York Wellhead Protection Plan

Frequently Asked Questions About Groundwater

About the York Wellhead Protection Plan Project

Over the past year, the City of York and a 16-person stakeholder group have been working on a plan to improve the management of the area's groundwater, which is the source of the city's drinking water. Partnering with the Upper Big Blue NRD, the city retained the services of JEO Consulting Group to develop a wellhead protection plan and recommend city zoning code updates that will better protect groundwater from future contamination. Together, the wellhead protection plan and zoning updates will assist with future decision making regarding the community's water supply, as well as lay out a roadmap for pollution prevention over the next five to ten years.

What is groundwater?

It is slow-moving water that passes through the tiny spaces in soils and gravels, the fractures in rock layers, or through channels and caverns in limestone or dolomite. The spaces where groundwater moves are called "aquifers."

Who uses groundwater?

Groundwater is so much a part of our lives that we take it for granted. Some people do not know that the water they are consuming is derived from groundwater. Over 85% of Nebraskans get their drinking water from groundwater, and 100% of York's drinking water comes from groundwater.

How are surface water and groundwater connected?

Most groundwater originates as precipitation that falls on "recharge areas," or from the flowing water in rivers and streams. Both of these sources recharge groundwater; however, they can also introduce pollutants into the aquifer. Most groundwater does not remain underground until a well is dug. On average, about 30 percent of stream flow is from groundwater, which may increase to 100 percent during droughts. Streams, lakes, springs, and wetlands continuously receive groundwater discharge.

How can development be planned to protect the groundwater supply?

For existing water supply wells, the groundwater flow system that provides water to the wells needs to be understood in sufficient detail to identify the recharge areas. Boundaries of flow systems, which often encompass considerably more than the immediate vicinity of the wells, need to be determined to delineate the area through which groundwater flows before reaching the wells.

Activities that are potential contaminant sources need to be managed in recharge areas, and practices that reduce the potential for contaminant release need to be adopted.

For proposed water supply wells, the ability of the flow system to yield more water beyond the existing demand needs to be determined. Conservation measures may be needed to expand the supply. Proposed well site locations need to be evaluated for (1) possible interference with existing water supply wells and surface water systems and (2) existing potential sources of contaminants to the proposed wells.

For both existing and proposed wells, the element of time needs to be considered; groundwater travel times are generally from years to decades, and planning for groundwater protection is necessarily long term. Ultimately, limits on the extent and manner of development need to be planned.

Can a city's, county's, or town's comprehensive plan be a useful tool for groundwater protection?

The comprehensive plan is a logical starting point for groundwater protection since it provides the foundation for all programs and land use management tools at the local level. It sets forth goals and policies to guide future land use and development policies of a community. In the event that a community's groundwater protection program is ever challenged, one of the best defenses will be a well formulated comprehensive plan which provides the basis and rationale for the challenged action.

Area-wide planning studies for public wells might examine land use types and densities in relation to groundwater vulnerability, and result in designating areas where conservation and protective measures are needed. This evaluation process can help localities to understand the nature of any potential threats to their drinking water supply, and provide an impetus for establishing goals to protect these valuable resources.

Site specific studies around individual wells can provide the basis for planning and goal setting on a site by site basis. In some cases, the individual results may suggest that the community revisit its development concepts and policies in order to address recurrent issues or problems.

Can a Capital Improvements Program (CIP) play a role in groundwater protection?

Capital improvements planning is an important component of a groundwater protection program, given the role that local government infrastructure plays in fostering development. In planning areas for future development, local governments must ensure that there will be adequate potable water supplies. If groundwater is to be relied on as the primary source of drinking water, this means considering the need for and the location of new wellfields. In addition, furnishing infrastructure to a region, or not doing so, can act as a means of locating future development in areas away from wellheads in order to lower vulnerability to groundwater contamination. The CIP also plays a role in contingency planning. In the event that a public well needed to be phased out, replacement supplies – either from surface or groundwater sources – would need to be identified, planned and linked to a source of funding.

How can community zoning and subdivision regulations be used as groundwater protection tools?

Zoning can be used as a tool to protect wellhead areas from contamination in a number of ways, depending on the level of development surrounding the wellfields. It is most effective for directing future development in a planned fashion – it is much less effective once an area is developed. This is a good reason to take a preventive and anticipatory approach in dealing with wellhead areas.

Are there other tools that can be used for groundwater protection?

Yes, these include conservation easements, purchase of development rights, water conservation, household/farm/business hazardous waste collection, "Best Management Practices" (BMPs), and cost share approaches.

Innovative public education programs on groundwater topics can develop interest in groundwater. These can cover the role of groundwater in meeting public needs, methods for preventing groundwater contamination, and helpful actions for residents, property owners, and business managers to take.