

LONG-TERM WATER MANAGEMENT PLAN (LTWMP)

Plan Development Package and Instructions

Table of Contents

1) Template (Pages 2-5)

- **LTWMP Client Identification** form (2 sections)
- **Calculation Worksheet** (12 columns best printed in Landscape on Legal sized paper)
- **Recording Worksheet** (6 columns best printed in Landscape on Legal sized paper)
- **Map** (best printed in Portrait on Letter sized paper)

This is what needs to be completed and submitted for an AF Water Specialist to review
If the exact location of a proposed water project is known complete an Environmental Checklist for it and submit as well.

Please send to:

Alberta Agriculture and Forestry
CAP – Program Delivery Branch
7000 113 Street NW
Edmonton, AB T6H 5T6
Fax: 780-427-5921

2) Directions on how to complete the LTWMP Template (Pages 6-11)

3) Example of a completed Template (Pages 12-14)

4) Information and Resources (Pages 15-16)

- Dugout Volume Calculation
- Information Resources

Producer Eligibility for the CAP Farm Water Supply Program

If your answer is **No** to either of the following questions you may not be eligible for the [CAP Farm Water Supply Program](#).

Do you or your corporation file Income Tax in Alberta?
___ Yes ___ No

Do you or your corporation have a valid Alberta Farm Fuel Benefit Number?
___ Yes ___ No

If you intend to apply to the Farm Water Supply Program, you may wish to verify your eligibility before starting the LTWMP process. Call 310-FARM (3276) if you have questions.

LTWMP Client Identification

LTWMP ClientID # Assigned
For Office Use Only _____

Client Name: (Legal Name or Corporate Name)			
Primary Contact (first name / last name) (if different from above):			
Mailing Address:		City/Town:	Postal Code:
phone: () ()	Home Telephone: () ()	Fax: () ()	Email address:
Legal Land Location of HOME YARD: QTR_____ - SEC_____ - TWP_____ - RGE_____ - MER_____		Municipal District/County:	
Describe your farming operation by checking the appropriate boxes and filling in number for checked boxes:			
<input type="checkbox"/> oilseed and grain farming (Acres _____)	<input type="checkbox"/> hog farming (Number of Sows _____ or Feeders _____)		
<input type="checkbox"/> other crop farming: (describe) _____ (Acres _____)	<input type="checkbox"/> poultry and egg farming (Type/size _____)		
<input type="checkbox"/> cattle ranching (Head _____)	<input type="checkbox"/> sheep and goat farming (Head _____)		
<input type="checkbox"/> dairy cattle and milk production (Head _____)	<input type="checkbox"/> other animal production: (describe) _____ (Head _____)		
<input type="checkbox"/> cattle feedlot &/or backgrounding operation (Head _____)	<input type="checkbox"/> greenhouse (crop/size _____)		
Do you have a valid Farm Fuel Benefit Number (FFB#)? Yes <input type="checkbox"/> No <input type="checkbox"/>			

Producer Declaration NOTE: PLEASE READ THIS CAREFULLY AND COMPLETE LTWMP BEFORE SIGNING

I, _____ of _____ ,
 Print name of Applicant or authorized representative of Applicant City/Town
 certify that the information I have provided in this Long Term Water Management Plan is true, complete and correct in every respect. I am signing this declaration with respect to all projects described in this document.
 I understand that:
 1. AF will use my approved Long Term Water Management Plan to assist me in future farm planning.
 2. AF will use aggregate data from my approved Long Term Water Management Plan and application for grants to CAP to track, report and improve this program and future programs.

LEGAL NAME OF APPLICANT (please print): _____

SIGNATURE: _____ **DATE:** _____

The personal information that you provide on this form and any attachments will be used for the purpose of administering the CAP Farm Water Supply Program. It is collected under the authority of section 33 (c) of the Freedom of Information and Protection of Privacy Act and is protected by the privacy provisions of the Act. Any questions about the collection, use or disclosure of this information can be directed to the Program Policy Supervisor at: 7000 113 Street NW, Edmonton AB T6H 5T5; Telephone (780) 422-9167; toll free dial 310-0000 followed by telephone number, or fax (780) 427-5921

L T W M P R e f.	Your Name:		Long Term Water Management Plan - Calculation Worksheet						For AF Use only: LTWMP ClientID#			
	Your Phone #:											
	Volume Units Used: _____		Annual Water Needs Assessment						Annual Water Supply Inventory			
	Land Location West of ____ <small>(Carry forward to next page)</small>	Existing Water Source (Mapped ID)	Type of Use	No. of People or Livestock or Acres	X Volume Used Per Day	= Total Quantity Per Day	X No. of Days	A = Volume Per Year Required	<u>Existing Water Source Details</u> <= Construction or installation information Well Production or Dugout Volume =>		B Volume Per Year Supplied	Additional Volume Per Year Required (A-B) <small>(Carry forward to next page)</small>
	A											
B												
C												
D												
	1	2	3	4	5	6	7	8	9	10	11	12

L T W M P R e f. ↓	Your name:		Long Term Water Management Plan - Recording Worksheet			For AF Use only: LTWMP ClientID# _____
	Your Phone #:					
	Volume Units Used: _____					
	Land Location West of ____ (From previous page)	Additional Volume Per Year Required (From previous page)	Water Source Concerns	Investigation to date	Proposed Improvements (Include dimensions or volume for dugout or dam if known)	Priority
	A					
B						
C						
D						
	1 (repeat)	12 (repeat)	13	14	15	16

Map of LTWMP

North



Your name:

Your phone #

(For AF Use below)
LTWMP ClientID #

Legend

- Water well
- Dugout
- Canal
- Spring
- Watercourse
- Dam
- Waterbody
- House
- Pumpsite/turnout
- Irrigation
- Stock tank
- Pipeline
- Fence

Directions
Proposed improvements should be dashed or circled in dashes.

Indicate distance of new projects to natural water bodies if closer than 100 ft

← 100 ft →

ID **Created for**

Directions on how to complete the LTWMP Template

What is the purpose of a Long Term Water Management Plan (LTWMP)?

A LTWMP will help to ensure that your farm has a sustainable water source(s) to meet the present and future water supply and water quality needs. Although individual LTWMP's may vary, all plans should address the security of a supply during drought periods, as well as ways to protect the supply from contamination or improve water quality. Ideally the LTWMP **should cover the complete extent of your farming operation**, either owned or regularly rented (if you are allowed access to the water supplies or sources available on them). Some more remote quarters or parcels of land can be left out if they do not have a water shortage and the water cannot be considered a water asset that can be shared with the rest of the farm.

How to Develop a LTWMP

The following is a step by step approach to developing a plan for your farm. The **Bolded** words in the descriptions refer to worksheets or other documents provided in the LTWMP package. Internet links to Agdex factsheets are provided at the end of this document.

Step 1

A review of the AF factsheet Agdex # 716(A01) **Drought Proofing Farm Water Supplies** provides a good overview of the options to consider when drought proofing your farm.

Step 2

- A) Ensure that all required documents have been provided in mailed package or printed out completely from website
- B) This includes:
 - **LTWMP Client Identification and Producer Declaration** form
 - a **Calculation Worksheet (12 columns)**
 - a **Recording Worksheet (6 columns) and**
 - a **Map of LTWMP**
- C) An example has been provided, using Imperial gallons (lgal) as the unit. Determine the unit of measurement to be used and identify it in the ID block or beside each number entered. Example litres (L), cubic meters (m³), acre feet (for irrigation).

Step 3

- A)** Begin developing a LTWMP for your own farm. Start by identifying yourself by completing the **LTWMP Client Identification** block. After you have completed the remaining pages required you can return to complete the **Producer Declaration** block. The remaining pages also have an identification block to be filled out in the top left corner (or top right for the **Map**). The LTWMP ID# referred to will be assigned by AF staff.
- B)** Next, Using the **Calculation Worksheet** identify the land location of all existing water sources used by the agricultural operation in Column 1.
- If there are multiple water sources on a single land location, evaluate each source individually. (e.g.) For a grazing situation that has several paddocks with individual water sources, on a single quarter section of land, identify and evaluate each paddock.
 - If there are locations that do not have an existing water source, but developing the source is planned, indicate the land location on the plan.
 - If expansion plans are being proposed, you may want to consider this in your proposed improvements. (e.g.) If an area is to be converted from crop land to pasture land and a water source is required, record the proposed water supply improvements. This may provide assistance when deciding the location a new well or dugout.
 - If your farm consists of land parcels owned individually but you manage your water needs and assets together you may wish to consider your LTWMP together. Discuss with your AF Water Specialist who will be reviewing it.
- C)** Indicate each water source use/purpose using descriptor names for easy identification, such as Well (W1), Dugout (D1), Irrigation (I1) etc., in Column 2.
- D)** Describe what the water source is being used for in Column 3. (e.g.) Household, cow/calf, yearlings etc.
- E)** Indicate the number of users of the water in Column 4.
- F)** Provide an estimated daily water volume for each user, in Column 5.
- These values can be found in the AF factsheet Agdex #716 (C01) **Farm Water Supply Requirements**. It contains the daily volumes of water required for people, livestock and other farm uses. (e.g.) People require 60 imperial gallons per day; a cow/calf pair requires 12 imperial gallons, etc.
 - If you currently meter your water consumption and have water use rates that differ from default values, use the metered rates. Please indicate this with an 'M' beside the number, i.e. 12.0 lgal M.
- G)** In Column 6, calculate the daily water requirement for the water source. Include the units being utilized.

$$\text{Total Quantity per Day} = \text{No. users} \times \text{volume consumed per day}$$

- H)** Provide an estimate of the total number of days that the water source will be used by each user, in Column 7.

- I)** Calculate the total, yearly requirement of the water source, in Column 8

$$\text{Total Yearly Requirement} = \text{Total Quantity Per Day} \times \text{No. of Days}$$

Step 4

A) Complete the “Annual Water Supply Inventory” portion (Columns 9-11) of the **Calculation Worksheet**. It indicates information about the water source and its capacity.

For Wells

A) Under “Existing Water Source Details” (Column 9) record the:

- Well diameter
 - Well depth and
 - Well identification number
- Generally this information can be found on a Water Well Drilling Report. If needed refer to the last page for the Alberta Water Well Information Database.
- If any new well production information is available, use these values instead.

B) In Column 10, indicate the well production or capacity.

C) Determine the expected “Volume Per Year Supplied” as follows:

$$\text{Expected Volume Per Year Supplied} = \text{Well production} \times 8 \text{ hours} \times 60 \text{ minutes} \times 365 \text{ days/year}$$

NOTE: This assumes that the well(s) will supply all daily water requirements in an 8 hour period.

D) Record the total volume in Column 11.

For Dugouts

A) Under “Existing Water Source Details” (Column 9), record the:

- Top width
- Top length
- Depth
- Side slopes
- End slopes

B) Determine the expected total volume of the dugout using the formula on the accompanying **Dugout Volume Calculation** page or an on-line calculator available on the AF website (www.agric.gov.ab.ca).

C) Record the total source volume in Column 10.

D) In Column 11, indicate the annual (yearly) volume of water that can be supplied from that water source.

NOTE: Dugouts are often built to store 2, 3 or 4 years worth of water requirements. Only indicate the expected water volume for 1 year. (e.g.) If a dugout is built to store the runoff from 2 years, the yearly supply to the dugout is expected to be ½ the total storage volume.

Step 5

A) Next, determine any “Additional Annual Volume Required” as follows and record the value in Column 12:

$$\begin{array}{rclcl} \text{Additional Water} & = & \text{Volume per Year} & - & \text{Volume per} \\ \text{Per Year Required} & & \text{Required} & & \text{Year Supplied} \\ & & \text{(Column 8)} & & \text{(Column 11)} \end{array}$$

- This will identify the amount of water that will be in surplus or required on an annual basis for each water source.
- Consider each water source individually and the impact of extended periods of drought.
- If additional water is required then water supply improvements should be made.

NOTE: If the water supplied exceeds the requirement or the water required is equal to the water supplied, that is acceptable.

Step 6

A) From the **Calculation Worksheet** carefully transfer the “Land Location” (Column 1) and “Additional Annual Volume Required” (Column 12) to the **Recording Worksheet**. The **Recording Worksheet** will become the basis for the water supply improvements you need to undertake.

Step 7

A) Identify and record all “Water Source Concerns” in Column 13. This may include concerns regarding:

- quality
- quantity
- dependability concerns

For example:

Wells

- The life expectancy of metal well casing and liners is approximately 20 years while plastic casing and liners will last much longer.
- Are the non-pumping water levels in your well(s) steadily dropping over a period of months or years? This could indicate a depleting groundwater supply.
- Are you noticing a decreased supply from your well but the pumping water levels in well (s) are steady? This could indicate plugging of the well intake due to biofouling, sediment or mineral incrustation.

- Are there increased sediment problems or deterioration in well water quality?
 - The publication “Water Wells That Last” will be helpful in assessing the dependability of your well supply and for planning new wells.

Dugouts

- Does your dugout(s) fill with runoff water in at least 8 years out of 10?
- Does your dugout contain at least a 2-year water supply plus losses due to evaporation or ice? In Alberta, ice depths during the winter typically range from 1.3 feet in the south to 3 feet in the north. Expected evaporation losses during the summer range from 3.5 feet in the south to 1.5 feet in the north.
- Has your dugout(s) lost considerable volume and depth due to sediment?
- Is it difficult to maintain good quality water in the dugout?
 - The publication, “Quality Farm Dugouts” will be helpful in assessing the dependability of your Dugout water supply and for planning new Dugouts.

Step 8

- A) On the **Recording Worksheet**, under “Investigations to Date” (Column 14) list the steps you have already taken or people you have contacted to discuss your water source options.
- Consultations regarding this information may help identify useful information that may have been missed or other potential solutions.

Step 9

- A) Identify and record the “Proposed Improvements” in Column 15 on the **Recording Worksheet**.
This may include:
- Projects to construct to address shortfall or
 - Management changes to how the water is used

NOTE: *If a water source does not require attention, indicate that no action is being proposed.*

Step 10

- A) Assign a priority for each “Proposed Improvement” in Column 16 on the **Recording Worksheet**.

Step 11

- A) Use the **Map of LTWMP** to provide a drawing of all the land locations involved in the plan. As in the example map, **accurately and clearly identify** the legal land location **and north direction** on it.
- B) Show both the existing water sources (solid lines) as well as proposed improvements (in dashes).

- Air photos may assist to locate features more accurately.
- Symbols commonly used to identify map features are listed in the legend.
- Define other ID's or symbols at the bottom of the map if needed.
- Review and follow the directions of the [Environmental Checklist](#) document to determine whether the proposed location of your new project will flag environmental concerns.
- Provide mailing and contact information in the top right hand corner of your map

Step 12

- A)** Contact an AF Water Specialist or contact names they have provided, if you need assistance with the LTWMP for your farm.

Step 13

- A)** Review and update your LTWMP when significant changes occur to your farm water sources and requirements. If you want to apply for a grant to any new project ensure you have contacted your AF Water Specialist prior to starting your project so that the amendment can be recorded.

L T W M P	Your Name:	Long Term Water Management Plan - Calculation Worksheet	Your Phone #:	For AF Use only: LTWMP Client ID#

R e f	Annual Water Needs Assessment							Annual Water Supply Inventory			Additional Volume Per Year Required (A-B) (Carry forward to next page)	
	Land Location West of <u> 4 </u> <small>(Carry forward to next page)</small>	Existing Water Source (Mapped ID)	Type of Use	No. of People or Livestock or Acres	X Volume Used Per Day	= Total Quantity Per Day	X No. of Days	A = Volume Per Year Required	Existing Water Source Details =< Construction or installation information Well Production or Dugout Volume =>	B Volume Per Year Supplied		
A	NW 30-59-30	Well (W1)	house hold cow/calf 4 people 130 pairs	60 Igal 12 Igal	240 1560	365 240	87,600 +374,400 462,000 Igal	well - 6 inch dia. 150 feet deep Well ID 047000 Constructed 1979	2.0 Igpm	350,400 Igal 2.0 gpm X 60 min X 8 hrs/day X 365 days	111,600 Igal short (350,400 - 462,000)	
B	NE 30-59-30	Dugout From runoff (D1)	cow/calf 70 pairs	12 Igal	840	120	100,800 Igal	Dugout dimensions 50 ft x 70 ft x 9 ft (2:1 sideslopes & 2:1 endslopes)	100,000 Igal	50,000 Igal 100,000 Divided by 2 yr	50,800 Igal short	
C	SE 30-59-30	Dugout from runoff (D2)	cow/calf 60 pairs	12 Igal	720	120	86,400 Igal	Dugout dimensions 80 ft x 50 ft x 8 ft (2:1 sideslopes & 2:1 endslopes)	112,000 Igal	56,000 Igal 112,000 Divided by 2 yr	30,400 Igal short	
D	SE 31-59-30	Dugout From runoff (D3)	yearlings 100	7 Igal	700	120	84,000 Igal	Dugout dimensions 170 ft x 70 ft x 14 ft (4 :1 endslopes & 1.5 :1 sideslopes)	536,000 Igal	268,000 Igal 536,000 Divided by 2 yr	184,000 Igal surplus	
E	NW 31-59-30	Stream Intake Cold Creek (I1)	Irrigation of forage 80 acres	-	-	~ 15 days	40 Acre-feet	Licensed withdrawal from Cold Creek June -Aug	-	40 Acre-feet	0	
	1	2	3	4	5	6	7	8	9	10	11	12

L T W M P R e f	Your Name:		Long Term Water Management Plan - Recording Worksheet			For AF Use only: LTWMP Client ID#
	Your Phone #:					
Volume Units Used: _____						
	Land Location West of <u>4</u> (From previous page)	Additional Volume Per Year Required (From previous page)	Water Source Concerns	Investigation to date	Proposed Improvements (Include dimensions or volume for dugout or dam if known)	Priority
A	NW 30-59-30	111,600 Igal	Insufficient well capacity on regular basis, Well water quality problems Over 30 year old well	Neighbors say they have better wells 80' deeper Check out neighboring well records on government database	New deeper well (W2) to improve supply and quality Abandon old well after new well performance proved	High
B	NE 30-59-30	50,800 Igal	Lack of water and cattle access difficult Dugout water quality concern - algae	Pipeline plow for shallow burial available through county office	Treat and/or aerate in interim Abandon dugout (D1) and replace with a pipeline system from new well (W2)	Med
C	SE 30-59-30	30,400 Igal	Dry by August	Check runoff area filling dugout Inquire about seepage potential in area Check for ditching in drainage area Check GF Grazing Program for application	Clean dugout (D2) and add exclusion fencing, aeration, floating intake and remote watering system for grazing	Med
D	SE 31-59-30	184,000 Igal (surplus)	No problems identified and has solar powered pumping system	Discuss with parents - dugout fills every year	None identified for dugout (D3) Potential supply for emergency water pumping or hauling	Low
E	NW 31-59-30	0	Intake plugs with fish and debris Water usage unclear	Review license and DFO regulations	Install improved intake (I1) with fish screen Install meter to measure withdrawal rate and volume for records kept	Med
	1 (repeat)	12 (repeat)	13	14	15	16

Map of LTWMP- Example

Include North Direction Arrow



Check your quarter section

Your name:
John Doe

Your phone #
(780) 000-0000

(For AF Use below)
 LTWMP ClientID #
123456

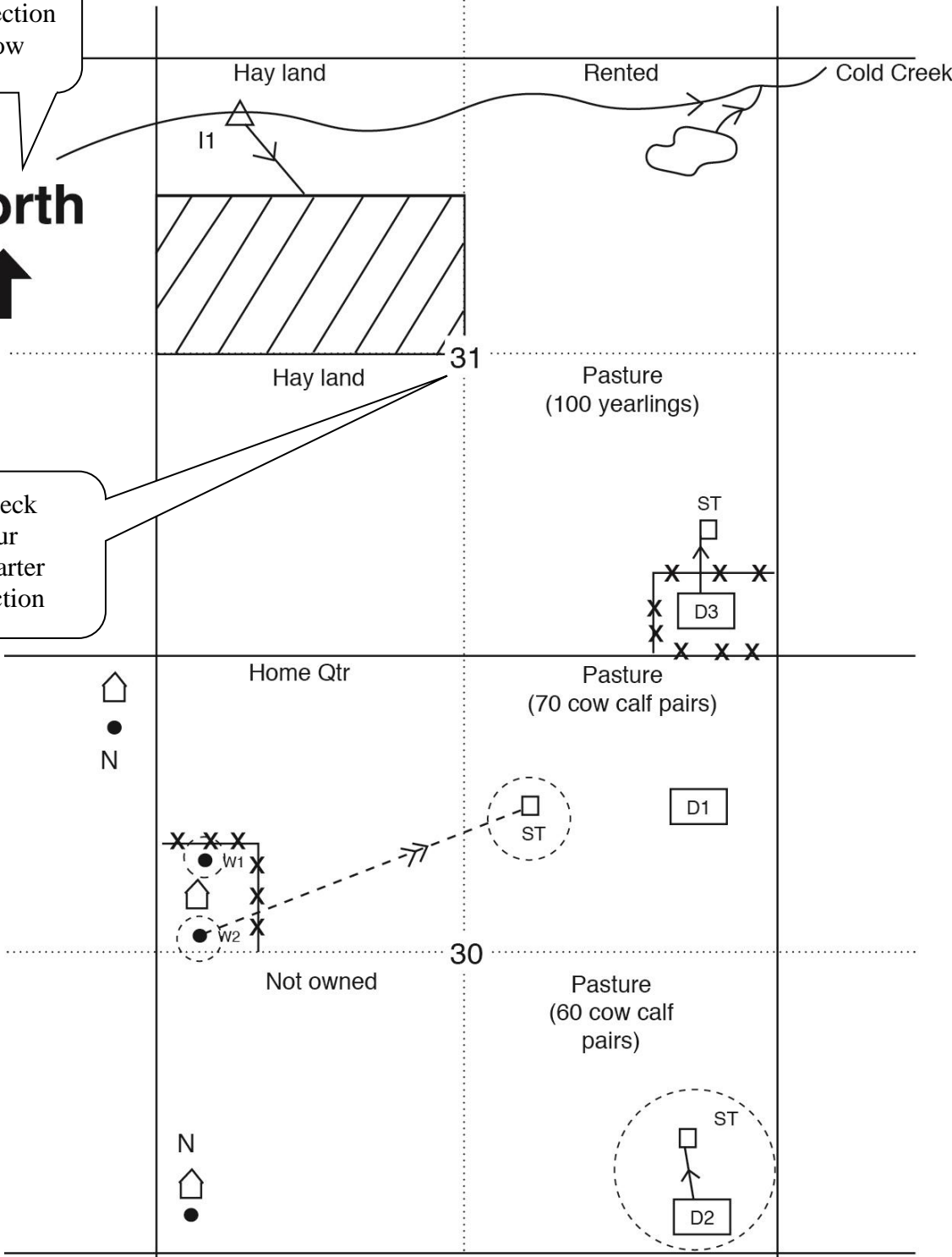
Legend

- Water well
- Dugout
- ≡ Canal
- ▽ Spring
- ~ Watercourse
- ⊕ Dam
- ☁ Waterbody
- 🏠 House
- △ Pumpsite/turnout
- ▨ Irrigation
- ST □ Stock tank
- Pipeline
- xxx Fence

Directions
 Proposed improvements should be dashed or circled in dashes.

Indicate distance of new projects to natural water bodies if closer than 100 ft

← 100 ft →



ID
N

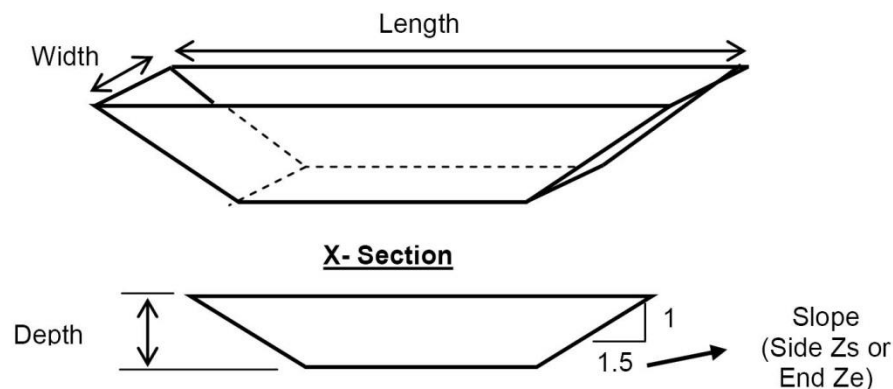
Created for
Neighbor houses marked

Dugout Volume Calculation

This dugout volume calculation can be used to estimate the water volume stored in your existing dugout(s). If you are planning new dugouts, first review the publication “Quality Farm Dugouts”

1. Measure the top length and top width and average depth along the bottom of the dugout.
2. Estimate the slope of sides and ends of the dugout as follows:

Measure the depth of water at several distances from the dugout edge along both sides and the ends. This can be done with a pole with a tape measure secured to it. The slope is a ratio between the horizontal distance and vertical distance (or depth). Example: If the water is 1' deep at 1.5' from the water's edge the slope is 1.5 ft to 1 ft or 1.5 to 1 (also noted as 1.5:1 or 1.5). See drawings below.



3. Use the above measured values in the formula described below:

$$V = [W - (Z_s \times d)] \times [L - (Z_e \times d)] \times d \times 6.23 \text{ gal/ft}^3$$

Where: V = dugout volume in Imperial Gallons
 W = Top Width in feet
 L = Top Length in feet
 d = depth in feet
 Z_s = side slope
 Z_e = end slope

Example:

$$L = 200 \text{ ft}, W = 100 \text{ ft}, d = 14 \text{ ft}, Z_s = 1.5:1, Z_e = 4:1$$

$$V = [100 - (1.5 \times 14)] \times [(200 - (4 \times 14))] \times 14 \times 6.23 \text{ gal/ft}^3$$

$$V = [100 - 21] \times [200 - 56] \times 14 \times 6.23 \text{ gal/ft}^3 = 992,215 \text{ Imp gal}$$

Note: This is a simplified formula to give an approximation of the dugout volume. It tends to give a volume smaller than the true volume. An easier to use and accurate [volume calculator](#) is available on the AF website at

<http://www.agric.gov.ab.ca/app19/calc/volume/dugout.jsp>

Major AF Internet Links on Rop'in the Web

Alberta Agriculture and Forestry ([AF](#))

[Drought Proofing Farm Water Supplies](#)

[Farm Water Supply Requirements](#)

[Quality Farm Dugouts](#)

[Water Wells That Last](#)

Other Resources

Ropin The Web (AF)

- Navigate to [Ag Engineering/ Farm Water](#) for complete list
 - Analysis and Treatment
 - Drought Management
 - Dugouts and Dams
 - Quality
 - Requirements
 - Water Systems
 - Wells and Springs

[Alberta Water Well Information Database](#) , Alberta Environment and Parks (780) 427-2770

Related tools

[Rural Water Quality Information Tool](#)

[Irrigation Water Allocation Calculator](#)

[Alberta Soil Information Viewer](#)