Volume 3, Number 2
Sept. 2005 Second edition

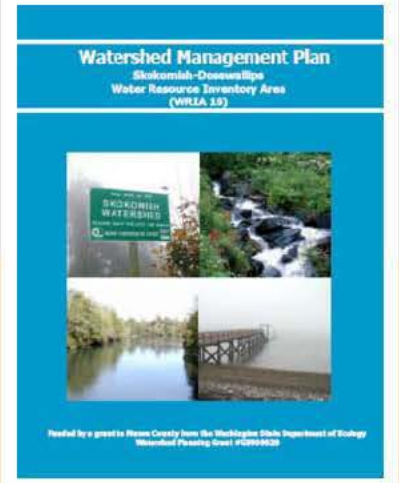
WATERSHED RESOURCE INVENTORY AREA 16

Rivers for Life

A Quarterly Newsletter of the WRIA 16 Planning Unit

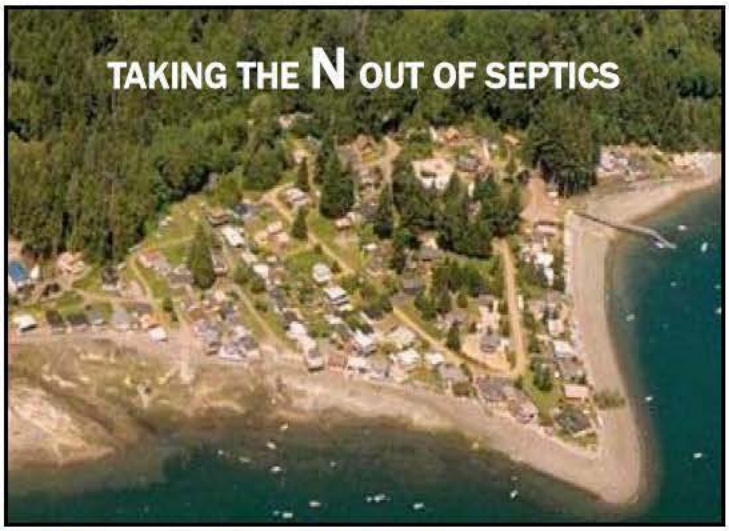
Do the following concern you?

Future Water Rights
Development
Threatened Fish Species
Water Pollution
Water Supply
Saltwater Intrusion
Wildlife Habit



Read the preliminary draft plan.
Learn about options.
Share your views!

An electronic copy of the draft Dosewallips-Skokomish (WRIA 16) Watershed Plan is available by sending an email to tpokorny@co.jefferson.wa.us. Send comments to Susan Gulick at soundres@earthlink.net.



Ayock Point south of Jorsted Creek, WRIA 16.

More than 24,800 homes and an unknown number of commercial and public facilities along Hood Canal rely on on-site septic systems (a.k.a. OSSs) to treat sewage. Using a conservative rate of 100 gallons per day, households alone generate on the order of 900 million gallons of raw sewage, wastewater, and food particles each year. That's enough to fill 1,370 olympic-sized swimming pools!

The vast majority of this unpleasant murk will be treated and disposed of in homeowners' yards.

*(See **N** on page 2)*

Preliminary Draft Watershed Plan Available

In August, the Planning Unit reviewed the first draft of the Skokomish-Dosewallips Watershed Plan (WRIA 16), authored by Cascadia. The planning unit's recommendations to address key water quality, water quantity and habitat issues will be added to the 117-page plan in September. Both the draft plan and the draft recommendations are available for review. In-stream flows will be negotiated on a separate tract from the plan but will be commencing this fall as well.

The plan contains an introduction to watershed

*(See **Plan** on page 3)*

Should the watersheds surrounding Hood Canal be considered nitrogen sensitive?

(N continued from page 1)

"Conventional" septic systems, that operate via gravity alone, are the most common type in Jefferson and Mason counties. Many parcels slated for development in WRIA 16 have soil and space constraints that make conventional systems inadequate. In these situations it's necessary to pump septage to a drainfield off-site or to install an alternative, certified treatment system (www.psat.wa.gov/Publications/PACA_html/paca_sewage.htm).

Signs of a failed septic system may include greening grass, saturated soils, and odor.

OSSs transform the waste from household plumbing into things that are, for the most part, innocuous. Ideally, a well designed, installed, and maintained OSS sends only water and a few soluble nutrients like nitrogen compounds into surrounding groundwater. Near Hood Canal, however, nitrogen compounds are trouble**.** Sources include human waste, food particles, and household cleaners. Depending on the OSS type and use, over seventy percent of the nitrogen slips right on through the tank, drainfield, and nearby soils.

In 1996, the U.S. Environmental Protection Agency set a standard of ten parts per million for nitrates in drinking water to protect against methemoglobinemia, or blue baby syndrome, a condition that prevents normal uptake of oxygen in the blood of young babies. This past July, the State Department of Health passed a Final Draft Rule to amend Chapter 246-272A WAC (www.leg.wa.gov) mandating that nitrogen from OSSs be addressed by lot size and treatment in "nitrogen sensitive" areas. Should the watersheds surrounding Hood Canal be considered nitrogen sensitive? That's one question that the WRIA 16 Planning Unit is asking.

The concern here, however, isn't "blue baby syndrome." It's believed that area wells rarely contain nitrate levels approaching or exceeding the drinking water standard. Rather it's the link between nitrogen as fertilizer (a nutrient that stimulates algae growth) and the nitrates released from septic systems that requires assessment (www.psat.wa.gov).

In seawater, algae have enough of everything their little mitochondria desire <u>except</u> nitrogen. Add a lot of "N", perhaps via septic systems, fertilizers, and/or livestock or pet wastes and, come summer or early fall, the algae bloom. Eventually they die and sink to the depths of the canal where they become lunch for oxygen-breathing bacteria. Dissolved oxygen levels drop as algae decomposes and bacterial populations balloon thereby diminishing the oxygen available to fish, shrimp and other aquatic organisms.

Filamentous algae indicates the presence of nitrogen-rich waters. Near Twanoh State Park, August 2005.

Human sewage contributes an estimated 39 to 241 tons of nitrogen to Hood Canal each year. That equates to 4 to 18 pounds of nitrogen per person per year or about sixty percent of the total nitrogen from human activities. This wide range in values reflects the difficulty of measuring nitrogen inputs to the Canal precisely, and presents a dilemma for watershed planners.

Vessel holding tank pumpout station at Twanoh State Park.

Elevated levels of bacteria caused the closure of shellfish harvesting at Twanoh State Park.

The big questions are, "How much nitrogen from human activities, including OSSs, actually reaches Hood Canal?" and "Is this amount significant when compared to the nitrogen content of in-flowing seawater?" Nitrogen is present in every living thing and makes up 78 percent of the air we breathe.

Most OSSs rely on a septic

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A recirculating gravel filter under construction.

(N continued from page 2)

tank and oxygen-rich dispersal zones, such as drainfields, to remove contaminants from wastewater. However, separating out the nitrogen is a more complex task because additional tanks, pumps and filters are necessary. Together, with bacteria, they manage to release nitrogen gas into the atmosphere (rather than nitrates into the groundwater).

One such septic system is called a recirculating gravel filter and it will remove between 51 and 64% of the nitrogen that enters it whereas standard systems remove on the order of 10 to 30%.

Other technologies, such as sand filters, are similarly effective. All of them are being tested and refined over time. The cost for including nitrogen-reducing technologies may be on par with other alternative systems best suited to many homesites around Hood Canal.

Federal, state, local and tribal governments are committed to finding new ways to manage sewage along Hood Canal. These include additional studies measuring the nitrogen discharged from several onsite sewage treatment systems including recirculating filters, cluster systems, and groundwater monitoring. A complete list of funded projects can be found at: www.psat.wa.gov/Programs/hood_canal/hc_projects_fundedo4.htm. In addition, elected officials in WRIA 16 could address the nitrogen problem in future county plans to manage on-site septic systems locally.

(Plan continued from page 1)

planning in WRIA 16, a "State of the Watershed" section, key issues and options, cumulative or cross-cutting issues, options for funding new efforts, recommendations, and implementing the plan.

The plan represents, "the culmination of months and years of diligent and careful work by community members, scientists, government planners, private business, landowners, and tribes. These and other involved parties have studied the watershed, identified issues and concerns, and developed recommendations for improving the water quantity, water quality, and aquatic habitat in WRIA 16."

Really Friendly Bacteria

Let's face it, life as we know it would be impossible without bacteria and wastewater treatment is no exception. Billions of individual bacteria are present in every functioning OSS. All OSSs are engineered to optimize natural biological processes that reduce the threats posed to human health by sewage. Nitrogen-reducing systems take this optimization at least one step further.

A conventional septic system costs less but its proper function depends on locating it within a suitable parcel—something in short supply along Hood Canal. For example, there must be adequate soil depth and space for an appropriately sized drainfield. If such conditions are lacking, an alternative technology such as a pressurized sand filter, mound, or other advanced treatment system may be a viable option.

Once the OSS is installed and residents move in, wastewater from toilets, bathing, laundry and dishes, and drinking and cooking flows into a settling tank built expressly as habitat for microorganisms. They enter with the wastes and get cozy (no additives needed), thriving and competing with each other under the varied and variable conditions present within the tank. Inside the house nearby, humans come and go. Maybe nobody is home for several weeks. Then, relatives and friends visit. Regardless, no problem—*as long as* the system has been properly designed, installed, inspected and maintained for the volume of waste that really does occur.

In the tank, solids settle to the bottom as "sludge" and fats and grease rise to the top as "scum." Bacteria digest the solids and excrete ammonia, water, carbon dioxide and methane. Their activities reduce the amount of solids in the

(Really Friendly continued on page 5)

Meet some Planning Unit Members

Ron Gold is currently Mason County PUD #1 Commissioner. He's a veteran of the U. S. Air Force (1969-1973) and graduated with a degree in resource planning and forestry from Evergeen State College. He was a reforestation specialist with the U. S. Forest Service and a forestry consultant specializing in environmental restoration including culvert replacement, wet land creation, and road decommissioning.

Bob Burkle is the Assistant Region 6 Habitat Program Manager for WDFW. He supervises the Watershed Stewardship Team and the Forest Fish Team that covers eight counties. A UW graduate from the College of Fisheries, he has been working in fish resources since 1975 for WDFW, USFWS, and ODFW. Bob is "totally committed to fishing and making the fishing better through habitat management and salmon recovery."

Marty Ereth, a habitat biologist with the Skokomish Tribe's Department of Natural Resources, has over 23 years of experience in the fisheries profession, including 20 years working in Hood Canal watersheds. He has been with the Tribe since 1992 and had been previously employed by the Washington Department of Natural Resources, Washington Department of Fish and Wildlife and the U.S. Fish and Wildlife Service. He has worked on salmon recovery planning efforts for Hood Canal summer chum, Puget Sound chinook, and bull trout, all three species listed as threatened and found in the Skokomish River. He represents the Skokomish Tribe on three separate planning units including WRIA's 15, 16 and 17.

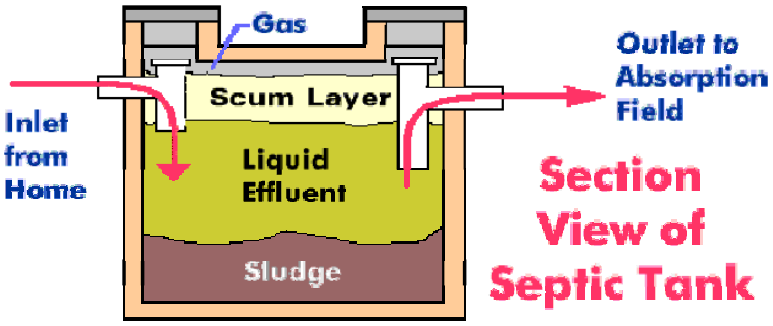
In Mason County hazardous wastes are collected in Shelton (427-5271), Belfair (275-6462), Union (427-5271) and Hoodsport (427-5271). Hazardous wastes from Mason County residents are also accepted in Port Orchard (427-5271).

In Jefferson County, the Household Hazardous Waste Facility can be found just inside the entrance to the Port of Port Townsend (379-6911). A south county collection event occurs each fall in Quilcene.

Maximize the life of your onsite septic system while reducing the impacts of nitrogen and other chemicals to Hood Canal.

- Conserve water routinely. Repair leaks.
- Monitor your septic tank solids level every year to evaluate the need for pumping.
- Add an effluent filter to the outlet filter of your septic tank if there isn't one there already.
- Minimize the use of harsh cleaners and chemicals such as bleach and ammonia.
- Avoid the use of antibacterial soaps.
- Take hazardous chemicals such as solvents to a collection facility.
- Know the capacity and location of your septic system.
- Keep vehicles and tree roots away from the septic tank, drainfield, and reserve area.
- Scrape and strain food waste into a receptacle rather than using the garbage disposal.

For more information:
Visit www.hoodcanal.wa.edu, www.doh.wa.gov/wastewater.htm, or the King County website www.metrokc.gov/health/wastewater.



(***Really Friendly*** *continued from page 3)*

tank. If it weren't for these helpful bacteria, we'd be pumping out our septics much more frequently to say the least.

Despite their seeming lack of culinary achievement, microbes won't eat just anything. Paint, chemicals, cleaners, oils, solvents, pharmaceuticals, *anti*bacterial products and some septic additives wreak havoc on tank ecology. Enough bacteria are present in human waste to support the decomposition process. Introducing bacterial additives forces the existing microorganisms, which are ideally suited to the system, into competition with newcomers. Obviously, any chemical that claims to kill bacteria should not be used since only live bacteria will decompose waste.

If the solids aren't processed into sludge or too much sludge and scum accumulates, the tank must be pumped out before it can damage the drainfield. A well-functioning OSS releases only liquids from the tank. If a certified contractor isn't performing regular inspections and maintenance on your OSS, it's essential to check the depth of the scum and sludge layers regularly to determine if pumping the tank is necessary. You may need to hire an operation and maintenance specialist rather than someone who only pumps out tanks. Contact county environmental health departments to get a list of licensed operations and maintenance contractors for your area (360/427-9670 ext. 352 in Mason county or 360/385-9444 in Jefferson county).

The liquids flowing into the drainfield are rife with pathogenic bacteria, viruses and nitrogen-containing ammonia. Perforated pipes conduct this partially treated effluent into gravel-lined trenches that maximize its contact with underlying soils. Beneath the drainfield the ammonia is transformed into nitrates as the fluids travel downward towards the water table.

These soils provide the final stage of treatment and disposal of wastewater. Diverse populations of microorganisms exist in the soil's *open* pores. They consume any remaining biological waste, and each other, until the water is clarified. If you examine the fluid entering a typical drainfield it'll contain a million or so bacteria per half cup. By the time it's seeped through just two feet of healthy soil, the liquid will be clear, odor-free, and contain very few disease-causing bacteria or viruses. Five to ten feet away, the biota present is what's normally expected in healthy soils.

Drainfield pipe plugged with septic tank solids.

However, when toxins or solids enter the drainfield, they kill off bacteria and the soil's pores close. No amount of pumping will repair the plugged, or "congealed," soil. Many household chemicals cannot be digested by bacteria and are released straight into ground or surface water. That's one reason why it's so important to dispose of leftover hazardous chemicals properly by taking them to an approved hazardous waste collection facility.

Once the drainfield's ecology is destroyed, a replacement drainfield must be constructed in a different, appropriate location at a potential cost of thousands of dollars. Without a functioning drainfield you risk exposing yourself and the neighborhood to the possibility of contagious diseases.

Consider having a professional educator explain the ins and outs, do's and don'ts of septic systems. Invite a few friends and neighbors and make it a "septic social." To schedule your "septic social" contact Teri King, Washington Sea Grant Program, (360) 432-3054 in Shelton, guatemal@u.washington.edu.

Whether you're building a new home, an addition, or your septic is due for replacement, consider the costs and benefits of the nitrogen–reducing OSS.

Write a "Septic Serenade" or "Ode to Nitrogen" for Hood Canal. We'll print it in the next newsletter!

UW monitoring buoy near Belfair used to measure dissolved oxygen levels.

You're invited to participate

The **Planning Unit** meets on the first and third Thursday of each month.
Call for times and locations.

For more information
and to correspond with the
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The newsletter is designed and written by Tami Pokorny, Natural Resources, Jefferson County. Send comments or ideas for future issues to her at tpokorny@co.jefferson.wa.us or (360) 379-4498.

Rub strips protect pilings from wear and prevent arsenic-laden wood scrapings from entering Hood Canal. Arsenic is highly toxic to marine life. Rub strips are required on new docks and retrofits. Before installation contact Margie Schirato, WA Dept. of Fish and Wildlife, at (360) 427-2179 for hydraulic project approval.

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