



Wellhead Protection Plan

Instructions, example, and template

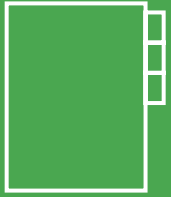
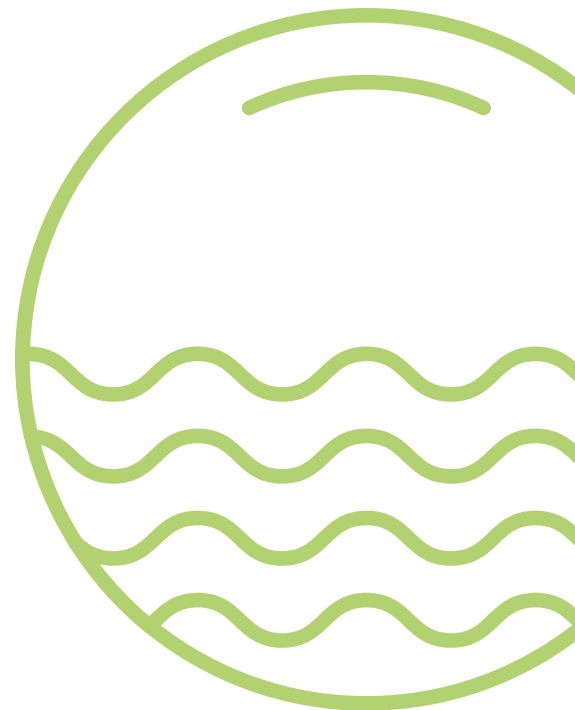


Table of contents

3	Introduction
4	Getting help
5	Part I. Well Information (instructions and example)
6	Part II. Potential Sources of Contamination (PSC) (instructions and example)
9	Part III. Map (instructions and example)
10	Part IV. Action Plan (instructions and example)
13	Wellhead Protection Plan blank template



Introduction

Keeping groundwater sources of drinking water clean and fit for human consumption is an important task for public water systems and well owners. In Nebraska, the aquifer that feeds your private well stretches for miles in any direction and is far beyond your control. Once contaminated, groundwater is very difficult to clean, and replacing your well can be expensive. Protecting your well and the immediate area surrounding it is the best way to avoid costly groundwater contamination. Having a wellhead protection plan that provides guidance for you will help to protect precious groundwater resources.

Using this document

This document was developed to help farmers and landowners develop and maintain their own plan to protect the source of their drinking water.

Starting on page 5, this document will walk you through each section of a Wellhead Protection Plan, giving instructions and examples.

Beginning on page 13, a blank template is provided for you to complete your own Wellhead Protection Plan.

Getting help

Wellhead protection may seem like a daunting task, especially if potential contamination sources are beyond your control. Sometimes, asking for help may be the best approach. The technical service providers in the following table may be available to help you prepare and/or manage your wellhead protection plans.

Name	How they can help	Contact
University of Nebraska-Lincoln Water	They offer various resources regarding well and well-head management.	water@unl.edu
Nebraska Natural Resources District (NRD)	Created to solve flood control, soil erosion, irrigation run-off, and groundwater quantity and quality issues, Nebraska's NRDs are involved in a wide variety of projects and programs to conserve and protect the state's natural resources. NRDs are charged under state law with 12 areas of responsibility including flood control, soil erosion, and groundwater management. NRDs help Nebraskans respond to natural resource challenges with local control and local solutions. Often, they build partnerships with other agencies and organizations, including the USDA Natural Resources Conservation Service, Nebraska Natural Resources Commission, Nebraska Department of Natural Resources, and other state and federal agencies, municipalities, counties and private organizations. The NRDs encourage stewardship by providing financial assistance to landowners for irrigation water management and best management practices to protect water. NRDs are not just water protectors; a number of NRDs operate drinking water systems for rural customers and small communities.	nrdnet.org
Servicio de Conservación de Recursos Naturales (NRCS)	As a branch of the U.S. Department of Agriculture, the Natural Resources Conservation Service (NRCS) has access to grant funding that may help wellhead protection activities. Traditionally more aligned with agricultural activities, the NRCS can also assist with environmental concerns.	nrcs.usda.gov/wps/portal/nrcs/main/national/enespanol
Center for Rural Affairs	Center staff can help you with the wellhead protection plan and connect you with resources for more information.	cfra.org
U.S. Environmental Protection Agency (EPA)	The EPA offers information regarding the importance of testing private wells and guidance on technologies that may be used to treat or remove any contaminants.	epa.gov/privatewells



Part I. Well Information

Filling out the form

For each well in your water system you will need the following information:

1. A description of where the well is located.
2. The coordinates of the wellhead (latitude and longitude). You can find this by clicking on the well spot on Google maps, or by looking up the well at dnr.nebraska.gov/groundwater.
3. The depth of the well.
4. The date installed.

If you do not have all the information necessary to fill out this form, you may be able to find it in the following places:

- Well drillers typically record the depth and date drilled. Contact the company that drilled your well.
- Well drillers typically record the depth and date drilled on the bottom of the well cap. Remove your well cap, being extremely careful not to dislodge any debris into the well.
- Nebraska has information on wells registered with the Department of Natural Resources.
- Nebraska law provides rules to promote orderly use and distribution of water and protect the groundwater supply under a permitting system for public water suppliers and industrial water users, along with a centralized repository of information about groundwater wells. With the well owner's name or the coordinates of the well, you can find information at dnr.nebraska.gov/groundwater.

Example

System name: <i>Bee House Farm Well</i>		System ID number: <i>1500</i>	
Created by: <i>Kirstin Bailey</i>		Date created: <i>07/03/2022</i>	
Well # 1	Location description: <i>North of the barn</i>		
	Coordinates: <i>41° 11' 2.994", -97° 0' 21.024"</i>		
	Depth (ft): <i>155 ft.</i>		Date installed: <i>04/19/1999</i>



Part II. Potential Sources of Contamination (PSC)

The default wellhead protection area is a 300-foot radius circle, centered on your wellhead. If you have multiple active wellheads, multiple protection areas will apply. In some cases, these areas will overlap. You may find it easier to complete Part 2 (Potential Sources of Contamination) and Part 3 (Map) at the same time.

This form lists many potential sources of contamination (PSCs) in four broad categories: herbicide/pesticide use, petroleum/hydrocarbon use, bacterial/inorganic chemicals, and other. These sources have the potential to generate mineral, chemical, and biological substances that may significantly contaminate groundwater, but they are not the only sources. Make sure you list any other sources of contamination on your property.

Filling out the form

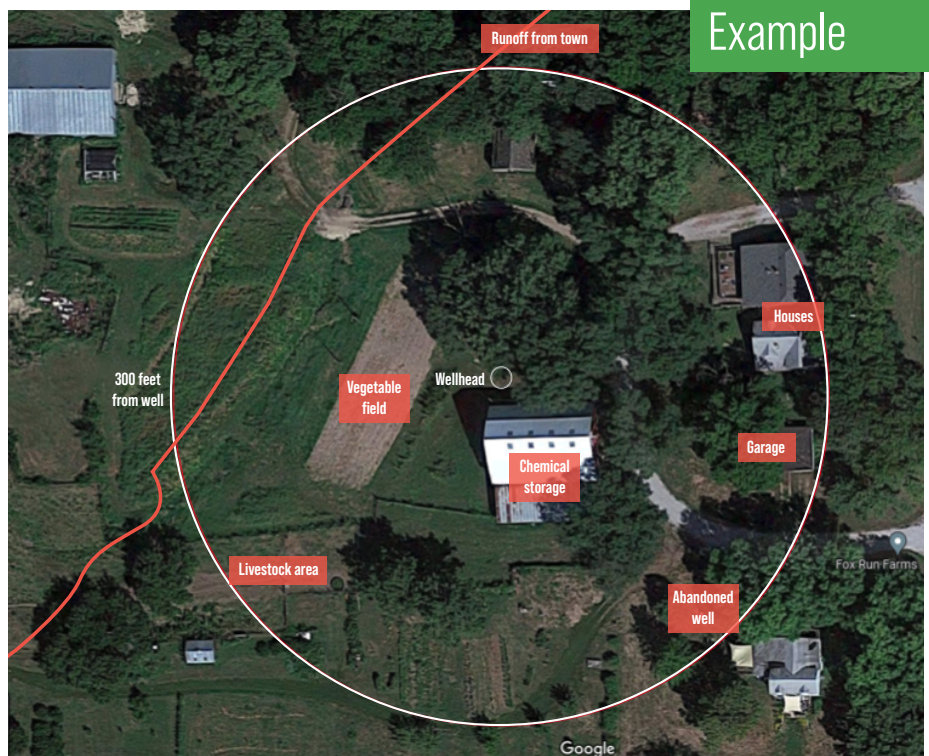
For each well in your system, fill in:

1. Your system name, system ID number, the date you filled out the form, and the name of the person inspecting the system or filling out the form.
2. For each wellhead in your system, indicate the number (if any) of PSCs within a 300-foot radius of your wellhead in the column marked “Number of Occurrences.”
3. Measure the distance from your wellhead(s) to the PSCs you have identified and enter it in the column marked “Distance to Well (in feet).” For PSCs that have large footprints, you should measure from the point of the PSC closest to the wellhead.

Potential sources of contamination example

In this example, seven types of potential sources of contamination are identified in red:

1. Runoff from town
2. Vegetable field
3. Livestock area
4. Chemical storage
5. Houses
6. Garage
7. Abandoned well



Example

Potential Sources of Contamination (PSC)		
System name: <i>Bee House Farm Well</i>	System ID number: <i>1500</i>	Date: <i>07/03/2022</i>
	Inspector name: <i>Kirstin Bailey</i>	
PSC	Number of occurrences	Distance to well (feet)
Chemical use		
Agricultural chemical spreading or spraying (pesticides, herbicides, or fertilizers)	<i>3</i>	<i>75 ft.</i>
Pesticide, herbicide, or fertilizer storage	<i>2</i>	<i>50 ft.</i>
Nursery or garden shop	<i>0</i>	
High-voltage transmission lines	<i>0</i>	
Petroleum/hydrocarbon use (Volatile Organic Compounds [VOCs] or Semi-VOCs)		
Aboveground oil storage tank (including home heating oil tanks)	<i>0</i>	
Underground oil storage tank	<i>0</i>	
Airport	<i>0</i>	
Auto or small engine repair or body shop	<i>0</i>	
Gas station, service station	<i>0</i>	
System	<i>0</i>	

Example

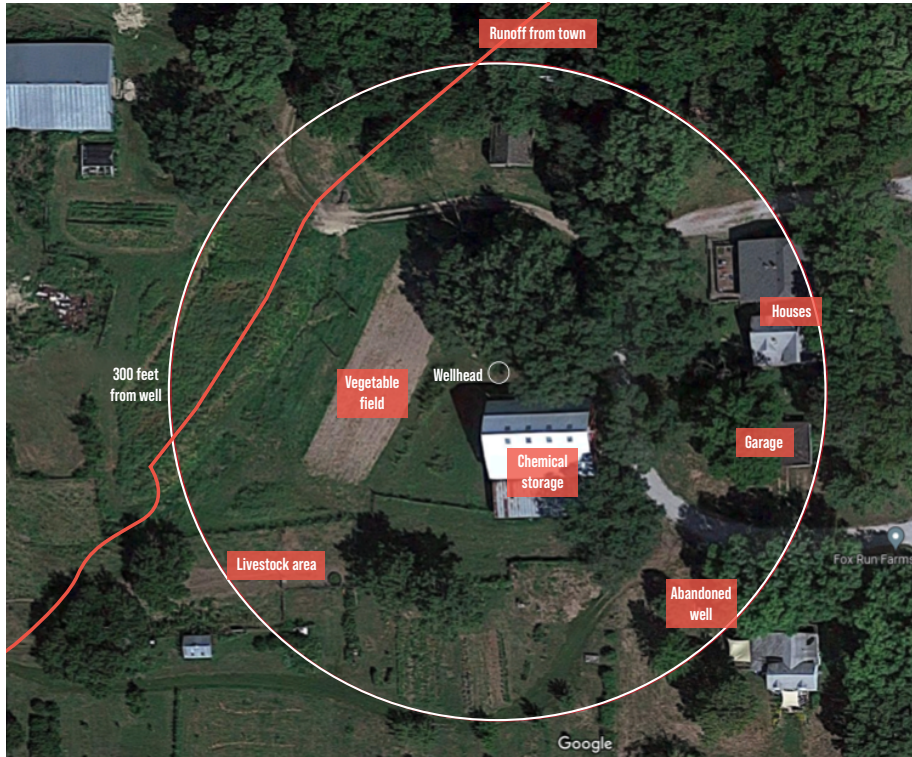
Potential Sources of Contamination (PSC), continued		
Bacteria and inorganics, such as nitrates/nitrites		
Animal burial (large-scale site)	0	
Animal grazing or barnyard	1	275 ft.
Manure pile or spreading	3	75 ft.
Septic system, septic waste disposal	1	280 ft.
Sewer line	0	
Sludge disposal or spreading	0	
Wastewater treatment plants or discharge	0	
Industrial solvents and other chemicals	0	
Landfill, dump, transfer station	0	
Other		
Railroad yard or line	0	
Residential home	2	290 ft.
Salt pile or sand and salt pile	0	
Abandoned well	2	115 ft.
Graveyard or cemetery	0	
Other: Town water runoff	1	225 ft.



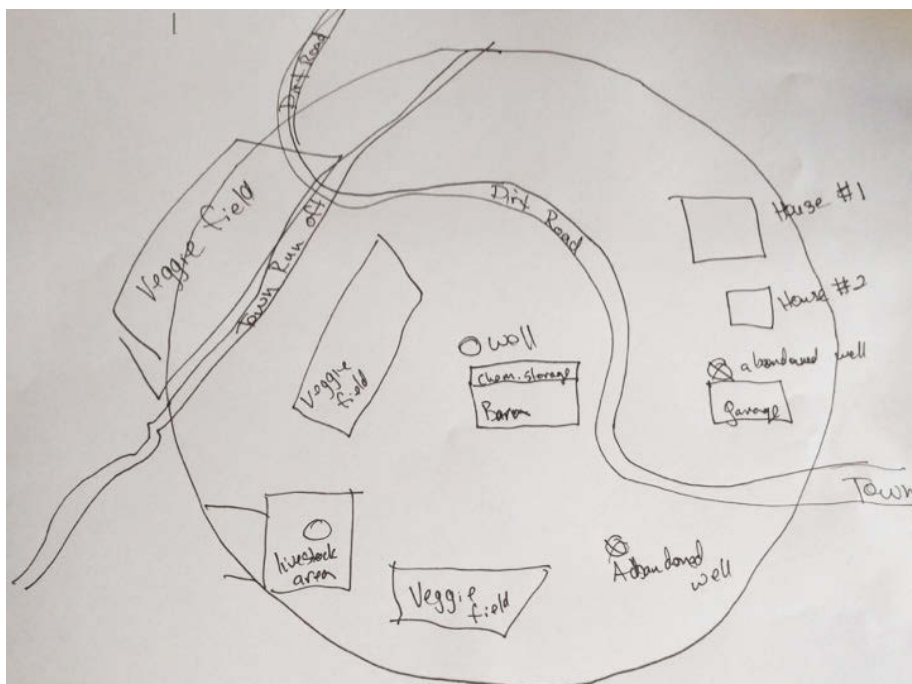
Part III. Map

Insert an aerial photo of the site (from Google Maps; can be edited in Google Drawing) or a hand-drawn map.

Example of aerial photo with labels



Example of hand-drawn map





Part IV: Action Plan

Management action

Outreach and education

Inform property owners near your wellhead that you own a well and would like their assistance to protect drinking water quality. You can do this by handing out information, writing a letter, or bringing it up when you see them next.

Reduce the use of chemicals

Various land use practices like agriculture, industrial factories, and commercial industries may introduce organic chemicals into groundwater. In chemistry, “organic” describes substances that contain the element carbon. Carbon is one of the most common elements in the world, and there are many natural and manmade organic chemicals in existence. Herbicides, pesticides, solvents, and petroleum products (like home heating oil and gasoline) are examples of organic chemicals.

Fifty-two organic chemicals are regulated by the Safe Drinking Water Act. Long-term exposure to these substances in drinking water can cause cancer, reproductive, and nervous system damage in adults, and harm to developing children. Organic chemicals are frequently characterized as Volatile Organic Compounds (VOCs), which means they evaporate very quickly and easily, and Synthetic Organic Compounds (SOCs), which means they are man-made.

Both nitrate and nitrite are water-soluble and found in fertilizers (as well as in animal waste). The biggest concern regarding nitrate is for infants younger than 6 months. Infants who consume water containing nitrate concentrations above 10 parts per million may develop a condition called methemoglobinemia or blue baby syndrome. The baby’s skin appears blue-gray in color, caused by a lack of oxygen in the blood. An infant suffering from this condition requires immediate medical care to prevent potential coma and/or death. Nitrate contamination may occur in areas downstream or down hill of septic systems and other sources of sewage, and downstream or hill of animal husbandry practices and fertilizer use. When used or disposed of incorrectly, these chemicals can leach into groundwater and pose a threat to drinking water quality. Reducing the use of these materials, or using safe alternatives, such as integrated pest management, will help protect groundwater quality.

Properly maintain your septic system

Pathogens and nitrogen are found in animal and human waste. Pathogens are disease-causing bacteria and viruses, and nitrogen is a waste product that becomes nitrate or nitrite in the environment (see discussion above). Pathogens generally cause acute gastrointestinal distress including nausea, vomiting, and diarrhea, and illnesses such as salmonella, cholera, typhoid fever, polio, and hepatitis A. For those with compromised immune systems, exposure to a pathogen can be fatal.

Proper septic system maintenance greatly reduces the risk of contamination of your well from waste products and pathogens.

Management action, continued

Stormwater management

Surface flow of water during a storm event can dissolve and carry a host of pollutants that may be harmful to groundwater quality. Chemicals, spilled motor oil, fuel, excess road salt, and pet waste are examples of what stormwater may pick up. If your wellhead is in an area that receives stormwater, like a drainage ditch or swale, it is at a higher risk of contamination. Redirecting the flow of stormwater away from the wellhead will help prevent contamination.

Physical protection of the wellhead

Sometimes, the best thing to do to protect your well is to prevent tampering. If you cannot secure your well, consider installing a locking sanitary well cap.

Example plan

Potential Source of Contamination (PSC)	Management actions	Date started	Timeframe
Runoff from town	Plant buffer strip to intercept water runoff	Fall 2022	3 years
Vegetable fields	Plant buffer strip to intercept water runoff	Fall 2022	3 years
Livestock area	Plant buffer strip to intercept water runoff	Fall 2022	3 years
Abandoned wells	Fill in and cap abandoned wells	Summer 2022	1 year
Houses	Outreach – contact neighbor and provide information about private water supply	July 14, 2022	One time
Garage	Education on properly storing chemicals; make sure they are in a contained storage area.	July 16, 2022	One time, repeat check 2x per year
Chemical storage	Education on properly storing chemicals; invest in a chemical storage unit.	July 16, 2022	One time, repeat check 2x per year

Resources

The following list of resources may be helpful in developing your Action Plan. Many wellhead protection planning resources are available online, and these are just a small sample to point you in the right direction. They contain a wealth of information and may provide inspiration for solutions that fit your unique circumstances.

- University of Nebraska-Lincoln Extension offices have a Well and Wellhead Management page that has information for Nebraskans: water.unl.edu/wells.
- An Environmental Protection Agency (EPA) fact sheet, “What You Can Do: In Your Home,” highlights residential use of household chemicals, landscaping and gardening, septic systems, and water conservation: epa.gov/nutrientpollution/what-you-can-do-your-home.
- Find an EPA page with many well-care information sheets at epa.gov/privatewells.





Wellhead Protection Plan Blank Template

The following pages are left blank for you to fill out.

Part I. Well information

System name:		System ID number:	
Created by:		Date created:	
Well #	Location description:		
	Coordinates:		
	Depth (ft):	Yield (GPM):	
	Casing size (in):	Date installed:	
Well #	Location description:		
	Coordinates:		
	Depth (ft):	Yield (GPM):	
	Casing size (in):	Date installed:	
Well #	Location description:		
	Coordinates:		
	Depth (ft):	Yield (GPM):	
	Casing size (in):	Date installed:	
Well #	Location description:		
	Coordinates:		
	Depth (ft):	Yield (GPM):	
	Casing size (in):	Date installed:	
Well #	Location description:		
	Coordinates:		
	Depth (ft):	Yield (GPM):	
	Casing size (in):	Date installed:	

Part II: Potential Sources of Contamination (PSC)

Potential Sources of Contamination (PSC)		
System name:	System ID number:	Date:
	Inspector name:	
PSC	Number of occurrences	Distance to well (feet)
Chemical use		
Agricultural chemical spreading or spraying (pesticides, herbicides, or fertilizers)		
Pesticide, herbicide, or fertilizer storage		
Nursery or garden shop		
High-voltage transmission lines		
Petroleum/hydrocarbon use (Volatile Organic Compounds [VOCs] or Semi-VOCs)		
Aboveground oil storage tank (including home heating oil tanks)		
Underground oil storage tank		
Airport		
Auto or small engine repair or body shop		
Gas station, service station		
System		

Potential Sources of Contamination (PSC), continued

Bacteria and inorganics, such as nitrates/nitrites

Animal burial (large-scale site)		
Animal grazing or barnyard		
Manure pile or spreading		
Septic system, septic waste disposal		
Sewer line		
Sludge disposal or spreading		
Wastewater treatment plants or discharge		
Industrial solvents and other chemicals		
Landfill, dump, transfer station		

Other

Railroad yard or line		
Residential home		
Salt pile or sand and salt pile		
Abandoned well		
Graveyard or cemetery		
Other:		

Part III: Map

Insert either hand drawn or aerial photo of site.

