New Approach to Agricultural Water Management
Water Security Agency’s New Approach to Agricultural Drainage

1. Regulations, Policy & Legislation
   • Historical Context
   • Current Status

2. Implementation of New Approach
   • Impacts & Risk
   • Mitigation Tools
   • Pilot Projects

3. Challenges & Knowledge Gaps
The Water Security Agency Act

being
Chapter W-8.1, formerly Chapter S-35.03\* of the Statutes of Saskatchewan, 2005 (effective May 27, 2005) as amended by the Statutes of Saskatchewan, 2006, c.34; and 2013, c.32.

The Water Security Agency Regulations

being
Chapter W-8.1 Reg 1 (effective August 21, 2015) as amended by Saskatchewan Regulations 33/2016.

Regulations, Policy & Legislation
Wetland-related Acts and Policy

- The Water Security Agency Act
- Environmental Management and Protection Act, 2010
- Conservation and Development Act
- Watershed Associations Act
- Saskatchewan Wetland Policy (mid 90s)
Historic Policy Approach in Saskatchewan

- 1950’s-1980’s - Provincial government actively promoted drainage through supporting creation of Conservation and Development Areas Authorities
- Since 1981 all new works required an approval but compliance rates are very low (<5%)
- The compliance approach has focused on first party damages and resolving neighbor to neighbor conflicts (Complaint Process)
Current Status of Policy Development

- Ministry of Environment is testing a voluntary wetland mitigation guide to support and encourage better management of industry development effects.
- Agricultural drainage is the largest cause of wetland loss.
- WSA is implementing a new approach to agricultural drainage to address downstream impacts (agricultural wetland loss included).
- New revised wetland policy will follow.
Drivers towards a New Approach in Saskatchewan

Social, economic and environmental drivers
Drivers towards a New Approach in Saskatchewan

Feedback from the Drainage Forum (500 participants, Oct 2013-Oct 2014)

- Drainage is not a landowner right.
- If drainage impacts cannot be mitigated, then the project should not be allowed.
- Regulatory scrutiny should be scaled to the risk of the drainage project.
- High risk projects should require approval. For low risk projects participants were split between requiring approvals, registration, or free to proceed without notification.
- Participants strongly encouraged enforcement of policy principles and approaches regardless of project size.
Drivers towards a New Approach in Saskatchewan

Feedback from the Drainage Forum (Oct 2013-Oct 2014)

• Those who benefit from drainage projects should bear the costs of building and maintaining such projects.
• Project owners should bear the cost of damages they cause.
• Existing works should require the same approvals or registration as new projects.
• Specific drainage design and operation standards and rules must be followed.
• Review of project impacts should include upstream and downstream, flow rates, erosion, and short- and long-term.
• Wetland management was a sensitive topic with participants.
• Calls for increased compliance and enforcement consistently arose throughout all phases of consultation.
The New Approach

The Saskatchewan government initiated the New Approach for several reasons:

• Develop new legislation and regulations for drainage
• Develop new strategies to address excessive moisture concerns on agricultural lands
• Calls from agencies to deal with illegal drainage
• Series of wet years with above normal runoff
The New Approach Components

The New Approach has 3 components:

1. New Regulations
2. Implementation of the Regulations and the development of policies and procedures to support the implementation
3. Development of new Legislation

WSA has new Regulations, and we are partway into the implementation of the Regulations
New Regulations- Sept 1, 2015

All existing and new drainage works require a permit

• In *Drainage Control Regulations*, Projects constructed prior to 1981 did not require Approvals
• In *The WSA Regulations*, the pre 1981 exemption has been removed
  • **Efficiency** - challenging to determine if a drain was constructed in 1980 or 1982
  • **Fairness** – the impact downstream is the same regardless of when the drain was built
  • **Knowledge** – adds all works to improve understanding of overall impacts of drainage works
A new suite of enforcement tools is being proposed, such as:

• Orders (current legislation)
• Fines (current legislation and new legislation)
• Stop work orders (new legislation)
• Administrative penalties (new legislation)
• The ability to lay charges easily (current legislation and new legislation)
In Section 13 of the Regulations, WSA must consider:

(2) On receipt of an application pursuant to section 12, the corporation shall consider:

   a) the current and future impact, including predicted future cumulative impact, of the drainage works on:
      i. the property of others;
      ii. hydrology or water quality;
      iii. fish or wildlife habitat; and
      iv. any other factor the corporation considers relevant;
15(1) The term of a drainage approval:
   (a) commences on the date on which it is issued; and
   (b) unless sooner suspended or cancelled, ends on the date
   stated in the drainage approval.
(2) At the time of issuing the drainage approval pursuant to section
14, the corporation may include as a provision of a drainage
approval any terms and conditions that the corporation considers
appropriate, including a requirement for measures to reduce the
impacts mentioned in section 13 that the corporation considers
necessary.
❖ This portion of the regulations will require WSA to develop
   mitigation policy to address flooding, water quality and habitat
   impacts
New Regulations- Sept 1, 2015

Ensure project impacts are addressed
- Review considers impacts to downstream flooding, water quality and habitat are addressed.
- Mitigation of impacts is a required part of the drainage works approval process;
Implementation of the New Approach
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<th>Responsible Drainage within Healthy Watersheds</th>
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<td>Goals</td>
<td>Water quantity (flooding / supply), water quality and habitat impacts of drainage are mitigated</td>
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| Strategic Outcomes | 1. Approval process mitigates risk of impact  
2. Extensive drainage is coordinated, organized, and properly mitigated  
3. Mitigation projects reduce cumulative impacts of approved drainage* | 4. Clients find approval process straightforward and timely  
5. We meet staff needs to deliver quality service  
6. There are enough QPs trained to meet client demand | 7. Clients voluntarily comply with requirements  
8. We target priority non-compliance (?)  
9. We target compliance efforts at highest risks | 10. We understand the impacts of drainage and how to mitigate them  
11. We gather, analyze and manage data to inform, facilitate, and adapt program implementation | 12. Producers value and lead the shift to responsible drainage  
13. Key clients, stakeholders and government MLAs are partners in the shift  
14. Government, producers, stakeholders and citizens are aware of the new approach and requirements |
| Critical Results | Approval conditions are reasonable and achievable  
Networks of drainage projects are identified  
Risks are identified by project and watershed  
Effective Mitigation is operational e.g.: | Approval process is lean and meets service standards  
Approvals are processed online  
The strategic approach and program targets align with available resources  
Clients have access to the advice and information they need  
Client needs are identified  
Staff needs are identified | The appropriate compliance approach is applied in each circumstance  
We monitor for and identify non-compliance  
We have local knowledge of communities and social networks  
Assigned staff have the necessary compliance knowledge and skills  
We have the legislative / regulatory authorities we need | We have detailed information on wetland location, status and drainage features  
Outcomes of the drainage program are tracked  
Decision support models are identified, developed and used  
Databases that integrate offices and information are developed and used.  
Decisions are adapted to reflect new information  
Progress / success is regularly evaluated  
Key research needs are identified | We engage agricultural producers as partners in the shift  
We seek feedback from key partners, stakeholders and government  
Key research projects are implemented with partners  
Program is adapted to respond to partner input  
Our compliance approach and requirements are effectively communicated to government, clients, stakeholders and citizens  
Intent and actual outcomes of the drainage program are communicated to government, clients, stakeholders and citizens |
| Performance Measures | X% increase in surface water storage within priority basins  
X% reduction of water drained into priority terminal water bodies  
X% reduction of contaminants drained into water bodies of concern  
X% increase in wetlands in priority basins | By 20XX, Y% client satisfaction  
By 20XX, application reviews are completed within X days (e.g. extreme, high, moderate, and low risk projects)  
By 20XX, X% works compliant with regulations  
By 20XX, X% damage complaints received for Y | By 20XX, no more than X damage complaints received  
By 20XX, drainage and wetland inventory is complete  
By 20XX, defensible targets for the goal of responsible drainage established | By 20XX, Y% stakeholder satisfaction with the program |
### Program Pillars | **Impact Mitigation**

#### Goals
- Water quantity (flooding / supply), water quality and habitat impacts of drainage are mitigated

#### Strategic Outcomes

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#### Critical Results
- Approval conditions are reasonable and achievable
- Networks of drainage projects are identified
- Risks are identified by project and watershed
- Effective Mitigation is operational

#### Performance Measures
- X% increase in surface water storage within priority basins
- X% reduction of water drained into priority terminal water bodies
- X% reduction of contaminants drained into water bodies of concern
- X% increase in wetlands in priority basins

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- **Impact**: is when the drainage activity results in a change in the resource which reduces the ability to use the resource

- **Impact mitigation is delivered through**:
  - Approvals process based on risk
  - Coordinated & organized drainage (C & D or network applications)
  - Mitigation conditions

- **To achieve this goal a combination of actions to reduce risk of impact will be developed**
Mitigation - Risk

• **Risk** – is potential for flooding, water quality and habitat impacts

• To assess risk 2 elements are considered:
  • **Where** the project takes place (i.e. watershed)
  • **Size/Permanence** of the individual project

• As a result, **risk of impact is project specific**
  • Larger impact projects in higher risked or more vulnerable basins will have more scrutiny.

*Figure 1: Identifying watershed vulnerability*

*Figure 5: Determination of Activity Risk in a High-vulnerability Watershed (based on extent surface drainage)*
Mitigation Tools

- Decline approvals (extreme risk)
- Land control to adequate outlet
- Construction, maintenance and operation conditions
- Flow control
- Permanent storage (maintaining or restoring)
- Coordinated application process and mitigation conditions for the Aquatic Habitat Protection Permit process (EMPA)
- Efficient approval process - online application, qualified persons
A Suite of Mitigation Tools

Impact

Flooding
- Terminal Basin
- Reduce peak
- Reduce total volume
- Erosion control
- Maintain habitat
- Other ...

Water Quality

Habitat

Manageable Environmental Vector

Regulatory Mechanism
- Decline Approval (?)
- Flow control
- Permanent Wetland Storage
- Construction Conditions
- Wetland Retention or restoration
- Other Options ...
Pilot Projects

- Upper Spirit Creek
- Gooseberry Lake

Components of Pilot:
- Approvals
- Mitigation
- Qualified Persons
- Compliance
A need to develop mitigation conditions that are:
- Acceptable
- Practical
- Incrementally address down stream impacts
Piloting Mitigation

- All works within a ‘network’ are approved at once
- Network approach is critical for adequate mitigation
- Developed approach for flow controls and storage
  - Throttles reduce flow to 1 in 2 flow rates
  - Restore 10% of the wetland acres
• Pilots engaged landowners/operators and 5 RM’s to seek approvals and implement mitigation measures within pilot areas.

• Of 225 quarters:
  • 82% of operators were Willing to participate
  • 9% Maybe willing to cooperate
  • 9% Not willing to cooperate
Lessons Learned

- Wetland inventory essential for designing mitigation
  - Which wetland to restore
  - Where to place flow controls
- Qualified persons were essential to approval efficiencies, land owner acceptance and mitigation design.
  - The need for educational materials, fact sheets and how to manuals
- Permitting in a “networks” allowed approval efficiency and mitigation design
- Mitigation conditions were acceptable to landowners
Large Networks

• WSA learned about:
  – There will be a number of large networks on the landscape.
  – Joint applications maybe an option for land control.
  – Efficiencies gained.
  – Pilot projects include a 113 quarter network.
CHALLENGES AND KNOWLEDGE GAPS
Current Challenges

• Estimate 100,000 to 150,000 unlicensed drainage works
• Resource constraints
• Staged implementation approach necessary or WSA will be inundated with applications
  – Anyone can apply at anytime?
  – Focus will be on the higher risk areas first?
• Enforcement will be phased in over time
• Seeking compliance over the long term
• Internal and landowner change management
• Perceived vs actual landowner acceptance

❖ Knowledge gaps - impacts of drainage need to be better understood so that WSA can fully exercise regulatory powers.
Knowledge & Information

Our program is based on evidence and supported by appropriate data and tools.

1. We understand the impacts of drainage and how to mitigate them
2. We gather, analyze and manage data to inform, facilitate, and adapt program implementation

- We have detailed information on wetland location, status and drainage features
- Outcomes of the drainage program are tracked
- Decision support models are identified, developed and used
- Databases that integrate offices and information are developed and used.
- Decisions are adapted to reflect new information
- Progress/success is regularly evaluated
- Key research needs are identified

❖ By 20XX, drainage and wetland inventory is complete
❖ By 20XX, targets for the goal of responsible drainage established

Knowledge & Information

- Is identified as a program pillar
- Science is essential to:
  - Address the Knowledge Gap barriers
  - Program evaluation and continuous improvement
  - Support the other pillars of the approach.
  - In particular, development and implementation of the Impact Mitigation pillar
Knowledge & Information

1. Understanding impact of drainage and how to mitigate

2. Set targets for mitigating the impacts of drainage

3. Develop and evaluation of effective mitigation

Impact Mitigation

Water quantity (flooding / supply), water quality and habitat impacts of drainage are mitigated

1. Approval process mitigates risk of impact
2. Extensive drainage is coordinated, organized, and properly mitigated
3. Mitigation projects reduce cumulative impacts of approved drainage

- Approval conditions are reasonable and achievable
- Effective Mitigation is operational
- Networks of drainage projects are identified
- Risks are identified by project and watershed

- X% increase in surface water storage within priority basins
- X% reduction of water drained into priority terminal water bodies
- X% reduction of contaminants drained into water bodies of concern
- X% increase in wetlands in priority basins
Knowledge Gaps

Primary Knowledge Gaps:

1. Determine the magnitude of impact associated with drainage activity related to:
   a) Water quantity
   b) Water quality; and,
   c) Habitat

2. Develop/define targets and thresholds

3. Evaluate the effectiveness regulatory program to address the impacts

4. Assess future mitigation options

5. Complete the wetland & drainage inventory
Knowledge Gaps - Flooding

1. Understanding the impact of drainage.
   – Drainage may increase flooding impacts (Pomeroy et al; but, van der Kamp et al)
   – We need:
     • certainty of the impact,
     • understanding of scale and magnitude.

2. Set targets/thresholds for mitigating impact
   – If drainage increases flooding impacts, then what is the magnitude and scale of the impact?

3. Develop and evaluate effective mitigation
   – What are the mitigation tools that effective, efficient, and acceptable.
     • E.g. Throttles, storage
Knowledge Gaps - Water Quality

1. Understanding the impact of drainage.
   - Wetland drainage contributes nutrients (Westbrook, Badiou).
   - Do these nutrient contributions result in an impact?

2. Set targets/thresholds for mitigating impact
   - If so, what is the magnitude and scale of the impact?
   - And, what thresholds should be set (PPWB, IJC)?

3. Develop and evaluate effective mitigation
   - What are the tools that effectively, efficiently, and are acceptable that mitigate the impact.
     - E.g. Flow control unlikely to fully mitigate - what are other options can be employed?
Knowledge Gaps – Habitat

1. Understanding the impact of drainage.
   – Wetland drainage reduces habitat (PHJV implementation plan).
   – Body of science exists to inform our understanding of the impact.

2. Set targets/thresholds for mitigating impact
   – Conserve SAR Critical Habitat and important fish habitat
   – Contribute to PHJV habitat objectives

3. Develop and evaluate effective mitigation
   – Decline applications and monitor compliance for SAR Critical Habitat and important fish habitat.
   – Incentive programs (NAWMP partnership).
   – Monitor habitat loss rates.
Knowledge Gaps

Other gaps:

1. Assessing future mitigation options.
   – As science fills knowledge gaps new and innovative mitigation options maybe developed evaluated and implemented.

2. Wetland & Drainage Inventory:
   – Current inventory 8.5 million acres complete
   – Proposed over 15 million acres completed in 3 years
Some Final Thoughts

• Why WSA is moving ahead
• Behavioral changes
• Compliance
• The challenges

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