Bored Well Decommissioning Calculation Worksheet

Name of Land Owner(s):_____ Telephone No.: _____

Mailing Address: _____

Land Location: (QTR sec._____- Twp_____- Rge_____W_____) Lat/Long: _____

1: Well Details (see Table 1 and abbreviations on reverse side of page)

Water Well Driller Report Number	Casing Diameter (in)	Casing Radius (ft)	Well Depth (ft)	Water Level (ft)	Well Pit (Y/N)	Casing Material

2: Material Requirements (conversions and example on reverse side of page)

Bentonite requirements are based on 1 foot thick sections with 1 foot (ft) thick bentonite plugs to be placed at the bottom of the well and at the top of the perforated section. Wells deeper than 40 ft require additional plugs every 20 ft.

Volume per foot of casing =	3.14 x (casing radius ft.)^2 x 1 ft. =	_____cu. ft. (A)

Bentonite Required	
Volume per bag: (assume 50 lb bag contains 0.7 cu.ft. of bentonite)	0.7 (B)
No. of 1 ft thick plugs (min. 2) (refer to Fact Sheet for location requirements)	(C)
Determine the bentonite quantity plugs: [_____(A) x_____(C)] ÷ 0.7 (B)	bags (D)
Bentonite Topseal (based on casing diameter refer to Table 2 on reverse side)	bags (E)
Total bags of bentonite needed: (D+E)	bags

Diagram of Proposed Well Decommissioning

Granular Material Required	
(Depth of well in ft – 10 ft) x A) + 30% =	
(_____ft – 10 ft) x_____A) + 30% =	_____cu. ft. (F)
_____cu. ft (F) ÷ 27 cu. ft /cu. yd. =	_____cu. yd.

Chlorine Required	
Length of Water Column: (well depth – water level)	_____ (G) (ft)
Quantity of Chlorine to Obtain Target Concentration: (Obtain from Table 3 on reverse side of page)	_____ (H) (litres/ft)
Total Volume of Chlorine for Disinfection: _____G x_____H	_____ (litres)

Comments: _____

_____

_____

_____ _____

Signature of Land Owner Date

_____ _____

Signature of Contractor Date

For technical assistance on determine how to decommission the well please contact the Water Security Agency at 306.694.3900 or email at groundwater@wsask.ca.

revised March 2023

Table 1: Casing Measurements

Casing diameter		Casing Radius	Volume per foot casing
inches	feet	feet	cubic feet
4	0.33	0.17	0.09
5	0.42	0.21	0.14
6	0.50	0.25	0.20
7	0.58	0.29	0.27
8	0.67	0.33	0.35
24	2.00	1.00	3.14
30	2.50	1.25	4.90
36	3.00	1.50	7.07

Table 2: Bentonite for Topseal

Casing Diameter (inches)	Number of Bags *
4, 5, 6	2
24	18
30	23
36	28

*Based on typical 50 lb bag containing 0.7 cu.ft per bag

Conversions/ Abbreviations:

1 cu. ft. = 28.32 litres
1 litre = 0.22 imp. gal.
1 imp. gal. = 4.54 litres
1 ft = 0.3048 meters
1 cu. yard = 27 cu. ft.
ft = foot
in = inches
cm = centimetres
m = metres
cu. ft = cubic feet
cu. ft = cu. foot.

Volume of a Cylinder

$V = \pi X\ radius^2 X\ height$

Where:
Radius = 0.5 X diameter
π = pi = 3.14

Table 3: Chlorine Calculation to Obtain 250 mg/l

Casing Diameter	* 5.25% Domestic Chlorine Bleach (Javex)	12% Industrial Sodium Hypochlorite	** 70% Granular Calcium Hypochlorite
	Litres needed per 1 foot (30 cm) of water in casing	Litres needed per 1 foot (30 cm) of water in casing	Grams dry weight needed per 1 foot (30 cm) of water in casing
Inches	Litres	Litres	Grams
4	0.012	0.005	0.9
5	0.018	0.008	1.4
6	0.026	0.012	2.0
7	0.036	0.016	2.7
8	0.047	0.020	3.5
24	0.424	0.185	31.7
30	0.667	0.292	50.0
36	0.952	0.417	71.3

* Domestic bleach has a relatively low concentration of 5.25%, which decreases over time as the product is stored. For this reason, its effectiveness for disinfection may be limited.
** If dry chemical is used, it should be mixed with warm water to form a chlorine solution prior to placing in the well.
***Always follow the manufactures recommended handling precautions.

1: Well Details (see Table 1 and abbreviations on reverse side of page)

Water Well Driller Report Number	Casing Diameter (in)	Casing Radius (ft)	Well Depth (ft)	Water Level (ft)	Well Pit (Y/N)	Casing Material
123456	30	1.25	45	12	N	Steel

2: Material Requirements (conversions and example on reverse side of page)
Bentonite requirements are based on 1 foot thick sections with 1 foot (ft) thick bentonite plugs to be placed at the bottom of the well and at the top of the perforated section. Wells deeper than 40 ft require additional plugs every 20 ft.

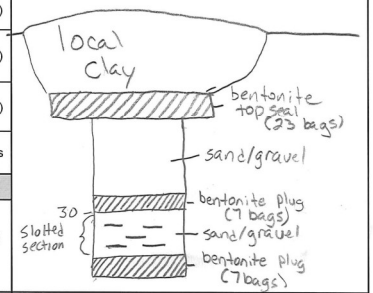
Volume per foot of casing =	3.14 x (casing radius ft.)^2 x 1 ft. =	4.9 cu. ft. (A)

Bentonite Required	
Volume per bag: (assume 50 lb bag contains 0.7 cu.ft. of bentonite)	0.7 (B)
No. of 1 ft thick plugs (min. 2) (refer to Fact Sheet for location requirements)	2 (C)
Determine the bentonite quantity plugs: [4.9 (A) x 2 (C)] ÷ 0.7 (B)	14 bags (D)
Bentonite Topseal (based on casing diameter refer to Table 2 on reverse side)	23 bags (E)
Total bags of bentonite needed: (D+E)	37 bags

Granular Material Required	
(Depth of well in ft – 10 ft) x A) + 30% = (45 ft – 10 ft) x 4.9 A) + 30% =	222.9 cu. ft. (F)
222.9 cu. ft (F) ÷ 27 cu. ft /cu. yd. =	8.3 cu. yd.

Chlorine Required		
Length of Water Column: (well depth – water level)	33 (ft)	(G)
Quantity of Chlorine to Obtain Target Concentration: (Obtain from Table 3 on reverse side of page)	0.292 (litres/ft)	(H) (12%)
Total Volume of Chlorine for Disinfection: 33 G x 0.292 H	9.6 (litres)	

Diagram of Proposed Well Decommissioning



Comments: well casing is in poor condition

Signature of Land Owner — Date

Signature of Contractor — Date

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