



Saskatchewan  
Environmental  
Society

## Submission to the Minister of Environment on Agricultural Drainage

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Prepared by the Saskatchewan Environmental Society

February 24, 2015



## A. Opening Remarks

The Saskatchewan Environmental Society is grateful for the opportunity to participate in this special consultation on responsible drainage. Thank you very much for inviting us to take part.

The Saskatchewan Water Security Agency is to be commended for the positive approach they have taken to setting up the online forum on farm drainage and the follow-up paper. The paper reflects very accurately the key points in the discussions. The Saskatchewan Environmental Society's detailed response to the proposed elements of "A Proposed New Approach To Drainage in Saskatchewan" is outlined in the next section of this brief. **In general, we are in agreement with the vast majority of the fifteen proposals.** The final sections of our brief address broader issues closely associated with drainage.

Before reviewing elements of your government's proposed drainage strategy in detail, **we would like to share some general observations and suggestions for your consideration. One is that the issue of flooding and drainage is not only a farm issue but is a much broader issue of land-use. This necessitates looking at the flooding and drought cycles that have been part of the prairie history for many years. The second is to encourage you to consider an expanded role and related enhanced capacity for the Watershed Advisory Committees. They could play an important role in proper land use planning to reduce drainage problems. Third, we encourage you to place more emphasis on source watershed protection in developing drainage policy.**

The reason for expanding the discussion to include more than farm drainage is that the flooding and drought cycle has led to drainage in flood time and water diversion in drought time. It has been shown that solving a problem in one cycle has led to significant problems in the next cycle, whether that cycle be flood or drought. Fishing Lake and Waldsea Lake are examples of this. **We urge consideration of a strategy to only approve development plans that are shown to have minimal impact on water retention systems, flood plains and wet lands, and that cause minimal disruption to natural water flows.** This should be considered a priority in land-use planning and water shed management regardless of the cycle we are in.

This is becoming more important as we get extreme weather cycles associated both with environmental degradation and with climate change. Periods of extreme weather patterns, drought and heavy precipitation, are projected to increase as our atmosphere warms. In that light, we would suggest that this drainage plan be expanded, using the same approach outlined in the paper, of targeting incremental change to build support and capacity for watershed management knowing that drought and flood are to be expected. We agree that the new approach needs to be resilient, sustainable, and one that serves a wide range of interests. However, we submit that it needs to include more than farmers and should be expanded to include urban development, forestry practice, road and rail development, cottage development, and hydro power development as well. In many circumstances, drainage should not be considered "development" but rather seen as an unfortunate need to address an "error" in properly assessing carrying capacity and the lack of rigour when approving development proposals.



On the second point, the reason for suggesting increasing the capacity of the Watershed Advisory Committees is because we think that **management at the watershed level is the key to addressing both flooding and drought. Our recommendation is that the Watershed Advisory Committees should be adequately resourced to work with the Water Security Agency to address issues of licensing, monitoring, record-keeping, technical assistance, and the enforcement of drainage permits during flood times and water diversion permits during drought times. We think the individual Rural Municipalities govern too small an area to be effective or efficient.** We also would suggest that the Water Security Agency needs to have the ability to establish policy related to zoning regulations and to providing input on developments that impact water retention and drainage, including being able to direct adequate resources to the Watershed Advisory Committees.

Finally, source watershed protection and protection of water quality is at the foundation of your 25-year Water Security Agency plan. It is important that these matters are considered as you shape your new drainage policy.

## **B. Response to the 15 Elements of the Proposed New Approach to Drainage**

1. **Approvals will be required for all drainage activities.** Over a period of time, all drainage works, including pre-1981 works, will be expected to obtain an approval or be closed.

**Observation:  
Agreed.**

2. **The approval process will be conducted online** to enhance client service, streamline review and approval times, improve data collection and analysis within the WSA, and improve efficiency.

**Observation:  
Would this include a master chart with GPS coordinates and retrieval method to check- audit?**

3. **Landowner agreement will serve as adequate land control downstream of works for most projects.** This will be a significant change from the current approach (which) requires applicants to obtain a registrable easement over potentially impacted lands. Even when a drainage proponent has the informal agreement of their neighbours, many neighbours are unwilling to allow registration of an easement, making the requirement for registrable land control unachievable. Revising this requirement to reflect the current working relationships in rural Saskatchewan will be an important step toward smarter regulation. It is proposed that legal easements on title will still be required for high investment projects, such as multiparty, organized works. Proponents will be made aware of the risks associated with not obtaining a legal easement and that it provides the best guarantee of long-term operation of their works.

**Observation:  
Will this include authorizing the Saskatchewan Water Security Agency to make policy, as well as to intervene with other Ministries where there is conflict in policy? (i.e. Agriculture, Government Relations, SaskPower and the Ministry of Economy)**



**4. The right mix of enforcement tools will be put in place.** Legislation will empower the WSA with enforcement tools, increased but reasonable fine limits, and clear powers and limitations re: investigations and inspections.

**Observation:**

**Agreed. The WSA may want to give consideration to increased penalties for those who fail to follow WSA drainage regulations on multiple occasions. Even under the present WSA rules we suspect staff spend an inordinate amount of time dealing with a relatively small number of players.**

**5. Risk will be determined during the application process and regulatory oversight will be risk-based:**

- a. **Application requirements will reflect risk.** Low risk activities will be required to simply provide basic project information; moderate risk activities will be required to submit more detailed project plans; high and extreme risk activities will be required to submit a plan prepared by a “qualified person”.
- b. **Application review will reflect risk.** Low risk activities will be issued an approval with no staff review; moderate risk activities will be fast-tracked with a less comprehensive staff review; high and extreme risk activities will be subject to more intensive review and analysis.
- c. **Approval conditions will reflect risk.** Low risk activities will be subject to simple and minimal design and operating conditions. Moderate risk activities will be subject to further conditions to minimize risks, including controlled releases. High and extreme risk activities may be required to take additional steps to offset expected impacts or approvals may be denied in some circumstances.

**Observation:**

**Will there be a clear statement as to the critical factors that differentiate the three levels of risk? Is there going to be an appeal process related to how the risks are categorized? Is there a mechanism to change the risk assessment after the project is approved and built?**

**The big challenge will be accurately defining the level of risk involved, and then conducting a follow-up check on the site to see what is actually happening. Clearly, some ‘ground truthing’ will need to be done to effectively carry out this work.**

**The Province will need to guard against what may be a tendency to categorize too many applications as low risk.**

**We believe risk assessment can be improved by adequately resourcing and making good use of the expertise of the Watershed Advisory Committees.**

**6. Minimization of impacts will be part of all drainage approvals.** Approval holders will be required to use best practices in design and construction of works to reduce impacts of drainage.

**Observation:**

**Agreed. It will be useful to build, and keep up-to-date, a resource base of best practice.**



7. **A mitigation fee will accompany the drainage approval where wetland drainage is allowed.** This fee would be based on wetland acres drained and the duration of the approval. Funds would be directed to projects that address drainage impacts (habitat loss, downstream flooding, and water quality), including restoration of wetlands or water storage.

**Observation:**

***This is a concern. It appears that this is making possible the buying of a short term benefit by a private landowner during a time of high precipitation with the high probability that this action will create flooding downstream, and also that there will be a community cost during drought. Wetlands are nature's flood and drought mitigation measures, and the land-use should reflect those realities. Artificial intervention should not be a financial consideration on an individual basis.***

***If wetlands are to be drained, we of course prefer to see a mitigation fee, but our preference is for wetland drainage to be minimized and wetland restoration to receive far more attention.***

8. **Approval holders may be required to install and operate structures to control release of water from a drain.** In order to prevent drainage adding to flood peaks, gates could be required to be installed and kept closed except to let drainage occur after peak runoff has passed. Other flow restriction structures, such as a suitably sized culvert, could be used to limit potential influence on peak flows.

**Observation:**

***This is interesting, and has merit, but needs to be reviewed carefully. It seems this has the potential for problems if a person has to close a gate and then flood themselves at the time of peak run-off?***

9. **The current drainage complaints system will end.** Complaints will lead to an investigation to confirm there are works and whether they are approved. If they are not approved the drainer will be given a short period to obtain an approval or be required to close the ditch. The process will thus move the owner of the works into the regulatory system where he or she must establish that no impact on neighbouring lands is occurring or that appropriate land control has been obtained.

**Observation:**

***Agreed. It is good to move away from an adversarial approach.***

10. **Requirements for multiple approvals will be streamlined.** Where drainage works will require both an Aquatic Habitat Protection Approval (AHPP) under *The Environmental Management and Protection Act, 2002* and an approval under *The Water Security Agency Act*, the two processes will be integrated to reduce redundancy and improve client service.

**Observation:**

***Agreed.***

11. **Group drainage projects will be facilitated in areas of concern.** Targeting improvements in these areas will achieve important results in terms of managing persistent drainage issues and risks.



**Observation:**

**Agree to a point. Land use and carrying capacity need to be triggered in the discussion at some point if the problem persists. Does WSA have the capacity/authority/resources to assess carrying capacity and put legislation in place to zone land-use including agriculture and forestry? Is this a feasible point without that capacity?**

**12. Designation and certification of “qualified persons” to assist in drainage planning and damage assessment.** The inclusion of qualified persons in drainage management will improve access to responsible drainage works design and operation as well as to damage complaint resolution. An application prepared by a “qualified person” will require less review by WSA and will therefore usually receive a faster approval. Provision of training and certification for qualified persons will ensure standards and access for clients. The certification requirements for qualified persons will vary according to project type, risk and complexity.

**Observation:**

**Agree to having a designated qualified person. We suggest this reside within the capacity of the Watershed Advisory Committees. We disagree that there should be much variance in certification requirements. We would prefer to see this standardized at the maximum requirement so that there is more flexibility (and less discussion) to assist.**

**13. Information and client service will be improved.** In addition to providing access to qualified persons, the right information will be available to help all clients navigate a new approval process, plan drainage projects, and negotiate a new complaint system.

**Observation:**

**Agreed. This should be looked at in relation to the Watershed Advisory Committees.**

**14. Knowledge of drainage status and impacts will continue to be developed.** The WSA will continue to build its inventory of wetlands and drainage works to allow appropriate risk identification and strategic risk mitigation decisions. In addition, work will continue to develop improved understanding of drainage impacts and targeting of mitigation efforts.

**Observation:**

**Agreed. This should be looked at in relation to the Watershed Advisory Committees.**

**15. Enforcement of new rules and programming will be phased in.** Gradual expansion to stronger enforcement of compliance with the approval requirement and conditions, including the use of fines and orders, will occur over a number of years. New programming will be piloted in targeted areas in 2015 and expanded over time.

**Observation:**

**Agreed. Enforcement and appeal need to be built into the regulations. Can't be at the RM level we suggest, as there is too much potential for conflict of interest.**



### **Proposed Implementation Plan**

This new approach to drainage is a significant change. Targeted and incremental implementation will build understanding, support and capacity for full scale adoption over time. As noted above, phasing in enforcement will allow producers a reasonable amount of time to achieve compliance with the new approach. Piloting new programming, learning from it, and adjusting and expanding our delivery as we go forward will enable the future approach to be most effective, the results acceptable, and the workload reasonable. Local landowners will have a particularly important role to play in the planning and implementation of solutions to drainage issues. Individual landowners have a proven ability to solve local problems and find novel ways to improve local conditions. This capacity to envision and implement change will be a vital part of solving any extensive drainage management issues that arise. The aim of this new approach to drainage is more resilient, sustainable water management that serves a wide range of interests – responsible drainage that balances the benefits of drainage with mitigation of impacts.

#### **Observation:**

Agreed.

## **C. Important Observations and Recommendations on Drainage and Closely Related Issues**

### **1. Observations on the Causes of Drainage Problems and the Essential Need To Protect Water Quality**

Farm drainage is sometimes a problem and some RMs are negligent in maintaining culverts and other drainage infrastructure. The result then is increased flooding.

However, there are many other major contributors to drainage and flooding issues, and these relate to land use planning and how we have allowed development to occur. For instance, cottage owners successfully lobbied government to build dams at the outlet of lakes, creating artificially high water levels. This reduces the capacity of the lakes to act as a buffer for floodwater. Developers have obtained building permits from government to fill wetlands and to build permanent structures on these areas. Floodplains have been developed in dry years and then there's a surprise when they flood in wet years. Urban developers have hardened shorelines to prevent erosion. This creates a virtual drainage ditch that accelerates the movement of water away from that area, resulting in downstream flooding in times of heavy runoff. Roadways are being built through wetlands and across natural drainage areas, acting as low head dams. They hold back natural drainage until times of flood - then the water bursts through the road.

The flooding, while causing considerable problems to private property, is creating major problems to public property, particularly water quality. There was a recent public service message showing the problem with throwing a cup of oil into a storm sewer. Flooding replicates this action many times over. Rivers become open sewers and lakes become sewage lagoons when floodwaters drain from



septic systems, from basements, from the oil patch, and from industrial development areas. This problem will be persistent and will be accelerated during drought times when evaporation occurs, leaving the toxic garbage behind in the water and on the lowlands.

Many nutrients can also be flushed into lakes and rivers during a flood event, including phosphates, nitrates, and pesticides.

Water quality therefore needs to be carefully monitored after flooding occurs – whether caused by inappropriate farm drainage, poor land use planning or extreme weather events.

There needs to be a change in how we approach our planning and development if we are to protect the quality of our water supplies. **We hope therefore that you will make sound land use planning and protection of water quality a central pillar of your new drainage policy.**

## 2. Tools that Would be Useful and Expertise to Draw Upon

- a) One technological tool that could help your Government in dealing with drainage issues is Lidar, high resolution topography. **It would be very helpful to have Lidar coverage in the southern half of Saskatchewan.** <sup>i</sup> Many jurisdictions in the United States have this for the entire state. Alberta also has good coverage.
- b) **Guidelines for riparian buffer strips and other tools that would help local groups deal with sediment/erosion issues would be an excellent complement to the proposed policy on drainage.** We hope these can be developed.
- c) Dr. Harvey Hill (ex PFRA) did some superb conceptual work on rural flood mitigation under a program he called LIRA. He is no longer working for Agriculture Canada, but could be a very good resource to draw upon.

## 3. The Close Link Between Drainage Issues And Loss Of Wetlands

- Heavy rainfall events and movement of water during spring melt are becoming more complex in Saskatchewan (with more negative effects) because of loss of wetlands.
- In large parts of southern Saskatchewan, a very significant portion of wetlands have been lost. (In the absence of a historical wetlands inventory, it is hard to put an exact number on the loss. Duck Unlimited has estimated the current rate of loss at 28 acres per day.<sup>ii</sup>) Technology is steadily expanding the area that can be drained. These lands are no longer able to play their valuable role in capturing and holding back water. When heavy spring runoff or intensive rainfall events do occur, the damage from flooding is therefore more serious than it would otherwise have been.
- A well documented Saskatchewan example of the impact associated with a sharp decline in wetlands is the small agricultural dominated Smith Creek prairie basin (393 square kilometers)





in southeast Saskatchewan. Smith Creek is not completely typical of most basins in southern Saskatchewan. Nevertheless, the research work done there by Dr. John Pomeroy and others at the University of Saskatchewan underlines the dangers that come with allowing too much wetland loss. Between 1958 and 2009, the wetland area of this basin was reduced from 24% to 10%.<sup>iii</sup> This has greatly reduced surface water storage capacity. Loss of wetlands in the basin combined with increases in rainfall (including rain on snow) due to climate change have driven a 14 fold increase in stream flow volumes in the Smith Creek prairie basin (when compared to the period 1975-1994).

- Wetlands are well known to be a valuable carbon sink, but when they are drained, they become a major source of greenhouse gas pollution. On the other hand, if a wetland is once again restored, it can sink carbon significant amounts of carbon.<sup>iv</sup> Restoration work to be most beneficial should also include adjacent riparian zones and associated uplands. Restoration work could be linked to carbon credits, so that some monetary gain can also be achieved for those doing this important work.
- Wetlands are critically important in times of drought. They can withstand the flood-drought cycle and in times of severe drought may be one of the few areas around which hay production can be sustained.
- Wetlands are of critical importance in protecting water quality. For instance, they play an important role in intercepting and dissipating pesticides. They improve downstream water quality through their ability to absorb phosphorous. And wetlands take up excess nitrate (from nitrogen fertilizer applications) that would otherwise degrade downstream surface water quality.<sup>v</sup>
- As part of managing drainage issues, it is very important for the Ministry of Environment and the Water Security Agency to encourage wetland restoration and to take action to prevent further loss of valuable wetlands. **We recommend wetland restoration and protection of existing wetlands become a central pillar of the Saskatchewan Government's new drainage policy.**
- Wetland restoration when combined with good design and placement of control gates will help a lot in managing difficult flooding situations.

#### 4. The Close Link Between Drainage Issues and Climate Change

- The global hydrological cycle is being significantly impacted as atmospheric greenhouse gas concentrations rise due to the burning of fossil fuels, deforestation, fossil fuel extraction, and other important emission sources.
- As greenhouse gas concentrations go up, a warmer atmosphere is able to hold more water vapour. The result is that more intense rainfall events are being recorded in many parts of the world, including Saskatchewan. So significant is the change that hydrologic stationarity is being lost. In other words, society is now faced with the predicament that it can no longer accurately predict the future based on the range of precipitation patterns in the relatively recent past.
- This has very important implications for drainage, because exceptionally heavy rainfall events have already become more frequent in Saskatchewan, and are likely to continue to do so. An example is the intense rains that were experienced in southeast Saskatchewan and



southwest Manitoba in 2011. The flooding that year was considered a one in one hundred year event. Yet three years later – in late June of 2014 - a similar set of heavy rainfall events was repeated over an even larger part of southeast Saskatchewan and southwest Manitoba. Many homes, farms and businesses were flooded for the second time in three years. Water and sewer infrastructure was unable to cope, as some communities got more than 150mm of rain within 2-3 days.

- Drainage is therefore shifting from becoming primarily a spring runoff issue (snowmelt) to also becoming an issue of how to cope with water from exceptionally heavy spring and summer rainfall events. These events not only produce flooding, but lead to soil moisture saturation, thus influencing the subsequent year's spring runoff patterns.
- The significance of this trend is clearly displayed by Saskatchewan Provincial Disaster Assistance spending which has risen by more than a 30 fold in the course of the last decade. A large portion of that increase is driven by flooding events caused by intense rainfall over one to three days. (A small portion of the increase also reflects worthy improvements in PDAP eligibility made by your government in 2010.)
- By way of illustration, the Saskatchewan portion of PDAP spending in fiscal year 2001-02 was \$1,500,000; in 2002-03 was \$1,675,000; in 2003-04 was \$618,000 and in 2004-05 was only \$276,000. In contrast, the Saskatchewan portion of PDAP spending in fiscal year 2011-12 was \$157,115,000; in 2012-13 was \$72,597,000; in 2013-14 was \$46,815,000 and is budgeted in 2014-15 to be in the range of \$150,000,000.<sup>vi</sup> Such rates of spending on PDAP in Saskatchewan are unprecedented. (PDAP is only one lens through which to view the shift that is occurring.)
- Other jurisdictions around the world are experiencing similar types of problems. As you know, Alberta faced unprecedented flooding in June of 2013. Many communities, including Calgary and High River, had to conduct emergency evacuations. Five Albertans died. (Later that summer Toronto was hit by very heavy flooding too.) What is less well known, but critically important, is that in the same month as the southern Alberta floods, Germany, Austria, and the Czech Republic were hit by very similar kinds of rainfall events. So were the Himalayas. To provide a sense for the scale of flooding and drainage problems created in Germany, 60,000 personnel were sent in to help affected communities. German flood waters reached a 500 year high in some locations. In the Himalayas, given the nature of the terrain, the drainage problems created by June 2013 rainfall were simply unmanageable. Over 5,000 people died.<sup>vii</sup>
- The United Nations, the World Bank, the International Energy Agency, the Intergovernmental Panel on Climate Change and every national science academy in the world are warning governments that they must move urgently to reduce fossil fuel consumption (and production) in order to prevent these kinds of extreme events from becoming far worse.
- **If greenhouse gas emissions issues are left unresolved, flooding and drainage issues in some parts of the world will ultimately become a threat to national security.** This was already evident last winter in the United Kingdom, when the country experienced its wettest winter on record. Hundreds of UK communities were hit by devastating floods. Five of the six wettest years on record in the UK have occurred since the year 2000.
- **The above information provides one example of why, in addition to undertaking adaptation planning (such as drainage management), the Saskatchewan Environmental Society urges you to give equally high priority to greenhouse gas emission reduction.** We hope your government will work hard to meet the greenhouse gas emission reduction targets that you set in 2009 (20% reduction in 2006 emission levels by 2020). Only by taking concrete action at



home, are we then in a position to expect other jurisdictions to also take appropriate action. This is a problem that can only be resolved collectively. Saskatchewan needs others to take action on emission reduction, or our drainage problems will become far worse in the decades ahead.

## End Note References:

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- <sup>i</sup> LIDAR (Light Detecting and Ranging) is a remote sensing method that allows mapping professionals to analyze natural and manmade environments with precision. It can be used for mapping the land and measuring riverbed elevations.
- <sup>ii</sup> <http://www.ducks.ca/your-province/saskatchewan/>
- <sup>iii</sup> "Impact of Increasing Rainfall and Rain-on-Snow on Flood Generation in a Canadian Prairie Catchment" by Stacey Dumanski, John W. Pomeroy and Cherie W. Westbrook, Centre for Hydrology, University of Saskatchewan.  
[http://fallmeeting.agu.org/2014/files/2014/12/ROS\\_PressTalk\\_DumanskiS\\_AGU0214.pdf](http://fallmeeting.agu.org/2014/files/2014/12/ROS_PressTalk_DumanskiS_AGU0214.pdf)
- <sup>iv</sup> Quantification Discussion Document — Wetlands Protocol Document No. 20090703  
Version No. FINAL Prepared for Climate Change Central and Ducks Unlimited, July 3, 2009.  
  
Euliss, N.H. Jr., R.A. Gleason, A. Olness, R.L. McDougal, H.R. Murkin, R.D. Robarts, R.A. Bourbonniere, and B.G. Warner. 2006. "North American prairie wetlands are important non-forested land-based carbon storage sites." *Sci. Total Environ.* 361:179-188.
- <sup>v</sup> The Role of Canadian Wetlands for Improving Water Quality: A review of the biological and economics values wetlands provide to society and environment by Lisette Ross (Prepared for Ducks Unlimited Canada).
- <sup>vi</sup> Government of Saskatchewan Public Accounts for the fiscal years 2001-02 through to 2013-14.
- <sup>vii</sup> "Heavy rains in southern Alberta force mandatory evacuations in areas of Calgary and surroundings", *National Post*, June 20, 2013.  
"German flood waters reach 500-year high", *The Associated Press*, June 4, 2013.  
"Indian floods leave tens of thousands stranded in Uttarakhand state", *The Guardian (UK)*, June 20, 2013.  
"Selected Significant Climate Anomalies and Events in June 2013", *National Oceanic and Atmospheric Administration, Government of the United States.*  
[ncdc.noaa.gov/sotc/service/global/extremes/201306.gif](http://ncdc.noaa.gov/sotc/service/global/extremes/201306.gif)