

Field Guide
&
Instructions



AWQA
Alberta Water Quality Awareness Day



TABLE OF CONTENTS

Introduction	2
Exploring Your Watershed.....	3
Safety.....	4
Testing Hints	6
Collecting Your Sample	6
Turbidity	
Procedure.....	8
Interpreting your results.....	9
Temperature	
Use of a thermometer	10
Procedure.....	10
Interpreting your results.....	11
Dissolved Oxygen	
Procedure.....	12
Interpreting your results.....	13
pH	
Procedure.....	15
Interpreting your results.....	16
Water Quality and Us, Making a Difference	17
Field Data Sheets	19

Additional Field Guide and Instruction booklet copies are available online at www.awqa.ca

INTRODUCTION



Thank you for participating in Alberta Water Quality Awareness (AWQA) Day! Together we are creating a province-wide snapshot of water quality.

Please remember to...

- Test the water from one or more waterbodies of your choice between May 1st and August 31st.
- Post your findings at www.awqa.ca by September 15th to contribute to the province-wide snapshot of water quality!

“Snapshot water quality monitoring” occurs when many sites are sampled over a short period of time.

The AWQA Day test kit contains the materials to test four basic water quality characteristics: water temperature, dissolved oxygen, pH and turbidity. These parameters provide a general indication of the health of a waterbody. While a truly scientific and accurate measure of water quality requires more intensive monitoring than AWQA Day, participating in the program is a great way to:

- Learn about four important indicators of water health.
- Spend time outside observing what’s going on in your watershed.
- Find out how you can protect water quality.
- Be a part of something big!

Get your feet wet and have fun exploring your local waterways!

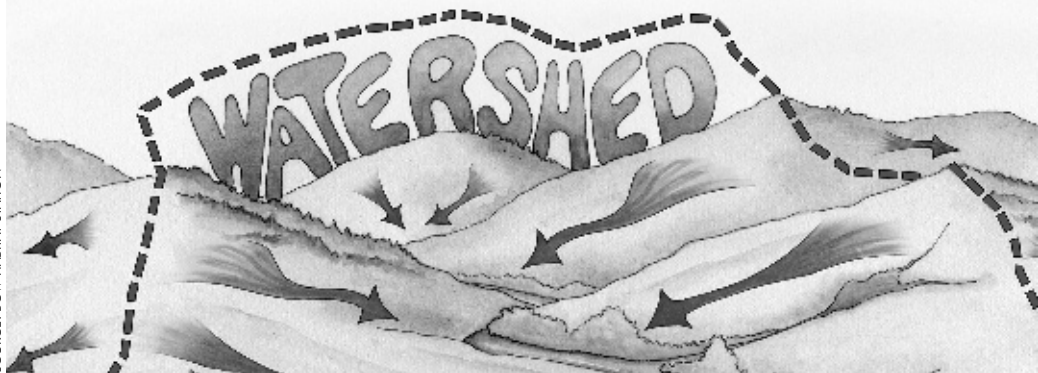
EXPLORING WATER QUALITY IN YOUR WATERSHED

Climate, season, wildlife activity and human activity are some of the many factors that impact the quality of surface waters in Alberta. Maintaining clean, safe water is important for our health, the environment, recreational activities and aesthetics. All activities within a watershed affect water quality.

What is a watershed?

It is an area of land that catches precipitation and drains into a larger body of water such as a wetland, stream, river or lake. No matter where you are, you are in a watershed.

There are seven major watersheds in Alberta: Peace/Slave, Athabasca, Hay, Beaver, North Saskatchewan, South Saskatchewan and Milk River watersheds.



FOR YOUR SAFETY

Before you take to the water, please read these safety instructions!

- Always monitor with one or more partners: getting together with friends and family makes for safe and fun water testing.
- Have a cell phone and first aid kit handy. Know any important medical conditions of your group members (for example heart conditions, diabetes, allergies) and bring any needed medications.
- Listen to your local weather report. Don't go monitoring in heavy rain or if a storm is predicted.
- Never cross private property without the permission of the landowner. Preferably, sample at public access points such as a bridge, road crossings or public parks.
- Never drink the water in a stream or lake. Assume it is unsafe, and bring your own water.
- Do not proceed with water testing if the water appears to be badly polluted or is posted against swimming.
- Avoid walking on unstable stream banks that may be in danger of eroding or collapsing.
- Never wade in swift or high water.
- Remain out of the stream as much as possible: stream bottoms are slippery, can contain deep pools or sink holes, and can also have sensitive habitats that should not be disturbed.
- If you take a boat out, follow safe boating practices. Wear a life jacket at all times!
- **ADULT SUPERVISION REQUIRED.** The Dissolved Oxygen tablets in the kit are hazardous if swallowed or if they come into contact with skin or eyes. To dispose of unused tablets, dilute

them in a bucket of water and flush them down the drain.

- Wear clean latex or rubber gloves when you take the sample and conduct tests. Wash your hands with soap when you are finished and dispose of all your trash properly when you have finished.

TEST KIT SAFETY

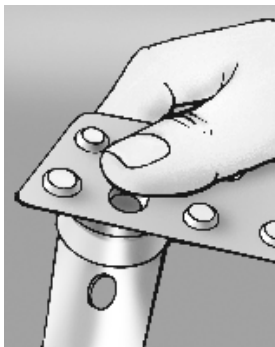
The tablet reagents used in this kit are designed with safety in mind. The single-unit, foil packaged tablets are easy to dispense. Store tablets in a cool, dry place and only open the foil when ready to use them. A single tablet, either alone or reacted with a sample, is not a health hazard. However, tablets should not be ingested. Additional information for all LaMotte reagents is available from Chem-Tel by calling 1-800-255-3924. Each reagent can be identified by the four digit number listed in the test procedures.

If at any time you feel uncomfortable about conditions at the site, stop monitoring and leave at once.

Your safety is more important than the data!

The numbers printed on the foil are insignificant. Look for the name of the test on the foil package to determine what tablets to use for each test.

For example: DO is printed on the foil of the tablets used for the Dissolved Oxygen test.



TESTING HINTS

- Follow all instruction steps in their listed order.
- A watch or timer is recommended for timing the 5 minute wait in the Dissolved Oxygen test.
- Attach Secchi sticker and two temperature strips to sampling container (see Turbidity and Temperature Procedure) PRIOR to collecting any water samples to ensure sticker adhesion.
- The Field Guide contains data sheets where you can record your results.

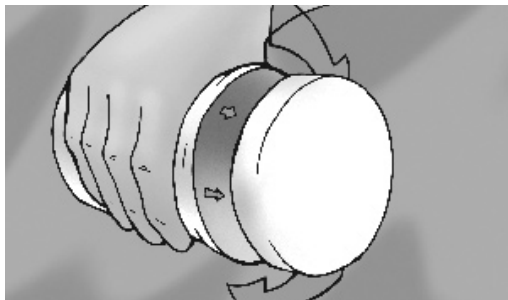
AFTER TESTING

All reacted test samples can be disposed of by flushing down the drain with excess water. While in the field, samples can be poured together into a waste container or brought home in the test tubes for later disposal.

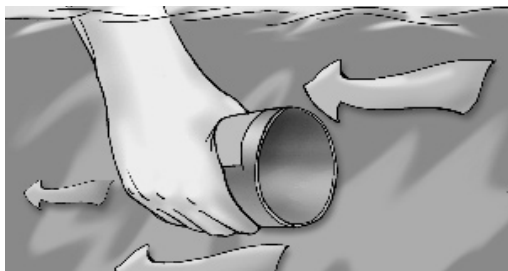


COLLECTING YOUR SAMPLE

- 1 Follow this procedure prior to each of the following tests: turbidity, dissolved oxygen, and pH.



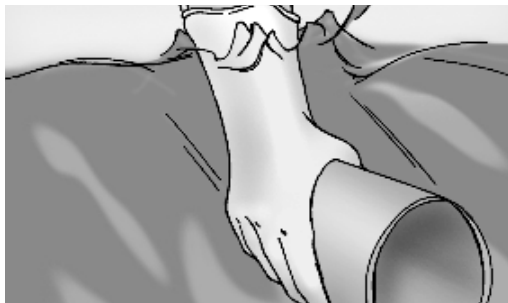
- 4 Turn the submerged container into the current and away from yourself.



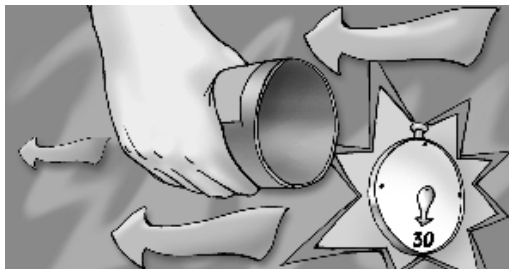
- 2** Remember to wear protective gloves! Rinse the sampling container 2-3 times with source water.



- 3** Hold the container near the bottom and plunge it (opening downward) below the water surface.



- 5** Allow the water to flow into the container for 30 seconds.



- 6** Cap the full container while it is still submerged. Remove it from the water immediately.



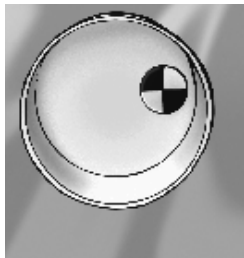
TURBIDITY: PROCEDURE

Remember to follow the 'Collecting your sample' procedure before each test and to wear latex or rubber gloves when sampling.

- 1** Remove the backing from the Secchi disk icon sticker.



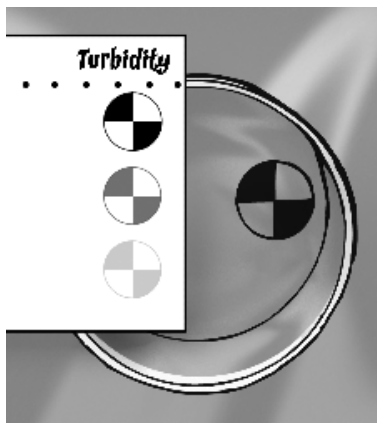
- 2** Adhere the sticker on the inside bottom of the sampling container. Position the sticker slightly off center.



- 3** Fill the jar, leaving an inch (thumb-width) of space at the top.



- 4** Hold the Turbidity Chart over the top edge of the jar. Looking down into the jar, compare the appearance of the Secchi disk icon in the jar to the chart. Record the result as Turbidity in JTU (Jackson Turbidity Units).



INTERPRETING YOUR RESULTS

Turbidity is a measure of how clear the water is. Water clarity changes depending on the amount of floating or suspended materials (such as mud, silt, sediment, and algae) in the waterbody.

Why is turbidity important?

Turbidity affects:

- The ability of aquatic organisms to see.
- The amount of light reaching aquatic plants.
- Dissolved oxygen levels.
- Water temperature.
- Enjoyment of recreation.
- Property value.
- Odour.

Did you know?

Suspended sediment absorbs the sun's energy, making water temperatures warmer.

What influences turbidity?

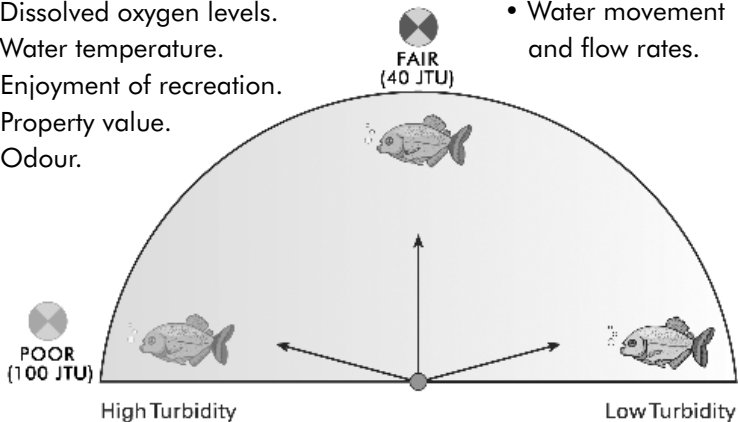
- Bottom sediment disturbances such as from boat traffic.
- Soil erosion.
- Algae growth.
- Urban runoff.
- Water movement and flow rates.

Quick fact

All three levels of turbidity (0, 40, 100 JTU) can be found in Alberta's lakes and rivers.

Did you know?

Lake property value increases with water quality.



TEMPERATURE: USE OF THERMOMETERS

The two thermometers have an adhesive back: attach them to the side of the sampling container to make their use easier.

Water temperature is indicated by the appearance of a green number on the thermometers. Please note: the smaller (low range) thermometer will appear totally black if temperatures are above 12 degrees Celsius.

PROCEDURE

Remember to adhere the two thermometer stickers to the outside of the sampling container before proceeding and wear latex or rubber gloves when sampling.

- 1 Submerge the sampling container with thermometers into the water, hold four inches below the water surface for **one minute**.



- 2 Remove the sampling container from the water, read the temperature and record it in degrees Celsius.



INTERPRETING YOUR RESULTS

Why is water temperature important?

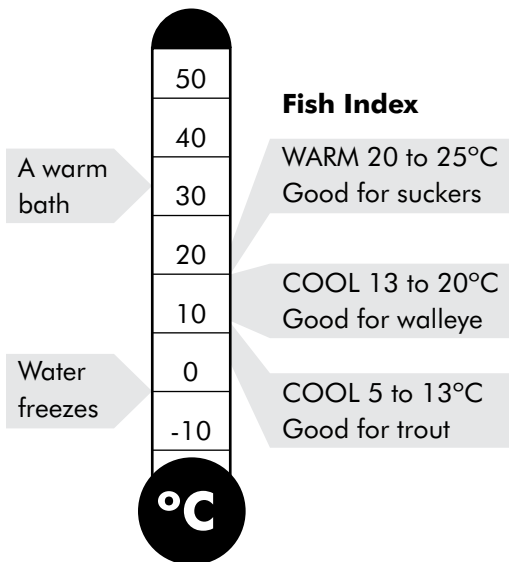
Aquatic plants and animals require water temperatures to be within a certain range for optimal health.

Temperature affects:

- The amount of oxygen water can hold (*Cold water holds more oxygen.*)
- How chemicals dissolved in water will act
- The metabolic rate of aquatic organisms.
- The rate of photosynthesis by aquatic plants.

What influences water temperature?

- Sunshine or light energy (*Water absorbs heat from the sun.*)
- Type and size of waterbody (*Deep water is generally cooler than shallow water.*)
- Human activities (*Wastewater or runoff may be warmer or cooler than the receiving waterbody.*)



Did you know?

Optimal water temperatures for fish vary depending on the species. Some species are adapted to colder water, while others are adapted to warmer water.

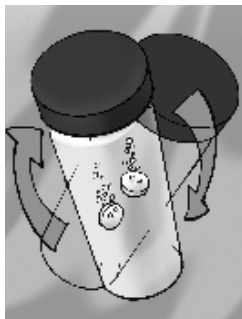
DISSOLVED OXYGEN (DO): PROCEDURE

Remember to follow the 'Collecting your sample' procedure before each test and to wear latex or rubber gloves when sampling.

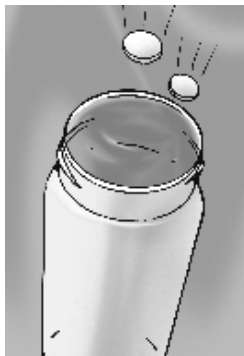
- 1** Submerge the small tube from your test kit into the new water sample. Carefully remove the tube from the water sample, keeping the tube full to the top.



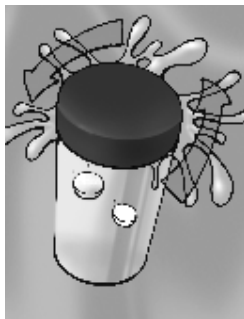
- 3** Screw the cap onto the small tube. Water should overflow as the cap is tightened. Make sure no bubbles are present in the sample.



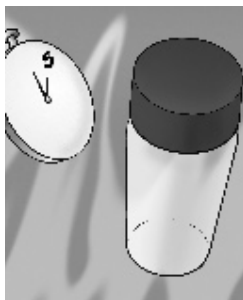
- 2** Drop two Dissolved Oxygen tablets into the tube. Do not worry if the water overflows when the tablets are added.



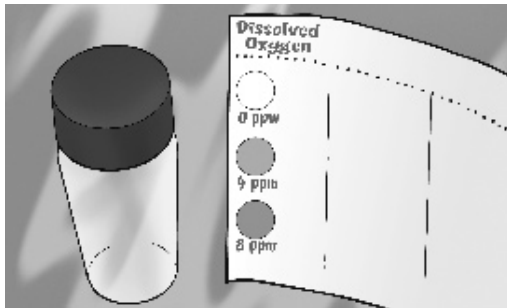
- 4** Mix by inverting the tube over and over until the tablets have disintegrated. This will take about 4 minutes.



- 5 Wait 5 more minutes for the color to fully develop.



- 6 Compare the color of the sample to the Dissolved Oxygen color chart. Record the result as ppm (parts per million) Dissolved Oxygen.



INTERPRETING YOUR RESULTS

Dissolved oxygen in water is a measure of the amount of oxygen available to aquatic plants and animals.

Did you know?

The amount of dissolved oxygen in water is usually highest midday because of the photosynthesis of aquatic plants.

Why is DO Important?

Aquatic organisms require a certain amount of dissolved oxygen to survive. The amount of dissolved oxygen needed varies with each species.

continued on pg. 14

DISSOLVED OXYGEN (DO): INTERPRETING YOUR RESULTS

What influences DO?

- Water temperature (*Cold water holds more oxygen.*)
- Aquatic plants and algae (*Photosynthesizing plants add DO; rotting plants and algae remove DO.*)
- Water turbulence and wave action (*Waves and rapids mix the water with oxygen from the atmosphere, increasing DO levels.*)
- Ice cover prevents oxygen from reaching the water.

Quick fact:

Most waterbodies in Alberta are well oxygenated in June, with DO levels greater than 6ppm.

DO 0ppm

- Unable to sustain life.
- Highly susceptible to disease and toxins.

DO 4ppm

- Moderate varieties and number of organisms are supported by this level of oxygen.
- More susceptible to degrading conditions and less able to assimilate toxins.

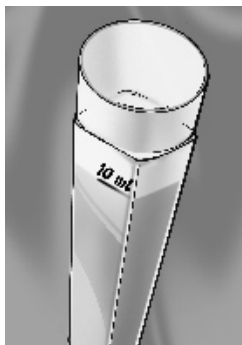
DO 8ppm

- Abundant life sustained: many and a variety of organisms, plants etc.
- High ability of filtering and assimilating environmental toxins: greater ability to self-clean and maintain health.

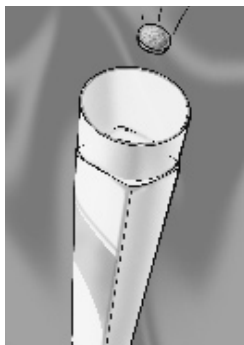
PH: PROCEDURE

Remember to follow the 'Collecting your sample' procedure before each test and to wear latex or rubber gloves when sampling.

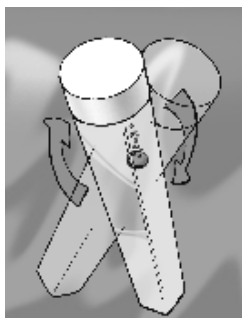
- 1** Fill the long test tube to the 10mL line with water from your new sample.



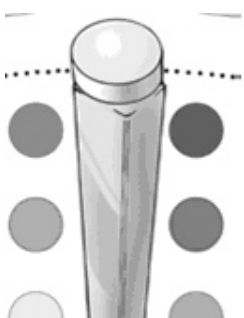
- 2** Add one pH tablet to the sample in the tube.



- 3** Cap the tube and mix by inverting over and over until the tablet has disintegrated. Bits of material may remain in the sample.



- 4** Compare the color of the sample to the pH color chart. Record your results as pH.



PH: INTERPRETING YOUR RESULTS

pH is a measure of how acidic or basic the water is. pH is measured on a scale from 0 (most acidic) to 14 (most basic).

Why is pH important?

- pH affects water chemistry and the biological state of aquatic organisms.
- Changes in pH can be very stressful on aquatic life, especially during reproduction.
- At a low pH certain compounds, like heavy metals, become increasingly toxic to plants and animals.

What influences pH?

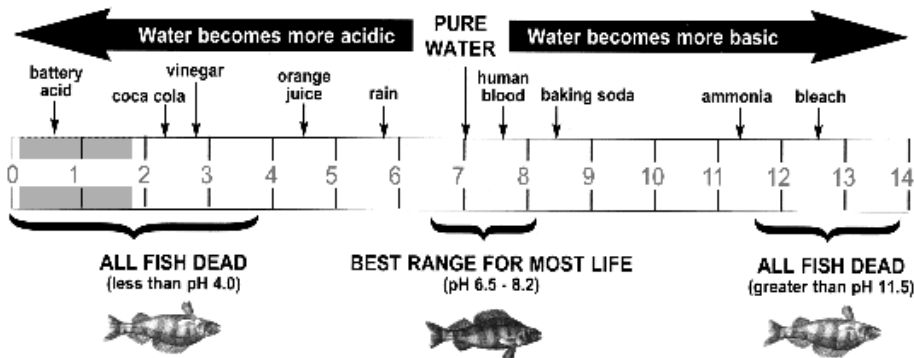
- The type of rocks and soil in the area.
- Human additions (such as fertilizers, chemical spills, urban runoff and acid rain).

Did you know?

Most of Alberta has carbonate-rich soil, which results in slightly basic water.

Quick fact:

Most waterbodies in Alberta have a pH between 6.5 - 9.5



WATER QUALITY AND US, MAKING A DIFFERENCE!

There are many things that we can do in our daily lives to improve water quality and the health of our watersheds. Here are some suggestions to help get you started.

Pharmaceutical Drugs: Don't flush your leftovers! Pharmaceutical drugs that are flushed down the toilet or thrown in the garbage can enter the water system. Take all unused, or "dead" drugs back to your local pharmacy for proper disposal.

Household Products:

Avoid hazardous household products that can be harmful to our waterways. Instead, try using "environmentally friendly" products, which can be found by looking for the Environmental Choice Logo. Common ingredients like baking soda, vinegar and dish soap also provide an easy and



Did you know?

Antibacterial soaps do not clean better than traditional soaps and they contain antibiotics that are harmful to our waterways.

inexpensive cleaning alternative. As a consumer, you can make informed choices.

Household Waste: Don't throw waste down the drain or toilet. What goes down our drains, goes into our rivers and lakes. Dispose of household items properly: use up all chemical products or dispose of leftovers at your local recycling or disposal facility, put solid waste into the wastebasket.



Pesticides: Even small applications of chemicals in yards and gardens can eventually find their way to shared water resources. Try using alternative forms of pest control, such as hand pulling weeds, companion planting, and snipping or discarding infected plant leaves.

Fertilizers: Excessive nutrients can impact our waterways by causing increased aquatic plant growth. As the plants die and decompose, oxygen is consumed by bacteria and oxygen levels in the water decrease. Try to use native plants and other natural sources to adjust the nutrient levels in your lawn/garden. If you must use fertilizers, apply only what your plants need.

Street Watch: Most of the water that runs off streets and through our storm drains is not treated at the sewage treatment plant before entering our waterways. This means that anything (oil, soap, salt, pet waste) that is on our streets makes its way into

our water system. Ensure that only clean rainwater makes it into the storm drain near your house.

Be active in your community

- Participate in AWQA Day annually.
- Join your local watershed group: visit www.ab.stewardshipcanada.ca to learn about groups near you. They are always in need of more volunteers and different talents.
- Read up on environmental issues.
- Be an active citizen: participate in public hearings, sit on an advisory committee, support federal, provincial and municipal action on water issues – take time to participate in these opportunities!

These are only some of the ways that you can improve water quality. For more information, visit www.awqa.ca. Let's make a difference!

Did you know?

One litre of oil can contaminate up to two million litres of water.

AWQA DAY FIELD DATA SHEET

Site Name _____

Waterbody Name _____

Date _____ **Time** _____ **Number of participants** _____

Waterbody type (Circle one)

lake reservoir pond stream/creek river wetland/slough spring/seep

dugout irrigation canal other _____

Water Temperature ____ °C

Dissolved Oxygen 0 4 8 ppm

pH 4 5 6 7 8 9 10

Turbidity 0 40 100 JTU

Additional comments (for e.g. participant names, watershed name, weather conditions):

AWQA DAY FIELD DATA SHEET

Site Name _____

Waterbody Name _____

Date _____ **Time** _____ **Number of participants** _____

Waterbody type (Circle one)

lake reservoir pond stream/creek river wetland/slough spring/seep

dugout irrigation canal other _____

Water Temperature ____ °C

Dissolved Oxygen 0 4 8 ppm

pH 4 5 6 7 8 9 10

Turbidity 0 40 100 JTU

Additional comments (for e.g. participant names, watershed name, weather conditions):

AWQA DAY FIELD DATA SHEET

Site Name _____

Waterbody Name _____

Date _____ **Time** _____ **Number of participants** _____

Waterbody type (Circle one)

lake reservoir pond stream/creek river wetland/slough spring/seep

dugout irrigation canal other _____

Water Temperature ____ °C

Dissolved Oxygen 0 4 8 ppm

pH 4 5 6 7 8 9 10

Turbidity 0 40 100 JTU

Additional comments (for e.g. participant names, watershed name, weather conditions):

For more information:

Phone: (780) 702-ALMS (2567)

Visit: www.awqa.ca

Email: info@awqa.ca



Alberta Water Quality Awareness (AWQA) Day Partners

The word "Alberta" in a blue, serif font.



Fisheries and Oceans Canada Pêches et Océans Canada



Agriculture and Agri-Food Canada Agriculture et Agroalimentaire Canada



This booklet is printed on 100% post-consumer recycled paper.

Photos: AWQA Day Participants, Bow Habitat Station and Water Environment Federation.
Design by Nephila Graphic.