



Photo Credit: Steve Schwarz

# 2013

## NWT Source Water Protection Planning



# Source Water Assessment and Protection Program



Photo Credit: Steve Schwarz



Photo Credit: Brenda Roberts

## Getting Started

Water is life! Access to safe drinking water is a key factor for our personal health and the health of our communities. During the development of *Northern Voices, Northern Waters: The NWT Water Stewardship Strategy*, many NWT residents expressed interest in safe drinking water. Communities discussed the importance of watershed planning to protect sources of drinking water in the NWT, such as rivers, lakes and groundwater.

Based on the NWT Water Stewardship Strategy, a Source Water Assessment and Protection (SWAP) Program was developed with input from NWT communities. The SWAP Program was designed to help NWT communities assess and protect their most precious resource, water!

This calendar was created for northerners to better understand source water protection and to help interested communities work on source water protection planning. The calendar provides definitions and background information related to source water protection. It also outlines the five stages of the NWT SWAP Program and suggests ways to work on the program over one calendar year.

The NWT Water Stewardship Strategy and Action Plan and the Source Water Assessment and

Protection Program are available online at [www.nwtwaterstewardship.ca](http://www.nwtwaterstewardship.ca)

*Note: The five stages of the SWAP Program are not meant to be associated with any particular month in this calendar. Source water protection planning, and the steps associated with it, can happen at any time throughout the year. The purpose of this calendar is to set out a realistic timetable for a community to develop their own Source Water Assessment and Protection Program.*

For more information or questions, contact:

Land and Water Division  
Department of Environment and Natural Resources  
Government of the Northwest Territories  
Box 1320  
Yellowknife NT X1A 2L9  
Tel: (867) 920-6334  
E-mail: [NWTWaterStrategy@gov.nt.ca](mailto:NWTWaterStrategy@gov.nt.ca)

## What is Source Water?

Source water is raw (untreated) surface or groundwater used for private and public drinking water systems. Source water from surface water supplies includes water from wetlands, streams, lakes, or rivers. Groundwater is another source of raw water and is found beneath the earth's surface.



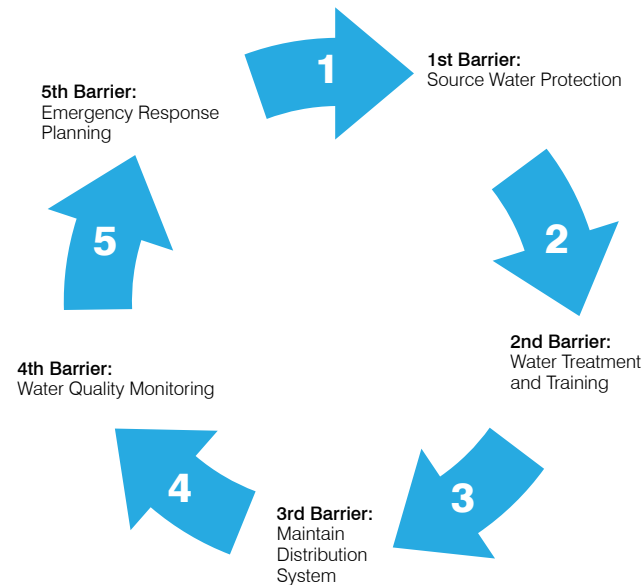
Photo Credit: Steve Schwarz

## What is Source Water Protection and Why is it Important?

Source water protection aims to prevent contaminants from entering surface and groundwater sources before water is treated. Source water protection works to keep water safe at the source, and contributes to overall aquatic ecosystem health. Preventing contaminants from reaching water sources is an important first step in protecting drinking water.

Source water protection is often referred to as the first barrier in the multi-barrier approach to safe drinking water. The multi-barrier approach is a set of barriers, or defences, built into a community water system to eliminate the potential for human consumption of unsafe drinking water. The barriers are designed to be protective at multiple levels. If one barrier fails, the next barrier is meant to catch the problem.

Figure 1: Multi-Barrier Approach to Safe Drinking Water



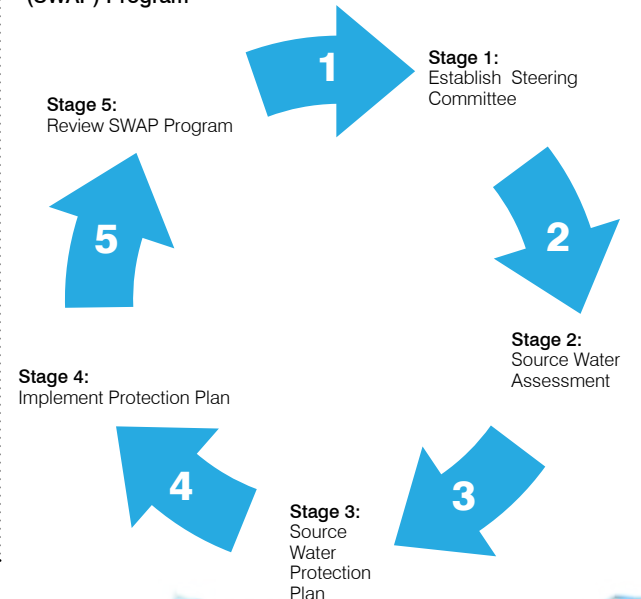
## NWT Source Water Assessment and Protection Program

The SWAP Program was created to help interested communities with source water protection planning. The SWAP Program is a multi-stage planning process (Figure 2) designed to help communities prevent contamination of their source water supplies. Protecting source water protects human health and aquatic ecosystem health. Communities are encouraged to engage in a SWAP Program to:

- Reduce water treatment challenges and costs;
- Reduce contamination threat and costly remediation; and
- Improve environmental stewardship.

*The SWAP Program should be completed in sequence, beginning at Stage 1 and ending at Stage 5. To be at Stage 3 means that you have completed Stage 2. "Stage jumping" is not encouraged – such practice will not lead to effective planning!*

Figure 2: Source Water Assessment and Protection (SWAP) Program





## STAGE 1: Create a Steering Committee

The first stage in the SWAP Program is to establish a community **Steering Committee**. Spend this month establishing a steering committee that includes community members committed to team work and collaboration.

Photo Credit: Mike Vassal

january **2013**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 New Year's Day	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

### Steering Committee Objectives:

- **Diversity** in membership to ensure a broad range of interests and backgrounds
- **Collaborative** and consensus-based decisions
- **Accountable** to the larger community, open meetings, accurate minutes from all meetings



Photo Credit: Christin Tondeur





## STAGE 2: Source Water Assessment Report

Once established, the Steering Committee will work together on a Source Water Assessment Report. This report has two parts:

- a) **water system inventory** of existing and potential sources of contaminants; and
- b) **risk assessment** for those potential contaminants that may be entering the water supply source. The focus for this month is to take inventory of your water system including source water with as much detail as possible.

Spend the next two months creating your water system inventory.

Photo Credit: Mike Vassal

february **2013**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					<b>1</b>	<b>2</b>
<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>
<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>
<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>		

# Steps to follow when doing your Water System Inventory:

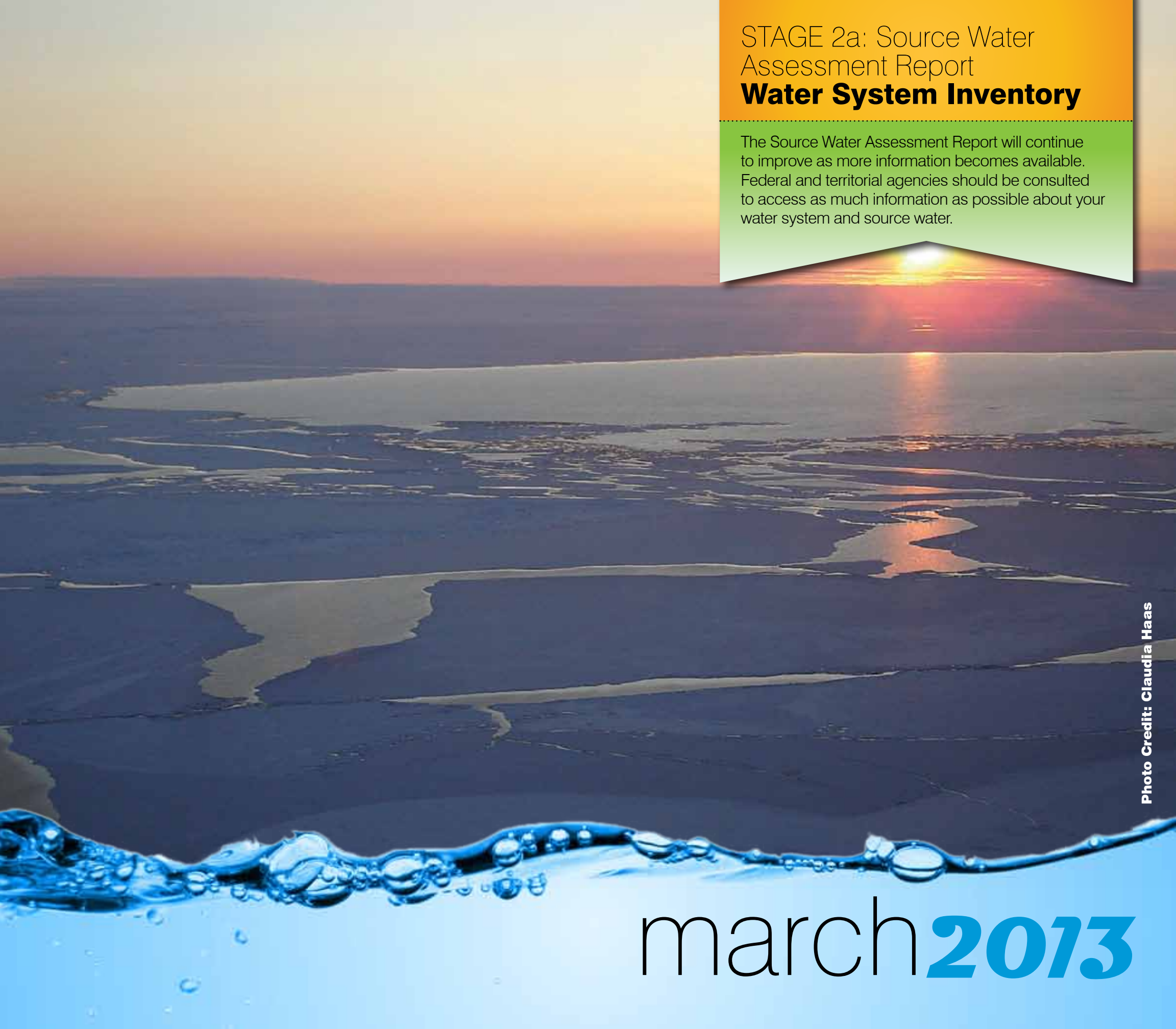
- Map the boundary of your source protection area; and
- Take inventory of existing land uses and activities such as location of the landfill, residential development, roads, fuel storage, industrial sites, etc. that may impact source water quality.

**Note:** Local and traditional knowledge will be an important source of information for the inventory. These steps should be completed by the Steering Committee with input from residents, Elders, Band Councils, local government and territorial agencies. ENR has developed community water catchment maps that can help with this process. These maps are available at <http://geomatics.gov.nt.ca/maps.aspx?i=8>



Hazardous Waste  
Photo Credit: Robert Patrick





## STAGE 2a: Source Water Assessment Report **Water System Inventory**

The Source Water Assessment Report will continue to improve as more information becomes available. Federal and territorial agencies should be consulted to access as much information as possible about your water system and source water.

Photo Credit: Claudia Haas

march **2013**



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					<b>1</b>	<b>2</b>
<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>
<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>
<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>
<b>31</b>					Good Friday	

# Questions to ask when doing the Water System Inventory:

- Are sources of contaminants present in your local source protection area?
  - Does the water supplier control all land use activities in the source water protection area?
  - Is there a backup water intake in place?
- Is there a backup drinking water source available?
  - Is the raw water source monitored for water quality and quantity?



Hazardous Waste  
Photo Credit: Gerald Enns



Photo Credit: GNWT



## STAGE 2b: Source Water Assessment Report **Risk Assessment**

Once you have completed a water system inventory, you can begin the risk assessment. A risk assessment is a critical part of the Source Water Assessment Report. The risk assessment identifies existing and potential sources of contaminants. The Steering Committee may require help from territorial agencies to complete this task. Local and traditional knowledge is often helpful when recording historical land use practices that may lead to sources of contaminants in source water.

Photo Credit: Christin Tondeur

april **2013**



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>
<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>
<b>28</b>	<b>29</b>	<b>30</b>				

Potential contaminant sources can come from:

- **Point sources**, such as effluent pipes, sewage lagoon outfall, fuel tanks
- **Non-point sources**, such as spring melt, road salts
- **Natural sources**, such as streambank erosion, landslides



Photo Credit: Mike Vassal



## STAGE 2b: Source Water Assessment Report **Risk Assessment**

Once a list is made of existing and potential sources of contaminants, the next step is to rate the level of risk from those contaminants. This is called the contaminant risk assessment.

Photo Credit: Ryan Gregory

may **2013**



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20 Victoria Day	21	22	23	24	25
26	27	28	29	30	31	

Things to consider when completing the contaminant risk assessment:

- Understand existing source water conditions
- Record existing source water protection actions such as:
  - Is there a source water protection plan?
  - Is there a back-up water source; a backup water intake?
  - Is raw water being monitored?
- Undertake a risk assessment by asking:
  - What is the **likelihood** of a contamination event?
  - What is the **consequence** to human health due to that contamination event?



Photo Credit: Mike Vassal

## STAGE 3: Developing a Source Water Protection Plan

Now that Stage 2 is complete, the Steering Committee can develop the Source Water Protection Plan. The Source Water Protection Plan should be a living document, something that evolves and changes over time as new knowledge and information becomes available and as new concerns surface. This stage will likely take several months.

Photo Credit: Sarah Elsasser

june **2013**



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						<b>1</b>
<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>
<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b> National Aboriginal Day	<b>22</b>
<b>23</b>  <b>30</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>

Source Water Protection Plan Objectives:

- To recommend source protection management actions such as landfill remediation or signage and education
- To use traditional and local knowledge to form management actions
- To make use of existing science-based monitoring data and programs to form management actions



Photo Credit: Maik Tondeur-Zetzmann



Photo Credit: Sarah Elsasser

## STAGE 3: Developing a Source Water Protection Plan

The Source Water Protection Plan includes management actions designed to reduce, or eliminate, risks identified in Stage 2. The Steering Committee must select from a wide range of management actions.

Photo Credit: Courtney Simpson

july **2013**



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	<b>1</b>  Canada Day	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>
<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>
<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>			

Management actions include structural activities such as:

- Sewage lagoon restoration
- Stormwater collection and treatment
- Intake pipe repair
- Road culvert replacement
- Landfill relocation



Photo Credit: Holly Norris

Photo Credit: Holly Norris

## STAGE 3: Developing a Source Water Protection Plan

The Source Water Protection Plan includes management actions designed to reduce or eliminate, risks identified in Stage 2. The Steering Committee must select from a wide range of management actions.

Photo Credit: Jennifer Skelton

august**2013**



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5 Civic Holiday	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Management actions can include non-structural activities such as:

- Land use planning
- Vegetation buffer along waterways
- Signage
- Public education
- Communication
- Developing a community-based water monitoring program



Photo Credit: Katherine Trembath



Photo Credit: Ryan Gregory



Photo Credit: Jennifer Skelton

## STAGE 4: Source Water Protection Plan Implementation

Now that you have created the Source Water Protection Plan, it is time to implement it! Implementation is where management actions identified in the Source Water Protection Plan are scheduled, budgeted, and put into place in your community.

Photo Credit: Maik Tondeur-Zetzmann

september **2013**



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<b>1</b>	<b>2</b>  Labour Day	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>
<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>
<b>29</b>	<b>30</b>					

Things to consider during implementation:

- Implementing the plan will require the Steering Committee to decide which hazards are the highest priority.
- Recommended management actions that were identified in Stage 3 should be prioritized.
- Don't get discouraged if things take longer than expected.



Photo Credit: Patti-Kay Hamilton

## STAGE 4: Source Water Protection Plan Implementation

Once the priority drinking water hazards have been identified the Steering Committee must develop timelines for implementation as well as funding sources to cover the cost of implementation.

Photo Credit: Christin Tondeur

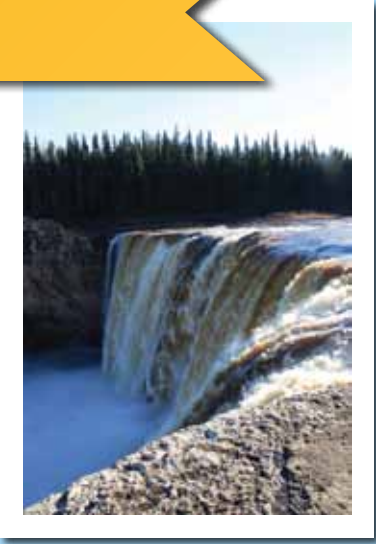
october **2013**



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
<b>13</b>	<b>14</b> Thanksgiving	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>
<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>
<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>		

### Things to consider during implementation:

- Some of the drinking water hazards that were identified as high risk may take a long time to resolve and could be very costly to fix.
- Other drinking water hazards may be quick to resolve with very little cost.
- Aim for early success! Try to resolve some of the simpler tasks first, while working to resolve the more difficult tasks.
- To help cover the cost of implementation, the Steering Committee may want to apply for funding from outside sources.
- ENR has water quality monitoring equipment available for community-based water monitoring.



Please see last few pages of the calendar for more information on community-based water monitoring and potential funding sources.

Photo Credit: Holly Norris





## Stage 5: Evaluate Source Water Assessment and Protection Program

Every five years, the Source Water Assessment and Protection Program should be reviewed and evaluated to effectively protect source water.

Photo Credit: Mike Vassal

november **2013**



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					<b>1</b>	<b>2</b>
<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>10</b>	<b>11</b> Remembrance Day	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>
<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>
<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>

What should be reviewed?

- Membership in the Steering Committee should be updated, if needed.
- The water system inventory should be updated to identify new or missed land uses and activities from the previous assessment.



Photo Credit: Mike Vassal

## Stage 5: Evaluate Source Water Assessment and Protection Program

Every five years, the Source Water Assessment and Protection Program should be reviewed and evaluated to effectively protect source water.

Photo Credit: Patti-Kay Hamilton

december **2013**



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	Christmas Day	Boxing Day		

What should be reviewed?

- The effectiveness of management actions.
- New management actions to match new risks identified in the updated inventory.



Photo Credit: Bob Patrick



Photo Credit: Courtney Simpson

## Resource Information

### Community-Based Water Monitoring Equipment

Your community may be interested in developing its own water monitoring program, or maybe your community already has a monitoring plan in place and has identified what needs to be monitored. If water quality is one of the things you would like to monitor, ENR can lend equipment to your organization or your community to measure a variety of water quality parameters. ENR and the Department of Aboriginal Affairs and Northern Development (Water Resource Division and Cumulative Impacts Monitoring Program) are interested in continuing to work with communities to develop monitoring programs.

There are training resources available online that show how to use the water quality monitoring equipment. Please visit <http://www.nwtwaterstewardship.ca>

ENR has kits that include a camera and a GPS. These kits can be borrowed to document things on the land and in the water that are of interest to your organization or community. With the camera, unusual things or things that are different than they were before can be captured. With the GPS, the location where you have observed changes can be recorded. The monitoring equipment can provide important information for designing or conducting community-based monitoring programs.

If you're interested in accessing water monitoring equipment, please contact Erin Kelly at [erin\\_kelly@gov.nt.ca](mailto:erin_kelly@gov.nt.ca)



## Potential Funding Sources

During the development and implementation of *Northern Voices, Northern Waters: The NWT Water Stewardship Strategy*, communities identified limited financial resources are one of the main barriers for developing water stewardship initiatives like community-based monitoring and source water protection planning. In response to this, ENR released a document called *Identification of Environmental Research Funding Sources*. ENR also created a calendar to help communities explore funding opportunities to plan and implement aquatic ecosystem community-based monitoring. It provides a list of potential funding sources, deadlines for applications for funding and tips on putting together a successful proposal.

*Identification of Environmental Research Funding Sources* and the Community-based Monitoring Funding Opportunities 2012 calendar are available at <http://www.nwtwaterstewardship.ca>

## Water Stewardship Strategy Website

If you are interested in learning more about the NWT Water Stewardship Strategy and water related initiatives in the NWT, please watch for the new NWT Water Stewardship Strategy website which is scheduled to be launched this year!



Photo Credit: Ryan Gregory



Photo Credit: Steve Schwarz











january

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

february

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	

march

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

april

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

may

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

june

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

july

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

august

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

september

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

october

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

november

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

december

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

2024

