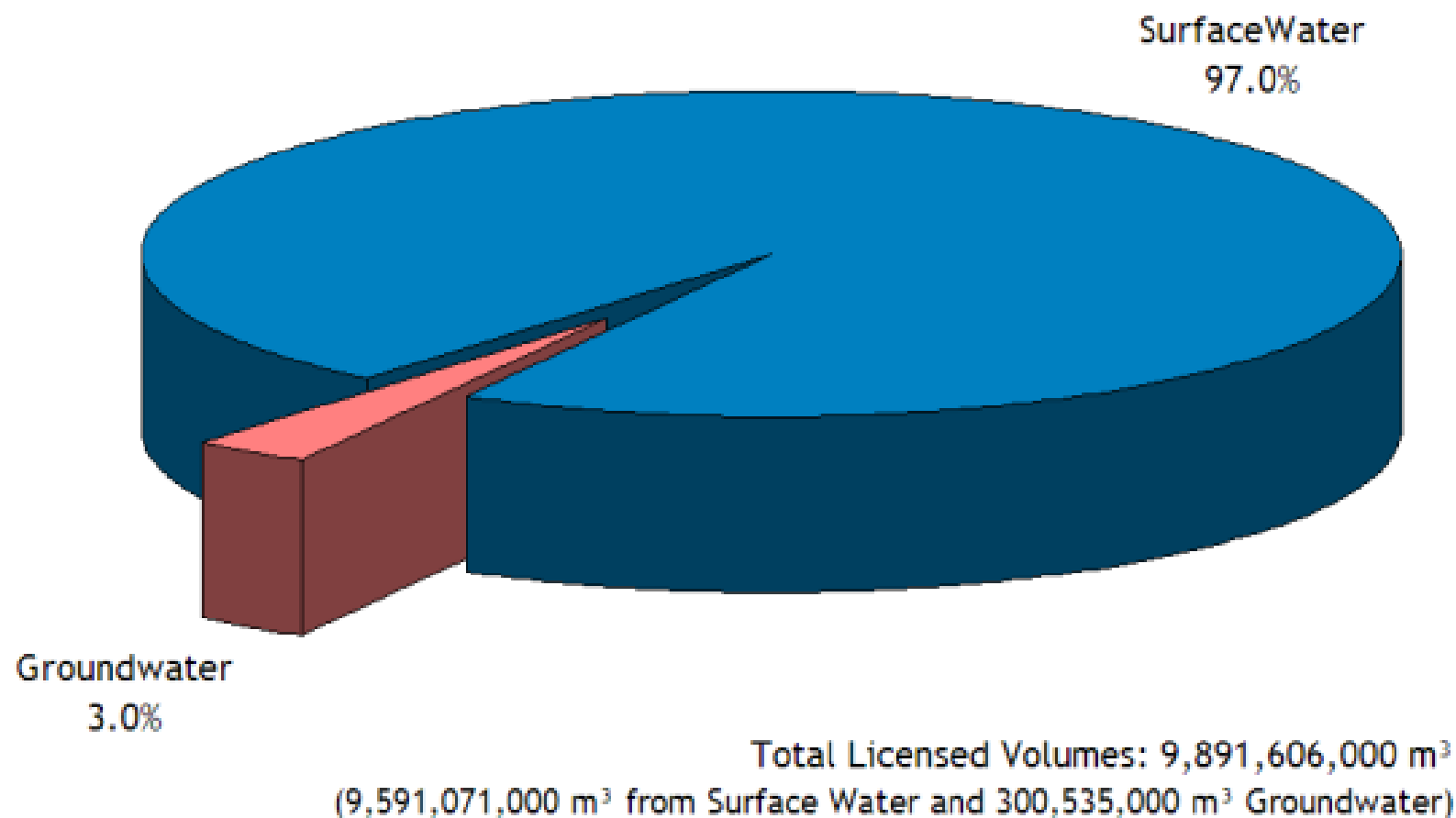


## Estimated Domestic Groundwater Use



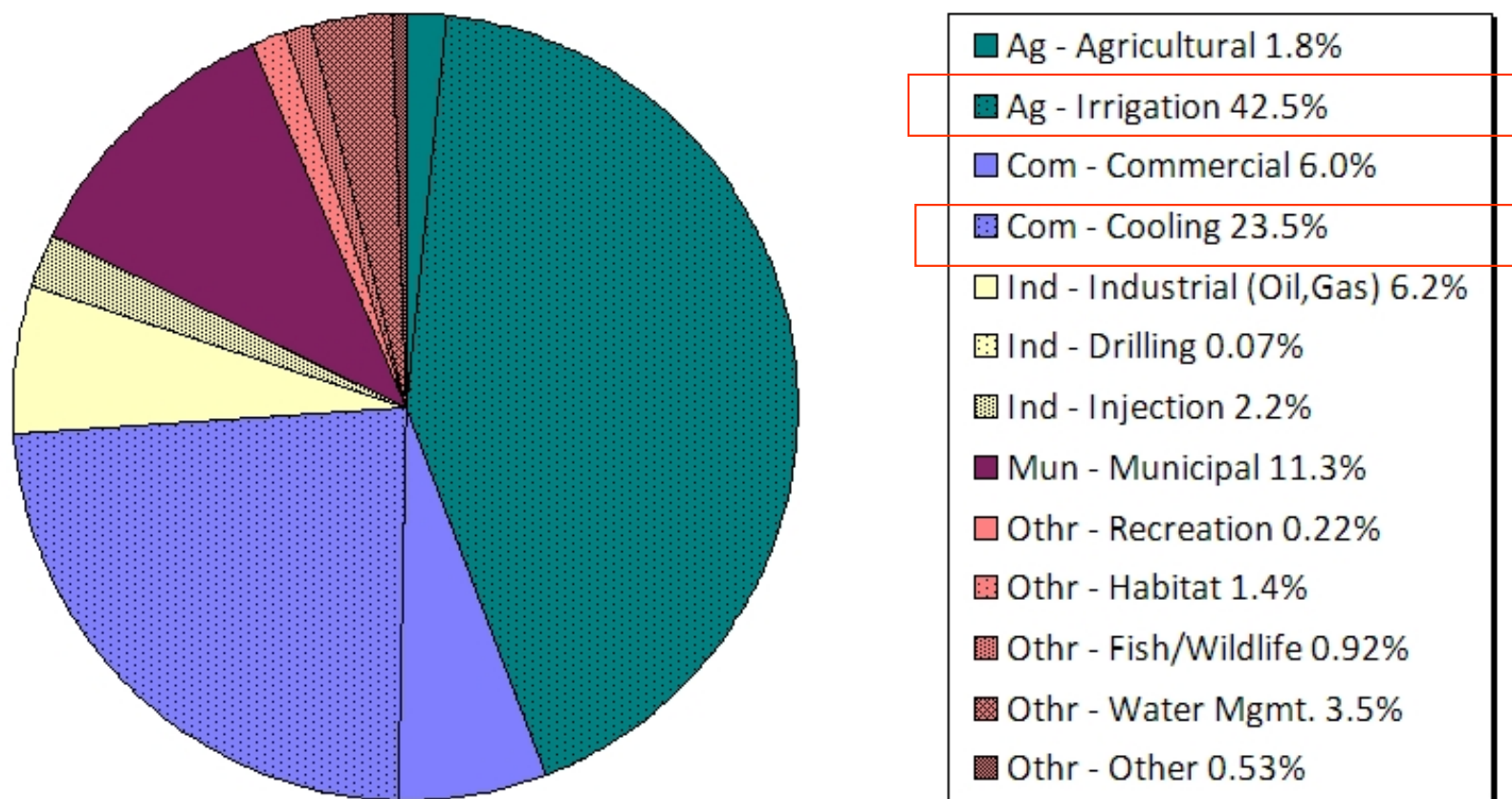
Data source: Alberta Environment

## Total Water Allocations in Alberta by Source (as of 2009)



# Water Allocations in Alberta by Specified Use

Government  
of Alberta  
Environment

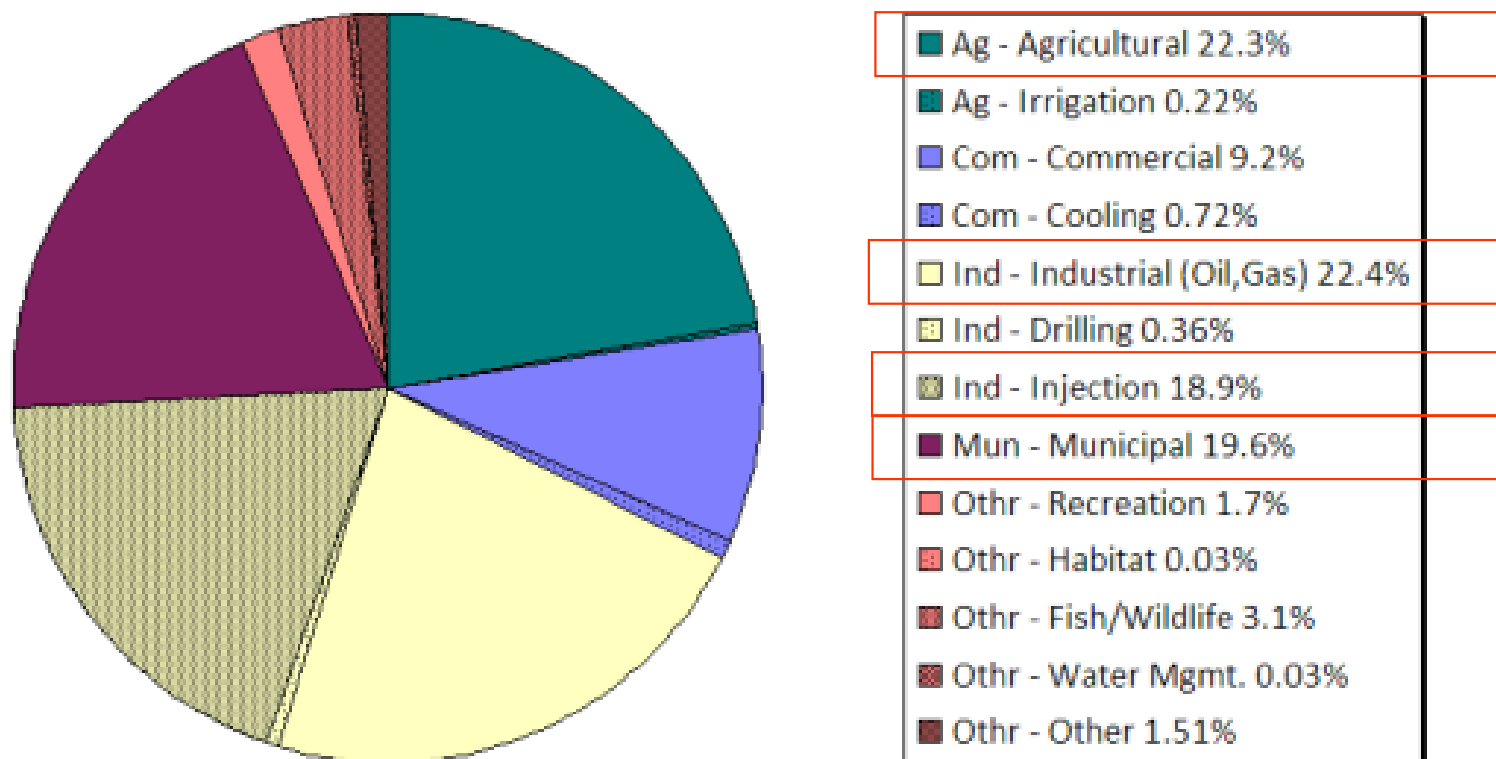


Total Licensed Volumes as of 2009: 9,891,606,000 m<sup>3</sup>  
(9,591,071,000 m<sup>3</sup> Surface Water; 300,535,000 m<sup>3</sup> Groundwater)



## Groundwater Allocations in Alberta by Specified Use

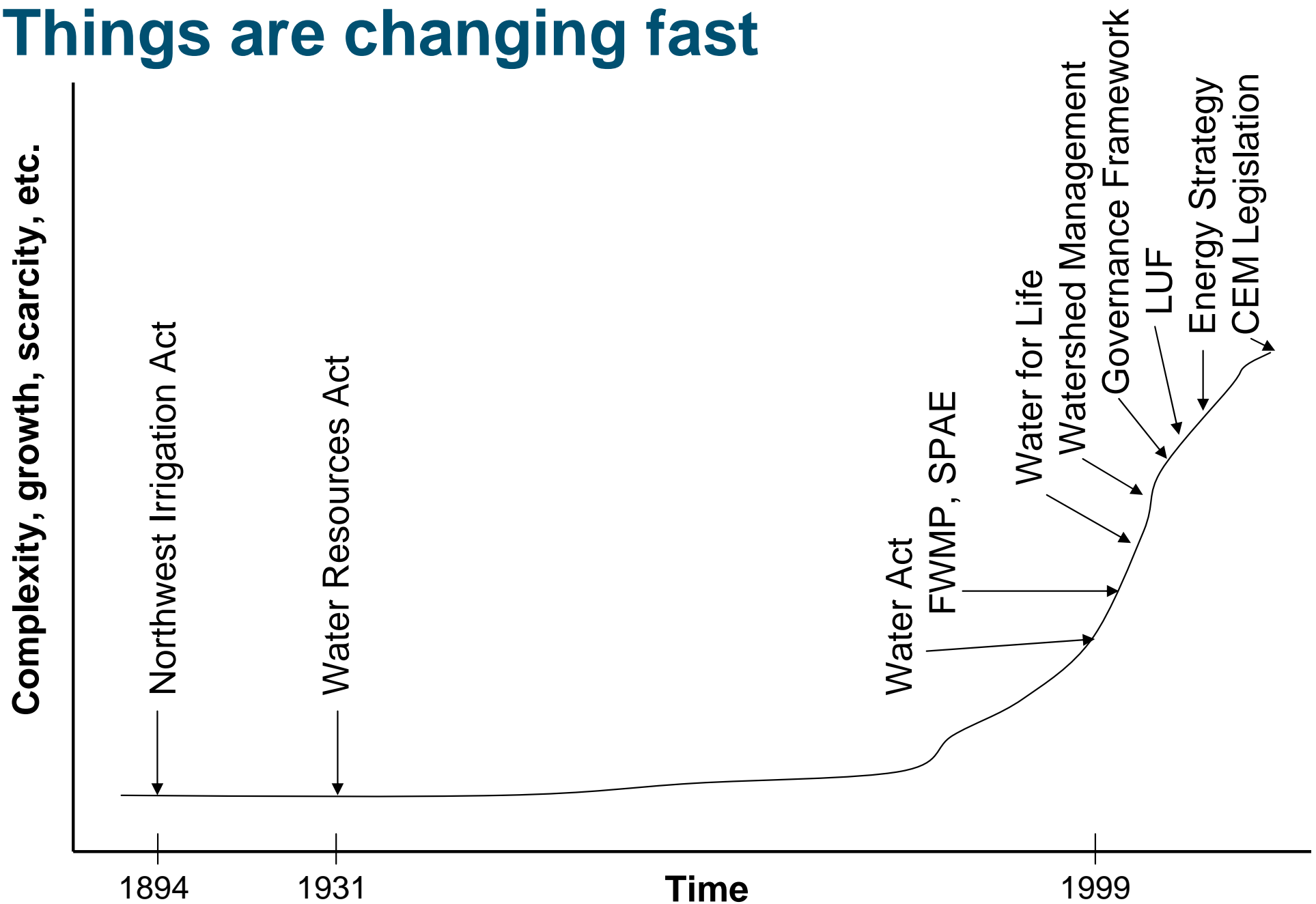
Government  
of Alberta ■  
Environment



Total Licensed Groundwater Volumes as of 2009: 300,535,000 m<sup>3</sup>

# Policy Challenges

# Things are changing fast



# Water Management Challenges

- Population is moving away from rural social context
  - Alberta is now the 2<sup>nd</sup> most urbanized province in Canada
- Climate change and variability require new adaptive solutions
- Resources increasingly require second order market based tools for the Crown to allocate
  - it is no longer just about how much we can allocate, but how to optimize the allocation for the benefits it will provide
- Governance structures need to evolve as the social context evolves
- Water is a whole system
  - Physical interrelationships between surface and groundwater, land use and landscapes
  - Environmental interrelationships with decisions impacting air, land, waste
  - Social interrelationships determining the social value of the use or preservation of water



# Policy Updates 2010-11

# ALBERTA ENVIRONMENT MANDATED REGULATORY SYSTEM

Water Quality –  
Environmental  
Protection and  
Enhancement  
Act

Water Quantity  
– Water Act

# Areas of Groundwater Policy

Water  
Wells/Drillers

Oil and Gas  
Activity

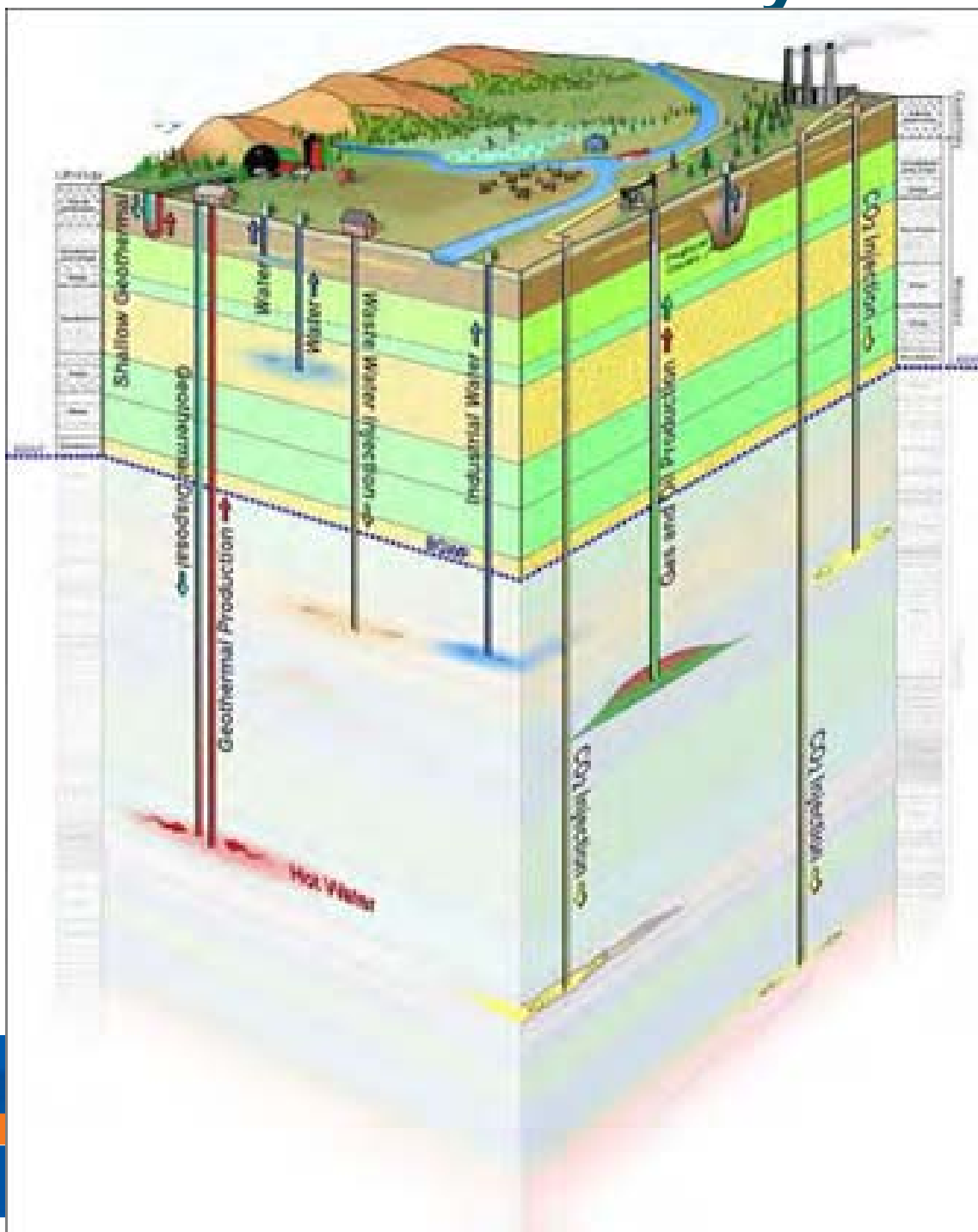
CO2 Injection

ISCG

Geothermal  
Regulation

Waste  
Disposal

CCME/Trans  
Boundary



Policy Review,  
Development and  
Implementation

Improving  
Knowledge  
(Science)

Improving  
Stewardship/  
Education

Building Capacity

# Definition of Saline Groundwater

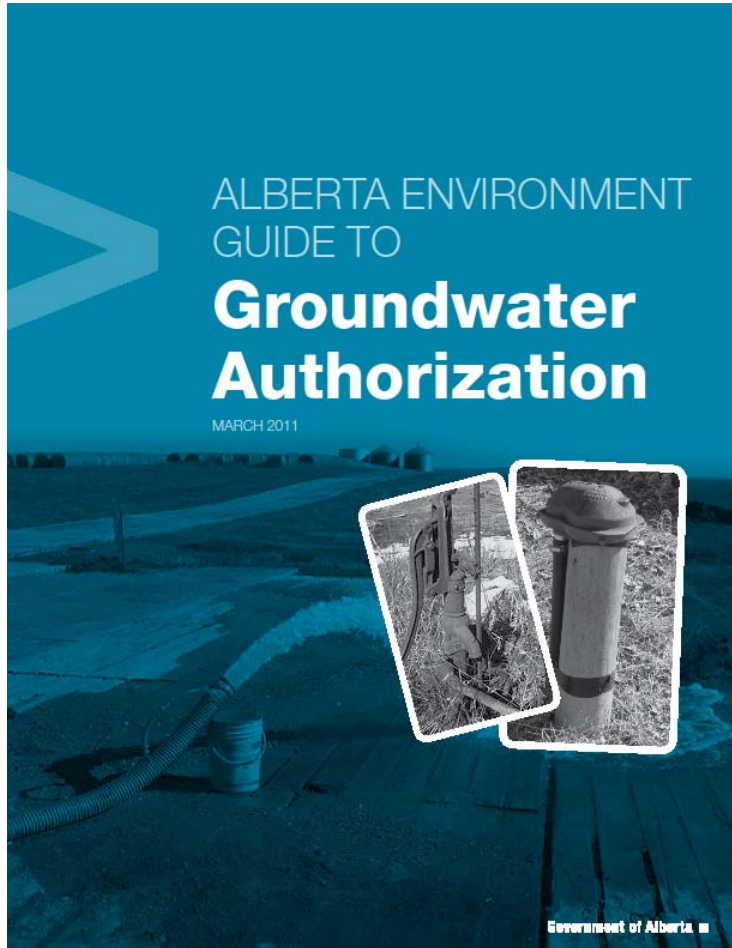
- Comment contained in Rosenberg Report in 2006
- Recently asked for clarification from ADM
  - Option 1: Status Quo – 4,000 mg/L TDS
  - Option 2: Brackish Water Addition
  - Option 3: Increase to 10,000 mg/L TDS
- Maintenance of status quo until 2015.



# TDS Methodology

- Varying TDS results in industrial source water wells in Northern Region
- Retests in 2009 for ERCB “re-classified” some wells from saline to non-saline
  - Discrepancy in classifications due to varying methods in determining TDS and not necessarily changes in geochemistry
- The TDS method standard that is to be applied is referenced in *the Standard Methods for the Examination of Water and Wastewater, published jointly by the American Public Health Association, American Water Works Association, and the Water Environment Federation, 1998, as amended.*
- From information known to date, the standard is thought to be the least disruptive from a regulatory and industry operations perspective.

# New Policy Document



- Update of 2003 Groundwater Evaluation Guide
- Provides updated Regulatory Framework for License and Approval Process for groundwater diversions
- Forms and expectations of groundwater evaluations
- Distributed to Regional Offices and provided on line for viewing
- Implementation by May 2011

# Analysis for Metals in Groundwater

## - Overview -

- The project was initiated in response to a need identified by the AENV Contaminated Sites Committee
- The purpose is to identify a standard, science-based approach for measuring metals in groundwater at contaminated sites
  - Spin-off: Methodology will apply to other AENV applications
- Agreement has been reached on the methodology
  - The analysis is always for total metals
- Implementation plan being developed

# Ongoing/New 2011-12



# Groundwater Management

- Building upon current guidelines and processes while providing a more consistent management process for all operators
- Using trigger values and trend assessments to proactively identify changes and ensure maximum flexibility for management options

## Groundwater

Groundwater is a vital resource in Alberta, supplying various domestic, municipal, agricultural and industrial water needs. More than 500,000 rural Albertans depend on groundwater for drinking water purposes. Groundwater also helps to maintain lake levels and river flows. In order to manage groundwater effectively, we must understand its occurrence, movement and quality. Improving our knowledge of groundwater resources is a key priority for the Government of Alberta. As we acquire a better understanding of groundwater we can implement policies and actions to manage this resource in a sustainable manner.

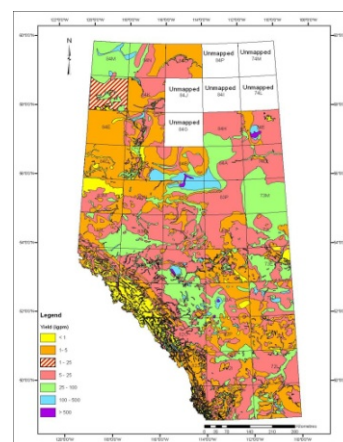
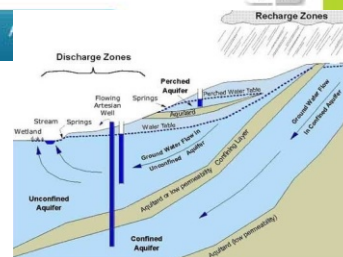
This groundwater webpage is divided into three major themes:

[Education](#), [Science and Knowledge](#), and [Regulation and Policy](#).

The [Education](#) section contains information on basic groundwater principals regarding its occurrence, movement and quality. It also highlights ways in which the provincial government is reaching out to Albertans to help learn more about groundwater and safely managing their groundwater supplies.

The [Science and Knowledge](#) section contains numerous sources of groundwater data, information, maps and assessments both within and outside the Government of Alberta. This information is critical in understanding the resource and is the foundation for developing effective policies around the wise use and management of groundwater.

The [Regulation and Policy](#) section compiles guidelines, standards, policies, frameworks and strategies that are relevant to groundwater in Alberta. The tools used to ensure protection of groundwater resources from various activities are found in this section, as well as links to important initiatives such as the [Water for Life Strategy](#) and [Land Use Framework](#).



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[Email](#)

[Central Region](#)

403-340-7052

[Email](#)

[Southern Region](#)

403-381-5322

# Oil and Gas Policy

- Work very closely with Energy Resource Conservation Board
- Directive 44
  - Low water production from ERCB's October 2009 *Status Report on Enhanced Groundwater Protection Efforts under Directive 044 (Nov 2006 – end of 2008)*
    - 2057 wells completed above the BGWP
    - 113 wells produced produced .5 m<sup>3</sup>/month (all within sandstone units – coal bearing 0)
    - Of 113 wells above, 76 wells produced less than 30 m<sup>3</sup>/month, 21 produced between 30 and 100 m<sup>3</sup> per month, and 16 wells produced over 100 m<sup>3</sup> of water per month
- Directive 35
  - Alberta Environment Baseline Water Well Testing Standard
  - Review ongoing

# Shale Gas

- Future energy resource base in Alberta and North America is unconventional oil and gas
- Alberta is impacted from both an economic as well as what happens in other jurisdictions
- Alberta has a very long history with oil and gas sector and has developed a comprehensive regulatory structure
- ERCB conducted an unconventional gas review, AENV was invited to participate in the water management issues
- Two significant policy pieces
  - Review of the Water Allocation and Conservation Policy for Oilfield Injection
  - Development of a Shale Gas Water Strategy

# Water Conservation and Allocation Policy Review

- Water Conservation and Allocation Policy for Oilfield Injection came into effect in 2006 to address concerns regarding non-saline water use in enhanced oil recover operations
- Policy principles have been used for other purposes – viewed as successful
- Currently conducting a qualitative and quantitative evaluation of the current policy which was enacted in 2006
- Potentially this policy can be adapted to a much broader allocation for the oil and gas sector

# Questions?



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