Drinking Water Protection Bulletin

News you can use from Oregon's Source Water Protection Program **Summer 2007**

DHS Oregon Department of Human Services

DEQ State of Oregon Department of Environmental Quality

This issue of the *Drinking Water Protection Bulletin*, the second in our series, focuses on several drinking water protection strategies that can be, or have been, used in Oregon to keep our drinking water safe. The national "Smart Growth" program offers options when designing new developments or redeveloping existing ones to minimize risk to drinking water. Cave Junction in Josephine County has developed ordinances that are designed to protect its drinking water resources, both groundwater and surface water. A unique partnership of water systems and government agencies in Lane County completed a legacy pesticide pickup that removed more than 20 tons of pesticides from their watershed and groundwater recharge areas. These success stories, along with other resource protection ideas, are described in these pages.

Success Story: The city of Cave Junction takes steps to protect its drinking water

The city of Cave Junction used its Source Water Assessment as a basis for designing site-specific ordinances to protect its drinking water supply

Cave Junction is a community of approximately 1,600 residents in the Illinois Valley of south central Josephine County. The city uses both groundwater (Daisy Hill Well) and surface water (an intake on the East Fork of the Illinois River) as sources of drinking water. The city expressed an interest in protecting these water supplies early in the Source Water Assessment process.

There are no state or federal regulations requiring communities to protect its drinking water, so Cave Junction decided to take steps of its own to address the issue. The city decided to develop a local regulatory framework to protect its drinking water, one of the many tools available to Oregon communities. Cave Junction, with the assistance of the Oregon Association of Water Utilities (OAWU), made use of the Source Water Assessment information provided by the departments of Human Services and Environmental Quality to develop a drinking water protection ordinance in July, 2004 that comprised both groundwater and surface water components. You can view both ordinances by logging on to www.deq.state.or.us/wq/dwp/assistance.htm. Scroll down the page to "Examples of Drinking Water Protection Ordinances. Under Cave Junction, select either surface water or groundwater.

Cave Junction's ground water protection ordinance was developed to "protect the public water supply in the city of Cave Junction and to those it serves from land uses which pose a threat to the quality (and/or quantity) of the ground water being extracted from the wells." The city used the delineation of the drinking water source area to identify Drinking Water Critical Impact Zones 1 and 2. These zones, associated with the Daisy Hill Well, correspond to the one and two-year

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If you have a success story to tell, please send it to Dennis Nelson (contact info on back page). The Bulletin would like to publish more articles from communities.

time-of-travel zones identified during the source water assessment (see figure 1 below).

Within Zones 1 and 2, the city encourages certain types of land uses, such as parks and greenways, and prohibits others, for example, auto repair shops, gas stations, dry cleaners, irrigated nurseries, high density (less than 1 unit/acre) housing, septic systems, dry wells, and others. The ordinance also recognizes Zones 3 and 4, corresponding to the two-five year and five-10-year time-of-travel, respectively (refer to figure 1). All uses are permitted within these zones provided they meet performance standards specified within the ordinance, such as secondary containment associated with chemical storage and use, double walled underground tanks and pipes, and properly abandoned unused wells, etc.

The city also has adopted surface water protection regulations to protect the sub-watershed area supplying the city's intake on the East Fork of the Illinois River. These regulations apply only to that part of the watershed that lies within the city limits of Cave Junction and, therefore, fall under the city's jurisdiction. The stated purpose of these regulations is to protect "existing or potential public water supplies from the effects of point and non-point pollution or sedimentation."

As with the groundwater protection area, the city has established use regulations, and has also developed specific review criteria for development within the designated water protection area (see figure 1).

Within the water protection area, certain land uses are prohibited, including storage, production, treatment or disposal of hazardous materials, dry cleaners, automobile service stations, disposal of septage or septic sludge, and others. The city also requires an impact study to be performed or reviewed by a registered professional engineer for any new application for a building permit, zoning amendment, subdivision of land. This study must be submitted to the city for review. The city will review the application to ensure that steps have or will be taken to reduce the risk to water quality (see review requirements at the Web site listed above). Importantly, spill reporting and recovery plans are required.

The city also has established a 200-foot buffer zone along any public water supply rivers and tributary streams that must be protected. Within the buffer zone, the natural state, with respect to vegetative cover and topography, must be maintained. Land uses such as

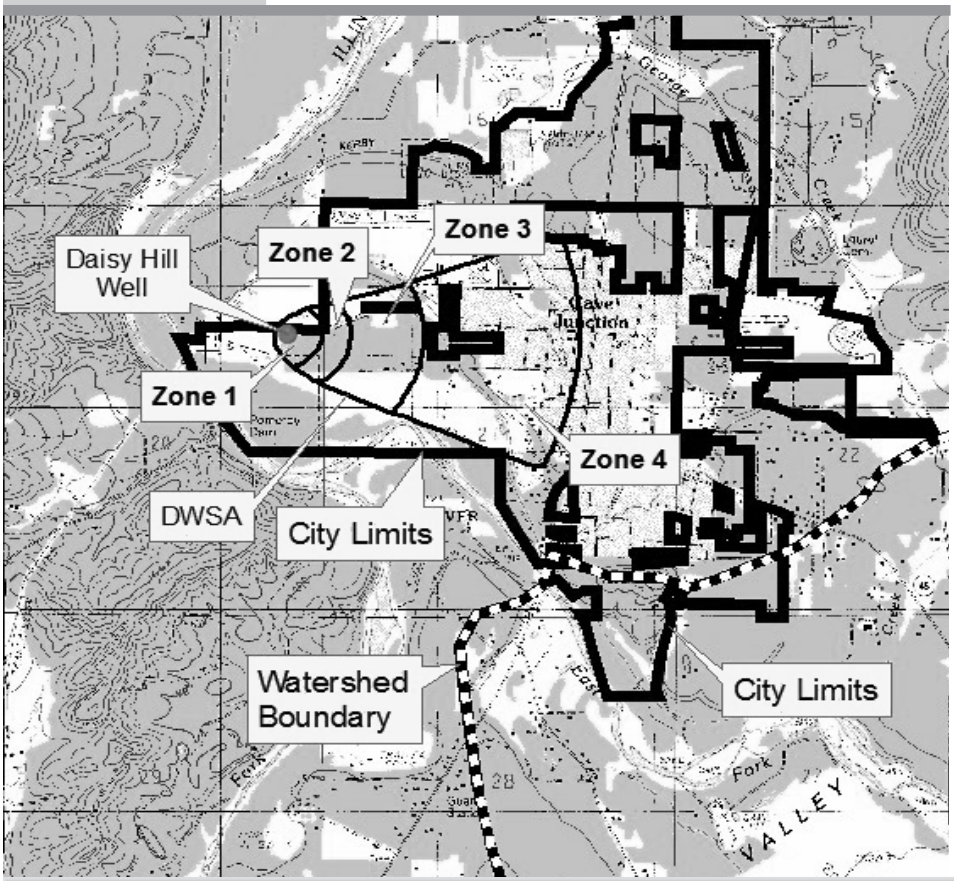


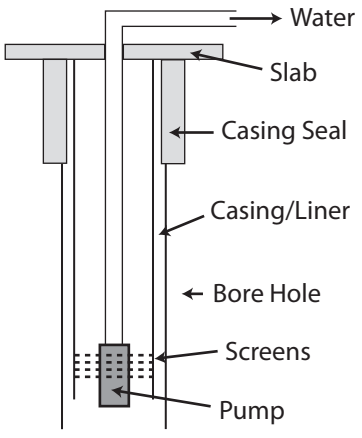
Figure 1. The Drinking Protection Area for the city of Cave Junction's Daisy Hill Well. Boundaries for the one, two, five and 10-year time-of-travel for groundwater to move through the aquifer to the well are marked. Also shown are the city limits and the watershed boundary near the city's intake.

septic tanks and drainfields, feed lots, fuel storage over 50 gallons, sanitary landfills, and others, are prohibited within the buffer strip and within 50 feet of the buffer strip.

The city also has developed a subdivision ordinance that is directed at waste disposal and stormwater runoff. Specifically, no septic systems or dry wells are permitted.

Through these locally developed regulations, the city has taken extraordinary steps to protect its valuable drinking water resources. These steps significantly reduce the risk of contamination of the city's drinking water supply and help preserve this resource for the future.

If your community is interested in developing an ordinance, there are excellent examples on the above Web site, particularly the model ordinance language provided by Environmental Protection Agency. Assistance in interpreting your city's Source Water Assessment Report, developing your protection strategies, and designing an ordinance that meets your city's specific needs can be found by contacting state agency drinking water protection staff (see staff contact and resource information at www.deq.state.or.us/wq/dwp/contacts.htm).



Well Diagram

Protection strategies you can use for

Abandoned Wells

In this section, we highlight management strategies that communities can use to reduce the risk from the most common or high-risk potential* threats to Oregon's drinking water.

What: Wells that are no longer in use or are poorly constructed and have not been properly abandoned.

Why are abandoned wells a risk? Poorly constructed wells, e.g. the casing seal (see Well Diagram), may allow shallow potentially contaminated groundwater to move down the outside walls of the casing and gain access to the water system's aquifer (see www.wellowner.org/awellmaintenance/unusedwells.shtml). For information on well construction see the Water Resources Department's rules (OAR 690-210-130 to 160) or oregon.gov/DHS/ph/dwp/safewell.shtml).

Are these in my drinking water source area? Check your Source Water Assessment and contact us (see information on back page) or do a well log search on Water Resources Department's Web page (www.wrd.state.or.us/OWRD/offices.shtml).

What can we do? The Water Resources Department has rules requiring temporary or permanent abandonment of water supply wells that are not in use. Temporary abandonment involves capping the well, and permanent abandonment involves filling the well with cement or other approved sealant. You can encourage well owners to follow these procedures in several ways.

- Contact the owners of older homes or known wells and inform them that their wells could serve as a conduit for contaminants to move into the community's drinking water source. Distribute fact sheets and discuss storage or application of chemicals near the well. If the home is served by the water system, mention that the well must be isolated from the house's drinking water supply to prevent a potential back-flow event.
- Subsidize well abandonment (approximately $2,000 or more). Elsewhere, communities use the following sources of funding:
  - Increase in the water-use fee to offset abandonment costs
  - Drinking Water State Revolving Loan: Oregon has both low-interest loans and grants (see back page for information)
  - Community Development Block Grants
  - General obligation bonds
  - Tax incentives.

**It is important to remember that the land uses discussed are only potential sources of contamination to the drinking water. Water quality impacts are not likely to occur when contaminants are used and managed properly and erosion and contaminant releases are minimized.*

Legacy pesticide pickup: A direct reduction in risk

by Amy Chinitz, Springfield Utility Board

Through a unique partnership between farmers and city, county and state officials, a significant threat of pesticide contamination was eliminated..

Hundreds of thousands of people depend on ground and surface water in the southern Willamette Valley for their drinking water. Protecting this precious resource requires us to identify risks and manage and reduce them accordingly. The recently completed and hugely successful Agricultural Chemical Removal Project is an excellent example of this approach.

The process began with an Oregon State University Extension Service survey of over 700 growers in the Upper Willamette Basin, which found that thousands of gallons of obsolete agricultural chemicals remained on farms. Explanations for the continued presence of these chemicals may have included high disposal costs, lack of knowledge regarding how to handle the illegal chemicals, and the fact that commercial growers are not permitted to participate in household hazardous waste collection events. Recognizing the potential threat these farm chemicals posed, several agencies (Lane County Waste Management, Eugene Water and Electric Board, Springfield Utility Board, OSU Extension Service and the Oregon Department of Environmental Quality) teamed up to create a free, no-risk opportunity for growers to safely dispose of unwanted and obsolete farm chemicals. The Agricultural Chemical Removal Project was launched in the fall of 2006 (see www.registerguard.com/news/2006/12/29/d1.cr.chemicals.1229.p1.php?section=cityregion), with grant funding awarded to EWEB by the Oregon Governor's Fund for the Environment. A second collection event occurred this spring.

Lane County Waste Management staff pack farm chemicals for safe transport.

Implementing this project involved a series of steps from mailing questionnaires to hundreds of growers to conducting the actual collection events in Glenwood, between Eugene and Springfield. Because many of the chemicals had been sitting in barns or sheds for decades, sometimes even pre-dating the current property owners, several growers needed assistance identifying and/or repackaging old chemicals. With help from McKenzie Fire and Rescue and the Eugene Fire Region 2 HazMat Team, we visited farms to provide this assistance and ensure the chemicals would be transported without spilling or leaking along the way. This often meant overpacking deteriorated drums or placing torn bags into larger and more stable containers.

Once the chemicals were safely packaged and inventoried, the growers delivered their chemicals to the Lane County waste management facility in Glenwood. A total of 126 growers disposed of 88,890 pounds of materials, which included pesticides, fertilizers, waste oil/ fuels, and other agricultural chemicals. Pesticides made up the largest portion (49,000 pounds) and included chemicals such as DDT, Aldrin, Chlordane, Dinoseb, Diazinon, Malathion and others.

The success of the Agricultural Chemical Collection Project demonstrates that protecting an important resource takes teamwork. This project never could have happened without the effective collaboration among agencies

and the willing participation of growers. Thanks to everyone involved, including other project partners such as the Oregon Department of Human Services Drinking Water Program, Southern Willamette Valley Groundwater Management Area, and East Lane Soil and Water Conservation District.

Other legacy collection events in Oregon have yielded similar results. A collection event in the northern part of the Willamette Valley in January 2007 at Donald and in February 2006 at Mt. Angel invited farmers from Marion, Yamhill and Clackamas counties. These events collected 34,000 pounds of waste pesticides (mostly legacy) from more than 80 growers.

Some of the assorted pesticides removed from farm storage during the legacy pesticide pickup. Note that the chemicals are packed in a drum for shipping.

"Smart Growth" as part of your Drinking Water Protection

Oregon is growing. The population is increasing and new businesses want to relocate here. In the context of economic security, the state is encouraging new businesses and industry to move in. This means new developments in areas that have been forested or undeveloped in the past, and redevelopment in urban areas using existing infrastructure. Many of these developments are proposed in areas that supply our public drinking water wells or surface water intakes. Measure 37 has substantially increased the number and size of these proposals as well. If developments are proposed in sensitive portions of your source area, there are tools you can use to encourage water quality protection.

"Smart growth" has emerged as a way to approach community, economic and environmental goals in an integrated fashion. It is a sound alternative to continuing the traditional approach of piecemeal, discrete development across the landscape, where the change of an individual site seen alone might not have a significant environmental cost but, cumulatively and over the long term, leads to the issues and problems associated with sprawl. Smart growth efforts have taken different forms around the country, but the guiding principles address a variety of goals. The actual tools used for water quality protection can vary according to local conditions and needs, often bundled together into what is referred to as low impact development (see www.epa.gov/watertrain/smartgrowth/19lt28.htm). One tool is for communities to encourage development in areas with existing infrastructure, which protects open space while revitalizing urban areas through infill and brownfield redevelopment.

When new developments are proposed, local communities should communicate their concerns about drinking water protection to regional or county planning agencies. Planning officials may not know about the source area that supplies your specific drinking water, even though they are generally supportive and recognize the importance of incorporating water quality protection measures into new construction. Use the maps in your Source Water Assessment to illustrate the sensitive areas needing protection.

SMART GROWTH RESOURCES

- www.epa.gov/watertrain/smartgrowth/resources/index.htm
- www.naco.org
- www.smartgrowth.org
- www.epa.gov/owow/nps/
- www.epa.gov/owow/nps/lid/
- nemo.uconn.edu
- www.cwp.org

By developing at higher densities within the watershed, ample open space or otherwise undeveloped land remains to perform critical watershed functions.

Reference: Protecting Water Resources with Higher-Density Development, EPA 231-R-06-001 January 2006

Here's an example of what an official from one small Oregon community requested of the county:

"We are seeking new ways to allow growth in our community and some of the growth is within our drinking water watershed. As a community, we are committed to promoting environmentally sound growth.

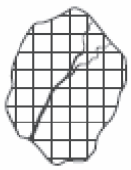
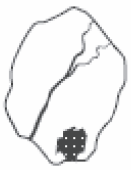
"We are asking our regional land use planning and permitting partners to assist us in protecting the watershed that supplies our community with its drinking water. We are concerned about the potential for large-scale changes in the watershed hydrology. In terms of the hydrologic cycle, developing land will generally mean that less water is infiltrated and more runs off at the surface. This could have significant impacts on our drinking water supply. Increased vehicle use, roads, construction site sediment runoff and residential trash and waste are all potential sources of concern for our drinking water during development and post-development. Greater paved surface area per capita results in increases of nonpoint source pollution from vehicles, pets and lawn care activities.

"As we incorporate measures to protect water quality in the source area for our drinking water, we also protect public health by providing safe, clean water for our community. If we can maintain the quality of the source water, we do not have to spend public funds for additional treatment facilities. We believe clean drinking water is beneficial for the entire region."

Research has shown that significant changes in the distribution and amount of water in a watershed can occur after development: greater volumes of precipitation run off the land more quickly, resulting in a sharp spike in stream levels, which can cause or worsen flooding and erosion. The effects of urban and suburban runoff are most dramatic when natural land is first developed. Soils that have been compacted by heavy machinery during construction, landscaping or farming often function like paved surfaces. Land that was once able to soak up rain without a rise in stream levels behaves quite differently after roofs, roads and other impervious surfaces are created.

In traditional development patterns, the number of stream channels can be reduced because stormwater conveyances are used to channel water away from the structures. Normal streamflow can be significantly reduced because rainfall and snowmelt do not infiltrate and recharge the smaller stream tributaries in the watershed. Low-density residential suburbs and office parks are generally surrounded by roads, shopping centers, recreational centers, schools, utilities and their associated parking lots, which together add up to increased impervious surfaces. In addition to decreased water quality for drinking water, increased impervious surfaces may lead to the destruction of habitat for fish and wildlife, increased nutrient pollution in water ways, sudden and large variations in stream temperatures, and polluted runoff from human and household sources.

In areas in the watershed where residents depend on wells, underground aquifers can be depleted due to increasing demand from development and an associated decrease in infiltration as impervious surfaces replace natural land cover. When aquifers are not recharged, groundwater

Scenario A	Scenario B	Scenario C
		
10,000 houses on 10,000 acres at a density of one house per acre consume one entire watershed.	10,000 houses on 2,500 acres at a density of four houses per acre consume 1/4 of one watershed.	10,000 houses on 1,250 acres at a density of eight houses per acre consume 1/8 of one watershed.

flow is reduced and the streams are not supplied with the base flow that groundwater normally provides.

In contrast, smart growth or low-impact development design techniques involve the incorporation of natural drainage systems. Using smart growth can help preserve natural water conditions by promoting infiltration and limiting impervious (paved) surfaces. This can be highly successful in reducing urban street runoff and promoting infiltration, which reduces both downstream peak flows and runoff pollutants.

Smart growth can address multiple planning goals. Natural drainage systems serve to retain the physical structure of the pre-existing wetlands and streams, as well as the diversity and abundance of aquatic life. Smart growth helps to meet multiple planning goals—community amenities, wildlife habitat, water resource management and aesthetic values. Smart growth concepts include a set of tools to better manage stormwater from areas appropriately designated for growth. Soil amendments, vegetated swales, green roofs, bioretention areas and rain gardens are just some of the techniques that can be used to improve water management in the watershed.

Smart growth can help protect drinking water quality through:

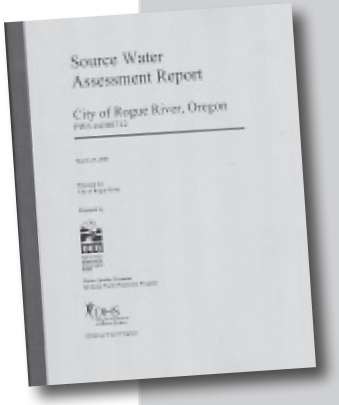
- conservation of open space and clustered development patterns,
- taking a regional approach to planning to avoid or reduce cumulative impacts to water quality, and
- recognizing that economic vitality is dependent upon a reliable, high-quality water supply serving the local region.

Since there are no regulations requiring the protection of public drinking water source areas, it is imperative that you (as public officials) express your desire to ensure that any new development be implemented with adequate protection for your drinking water resource.

Source Water Assessments: A brief reminder

In the fall 2006 issue of the *Drinking Water Protection Bulletin*, the benefit to communities of using the federally required Source Water Assessment reports was described (see www.oregon.gov/DHS/ph/dwp/dwpb.shtml). The assessments contain information that communities can use to help manage risks to their drinking water supplies:

- maps showing the location of the source area(s) for the drinking water supply,
- potential contaminant sources within that area, and
- an evaluation of the relative susceptibility of the drinking water supply to those potential contaminant sources.



Source Water Assessments were unique to each community, and each should have received a copy of the report for their water supply. If your community does not have a copy, you may request one from the Drinking Water Protection Programs of the departments of Human Services and Environmental Quality. For communities using surface water, contact Sheree Stewart, DEQ and for those using groundwater contact Dennis Nelson, DHS (see back page).

Both agencies are now working with communities to help them identify and prioritize specific protection strategies for their water supplies. Drinking Water Protection is voluntary in Oregon; however, in doing so, you are investing in the long-term viability of your community. If you are interested in initiating such efforts in your community, please contact either Sheree (surface water) or Dennis (ground water).

Would you like to receive this newsletter electronically?

email: dennis.o.nelson@state.or.us

DHS Oregon Department of Human Services

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Drinking Water Protection Bulletin

Drinking Water Protection Resources

GIS coverages of drinking water source(s), drinking water source area(s) and potential contaminant sources are available for your community by contacting Steve Aalbers, DEQ, at 503-229-6798 or aalbers.steven@deq.state.or.us.

Source Water Assessment reports should be available from your PWS. If not, contact Dennis Nelson for groundwater systems and Sheree Stewart for surface water systems (see contact information in box)

Drinking Water State Revolving Fund: provides funds in the form of loans and small grants for drinking water protection Roberto Reyes-Colon at 971-673-0422 or roberto.reyes-colon@state.or.us.

Oregon Association of Water Utilities: Assistance for small public water systems. Shawn Stevenson at 503-873-8353 or sstevenson@oawu.net.

Oregon Water Resources Department: Information on water rights, conservation and water law. Contact your local watermaster. See www.wrd.state.or.us/OWRD/offices.shtml.

Department of Land Conservation and Development: Assistance in land use planning and drinking water. Doug White at 541-318-8193 or doug.white@state.or.us.

U.S. Environmental Protection Agency: A series of fact sheets on best management practices for drinking water protection. See www.epa.gov/safewater/protect/swpbull.html.

The Trust for Public Land: has multiple tools to help keep drinking water clean. See "Publications" at www.tpl.org.

DEQ's Toxic Use/Waste Reduction Assistance Program: www.deq.state.or.us/wmc/hw/tuwrap/tuwrap-contacts.html.

Ecological Business Program: www.ecobiz.org.

Key Oregon Contacts

Public Health Division Drinking Water Program: technical assistance for groundwater sources, public water supply data, drinking water standards. oregon.gov/DHS/ph/dwp/index.shtml

Dennis Nelson 541-726-2587 x21
dennis.o.nelson@state.or.us

Department of Environmental Quality: technical assistance for surface water sources, drinking water protection planning, GIS coverages, Best Management Practices.

www.deq.state.or.us/wq/dwp/dwphome.htm

Sheree Stewart 503-229-5413
stewart.sheree@deq.state.or.us