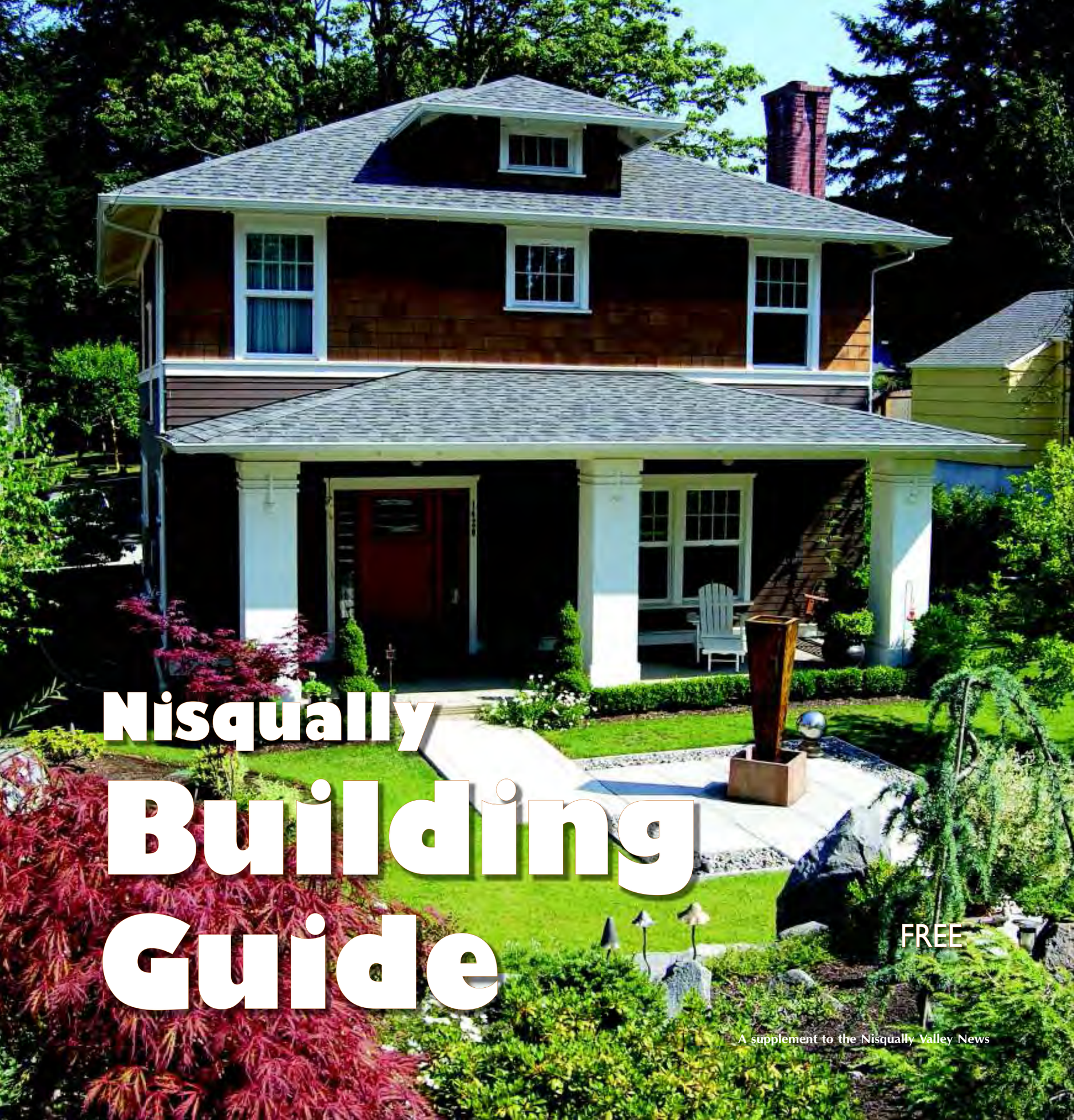

Nisqually Building Guide

FREE

A supplement to the Nisqually Valley News

SALMON SAFE

Wilcox eggs are Salmon-Safe.

Since 1909, Wilcox Family Farms has been caring for the land and producing quality farm fresh eggs for our local community. That is why we worked with Stewardship Partners to become Salmon-Safe certified. Salmon-Safe recognized us for our commitment to restoring the Nisqually River and protecting habitat, water quality and soil resources on the farm.

Support our 4th generation Salmon-Safe farm. Look for Wilcox Organic and Cage Free eggs at your local market.

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Since 1909 Wilcox Family Farms

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Nisqually Building Guide

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Nisqually Valley News

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Production and Printing by

Nisqually Valley News

Welcome to the first annual Nisqually Building Guide!

The Nisqually Building Guide is a collaborative effort of the Nisqually River Council, the Nisqually River Foundation, Stewardship Partners, the U.S. EPA Targeted Watershed Grant program, and the Nisqually Valley News.

The Nisqually River Council was formed in 1987 out of a desire to manage, preserve, and protect the environment, economy, and communities of the Nisqually Watershed. The membership of the Council includes representatives from local, state, and federal agencies, the Nisqually Indian Tribe, and an active Citizens Advisory Committee. During the 22 years of work for the Nisqually Watershed, the Council has participated in efforts for salmon recovery, the timber fish and wildlife agreement, public access to the river, environmental education about the Nisqually for students through the Nisqually River Education Project and adults through the Stream Stewards program, habitat protection and recovery, land use planning, and many more topics.

In 2003, the Council updated its management plan for the watershed and wholeheartedly embraced the concept of sustainability with the environment, the communities, and the economy working together to meet the needs of today without negatively impacting the needs of future generations. This Nisqually Building Guide is an important part of this effort. The Nisqually Watershed will continue to see dramatic growth in population in the years to come and the Council wants to find a way to absorb all these new residents without negatively impacting the watershed that we know and cherish. Low Impact Development, a set of tools that helps manage stormwater and reduces the impact of development on the natural processes is one way to support sustainable growth. There are several articles that describe and discuss this strategy in the Guide. Green building technologies offer ways to help buffer the impact of all our new neighbors. Suggestions, resources, and tips for green building are included throughout the publication. Simple efforts such as choosing native plants for your landscaping and using rain barrels to catch water for your garden can have a large impact when enough people get on board. Inside these pages you will find information on how you can begin reducing your impact, you will also find information about groups and programs working in the area to preserve and protect the watershed and to provide assistance to landowners in meeting their own goals for their property.

If you are interested in participating with the Nisqually River Council please call 360-438-8715 or email info@nisquallyriver.org. The Council meets at various locations throughout the watershed on the third Friday of every month. The Council's Advisory Committees – Citizens, Environmental, Economic, and Community – meet quarterly. Meeting information will be posted on the current events section on our website.

More information about the Nisqually River Council and its programs can be found at www.nisquallyriver.org.

Justin S. Hall
Executive Director, Nisqually River Foundation
The Nisqually River Foundation provides staffing, program and grant management, and fundraising for the Nisqually River Council

On the cover

The house featured on the cover was built by Scott Homes. Scott Homes has been building homes for 25 years and have received many awards for energy efficient and sustainable building practices, including the 2009 "Builder of the Year" Energy Value Housing Award, the GOLD AWARD for Custom Builder, "Cold Climate" Energy Value Housing Award, Best "Small Home Designed" and, in 2008, they were "Small Builder of the Year". The homes are third party verified for NAHB Green, Energy Star, Built Green, and Builder's Challenge certifications. As a proven, national leader in residential construction, they are committed to building homes that are beautifully designed, exceptionally built, and highly energy efficient. Whether building a mansion or a bungalow, their homes cost less to operate, are more comfortable to live in, have healthier indoor air quality, and less impact on the environment. For more information on Scott Homes, Inc., please call 360-357-9167 or go to www.scotthomes.com

Contents

Salmon-Safe certification protects water quality

Salmon Safe certification is a Northwest regional eco-label to recognize land use practices in both rural and urban environments that protect and restore water quality and fish and wildlife habitat.

The regional eco-label, which originated in Oregon in the late 1990s, was brought to the Puget Sound agricultural landscape by the non-profit Stewardship Partners in 2004.

Salmon-Safe farms restore stream banks, prevent soil erosion, practice water conservation, protect natural areas, minimize impacts from animals, and use natural pest control methods.

The Salmon-Safe label has gained national recognition as one of the most credible environmental labels in the country (according to Vanity Fair magazine, Real Simple, and Consumers Union).

There are over 60 farms certified as Salmon-Safe around Puget Sound and another 25 vineyards and wineries throughout the state.

Salmon-Safe eggs, produce, berries, wine, and other products are available at local groceries, farmers markets, and directly through participating farms.

Notable Salmon-Safe farms in the Nisqually Watershed include Wilcox Farms, Pigman's Organic Produce Patch, and Yelm Earthworm and Castings Farm. With the success of the Salmon-Safe label in promoting local environmentally friendly farming practices, the program has expanded to more urban and suburban land management, certifying corporate and university campuses.

These certifications conducted by a team of specialists, emphasize stormwater management along with the suite of guidelines for protecting habitat and water quality.

The University of Washington, Port of Seattle Parks, and Department of Ecology Headquarters in Lacey are among the first campuses in the state to receive the Salmon-Safe designation.

With the help of Stewardship Partners, the Salmon-Safe program is now expanding to two additional sectors - residential development and golf course management - as a means to promote habitat protection, stormwater infiltration, Integrated Pest Management, water conservation, and other environmentally friendly practices within these potentially high impact land uses.

Salmon-Safe residential development will build on successful green building programs, specifically LEED certification and Built Green®.

These programs focus on energy efficiency, materials procurement, use of low toxic substances, indoor air quality, and related issues associated with buildings. Salmon Safe will complement these practices to promote habitat protection, stormwater management, and landscape care associated with site development

Photo by Stewardship Partners

Above: Andy and Barrie Wilcox of Wilcox Family Farms enjoy recognition for protecting native fish in the Nisqually Watershed. Below: Jim Wilcox, CEO of Wilcox Farms helps restore salmon habitat.

Salmon-Safe has also developed a new program targeting the golf course industry.

Many golf courses are located along productive stream systems, and if not managed carefully, can have an impact on the environment from use of water, chemicals, and the impact of facilities.

The first pilot Salmon-Safe golf course will undergo certification this spring to promote practices that reduce chemicals, curtail stormwater impacts, restore salmon streams. and protect other wildlife habitat.

With the population of Puget Sound expected to increase by 2 million people by 2020, the problems of habitat loss, stormwater runoff, and water pollution will be exacerbated, unless action is taken immediately. The Salmon-Safe label is a well recognized tool for engaging businesses, institutions, and landowners in sustainable practices that protect and restore the Nisqually watershed.

As the program expands, look for the Salmon-Safe label on local food products and associated with land use management practices throughout the watershed.

Salmon-Safe Locations

Local farms doing it naturally

Local farms contribute to watershed health in many ways: they provide wildlife habitat, help safeguard water quality, and preserve critical open space. As the Nisqually River watershed's population grows, however, development pressures pose an ever-increasing threat to the land and waters that sustain us.

We live in one of the fastest growing areas of Washington State. In Thurston County alone, more than 32,000 acres of farms, forests, and prairies have been converted to residential use in the past 15 years. Since the mid-1950s, 75 percent (over 90,000 acres) of Thurston County farmland has been developed. Most of what remains is within three miles of an urban growth boundary, and at risk of imminent future development.

As development pressures increase, the high costs of buying and owning land hinder many who seek to make their living in agriculture. Affordable, secure land tenure often eludes local farmers already struggling to compete with larger producers. In spite of these and other challenges, many area farms are thriving.

Among the 17 counties in Western Washington, Thurston County ranks third in both the number of USDA certified organic acres – 2,900 – and the estimated value of organic goods sold directly from the farm. Many local farms strive to preserve environmental quality and wildlife habitat and participate in programs such as "Salmon-Safe" certification, which helps them convey these practices and tell their story to customers.

Direct sales marketing is key to the success of many area small- and medium-sized farms that sell their products at on-farm stands, farmers' markets, and community supported agriculture subscription programs.

Community Supported Agriculture (CSA) is an increasingly popular arrangement that allows people to directly invest their money into local agriculture. Members of a CSA pay a flat fee to a farm at the beginning of each season, and receive boxes of fresh farm products at agreed-upon intervals, usually weekly. This provides security for farmers and gives community members the opportunity to share both the risks and the bounty of the harvest.

CSA farms are among 44 local producers listed in the 2009 Thurston County Direct Sales Farm Map. The map provides a guide to area farms offering fresh, seasonal products throughout the year. It is free and can be found throughout the county at farmers' markets, restaurants, government agencies, and participating businesses.

Photo by Narrative Labs

Joining hands for collaborative conservation: Jim Wilcox (Wilcox Farms), David Burger (Stewardship Partners), and Billy Frank Jr. (Nisqually Indian Tribe and Northwest Indian Fisheries Commission).

The map features a listing of 44 local producers of vegetables, meat, fiber, honey, flowers, fertilizer, berries, and other farm goods for sale directly to consumers. An online version is available at www.communityfarmlandtrust.org.

The farm map is produced and distributed each year by the South of the Sound Community Farm Land Trust, an Olympia-based organization dedicated to the permanent affordability, agricultural production, and stewardship of farmland in the South Sound area.

Buying directly from farmers is one great way to sustain local agriculture. Landowners interested in permanently protecting their farmland can also contact the farmland trust at 360-402-0302 to learn about the options available.

■ ***Caitlin Krenn is from South of the Sound Community Farm Land Trust.***

Stream health report indicates our watershead is in trouble — see Connecting growth with watershed health, page 8

How do Streams in Pierce County Rate?

Data collected through 2008 ranks Pierce County's overall stream health at C (Fair Condition). The rating was 60.0 out of a possible 100.0.

Stream	Rating	Grade
Artondale Creek	65.0	C+
Canyon Creek	73.5	B-
Canyon Falls Creek	62.1	C+
Clear Creek	47.8	D+
Clover Creek	40.0	D
Crescent Creek	59.2	C
Diru Creek	60.5	C
Dutcher Creek	57.5	C
Fennel Creek	66.5	C+
Goodnough Creek	65.8	C+
Horn Creek	55.5	C
Kapowsin Creek	60.5	C
Lacamas Creek	54.5	C-
Little Minter Creek	73.0	B-
Lynch Creek	68.5	B-
Mark Dickson Creek	67.0	C+
McCormick Creek	57.8	C
Minter Creek	61.5	C+
Nelyaly Creek	49.0	C-
Ohop Creek	58.5	C
Ohop Creek downstream	63.3	C+
Purdy Creek	56.0	C
Ray Nash Creek	55.8	C
Rody Creek	53.5	C-
Rosedale Creek	60.0	C
Spanaway Creek	49.0	C-
Spiketon Creek	64.0	C+
Squally Creek	70.3	B-
Swan Creek	55.7	C
Tanwax Creek	55.5	C
Voight Creek	61.7	C+
Wilkeson Creek	72.2	B-
Pierce County Overall	**60.0**	**C**

Thurston County adopts new stormwater design manual

Effective November 16, 2009, the Board of County Commissioners adopted the 2009 Thurston County Drainage Design and Erosion Control Manual (Drainage Manual) - the first Drainage Manual update since 1994. The new Manual applies to all new development and redevelopment within unincorporated Thurston County.

Since 1994 The Federal Clean Water Act and National Pollution Discharge Elimination System (NPDES) have been expanded to include smaller communities, including Thurston County. The Department of Ecology has also twice updated their Stormwater Management Manual for Western Washington (2001 & 2005).

The Drainage Manual is at least as stringent as Ecology's 2005 Manual. The new Thurston County Manual goes further by integrating Low Impact Development (LID) techniques and strategies into the design process, while not making them mandatory. A wide range of LID techniques are allowed and encouraged including compost amended soils, porous or pervious pavement, bioretention cells (rain gardens), dispersion, and infiltration. (See Low Impact Development means High Impact Stormwater Solutions article.)

Full Dispersion is one allowed LID technique that eliminates the need for flow control or water quality treatment facilities if native vegetation is preserved and impervious surface is limited to minimum thresholds. In this approach all stormwater is dispersed to protected native vegetation areas eliminating the expense of collection and conveyance systems.

In 1994, Thurston County was unique in the State of Washington by requiring infiltration of stormwater. The required infiltration was calculated using models simulating a 24-hour storm. The 2009 Drainage Manual also requires stormwater infiltration on projects whose soils have infiltration rates of at least ½ inch per hour. Average annual infiltration volume for the project in pre-development must be met or exceeded in post-development as determined by a hydrologic computer model developed for the Department of Ecology and modified for Thurston County rainfall data. The model uses over 50-years of actual rainfall records to account for the effect of multiple back-to-back storms. The model is also required for designing water quality treatment facilities and determining detention storage volumes.

The 2009 Drainage Manual requires a project to address 12 minimum requirements. For small projects, some requirements are waived. Generally, if your project creates more than 5,000 square feet of new impervious surface (i.e. roofs, driveways, gravel areas) or converts more than ¾ of an acre of land from native vegetation to landscape or lawn, then all 12 requirements must be met.

The 12 requirements include managing stormwater on-site, stormwater quality treatment, controlling stormwater discharges to pre-development rates, source control of stormwater pollutants, stormwater controls during construction, maintaining the natural points of discharge for stormwater, and maintenance of stormwater facilities after construction.

Stormwater quality treatment in the Manual includes basic and enhanced treatment, phosphorous and oil control. Basic treatment targets suspended solids (silt) and applies to most projects. Enhanced treatment targets dissolved metals and applies to commercial, industrial and high use road projects. Phosphorous treatment is required if a project is within the drainage basin of a lake impacted by phosphorous. Impacted lakes include Black, Pattison, Long, Lawrence, Capitol, and Clear Lake (in the Nisqually Basin). Oil control water quality treatment is required for high use roadway intersections, high traffic commercial sites, and sites with vehicle fueling.

The Department of Ecology exempted the Nisqually River from flow control (detention) requirements; however, Thurston County only exempts discharges directly to a salt water body. Being exempt from flow control does not mean there is an exemption from water quality treatment.

For homebuilders, submittal requirements are less extensive than for subdivisions, commercial, or industrial developments. Generally the builder will have to prepare a plan for managing stormwater during construction (for which a template is available) and will also need to prepare an abbreviated drainage plan that may or may not require the hiring of a civil engineer. A civil engineer may be required for home construction on small lots with soils that don't infiltrate, near critical areas, or where there have been drainage problems in the past.

For most homes, managing stormwater by containing runoff on-site by infiltration or dispersion of roof downspouts, dispersing runoff from driveways and other impervious surfaces, and providing compost amended soils within the lawn and landscape areas will be adequate to obtain a drainage approval from the County.

■ ***For more information call Pat Allen, P.E., Thurston County Water Resources Division at 360-754-4681.***

Pierce County adopts new manual

Low Impact Development has been approved for use in new developments, new construction and redevelopment for many years. As of March 2009, in unincorporated Pierce County, the county implemented the new Stormwater Management and Site Development Manual. The manual, available online at Piece County's website, guides users through the various LID techniques and specifies requirements, design, and performance standards. Staff at Pierce County Surface Water Management and Planning and Land Services are available to help developers and homeowners understand how LID strategies can be applied to a single-family home for stormwater management or to an entire development, while meeting national and state stormwater management requirements.

Currently the LID approaches and BMPs outlined in the volume are encouraged for all private development. Pierce County is in the process of developing public road standards for LID. However, until those guidelines are finalized, LID approaches in public right-of-ways require prior approval by the county engineer and may require a deviation. Ask your code official (Pierce County Planning and Land Services) for an update when it's time for your project.

At this time, most LID design approaches are voluntary. Some zoning classifications, community plans, and habitat protection areas may require LID. LID can be applied to a variety of zoning and land classifications, but the manual specifically calls out the following areas as sites appropriate for LID:

Sites draining to a closed depression

Sites that contain or are located adjacent to wetlands, riparian areas, fish or wildlife habitat areas, estuaries, and other sensitive and critical habitats

Sites that feed critical aquifer recharge zones

Sites within a designated open space area

Subbasins where tree preservation is recommended.

To find out about LID in Pierce County contact Dawn Anderson, Low Impact Development Coordinator at 253-798-2725.

Connecting growth with watershed health

Rapid development occurring around Puget Sound and within the Nisqually Watershed is having a large impact on the natural environment. Fragmented habit, contamination of waterways, loss of productive farmland, and decline of native salmon, Orcas, and other signature wildlife are some of the indicators that our natural systems are deteriorating.

The population of Puget Sound region has nearly doubled since 1960 and is expected to increase from its current level of 3.8 million people to 5.2 million by 2020. The result of this population growth is conversion of forests into towns and cities. Between 1972 and 1996 the amount of land with 50% tree cover in Puget Sound decreased by 37%. This was replaced by impervious surfaces such as roads and buildings.

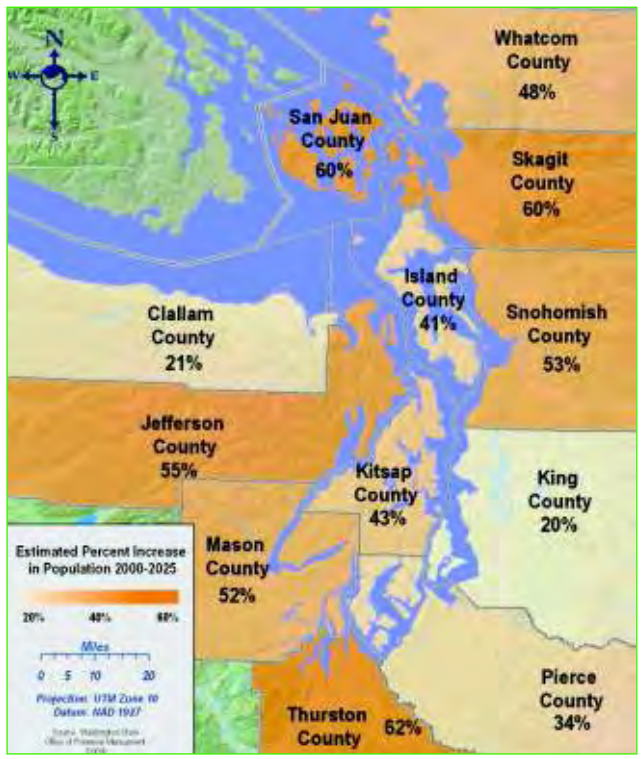
The accompanying graphic shows Thurston County and portions of the Nisqually Watershed are expected to receive some of the highest numbers of new residents over the next 10 years.

What kind of watershed impacts can we expect to see with this dramatic increase in population and the housing and business construction that will result?

One of the biggest environmental impacts from all this development is stormwater pollution from runoff flowing off of pavement and concrete directly into streams and out to Puget Sound.

Conventional land development typically involves clearing and grading a site, which results in the removal of all vegetation, and compaction of soils. It involves paving areas for roads and parking, building structures, and landscaping areas with minimal amounts of topsoil. Engineers design stormwater facilities, such as curbs and gutters, underground conveyance systems and detention ponds to remove pollutants and to rapidly and efficiently drain the site.

Research shows that these conventional construction techniques are not entirely effective at managing stormwater to prevent damage to water quality and watershed ecosystems. Pavement and other impervious surfaces prevent infiltration and the resulting runoff becomes a serious pollution problem to local waterways.



As the amount of impervious surface in a watershed increases, we begin to see dramatically higher stormwater flows that cause flooding, damage to public and private property, and harm to habitats for salmon and other fish and wildlife. Water that does not infiltrate moves very rapidly and causes erosion of stream banks and scouring of streambeds. The results are increases in fine sediments that choke salmon spawning gravels and pollutants from automobiles and landscaping chemicals (pesticides and fertilizers) entering the streams. Reduced infiltration also means reduced groundwater recharge during the summer drought season when it is needed most to keep streams and rivers flowing with the cold, clear water in salmon spawning gravels.

These changes in watershed health can best be illustrated in the following graphics from the Low Impact Development Technical Guidance Manual for Puget Sound. The first diagram shows how water moves over and through the land before development.

In a natural setting, the vast majority of water is taken up by plants, evaporated back to the atmosphere (through evapotranspiration) or infiltrates into the ground. Surface runoff is only about 1% and moves to streams, wetlands, and other water ways very slowly, taking days, weeks, or even months to recharge streams, wetlands, and aquifers.

This second diagram shows how water moves through a suburban development. When forests are cleared, soils stripped away, and roads, rooftops, and parking areas, built, evapotranspiration and infiltration decrease and surface water runoff increases dramatically. Note that surface runoff has increased from about 1% to about 30%. This is because so much rainfall that was stored by trees, vegetation, and soils, now becomes surface runoff.

See **HEALTH**, *page 14*

What is a green home?

There are many paths to a green home. You can remodel an existing home or build a new one. Green homes cut across a vast spectrum of sustainable choices from just replacing incandescent with compact fluorescent bulbs to a home that generates its own electricity. If you have ever remodeled or built a new home, you understand the thousands of decisions that go into the construction process.

A green home is one where one or many of these choices are made with consideration to site conditions, water conservation, energy efficiency, indoor air quality (IAQ), and material selection. To understand how to sort among these choices for a green home, it helps to understand the pressures that influenced green building in the first place (see sidebar How did we Get Here for compelling facts about resource use and the implications of status quo).

Green building emerged to find solutions to energy shortages, drinking water quality concerns, over-burdened landfills, and a growing population. In general, the movement was stimulated by the desire to seek alternatives to resource depletion and see if we could find ways to make buildings use less to do more. Along the way, can these buildings help to delay and even counteract global warming and climate change? Yes, green homes offer an alternative: we can maintain our current lifestyle by building smarter, appropriately sized, well-insulated homes where functionality is valued over size exclusively.

Green Building is Redefining the Housing Paradigm

It used to be that the "3R's" referred to reading, writing, and arithmetic. In green building it refers to a material management strategy: Reduce, Re-Use, and Recycle. Reduce whatever you can: waste, pollution, and impacts. Reuse everything: materials for construction, finishes, and furniture. Recycle as much as you can: wood, metals, and cardboard.

Photo by Megan Hansen

New construction - beautifully designed, exceptionally built, and highly energy efficient homes in the Nisqually. These homes cost less to operate, are more comfortable to live in, have healthier indoor air quality, and less impact on the environment.

The options are endless: reduce the amount of land cleared for site and road preparation, materials used for construction and finishes, and water and energy used compared to traditional homes. Reduce the toxins in the building process that create an impact on the environment by choosing low toxic finishes, and good job-site operations. Reduce the size of a home to match the requirements of the occupants. For example, the average size of an American home has grown from 983 sq. ft. in 1950 to 2,349 sq. ft. in 2004 – while the average number of occupants has steadily decreased. (Source: NAHB Housing Facts, Figures and Trends 2006.) Green building focuses on efficient home designs that emphasize quality over quantity (often providing occupants with more free time due to lower maintenance requirements – where else in your life can you buy extra time at a very low cost?). Additionally, research has shown there is a direct correlation between a home's size and the amount of materials and energy consumed. In fact, energy efficiency is becoming a driving force within green building. Homebuyers are asking for strategies such as increased insulation and air sealing, high-efficiency heat pumps, tankless water heaters, and other renewable energy options. Why not? These features save the planet and the pocketbook.

Personal health and buildings go hand in hand. On average, Americans spend as much as 85% of their time in their homes, in what is customarily considered a safe haven. However, in traditionally built homes, indoor pollutant levels may be two to five times greater than outdoors. This is because a growing cocktail of chemicals (in particular, Volatile Organic Compounds (VOC), such as formaldehyde) are released from almost every type of traditional building products. Of greater concern is a new breed of chemicals known as persistent organic pollutants that are found routinely in fire retardants contributing to the indoor toxic mess that can be present in new and existing homes. Because of these problems, evidence suggests traditional homes may be harmful to the health of their occupants, especially those with respiratory sensitivities exacerbated by air pollution, especially children, the elderly, people with allergies, and people with asthma or other lung disease. With an estimated 36 million Americans suffer-

See **GREEN**, *page 11*

Financing green in a black and white world

Lending for residential new construction or remodeling has become more challenging in our current economy, with many financing options harder to achieve. One way to finance a green home or energy upgrade remodel in a distressed market is to use the Energy Efficient Mortgage (EEM).

Whether you are buying, selling, refinancing, or remodeling your home, EEMs can translate directly into increased comfort and cost savings from reduced energy bills.

According to the EEM Homeowner's Guide, on line at the Housing and Urban Development's website, www.hud.gov, EEMS are "easy to use, federally recognized, and can be applied to most home mortgages.

EEMs provide the borrower with special benefits when purchasing a home that is energy efficient, or can be made efficient through the installation of energy-saving improvements."

The energy efficient mortgage concept was first introduced by HUD in 1992 as a pilot program and expanded nationally in 1995.

The program was established to encourage energy efficient home building and remodeling, and as such, recognized that energy efficiency equals reduced energy costs.

These savings allow a homeowner to borrow more to cover the cost of the improvements.

The program is twofold. First, the energy efficient upgrades can be rolled into the loan amount, and secondly, the consumer qualifies with a higher debt to income ratio for their housing payment, thus allowing them to afford "more home."

Who qualifies for an EEM? Anyone looking to purchase, refinance, or remodel, and wants to use energy efficient products and strategies qualifies. Which loan programs qualify for an EEM is generally more restrictive.

FHA and VA guaranteed loans are still most commonly partnered with the EEM and although there are some banking institutions who offer "Green Incentives," it usually comes back to an FHA or VA loan program with the energy efficient mortgage incentives included.

In addition to the energy efficient mortgage options, you can receive tax credits and special offers and rebates. To find out which ones are available in your area check out these web sites, particularly, www.DSIRE.org, Database of State Incentives for Renewables & Efficiency, that lists state and federal incentives, also see www.energystar.gov, www.energysavers.gov, www.ase.org , and www.hud.gov. As with any specialized program, seek out a professional who is experienced in energy efficient mortgages.

Also, remember to ask your local credit unions and saving and loans institutions what programs they have available. They may not offer FHA or VA products, but may have specialized green building products within their portfolio. Remember you can save some green by building green!

■ ***Nita Cook is from Madrona Mortgage, an affiliate of Seattle Bank.***

Green home buying — creating a plan

Interested in buying a green home, but uncertain as to the first steps? Perhaps the most important step is to become educated about the elements of green building that interest you. This way you know the right questions to ask your green real estate agent. The Internet is a great place to start. Another place to find hands-on green building information is through local experienced professionals who are a part of sustainable building organizations, such as The Northwest EcoBuilding Guild or Cascadia Region Green Building Council. You can find knowledgeable realtors who have green building credentials or affiliations with the local Master Builder's Built Green® program (see sidebar for more information on a program in your area). Also, there is a wealth of information in this magazine on all aspects of green homes. However you get your information, you should be well informed before making a green home purchase, since there are many choices and many features you will want to consider.

To find a green home, you can now easily identify certified green homes in the Northwest Multiple Listing Service (a program used by your real estate agent to search for all homes in your area). There are three certification programs (rating systems) listed in the NWMLS: Built Green®, NW Energy Star®, and LEED for Homes (for more information on these programs, see sidebar). Basically, these rating systems allocate variable points for different sustainable features, such as solar panels, recycled-content insulation, or landscaping features that infiltrate stormwater, such as bioswales or rain gardens. More green building strategies mean more points, which translates to a higher rating. The NWMLS helps you find certified homes in your area. It also identifies some of the green features of the home, as well. For more information on an individual home, ask your real estate professional for a copy of the certification checklist.

These certification checklists are basically a menu of green building choices, emphasizing indoor air quality, energy efficiency, water efficiency, durable and sustainable materials, providing for low maintenance, and preserving natural resources during the entire life of the building – from the time it is built to the end of its useful life. Here in the Northwest, we spend a significant amount of time indoors, particularly during the rainy season. Green building features combine to create a home that is comfortable and healthy with lower energy bills. The checklists from the certification program helps builders choose green features for their homes, and help buyers know exactly which green features are present in each individual green home.

A home is the single largest purchase you will ever make. Applying sustainability to the purchasing evaluation process, three essential issues emerge. The environmental (health), social (community), and economic (cost) benefits from living in a green home should all be considered equally. Analyzing these in relationship to your own lifestyle, family size, budget, and values are crucial in determining what choices matter to you and your family, and what type of home you want to live in.

A great deal of thought should go into evaluating the "shades of green" you wish to include as a priority in your new home selection.

At a minimum, every green home should offer improvements in the building envelope beyond a home built to code. Living in a well designed, sustainable home with a superior building envelope will directly affect your ongoing comfort and health, and in particular your heating and cooling bills.

■ ***Debra Shapiro is from Green Village Realty, 360-970-6826.***

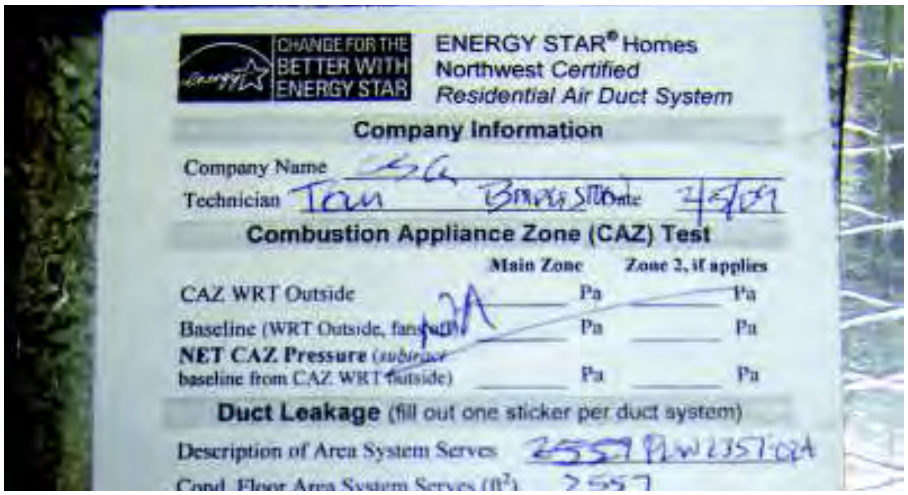


Photo by Cate O'dahl

Make sure the home is certified by looking for the certification label. Energy Star Labels are usually placed on the inside of the fuse box or on the furnace.

GREEN: *Eco-friendly houses a healthy option*

Continued from page 9

ing from allergies or asthma, indoor air quality concerns are becoming more prevalent and better understood. Many green building strategies offer a respite from traditional construction by providing better design and materials selection, improved ventilation and air circulation, and overall, better air quality. See the Healthy and Safe Indoor Environments article for more information on indoor air quality.

Does buying a green home guarantee that all of the sustainable elements, site, water, energy, and material benefits are included in every home? No, different green homes offer different green advantages.

The differences depend on personal preferences, site conditions, resource availability, and of course, budget. Can a green home be "deep" green and have all the green advantages? Yes, but usually at a 20% or greater premium, similar to any custom-built home. Do typical green homes on the market offer all the green advantages? They can, and many do, providing energy and water conservation along with improved indoor air quality without a cost premium. The distinction is in the degree of these features and other builder choices (see Green Homes in the Marketplace).

Your job as a consumer is to determine which green advantages you prefer and which additional features are available in your price range or budget. The same applies to remodeling for green: pick the low-hanging fruit for all sustainable elements and choose the upgrades that align with your site, preferences, budget, schedule, and local building code.

Green building program certifications help to determine the extent that green strategies have been implemented in each certified home. Homebuyers should be asking questions of builders and real estate professionals selling a home. Find out what materials and techniques were used to ensure superior indoor air quality.

How is this home more energy efficient and water efficient than a home built to code? Can they point out the features that go beyond code? Find the home that fits your lifestyle, budget, and green preferences – they are out there!

■ ***Fiona Douglas-Hamilton, SEEC LLC and Cate O'dahl, ESP Services.***

Ania's Quick Quiche

- 4 farm fresh Stiebrs Farms eggs
- 1 cup half and half
- 1/3 cup mayonnaise
- 1/3 cup onions, diced
- 8 oz. Swiss, cheddar, gruyére or goat cheese, grated or finely chopped
- 1 package frozen spinach, thawed
- salt, pepper, garlic powder to taste
- 1 pie shell

Preheat oven to 350 degrees. Whip first four ingredients until well incorporated. Add the remaining ingredients. Pour into pie shell. Bake 45 minutes to 1 hour or until top is golden.

Optional add-ins: Chopped chicken breast, roasted bell peppers, broccoli and other veggies, ham... or anything else you think would be delicious!!

Low carb option: Pour into greased glass bakeware without pie shell.

How green is green?

Green building certifications for new construction and remodeling

How green is "green"? As you may have gathered while reading the Nisqually Building Guide, there are many opportunities to "green" your home.

Personal preferences, budget, and resources play a factor in determining what green features are included in any project.

If you are buying a new home, how is a consumer to know how to find a green home on the market?

Consumers can now look for Green Building Certifications to help determine what is so green about that green house.

The Northwest Multiple Listing Service (NWMLS), the regional listing of homes for sale available through your real estate agent, now includes "E-Certification" as one of the searchable components of a home listing.

The E-Certification will let you know if the home is certified to any of the three green certification programs.

The three programs listed include Washington's own local Built Green® programs, and two national programs, LEED for Homes and NW Energy Star® Homes.

Built Green and LEED are both comprehensive programs that take all of the sustainable elements –site, water, energy, indoor air quality, and materials into consideration.

NW Energy Star Homes is primarily an energy performance program. In most cases, participation in any of the programs is voluntary; however, some developments in King County, for example, are now requiring builders to build to these market-based standards.

In Washington the Built Green programs (www.builtgreenwashington.org) are locally managed by the region's homebuilder associations. In the Nisqually there are two active Built Green Programs.

Olympia Master Builders - Built Green®
www.omb.org

Serving: Thurston, Lewis, Mason, Grays Harbor, and Pacific Counties. Programs offered: Single family and remodel, both with 1- to 5-star levels.

Contact:
Stacey Genzlinger at 360-754-0912

Tacoma-Pierce County Built Green®
www.builtgreenpierce.org

Serving Pierce County. Four certification programs offered: Single Family 1- 5 stars,
Multi-Family Remodel, and Green Communities 1-3 stars

Contact:
Tiffany Speir at 253-272-2112, ext. 105

The Built Green programs operate by using a checklist, essentially a menu of green building options, to assist in designing and building an environmentally friendly home. Each option is worth a certain number of points.

When construction of the home is complete, the points are tallied for each option adopted.

The total points determine at which star-level the home will be certified from one (entry level) to three to five star levels.

The higher the number of points, indicate a "greener" project.

Projects at the higher (4 and 5-star) levels require independent third-party verification to ensure that all elements of the checklist have been incorporated as claimed, and more importantly, installed properly.

For builders, the checklist provides direction and inspiration to include as many green features as possible. For consumers, the checklist provides assurance of green construction.

This allows consumers to compare green properties to each other and to conventional homes. The Built Green brand is becoming increasing popular and is proving to be an important market indicator.

Many of the checklists for the Pierce County's and Olympia Master Builder's programs are available online at their websites. The other two Green Building Certification programs listed in the NWMLS are national programs with local management.

The national US Green Building Council, www.usgbc.org/leed/homes, offers the LEED for Homes program through its local chapter in Seattle, Cascadia Green Building Council 206-223-2028.

Like the Built Green programs, LEED, which stands for Leadership in Energy and Environmental Design, uses a comprehensive checklist that includes all of the sustainable elements.

LEED for Homes is not often used by small builders, but rather large developers, so it may not be as prominent as Built Green in your area.

However, it offers the same quality and assurances as the higher rated Built Green homes, since LEED for Homes are always third-party verified.

Also, like the Built Green programs, the checklist determines the home's overall rating with a corresponding rating level, in this case, Platinum, Gold, Silver, and Certified, with Platinum being the highest rating. The third Green Building Certification program available in our region is the NW Energy Star Homes Program, www.northwestenergystar.com.

The NW program is an offshoot of the national program administered by the US Environmental Protection Agency, but designed specifically for the northwest.

According to their website, "Northwest Energy Star® homes are better-built, more comfortable homes that save you money on your utility bills every month.

Every NW Energy Star qualified home has been built to meet energy efficient guidelines set forth by the Environmental Protection Agency."

Certification guarantees that a home will be a minimum of 15% more energy efficient than a code built house, and in many instances achieves a 20-30% increase in efficiency.

The program is so comprehensive for energy efficiency that the Built Green programs award points for having the NW Energy Star Homes certification.

This program is a pass/fail system and does not offer a tiered approach.

■ ***Cate O'dahl, ESP Services.***

What is the price for 'green'?

What type of homes are buyers looking for in a bedroom community that would accommodate Fort Lewis families or Federal Way/Seattle commuters? According to Christy Gerrish of Windermere Builder Services, the most requested price point for homes is between $189,000-$240,000 for 1,500 to 1,900 square feet. Typically this price range is a starter home with buyers having an average income between $40,000-60,000.

In the past six months, fifteen homes have sold in the area between the price range of $180,000-$500,000. There are currently fifty-three homes active on the market between $169,900 and $500,000, with a number of these homes being Built Green and/or Energy Star certified. The starting price for 3-Star Built Green from Quadrant Homes is $164,900 for 1,083 square feet to $204,226 for a little over 2,000 square feet. Energy Star certification is offered by Quadrant as an upgrade for an additional $800, which is a bargain when one considers the utility savings over the life of the home that this offers. At the top end of the "green" offerings is an Energy Star certified, 5-Star Built Green, 2,277 square foot custom home at $385,000. The Quadrant homes are right in the range of first time buyers, and yet according to Gerrish there seems to be a sentiment among Yelm and Rainier realtors, as well as buyers, that green is too expensive for the average buyer.

What is creating the distortion in the market's perception of green? For one thing, real estate professionals lack the education and understanding of green features and their benefits. This point was acutely demonstrated when the listing agent of the Quadrant homes did not know the Built Green rating level or have any information on the particular green features that Quadrant had chosen.

As one reviews the list of green features, it becomes abundantly clear that at its most basic level, green construction really means best construction practices in how the home is built, and at its highest level, best construction practices that also protect the environment. Quadrant is leading the charge as a developer claiming their homes are built with best construction practices that help protect the environment. They are also beginning to use some recycled-content products and establishing jobsite-recycling programs. However, they are clearly not marketing their green efforts as well as they could, as shown by real estate professionals selling their homes that do not understand the implications of these efforts.

Besides the lack of real estate agent training, there is another reason for the lingering perception that green is too expensive. The current checklist format of the main green certification programs encourages builders (unfamiliar with the real intent of green building) to view green building as individual features that are obviously upgrades to their current way of building. This then develops the perception that green is an upgrade. And upgrades always cost more, translating into the consumer having to pay more for a green home.

However, this should not be the case. One of the primary tenets of green design and construction is that of "integrated design" or "whole building design," whereby a building is viewed as an interdependent system, as opposed to an accumulation of its separate components. This helps reduce overall costs. Another important concept of green design is the reduction of the overall square footage of the home. There is a direct correlation between a home's size and its consumption of materials and energy. In other words, the savings on square footage should be applied to improving the home's quality, whether that is better indoor air quality, more efficient heating systems, more durable materials, better quality construction, or better insulated.

Understanding of these green design concepts has not transferred over to the development community, or to real estate professionals. Ask most any agent and they will tell you people want more, not less, square footage. This has been a trend in America for a number of years: in the 1950s the average American family lived in a home approximately 983 square feet. In 2004, the average size of American home had grown to 2,349 square feet (Source: NAHB Housing Facts, Figures and Trends 2006). So, if a builder simply "greens a home' without reducing its overall square footage, it stands to reason that it will cost more. Likewise, if a builder sees green building as independent features, and not as a whole design concept, the same reasoning applies.

The fact that the market is beginning to show premiums for green may be good news for a builder or developer, but only if the value premium is used to recognize quality, not used to justify charging more. Otherwise the consumer looks to be gouged again. Are we ready and willing to give up our need for more space in our homes in exchange for quality? Are we willing to recognize integrated design as quality, and value it for its contribution to reduced energy bills and lower maintenance? The value of the quality is starting to be established. If consumers make that connection, then we will not have to pay more in order to live in healthy, energy efficient, durable, and environmentally friendly homes.

■ ***Fiona Douglas-Hamilton, SEEC LLC.***

HEALTH: *Less costly options with LID*

Continued from page 8

Studies have indicated that watershed function and health are seriously degraded when the total impervious area reaches between 5 and 10%, and becomes irreparable when it reaches about 20%. The "Total Impervious Area" for the overall Nisqually Watershed is estimated at 2.5%, with higher concentrations in urban areas such as Roy, Eatonville, Yelm, DuPont, and the Nisqually Reach.

Fortunately, with conscientious planning, there are ways to lessen the environmental impact of development.

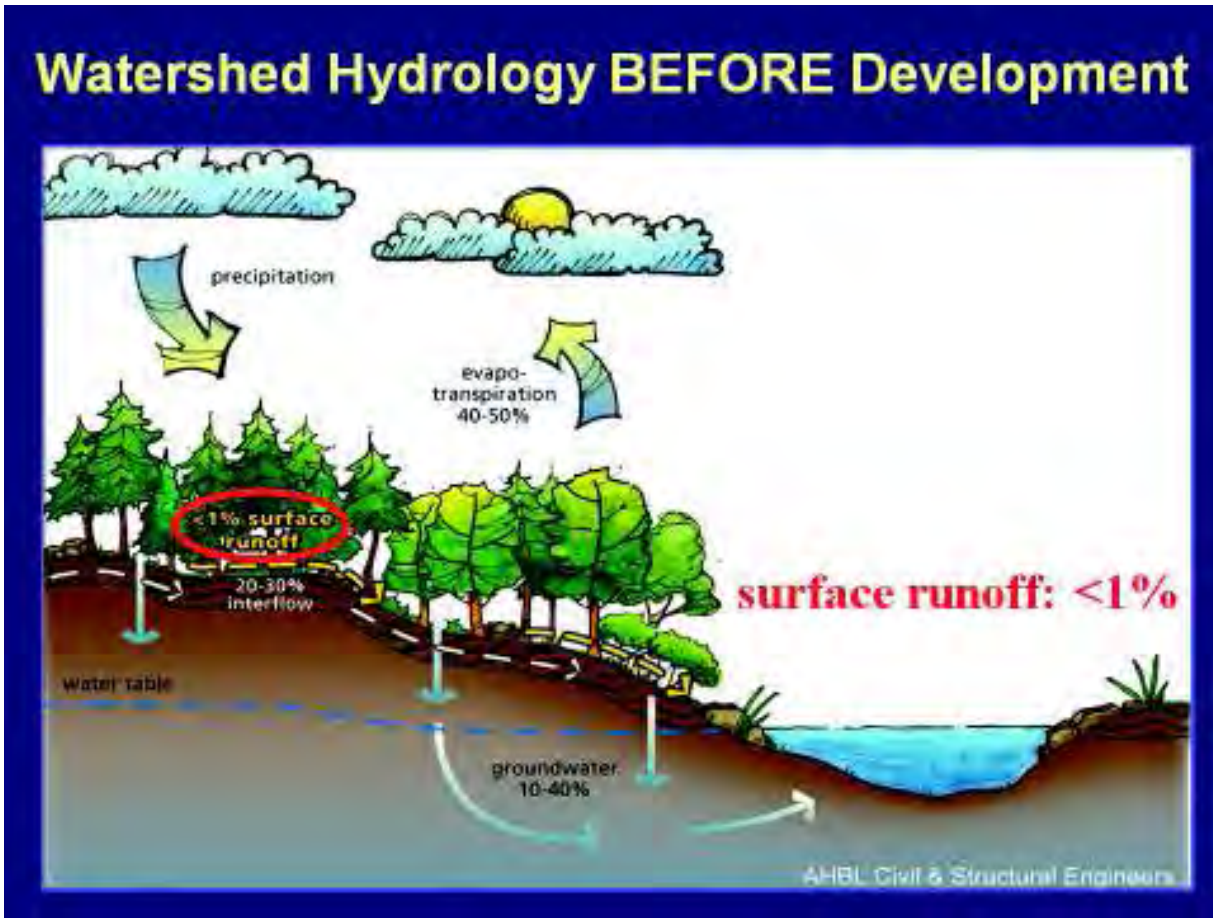
Low Impact Development (LID) is a set of practices that integrate a site's existing natural features with best management practices to mimic natural hydrology, allowing water to infiltrate into the ground instead of flowing off of pavement and other impervious surfaces into local waterways.

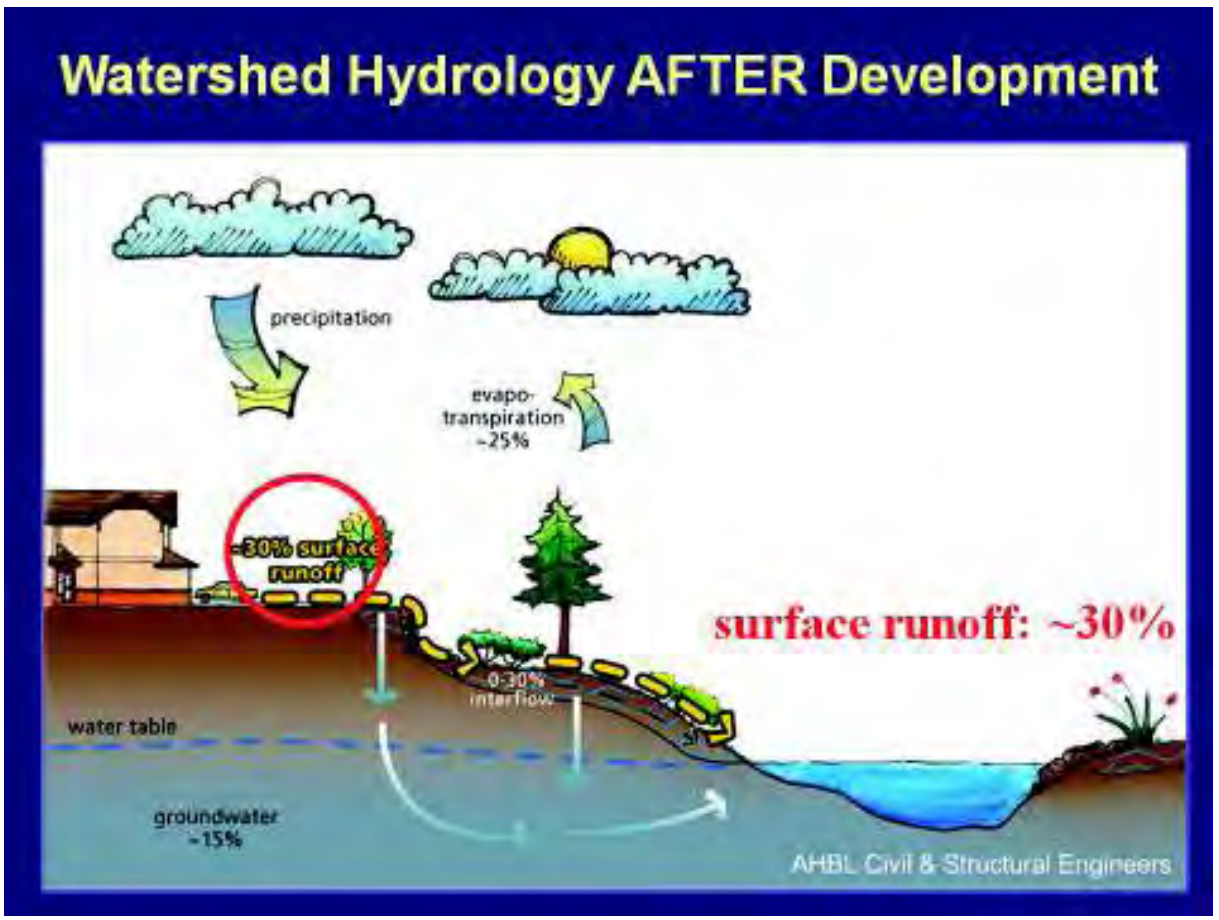
Retaining native soil and vegetation, using natural landscaping, and small-scale hydrologic controls which slow, store, and infiltrate stormwater are all integrated into a development's infrastructure layout and site design.

Rain gardens, green roofs, and pervious pavement are some of the strategies. LID practices help to protect water quality by reducing sediment, nutrient, and toxic loads entering waterways and reduce impacts to fish and wildlife habitat by preserving natural ecosystems on-site and reducing the damaging impacts of peak flows. These practices, as discussed throughout the Building Guide, are appropriate for all parcels in the Nisqually Watershed, regardless of lot size or density.

Low impact techniques can be less costly to implement than standard development, with savings ranging from 10 to 20 % depending on the LID techniques used and the size of the project (see Low Impact Developments with High Impact Solutions).

The Nisqually is one of the most beautiful and ecologically intact watersheds in Puget Sound. With conscientious development that uses state of the art techniques for managing stormwater and protecting the environment, we could assure that it remains that way for future generations.





Green Home Remodeling for Every Budget

When remodeling a home, homeowners are faced with a vast array of decisions. From spatial orientation to color choices, there are an endless number of ways a homeowner can make their house a home. One decision is easier than you think – going green! Depending on the project and your individual remodel choices, a green home remodel will not only improve the aesthetic appeal to your home, but can also offer additional value, monthly savings on utility bills, increased indoor air quality, and of course, the added benefits to the environment. There are green remodeling options for every budget.

An energy audit, or evaluation of your home's energy efficiency performance, is one of the least expensive ways to make the most of your energy upgrades. The audit may cost up to $350 to $500 (or may be subsidized by your local utility), but it saves more money than that by focusing and prioritizing energy upgrades. A certified energy auditor comes to your home to determine where your home may be leaking energy by performing a few different tests. A blower door test helps to identify leaks in the building envelope and at plumbing and electrical penetrations. The test involves closing all doors and windows, blocking other openings, and using a fan to simulate a 15- to 20-mile per hour wind depressurizing the interior. Then the auditor walks around the home to see where the leaks are, they may also take thermal imaging pictures, to visually see where heat is escaping. With these tests they can pinpoint areas for sealing, caulking, flashing, or other weatherization strategies. Another test, the duct-blaster test, helps to identify leaks in forced-air heating and cooling ducts. Sealing all the leaks can in itself, make a significant contribution to energy efficiency, the auditor will recommend weatherization strategies based on the least cost for the greatest benefit, helping you to strategically target your energy upgrades.

Weatherization involves a variety of activities homeowners can undertake to make their home more energy efficient. Simple weatherization techniques include sealing gaps, cracks, and holes often found around windows and doors, as well as where wiring and pipes penetrate floors and ceilings. Recessed light fixtures are also a major unseen source of air leakage and a great opportunity to prevent air and heat from leaking into the unconditioned attic. Other weatherization techniques include: storm doors, storm windows, exhaust dampers, and installing energy efficient windows. Depending on the extent of the weatherization required, once the areas of heat loss and air infiltration are identified, a typical homeowner can invest as little as $250 to $300, to reap the benefits of having a more energy efficient home.

On the other extreme, if your budget allows, and your green focus is energy efficiency, you may wish to consider a Passive House retrofit. Today's highest energy standards are represented by the Passive House standards of energy consumption. Accomplishing a Passive House retrofit may include: installing a second skin of insulation to the home, thus eliminating any thermal bridging; installing super-high efficiency windows; extreme weatherization, and installation of mini split ductless heat pumps in conjunction with a Heat Recovery Ventilator. Most local utilities now offer rebates for the installation of high efficiency systems check with your local utility to get specifics. As with lower cost options, the cost of a Passive House retrofit varies greatly, depending on the home and the complexity of the retrofit, it can cost upwards of $100K. However, when implemented, a Passive House retrofit can reduce heating consumption by up to 90%! From low-cost alternatives to full energy retrofits, there are many ways you can make your home more energy efficient.

Photo by The Artisans Group

Green remodel on 1970's post and beam home. First Built Green Level 3 remodel in Olympia. What makes it green? Bamboo cabinets, Locally harvested/milled madrona flooring, Paperstone countertops (recycled paper material, locally manufactured), Energy Star appliances and Low-No VOC finishes.

The type of materials selected for a remodeling project is also a large part of the footprint of your project. Material considerations include:

The longevity or durability of the materials, to reduce maintenance and replacement or repair

Whether or not materials are locally made or harvested to reduce their overall energy impact, often referred to as embodied energy

The sustainability of the harvest, whether reduce, reuse, and recycle strategies were applied during harvest.

High-performance materials, energy and water efficient fixtures and appliances, as well as materials produced from reclaimed or recycled materials

Low-toxic finishes, adhesives, furniture, cleaners, and flooring choices (see companion article Healthy and Safe Indoor Environments).

Another wonderful opportunity to save resources and decrease your personal impact on the environment is to minimize water use. "The average household spends as much as $500 per year on their water and sewer bill and can save about $170 per year by installing water-efficient fixtures and appliances."1 Consider installing some rain barrels to minimize your potable water use for landscaping, to further reduce your home's water impact.

Adding a water filtration system is another step in making your home greener. Rather than drinking purified store-bought water from plastic bottles, you can remove chlorine and other chemicals, as well as sediment, from tap water. Not only will you and your family enjoy the health benefits of drinking pure water, but the landfill will thank you for not adding to the billions of water bottles they receive each year.

In the end, your remodeling project will be full of many decisions that will make your home unique. Choosing to go green will be one of the most rewarding decisions you will make. The benefits to a green remodel extend beyond your own home and reach out to enhance our local and global community. If you are looking for help with these decisions, try a green building expert or Passive House Consultant; the NW EcoBuilding Guild's Green Pages is an excellent resource to locate knowledgeable green experts.

Low Impact Development for High Impact Stormwater Management

Managing stormwater through new "best management practices" (BMPs) can improve stream habitat, provide natural pollutant treatment, increase aquifer recharge, and in most cases, reduce construction and development costs.

These new BMPs are gaining acceptance throughout the country particularly in our region. Collectively the techniques are called Low Impact Development and they include: pervious pavement, bioretention cells (also called rain gardens), vegetated roofs, rainwater harvesting, amended soils, minimum excavation foundations, maintaining or planting trees, native drought resistant vegetation, and surface dispersion.

Many of the articles in this Building Guide offer complementary information for some of these individual techniques.

There is information about the effects of local code, building, or site considerations, and additional resources for more information.

While Low Impact Development techniques are considered "new" in the Pacific Northwest, they actually have been used throughout the United States and in other countries for decades. There are examples of pervious pavement in Europe constructed shortly after WWII that are still in use and still functioning properly.

The use of low impact development techniques provides the opportunity not only to infiltrate rain back into our aquifers, improve stream habitat and water quality, but to also reduce the costs required to comply with stormwater mitigation.

Also popular in Europe are vegetated roofs, precisely planted roofs that collect and filter rain water, reduce urban heat, and provide insulation benefits, as well.

Rainwater harvesting – collecting rainwater from the roof for irrigation or toilet flushing – is used throughout the world, and some states even provide incentives. Bioretention cells, or more commonly referred to as rain gardens, and pervious pavement have been in use for several decades in other states, and are rapidly becoming popular here in the Puget Sound.

Established scientific organizations now recognize stormwater as one of, if not the primary contributor of pollutants to Puget Sound and our waterways. Different options for stormwater management are needed as our region continues to grow. Stormwater sewers are expensive to install in new developments. Low Impact Development changes the paradigm of stormwater management from "collect, concentrate, convey and dump" to one where small stormwater facilities collect and deal with stormwater close to where it falls.

Traditional stormwater techniques result in the collection of pollutants from lawns, roads, and parking lots during storm events where it often causes erosion in stream channels.

Techniques such as pervious pavement and bioretention cells provide for infiltration of naturally treated stormwater back into our aquifers, as well

See **IMPACT** *page 29*

Bioswales can be a simple elegant stormwater solution

Bioswales are modified grassy swales that, like rain gardens, use amended soils and specific plants or grasses to improve water quality and slow storm water runoff.

These systems perform the same functions as traditional grassed swales by serving as a conveyance structure and filtering and infiltrating some of the runoff.

Bioswales differ, in that they use amended soils and specific plants to enhance filtration, improving nutrient and pollutant removal.

Bioswales are mostly used for conveyance, where rain gardens are meant to be an end point for infiltration.

So you could use a bioswale to deliver runoff to a rain garden or a drainage structure. For more information see the companion article on Rain Gardens (page 2).

Bioswales are appropriate for use in most areas – anywhere or wherever you would use a traditional swale – and work best when designed, installed, and maintained properly.

Other situations where bioswales are appropriate are where your site footprint is limited. Rain gardens can get rather large due to design requirements. Bioswales can fit in tight spaces, such as street medians. Bioswales can also be used where there is low infiltration rates in the sub-soil.

This achieves water quality treatment as the water filters through the vegetation in the conveyance, but run off is eventually discharged somewhere and does not infiltrate.

Bioswale slopes should be kept to a minimum and should not exceed 5 percent.

This minimal slope is a critical component to ensuring reduced flow velocities and a stable, non-erosive swale. Underdrains are recommended in areas with low subsoil permeability or shallow soil profiles.

Underdrains must tie into an adequate conveyance system and should include observation/cleanout access where appropriate. Bioswales are not recommended in areas of high sediment loads or where the site is not entirely stabilized.

Bioswale Maintenance:

Once established, bioswales require less maintenance than turf grass because they need less water and no fertilizer.

Native grasses and plants should be used since they are adapted to the local climate and soil conditions, as well as, have inherent resistance to local pests, diseases, and weed infestations.

The primary maintenance requirement for bioswales includes routine inspections in order to ensure proper hydraulic efficiency – a fancy way of explaining that the water flows and infiltrates as intended and designed.

Inspections should be performed annually in spring and after extreme storm events. Visually inspect the swale to confirm that stormwater is infiltrating properly and is being conveyed through the length of the bioswale.

Water ponding in a bioswale for more than 48 hours may indicate low infiltration and most likely will require repair.

Another critical item to inspect is the overall health of the vegetative cover. It is important that the vegetation within the bioswale is dense and healthy.

Maintenance activities for bioswales include:

Periodic mowing (with grass never cut shorter than the design flow depth – the design depth that water is meant to flow within the bioswale to achieve flow control and water quality treatment. Anything above this will most likely go into an overflow control structure.

Clearing debris and channel blockages

Removing sediment build-up

Reseeding or replanting bare areas (annually)

Repairing any erosion along the bottom of the swale channel

■ ***David Hilgers is a Landscape Architect for Triad Associates.***

Construction Waste & Recycling in Thurston Co.

In Thurston County, 23% of landfilled materials come from construction, demolition, and remodeling activities. Much of this material is recyclable or can be reused at a significant cost savings over tipping fees. Because every building project and construction site is different, there isn't one answer on how best to handle construction waste. Information provided here should prove helpful for most situations.

Identify Recyclables Plan ahead! Determine what can be recycled from your site. For an extensive list of items with information on where to take them, see www.WhereDoITakeMy.org. In addition, Recovery 1, in Tacoma, lists items on their website, www.recovery1.com. It is critical you know the requirements for each material at each facility. Construction debris is handled very differently than demolition debris. There is a charge to recycle certain commodities, but the cost is usually lower than trash disposal rates. You may even receive payment for certain items.

Choose a Recycling Method You can contract with a hauler or self-haul. Take transportation time and distance into account to find the right choice for you. If self-hauling, contact the facility ahead of time. Describe your materials and check hours, fees, and special instructions. If you have materials hauled, require they be recycled, and ask where the materials were taken. Ask for a copy of the destination receipt to ensure the materials were actually recycled (this is essential if you are participating in a green building rating program). There are several hauling companies that will provide containers for on-site recycling.

To Separate or Not to Separate Mixed construction and demolition waste can be recycled, but the tip fee for separated materials is generally lower. Let employees and subcontractors know and mark bins or collection areas clearly to make sure materials are placed in the correct spot. Keep recyclables free of garbage or they may not be accepted at the recycling facility, or if accepted charged a higher rate.

Reuse Reusing materials is always a better environmental choice than recycling since it doesn't require energy to remanufacture. There are several free-to-use materials' exchange websites where you can shop for or sell used building materials and other goods: see list in Pierce County side-bar.

Local salvage companies for used building materials:

Olympia Salvage specializes in salvaged building materials, locally harvested FCS wood products, cabinetry, plumbing and electrical fixtures, furniture, doors, windows, flooring and more in their retail store. Donations are tax deductible. 113 State Ave in Olympia • 360-705-1300 • www.olympiasalvage.org

South Puget Sound Habitat for Humanity ReStore is another local spot to buy or donate. All proceeds fund affordable housing projects. Donations are tax deductible. 415 Olympia Ave in Olympia • 360-956-3456 • www.spshabitat.org.

Hazardous Materials Unwanted hazardous materials can go to HazoHouse, located at the Thurston County Waste and Recovery Center, 2418 Hogum Bay Road N.E., Lacey. Service is free for residents with a small fee charged for qualifying businesses. Businesses must be registered. Open Monday-Friday, 8 a.m. to 5 p.m. For more information, call 360-786-5457 or 360-754-3354. The Swap Shop at HazoHouse is where residents and businesses can shop for free materials such as automotive products, cleaners, and paint. Incoming products are checked to ensure they are in good condition, and then made available to the public free of charge.

Finally, you can save money, conserve resources, and generate less waste by changing your construction practices. Be part of the solution with green building information and resources in this publication. Go to www.ThurstonSolidWaste.org and click on Construction and Demolition debris for names and addresses of recyclers and haulers in Thurston, Mason, Lewis and Pierce Counties.

■ ***Provided by Terri Thomas, Thurston County Solid Waste 360-754-2896 thomaste@co.thurston.wa.us***

Pierce County Construction Waste and Recycling

A 1995 waste audit found that 20.2% of materials disposed in Pierce County consisted of construction debris, which includes demolition and land clearing debris (CDL). Most CDL materials are easily recyclable and do not need to be landfilled. In 2005, 126,000 tons of yard waste and 161,000 tons of landclearing and wood debris were recycled or diverted for other uses.

New waste diversion programs, technology and CDL recycling businesses have formed since 1995, so Pierce County is conducting a new waste characterization audit to determine how much CDL and other waste is currently being disposed. The waste audit is scheduled for 2010.

Recycle, salvage, compost or reuse Recycling CDL materials are important to you and the environment. For you, recycling CDL materials can save money, for the environment, it diverts a usable waste stream into productive uses rather than taking up valuable space in over-burdened landfills. Most CDL materials can be recycled, composted, reused or salvaged at a significant cost savings over landfilling. There are a variety of markets for CDL materials. Contact local recyclers to determine what materials they accept and whether they require them to be separated. Separation at the job site can increase the value of CDL materials, but some recyclers do accept mixed loads of materials. Thirteen businesses in Pierce County are permitted to divert CDL materials.

A list of businesses that recycle, salvage, compost, or reuse CDL materials is available on Pierce County Public Works and Utilities' website at: www.piercecountywa.org/recycle (click on link at the website to get to the Recycling Directory). Reuse Reusing materials is always a better environmental choice than recycling since it doesn't require energy to remanufacture. There are several websites where you can buy or sell used building materials and other goods:

- www.2good2toss.com
- http://seattle.craigslist.org/
- www.govlink.org/hazwaste/business/imex

One local reuse center is the ReHarvest Center in Tacoma. The donation center accepts building and reusable salvage materials. This facility is located at the Tacoma Landfill at 3510 South Mullen Street in Tacoma. Open 7 days a week, 8 am – 6 pm. (253) 531-5845

Hazardous Materials Residential hazardous waste materials can be taken to two locations: in Puyallup (South Hill) or Tacoma. A third location will be available soon in Purdy.

■ Hidden Valley Transfer Station, 17925 Meridian Street E., in Puyallup, 253-847-7555.

Open Tuesdays and Thursdays, 8 a.m. to Noon and 1 p.m. to 5 p.m.

■ Tacoma Landfill, 3510 South Mullen, in Tacoma, WA, 253-591-5543.

Open 7 days a week, 8 a.m. to 6 p.m.

Visit www.piercecountywa.org/hhw for more information about materials accepted, not accepted, and tips for transporting hazardous waste. For information about disposing of hazardous waste from businesses, contact the Tacoma-Pierce County Health Department at 1-800-287-6429.

■ ***Provided by Pierce County Public Works and Utilities, Pierce County Solid Waste, 253-798-2179, pcsolidwaste@co.pierce.wa.us, www.piercecountywa.org/solidwaste.***

Healthy and safe indoor environments

American's spend 85 – 95% of their time indoors, yet some of their indoor spaces have air quality as bad as the outdoor air in most polluted cities," according to Alex Wilson, editor of Environmental Building News. There are many threats to indoor environments, from excessive moisture to chemicals from building strategies and materials, furnishings, and furniture. The number of individuals with respiratory illnesses and chemical sensitivities are exponentially increasing and general health issues arising from "sick building syndrome" have been documented since the 1980's. The good news is that we now know a great deal more about indoor air quality, and have solutions to this growing problem. Many of the solutions are low-cost or no cost, but represent a change in habits, product choice, and lifestyle.

Here in the Northwest, we are particularly vulnerable to high moisture levels that can cause uncontrolled and concealed mold growth. Many mold species, in and of themselves, can contribute to allergies, asthma, and other respiratory ailments; however, it is the literal "chemical warfare tactics" employed by mold species against one another that is largely responsible for the increased health problems associated with mold. Beyond mold and its inherent problems, the toxic chemical soup we are creating with current construction techniques, building materials, furnishings, and household cleaners, is increasingly becoming a problem of epidemic proportions.

Another component of poor indoor air quality is combustion gases that can leak from furnaces, water heaters, fireplaces, and other combustion appliances. If you are purchasing new appliances, make sure you use direct vent or power vent models that do not use inside air for combustion. These models are sealed so that all the air that feeds combustion and the exhaust air comes and goes directly from the outside. Many building scientists go so far as to say that for high quality indoor environments, you should eliminate indoor fireplaces altogether (in fact, they even suggest no open combustion at all, including candles – there goes that romantic candlelight dinner!).

Building and furnishing materials are manufactured with a plethora of chemicals that off-gas or release by-products that can be toxic, such as volatile organic compounds, VOCs. From computers to insulation, most of our indoor products off-gas some chemical that is adding to poor indoor air quality. The danger of these chemicals depends on the specific chemical, its reaction to other chemicals, the quantity of the chemical, and the sensitivities of the occupants. In general, for chemically sensitive people or folks bothered by asthma or allergies, it's best to avoid vinyl products (flooring, wallpaper, shower curtains) that may off-gas phthalates – a chemical used to soften plastic. Although scientific opinions vary on the level of danger from phthalates, both the US and Europe have recently enacted laws to eliminate the use of phthalates in children's toys and child care articles due to concern that these chemicals are impacting children's health, primarily as an agent that disrupts normal hormone functions.

Another culprit that can significantly contribute to bad indoor air quality is carpet. Although wall-to-wall carpeting has improved dramatically over the years, it poses a significant indoor air quality problem for three reasons: 1) synthetic carpets, pads, and adhesives off-gas volatile organic compounds (to eliminate this source, consider wool carpeting); 2) carpets act as a sink for biological contaminants, such as dust mites, mold, and bacteria that can cause asthma, allergies, and other health problems; and 3) carpets attract and hold pollutants tracked in from the outside on shoes – bringing oil, gasoline, antifreeze, and pesticide particles into the indoor environment that can accumulate in among the carpet fibers. The best (and cheapest!) IAQ strategy that everyone can employ is to institute a lifestyle policy of removing shoes at the entryway. That way, potential pollutants do not even get through the door! Removing synthetic carpet and replacing it with wool carpet or hard surfaces, such as hardwood, tile, cork, or linoleum is another great way to improve indoor air quality.

Photo by Cate O'dahl

Builders should not use the furnace during construction. It creates a dirty furnace before the occupants even move in.

Removing vinyl and carpet is only one strategy among hundreds that can improve indoor air quality and it is not the only answer for dealing with these two common household products. It is not practical to assume that all of the Nisqually Building Guide readers are going to go out and remove all the vinyl and carpeting in their homes. And, that is not what we are suggesting. We are still learning about the causes and solutions for air quality. So at this time, it is best to consider one simple rule-of-thumb regarding chemical in the home: Eliminate, Isolate, and Ventilate.

Eliminate

Eliminate future problems with smart construction design and details. Take measures during construction operations to avoid moisture and dust problems later, i.e. manage your moisture sources and clean up the dust. Design your building to perform in our climate – understand what sources and strategies encourage mold growth.

Here are a few key tips for new construction:

Keep wet materials out of construction – Keep stored materials dry and protect woodwork from moisture damage during transit, handling, and delivery.

Completely dry out the house before installing insulation and drywall. The framing members (studs)

See **SAFE**, *page 28*

Community based forestry

A vision for forestry in the Nisqually Watershed

Imagine walking into the local lumber store and having the option to purchase wood products that came from your neighbor's forest. Imagine homes, office buildings, schools, and other construction projects within the Nisqually watershed being constructed primarily of wood products that were grown and processed within the watershed. Imagine a vibrant forest-based economy with thousands of Nisqually residents employed managing our forests, milling and manufacturing wood products, enhancing and maintaining diverse wildlife habitat, and coordinating tourism activities based on our ecological and cultural resources.

Northwest Certified Forestry, in partnership with the Nisqually River Council and other key watershed partners are working to make this dream a reality.

The impetus for this collaborative effort stems from the Nisqually Watershed Stewardship Plan that was completed by the Nisqually River Council in 2005. The plan identifies the following objectives as essential for reviving a sustainable forest-based economy within the watershed:

1. Support incentives for sustained timber production
2. Support the use of local forest products
3. Support and expand small landowner assistance programs in the watershed
4. Develop programs to assist in sustainable harvest and marketing of timber and non-timber products.

Northwest Certified Forestry

Northwest Certified Forestry (NCF) is a membership program for small woodland owners managed by the Northwest Natural Resource Group. In 2007 NCF developed a strategic focus in the Nisqually Watershed to help facilitate the development of a watershed-scale forest management and wood products manufacturing program. Over the past few years, NCF has been building a network of small woodland owners and wood products manufacturers who specialize in producing *Nisqually grown* wood products.

Currently NCF has over 20 members and more than 2,500 acres within the Nisqually Watershed. One of the hallmarks of NCF's services to its members is to provide low-cost "green" certification through the Forest Stewardship Council (FSC). FSC certification provides market recognition for landowners who manage their forests to the highest environmental standards in the world. FSC markets are increasingly paying a premium for wood products that originate from well-managed forests, thus helping promote continued good stewardship of these lands.

NCF also markets "carbon offsets" through NW Neutral, a carbon market program uniquely designed for small woodland owners.

A carbon offset is a financial instrument that individuals or companies can purchase to compensate for or mitigate their carbon footprint either associated with a particular activity or product.

Recognizing that forests play an important role in mitigating climate change, NCF's carbon offset program invests directly in small woodlands in order to maintain existing stores of forest-based carbon. This program provides yet another market-based incentive to forest owners whose stewardship practices provide clean air, as well as other public benefits.

For landowners who want to enhance the wildlife habitat and environmental quality of their forests, NCF provides a broad suite of resources ranging from financial and technical assistance to educational and training programs. NCF specializes in helping small woodland owners do more themselves with their own forest resources.

Photo by Kirk Hanson

Above: Forest inventory workshop at Northwest Trek in Eatonville. Below: Recovery 1 in Tacoma.

Today builders, wood workers, and home owners can contact NCF to purchase a wide variety of locally produced and FSC certified wood products that includes framing lumber, trim, molding, flooring, barn boards, beams, and more.

Landowners who are interested in taking a more hands-on approach to managing their woodlands and marketing their forest products can also contact NCF for assistance. NCF always provides a free site visit to landowners who are new to the program.

Healthy forests and a viable forest economy are essential to maintaining the Nisqually Watershed's rural character and quality of life. However, our forests face many threats such as increasing development pressures and devaluation of forest products and forest ecosystem services. Without public and consumer support through proper markets and incentives, private landowners will increasingly be hard pressed to maintain forestland as forests and to manage them sustainably.

■ ***Kirk Hanson. For more information on Northwest Certified Forestry go to www.nwcertified.org.***

Forest Stewardship:

FSC vs. SFI — Does it make a difference in WA?

There are two primary forest stewardship organization operating in Washington, the global Forest Stewardship Council, operating under the auspices of Smartwood® here in Washington, and the Sustainable Forestry Initiative, favored by Weyerhauser. Both programs have certified forests operating in Washington, both claim to provide environmental and economic benefits, both claim to promote sustainable forestry management with independent third-party verification.
So, what's the difference? And, does it make a difference in Washington. We asked representatives from both organizations to define themselves by answering the following questions.

Forest Stewardship Council

1. Does your program allow for clear cutting and why?
A: FSC's forest management standards are highly restrictive regarding clear cuts, but the practice is not absolutely prohibited because there are rare and limited situations in which a clear cut can result in an ecosystem and conservation benefit. In the Pacific Coast states, FSC has an absolute limit of 6 acres on clear cuts.

2: Does your certification allow for old-growth harvesting?
A: Old-growth logging is highly restricted in all FSC-certified forests. It is only allowed when it doesn't diminish the extent or values associated with the particular old-growth stand. The stand must be conserved as old-growth habitat of equal or greater ecological value.

3: What is your certification's position on the use of pesticides in certified forests?
A: FSC allows pesticides as a last option in an integrated pest-management strategy, with a long-term goal of ceasing the use of pesticides. They must be applied by qualified personnel and their use must be fully documented. At the global level, FSC prohibits the use of dozens of specific chemicals deemed to be highly hazardous.

4: How does your certification address the conversion of forests to other less sustainable land uses?
A: FSC's Principles & Criteria prohibit the conversion of forests or any other natural habitat.

5: How does your certification address genetically modified (transgenic) organisms?
A: FSC prohibits the cultivation of genetically modified trees (GMOs) in FSC-certified forestry practices.

6: Why should a buyer choose your label over any other?
A: FSC is the world's most respected assurance that the forest products you buy come from forests that are managed with consideration for people, wildlife and the environment. Only FSC certification ensures that forests of high conservation value, such as those containing rare and endangered plants and animals, are protected, natural forests are not cleared and converted to other uses, highly hazardous chemicals are prohibited and chemical use is generally diminished and the rights of indigenous peoples, workers and forest-dependent communities are protected.

Sustainable Forestry Initiative

1. Does your program allow for clear cutting and why?
A: All forest certification programs in North America allow for clearcutting. However, SFI has a limit on clearcut size. When used appropriately, clearcutting is an acceptable harvesting method that can mimic natural disturbances and benefit many plant and animal species that require openings in the forest.

2: Does your certification allow for old-growth harvesting?
A: SFI certification has measures to protect old growth and endangered forests. SFI's performance measures require support of and participation in plans or programs for the conservation of old growth forests in the region of ownership.

3: What is your certification's position on the use of pesticides in certified forests?
A: All forest certification programs in North America allow for chemical use. However, SFI requirements make it clear that program participants shall minimize their chemical use. In addition, the standard requires the use of least toxic and narrowest spectrum pesticides.

4: How does your certification address the conversion of forests to other less sustainable land uses?
A: A forest that is being converted to other uses cannot be SFI certified, as it would not meet the standard requirements.

5: How does your certification address genetically modified (transgenic) organisms?
A: As no genetically engineered trees are approved for commercial use in North America, they are not in the managed forests that would be certified.

6: Why should a buyer choose your label over any other?
A: With only 10% of the world's forests certified, supporting all forest certification programs is important. All forest certification programs address key values such as biodiversity, reforestation, water quality and critical habitat for wildlife.

Rain gardens key to protecting sound

As the Nisqually Watershed is developed and becomes progressively more urbanized, roads, roofs, driveways, and other hard or impervious surfaces replace increasing amounts of native forest and prairie lands. Rainfall that was previously intercepted by the forest canopy or soaked into the soils now becomes stormwater runoff, flowing across the landscape.

Increased pervious surfaces and stormwater runoff create two problems. Localized flooding can occur when local waterways flood yards, streets, and parking lots. In addition, stormwater washes a variety of pollutants into local creeks and rivers, and ultimately Puget Sound.

These pollutants can include motor oil, pesticides, excess fertilizers, trash, and fecal bacteria from pet waste.

While modern developments include highly engineered solutions for stormwater management, such as catch basins and pipes that convey the water to central storm ponds, there is a new, low impact development approach that enables individual homeowners to help protect streams and wetlands.

One strategy that generally works at any site is rain gardens; they work like native forests by capturing and infiltrating stormwater from rooftops, driveways, and other hard surfaces. Rain gardens collect, detain, filter, and slowly release your site's stormwater.

Rain Gardens reduce flooding by collecting and absorbing water from nearby impervious surfaces.

Rain Gardens filter oil, grease and toxic materials before they can reach streams, lakes and bays. Rain Gardens help to recharge aquifers by increasing the quantity of water that soaks into the ground where it falls, providing beneficial wildlife habitat.

Rain gardens are modest depressions in the landscape of a yard.

In a nutshell, rain gardens are typically excavated to a depth of about two feet, and then a mix of highly amended, compost-rich soil is placed in the depression filling it to a level about 6 to 12 inches below the surrounding landscape, to enable ponding to occur during periods of heavy rain.

This soil and compost mix rapidly soaks up water and retains it temporarily, allowing the stormwater runoff to slowing infiltrate into the ground.

To make a rain garden effective, a variety of plants that do well in both wet winter and dry summer conditions are planted to assist with absorption and toxic material removal.

Photo by Linda Andrews/Gary Schuldt

Above: Installing rain gardens requires a mix of highly amended, compost-rich soil. Below: A rain garden was installed at Yelm High School.

While many of these plants are native to the Northwest, a number of non-native ornamentals may also be used to create a colorful, attractive landscape amenity.

Rain gardens are simple to create, and yet they must be built carefully. They have to be designed to accommodate an accurate amount of rainfall that will collect on the site.

Soil conditions must also be carefully assessed during the design to determine the depth of the soil and compost mix required. Finally, careful plant selection is essential.

A number of demonstration rain gardens have been constructed throughout the Nisqually Watershed as examples of what you can do in your own home or business location:

Yelm High School (Industrial Arts area)

Columbia Crest Elementary School in Ashford

UW Pack Forest and Conference Center at Eatonville

Pierce County Library at Eatonville

Chloe Clark Elementary School in DuPont

Roy Elementary School in Roy.

It is easy to learn the essentials of incorporating

a rain garden into your yard's landscape, as well as other low-impact development practices.

A number of local organizations can provide information on planning and designing rain gardens at your home:

Pierce Conservation District and Stream Team, 253-845-2973

Thurston Stream Team, 360-754-3355 ext. 6377

Stewardship Partners, 206-292-9875

■ ***Dave Hymel, Stewardship Partner. For more information go to www.stewardshippartners.org/raingarden_central.html***

Restoring the Nisqually Estuary

Humans have influenced and enjoyed estuaries for centuries. Their strategic location at the confluence between rivers and the ocean has led many to be developed as shipping ports and industrial areas.

The soil deposited by the rivers has also made estuaries fertile for agriculture. In the Nisqually Delta, agriculture dominated the landscape for many decades beginning in the mid 1800's.

In order to cultivate crops and pasture livestock in the tidal zone, dikes were constructed to keep Puget Sound at bay.

These dikes allowed farming, but significantly reduced salt marsh, mudflat, riparian, and tidal channel habitats used by waterfowl, salmon, shorebirds, other fish, and wildlife.

Following the farming era, vigorous community organizing during the late 1960's and early 1970's prevented industrial development of the Nisqually Delta from occurring as it had in many estuaries to the north (Tacoma, Seattle, and Everett).

In 1974 Nisqually National Wildlife Refuge (Nisqually NWR) was established, further protecting the unique delta habitat from development with the primary purpose to conserve wildlife and essential habitat. Beginning in 1996, the Nisqually Tribe began allowing tidal waters into nine acres of diked habitat on the east side of the Nisqually River that they had acquired from the Braget Farm within the Refuge boundaries.

The Tribe then proceeded to remove the dikes around 31 additional acres in 2002 and 100 acres in 2006 all on the former Braget Farm. Juvenile salmon were observed in the tidal channels within months of tidal action being restored and salt marsh vegetation began to colonize these areas the first growing season.

Photo by Jesse Barham

Dike removal and borrow ditch filling during construction summer 2009 at Nisqually Wildlife Refuge.

The Tribe's projects have provided a unique opportunity to observe how quickly the estuary can recover and the knowledge has been invaluable in supporting the design of the large estuary restoration project at Nisqually NWR.

With the help of Ducks Unlimited, the Refuge is restoring 762 acres of former mudflats, salt marsh, and tidal channels after a century of being separated from Puget Sound by the five mile Brown Farm Dike.

This estuary restoration project is the largest in the Pacific Northwest and is expected to improve habitat for federally threatened Chinook salmon and steelhead trout as well as other salmonid species, shorebirds, waterfowl, seabirds, and many smaller organisms critical to the estuary food chain.

This project will be a significant step in the restoration of Puget Sound.

The project will reconnect over 21 miles of historic tidal channels to Puget Sound that are heavily used by juvenile salmon as they leave the river. It also has the potential to increase vegetated salt marsh in southern Puget Sound (south of Tacoma Narrows) by approximately 50%.

Each salmon in the Nisqually Watershed has to pass through the delta twice during its life, making the estuary the top priority to restore Chinook salmon in the watershed. Many individuals and organizations (including the Nisqually Indian Tribe, Nisqually NWR, and Ducks Unlimited) have contributed over the decades to making this restoration effort possible.

Other South Puget Sound watersheds each sacrificed their own salmon recovery restoration projects to contribute significant funding to the estuary restoration project at the Refuge.

The many partners supporting the project recognize that the restoration of the Nisqually Estuary has benefits for salmon and other wildlife throughout Puget Sound.

■ ***Jess Barham, Nisqually National Wildlife Refuge, 360-753-9467.***

Know your water rights

With respect to residential building codes and health regulations, where does the State of Washington stand regarding important water conservation strategies: rainwater catchment (collection) for residential use and graywater recycling for outdoor irrigation?

This article attempts to answer this question with regard to current rules and standards, but there is not a complete answer to this question as yet.

You may think your rainwater is free, but let's find out just what are your Water Rights.

Effective October 9, 2009, Ecology released its interpretive statement "the on-site storage and/or beneficial use of rooftop...collected rainwater is not subject to the permit process..." Washington residents can collect rainwater without permit.

Rooftop Rainwater Catchment Systems – Rain barrels, Rain Gardens, and Water Collection/ Storage Cisterns

Back in 1917 Washington State passed the Water Code in order to address water management and surface water allocation issues of the time.

Unfortunately the language used at that time was both verbose and obscure, and the resulting ambiguity has led to confusion over who has the rights to rainwater falling on lands of the state.

In turn, this outdated code has created a present day interpretative nightmare for Washington State's Department of Ecology as the administrative agency for the water code.

While the Attorney General's office views rainwater as surface water, and therefore covered under the Water Code, Ecology has never really enforced the law.

As such, there have only ever been two general permits issued allowing rainwater catchment (one for King County and the other for the San Juan Islands).

However, with weather patterns shifting in Washington (less water in summer and stronger rain events in the winter), and green building certification programs emphasizing rainwater collection, both as stormwater management mitigation and for water conservation to reduce reliance upon potable water from our aquifers for irrigation and toilet flushing, the issue is coming to a boiling point.

The Attorney General's office would like Ecology to expand its jurisdiction concerning

See **WATER**, *page 27*

Site planning and landscaping for healthy soils and water quality

Heavy equipment and site disruption at new construction areas creates soil compaction, loss of plant cover, and erosion, all of which can lead to stormwater runoff, flooding, and water pollution.

The more our forest and prairie lands are developed, the more impact these problems have on our communities and ecosystems. Fortunately, careful site planning and landscaping can minimize these construction impacts.

We can take steps to reduce soil compaction, protect existing trees and vegetation, plan for stormwater absorption on site, control erosion, minimize impervious surfaces, and build healthy soils.

New plantings, chosen to withstand our wet winter/dry summer climate without supplemental water, will also absorb stormwater, filter pollutants, limit erosion, create beauty, and recreate lost habitat.

When clearing land, disturb as small an area as possible, leaving remaining soils and vegetation intact. Stockpile and protect topsoil on site for redistribution around the property at the end of the project.

Heavy equipment squeezes the air out of soils, damaging their ability to absorb and filter stormwater, and damaging the ability of plants to take in water and nutrients through their roots.

Limit this damage by using lighter machines; distribute the weight by using tracks instead of wheels and laying down ground protection mats or plywood. "Rip" or "scarify" to loosen compacted soils at the end of the land clearing process using a backhoe or excavator with ripping teeth or an agricultural cultivator.

Grade the site to reduce drastic changes. Consider constructing a building that fits the terrain rather than grading the terrain to fit the building. The house will have a feeling of "rightness" and elegance well beyond that of the typical house on a cleared, flattened lot covered in lawn. Stormwater absorption will be enhanced and erosion reduced.

Channel rainwater into compost-enriched vegetated swales or rain gardens rather than onto the street and into storm drains (see Bioswales and Rain Garden article for more information on these strategies). Create a series of terraces, where necessary, rather than monolithic retaining walls. Avoid disturbing sensitive slopes.

Protect soils on slopes with compost and erosion cloth, straw mats, compost socks, and plants. Diverse plantings absorb stormwater and reinforce slopes with their roots.

Photo by Gary Schuldt

Close plant spacing, groundcovers, and mulch help crowd out weeds.

Trees are environmental heroes, absorbing stormwater, sequestering (absording) carbon, providing habitat for wildlife, modulating temperatures for our homes and yards, and providing beauty. They are worth the effort to preserve!

Keep heavy equipment off of tree roots. Fence trees off at the drip line to make sure everyone keeps

See **SOIL**, *page 27*

Beyond Organics

The story of one small Nisqually Watershed farm

People who support local sustainable agriculture do much more than support their own personal health.

Their support helps to create local jobs, empower local monetary systems, decentralize corporate food growing and supply channels, and contribute to the spiritual and psychological health of their communities.

These are worthy goals and once committed to, lay solid foundation for local empowerment that transforms the reality of every individual.

Paradise Organics began in the Nisqually with a desire to embrace a healthier lifestyle. Rapidly, we grew into one of the most popular local organic farms in the Nisqually Watershed. Our customers are people with a growing awareness and desire to eat more life sustaining food.

As more people become educated concerning the quality, nature, and reliability of locally grown food, they choose to seek healthier alternatives to typically lower quality convenience offered by traditional supermarkets.

Photo by Roddy Scheer

Oxbow Farm and a Farmer at a Farmer's Market. Farmer's Markets offer fresher, healthier produce locally at reasonable prices.

Paradise Organics recently chose to acquire their vegetable and fruit certification through a grass roots movement certifier, the "Certified Naturally Grown" program.

This is one of several certification programs, such as the regional "Salmon-Safe" label, that looks at overall sustainability and conservation practices and provides a credible endorsement as an alternative to or addition to USDA organic label. (See companion article for more details on Salmon Safe.)

Local farms offer fresher, healthier produce at reasonable prices by eliminating long distance transportation and intermediaries in the food distribution chain.

This affordability attracts people who once thought purchasing organic was beyond their budget.

These local farmers feel good about their contribution to community, and people in these communities feel better about what they eat.

Creating and maintaining local markets while simultaneously caring for the land is challenging; indeed, most small-scale, direct-market farmers work long hours with minimal pay. On the upside, they report that nurturing the land and providing valuable community services is truly satisfying; by reducing their impact on global resources, farmers can produce benefits to the global scene while acting locally.

Local farms provide local jobs, yet perhaps more importantly, sustainable agriculture is about providing the community with quality food while nurturing the land to greater levels of fertility for the enjoyment of following generations.

The essential practice of the Iroquois, their Great Law, is a concept being embraced by many small, local farms, including Paradise Organics. "In every deliberation, we must consider the impact on the seventh generation…".

Nutritional food is an essential link to a strong, healthy, and vibrant sustainable community. Local organic farms really make a difference.

Local farms can quickly and sufficiently provide quality foods within local communities.

This simple act helps people maintain optimal health, which can contribute to making smarter choices for maintaining better standards of living!

The local farmer is a small, but extremely important part of the larger global community.

Their profession is first among those providing the most primary needs of humanity. It underpins the success of all modern society. We salute all who choose the path of providing sustainable agricultural products within their communities.

Likewise, we salute the increasing number of people who recognize and choose to support the vital contribution of small-scale, direct-market farmers.

■ ***Paradise Organics, 360-894-1328.***

'Green' Your Landscape

How to protect water resources through your garden

A well-designed yard can be a beautiful extension of your house: a place to relax and entertain, play, grow food, and a worthwhile investment. Another less obvious benefit is that your yard can also help protect drinking-water supplies, streams, lakes, and Puget Sound, as well as the salmon, shellfish, birds, other wildlife, and people who depend on clean water. You will be able to enjoy visits from birds and butterflies—and a healthier yard for your family—as you create habitat right outside your windows.

Some keys to sustainable landscaping include:

- Build healthy soils
- Plant in layers—like a forest
- Choose water-wise plants
- Have "just enough" lawn and practice healthy lawn care
- Use pervious decks, patios and walkways
- Manage drainage on site

Some details are offered below, but you can learn more about each of these strategies by checking resources from local agencies and by taking free classes offered by WSU Extension and other horticulture and low-impact development experts.

Building Healthy Soils

Healthy soil grows healthier plants, allowing stormwater to infiltrate, stores water for plants in the summer, and reduces the need for chemicals—such as fertilizers and pesticides—that are harmful for streams and our families' health.

Healthy topsoil has 50% pore space (half its volume is available for stormwater storage!). When soil covers your entire yard, improving your soil is the easiest way to slow and infiltrate stormwater, and healthier soil makes your yard beautiful, too! Some rocks and bits of clay are a natural reflection of your soil, but if your soil is consistently as hard as a rock, or mostly clay, you'll benefit by improving it with compost and mulch.

If your soil has been removed or compacted by machinery during construction, you'll need to break up the compaction and mix in compost—or add a compost-amended topsoil—to get off to a good start.

Mulch is a layer of coarse organic material—such as wood chips—that is spread on the surface of the soil around and between plants. Mulch conserves water by reducing evaporation; breaks down over time, further nourishing your soil with new organic matter; prevents compaction and surface erosion of bare soil; and allows more rainfall to absorb into the soil.

Planting in Layers

Once you've enriched your soils, it's time to think about your plantings. Aim to plant layers—or different heights—of vegetation wherever possible. Layers mimic the structure of our native forests, with trees, mid-sized shrubs, low shrubs, and groundcovers, providing lots of benefits in your yard:

Layered plantings creates an aesthetically appealing structure for your landscape

You'll enjoy more of the seasons, with varying flowers, fruit, foliage, and bark all in one scene

You'll slow down stormwater and allow it to evaporate, transpire, and slowly trickle back into the ground instead of running off to storm drains

You'll create habitat for animals, especially songbirds and butterflies

You'll reduce maintenance requirements over time, as the plants will grow more closely together to crowd out weeds

Trees are especially important. They soak up more rainfall, stabilize slopes, buffer winter winds, and provide summer shade when properly located in your landscape.

In open areas of your yard, you might have just a few layers, such as low shrubs with groundcovers and perennials. In another part of your yard, you can create a little "wildlife zone" with a tree or two and several plant layers below. If you're on a small lot, choose trees that are well suited to small spaces.

Smart Plant Choices to Protect Water

Choosing the right plants for your yard will save you time and money, and will protect and conserve water.

Water-wise plants: In our region, we're lucky to have a wide range of beautiful plants—both native and non-native—that are adapted to our climate, soils, pests, and diseases. Water-wise plants help protect water because they are:

Resistant to drought, so they can thrive in our wet winters and dry summers without supplemental water once they're established

Resistant to diseases and pests, so they won't require extra fussing or the use of chemical treatments that can harm groundwater and local waterways

Photo by Gary Schuldt

Planting in layers will not only help you manage stormwater on your property, but will also provide privacy, noise reduction, a home for birds and butterflies, and reduced yard maintenance.

Tough and hardy, so they won't require frequent replacement. Replacing plants uses more water as you repeat the process of getting them well established for the first two summers.

Right plant, right place: Once you choose your favorite water-wise plants, make sure you understand their requirements. Some plants are versatile, and can thrive equally well in sun or shade, but many have specific requirements. A shade-loving plant will never be water-wise if it's placed in the sun, and a sun-loving plant will never thrive in the shade.

"Just Enough" Lawn

Only you can decide what size lawn is just right for your family. Some families play sports regularly that require a big lawn; some families enjoy a tiny patch of lawn for summer lounging; and some families have given up all their lawn! When you transform lawn space to another use, you eliminate the

See **GARDEN** *page 26*

Voluntary Conservation Agreements

Do you own land with important natural resources, such as a farm, a ranch, or timberland?

If so, donating or selling a voluntary conservation agreement, also known as a conservation easement, can be one of the smartest ways to conserve the land you love and protect the Nisqually River watershed's natural heritage – while also maintaining your private property rights and realizing added income or significant federal tax benefits.

What do you need to know to enter into a voluntary conservation agreement? Here are the facts:

A voluntary conservation agreement, also known as a conservation easement, is a legal agreement between a landowner and a nonprofit land trust, such as the Nisqually Land Trust, that permanently limits uses of the land in order to protect important conservation values.

It allows you to continue to own and use your land and to sell it or pass it on to heirs, but be aware that the conservation status is perpetual.

When you enter into a voluntary conservation agreement with a land trust, you give up some of the rights associated with the land.

For example, you might give up the right to subdivide your land or build additional houses, while retaining the full right to grow crops. Future owners also will be bound by the agreement's terms.

The land trust is responsible for making sure the terms of the agreement are followed. Voluntary conservation agreements vary widely.

An agreement to protect rare wildlife habitat might prohibit any development there, for example, while one on a farm might allow continued farming and the building of additional agricultural structures.

An agreement may apply to just a portion of the property, and need not require public access.

A conservation donation or sale requires not only a willing donor or seller, but also a qualified conservation organization to accept the donation.

That organization needs to be able to show that the donation closely fits its particular charitable mission.

A land trust will not accept a donation that does not fit its mission and purposes.

A voluntary conservation agreement can help a landowner pass land on intact to the ne xt generation.

By limiting the land's development potential, the agreement lowers its market value, which in turn lowers estate tax.

Whether the agreement is sold, or donated during life or by will, it can make a critical difference in the heirs' ability to keep the land intact.

If a donated conservation agreement benefits the public by permanently protecting important conservation resources and meets other federal tax-code requirements, it can qualify as a tax-deductible charitable donation.

The amount of the donation is the difference between the land's value with the agreement and its value without the agreement.

To qualify as a charitable donation, or to qualify for purchase, a conservation agreement must be permanent. A landowner should get professional financial planning and legal advice before making such a major donation.

When you donate or sell a conservation easement to the Nisqually Land Trust, you join a watershed-wide partnership that is widely recognized for its supportive and cooperative approach to conservation.

This partnership includes many of your friends and neighbors, local businesses and professionals, and public and private agencies – people you can turn to for education, advice, help, and resources in the ongoing stewardship of one of your most precious possessions.

The Nisqually Land Trust would be happy to work with you to explore ways you and your land might benefit from a voluntary conservation agreement.

■ ***Joe Kane is the Executive Director for The Nisqually Land Trust. For more information call 360-458-1111 or email at jkane@nisquallylandtrust.org***

GARDEN: *landscape*

Continued from page 25

hassle and expense of regular mowing, watering, and weed care.

For your watershed, that means saving water, cutting down on pollution from lawn-care products, and less stormwater running off lawns, especially if the lawn sits atop compacted soils.

For your neighborhood, that means less noise pollution, significantly less air pollution, and more green spaces to provide homes for songbirds, butterflies, and other small animals.

Shrinking Your Lawn

There are several methods for reducing your lawn when you're ready, including sheet mulching and sod cutting. Converting a little lawn at a time is one way to ease into lawn removal.

■ ***Erica Guttman is with WSU Extension Water Resources Program.***

SOIL: *Trees are worth the effort to preserve*

Continued from page 23

clear. Keep soil levels consistent with original grades around trees, creating retaining structures where necessary. Burying or exposing roots will kill a tree.

Integrate 3-6 inches of compost into all disturbed soils unless they are already of excellent texture (fertile sandy loam).

This will help restore soil fertility, porosity, and rainwater absorption rates.

Plants will also be healthier and more resilient in compost-enriched soils.

Native plants and non-natives from similar wet winter/dry summer climates around the world are great candidates for a successful landscape.

These plants will require only minimal watering once established. Planting in layers, from trees to groundcovers heightens interest and environmental benefits.

After planting, cover soils with mulch—woodchips, bark, compost, straw, or another biodegradable material.

Mulch protects soils from erosion, retains moisture, suppresses weeds, and adds organic matter to the soil as it breaks down.

Finally, reduce impervious surfaces (which generates stormwater runoff) such as concrete driveways and patios; opt for permeable paving systems instead (thus allowing water to infiltrate the soil on site).

These include permeable interlocking concrete pavers, permeable concrete or asphalt, clean aggregates, and un-mortared flagstone.

Limit the square footage of hard surfaces to what is truly needed, and grade them towards rain gardens or swales whenever possible.

Finally, whenever possible, disconnect one impervious surface from another by inserting a vegetated strip in between the two hard covered areas.

That is, do not let an impervious surface like a driveway connect directly to a street, install a vegetated filter strip in between.

Photo by Linda Andrews/Landscape & Design

Landscape remodel includes soil amendment, native plants, and tree retention.

Protecting soil and water quality with these techniques requires a new approach—one of respect for how Nature has provisioned the site.

But it solves many problems and provides many benefits to the homeowner, the builder, and the greater community.

■ ***Linda Andrews is principal of Linda Andrews Landscape and Design.***

WATER: *Knowing rights to rainfall collection*

Continued from page 23

rainwater.

On the other hand, Ecology is taking the position that instead of expanding their jurisdiction, they would like to diminish it for all rooftop rainwater catchment practices.

DOE has issued the ruling permitting rain water harvesting.

The interpretative statement will still allow Ecology to set limits in specific areas, if the cumulative impacts of residential rainwater collection in a certain water resource inventory area (WRIA) were affecting instream flows (ISFs).

Better yet, since this is a reinterpretation of an existing law, it does not require legislative change.

Until that interpretative statement is issued it would seem Ecology's unofficial position is that it will not, nor does it want to, enforce permits for rooftop rainwater collection systems.

Graywater for Outdoor Use

Contrary to what you might be told at your local building department, Washington State Department of Health (DOH) only has jurisdiction over graywater for outdoor use (graywater for indoor use is covered in the article Graywater Innovations).

Again there has been much confusion on this issue.

Currently the State only permits (through local health jurisdictions) graywater for subsurface irrigation and anyone embarking on such usage is required to follow the guidance document for Water Conserving On-Site Wastewater Treatment Systems.

The Department of Health has an excellent fact sheet on graywater on their website (see http://www.doh.wa.gov/ehp/ts/WW/greywater/greywater.htm and then follow the link under "Did you know….?" Recommended Standards….., for the full 66 page document.)

However, the State has recognized the current standards requiring homeowners to follow the on-site wastewater treatment guidelines are both onerous and expensive and perhaps not necessary. Department of Health consequently has formed a stakeholder group to review the Standards and develop simpler guidelines. This review has to be complete by the end of 2010.

When all the changes talked about above go into effect, Washington State will at last be in line with supporting water conservation rather than hindering individuals' efforts through antiquated legislation and overly complicated and expensive systems.

■ ***Fiona Douglas-Hamilton, SEEC LLC.***

SAFE: *Decisions to keep homes healthy*

Continued from page 18

and flooring should be checked with a moisture meter and show a reading of less than 5%.

Design and install proper basement foundations – moisture barriers under floor slab or on the ground with a crawl space, provide drainage layer, and seal all penetrations.

Use properly installed flashing instead of caulking to seal doors and windows and flash all roof-to-wall intersections.

Vacuum stud bays before sheetrocking, and vacuum as you go to eliminate dust that could get trapped.

Mask floor registers or use temporary protection to prevent debris from accumulating during construction. Slope exterior away from the foundation.

Investigate alternative building envelope options, such as Advanced Framing, Structural Insulated Panels, Insulated Concrete Forms, or Strawbale (where permitted).

Properly size and place roof overhangs to keep water off the envelope.

Install a rain screen on the home's exterior to keep moisture out of the building – for more information on installing rain screens see the Building Guides reference listed under Resources below.

Insulate cold water pipes.

Isolate

What you can not eliminate, isolate:

Seal all penetrations, in drywall, electrical and plumbing penetrations, cracks and gaps.

Keep vegetation at least a few feet away from the house to eliminate the need for pesticides.

Detach the garage in new construction to isolate exhaust fumes and other hazardous gases from the garage from living environments.

Install walk off doormats to collect shoe debris and contaminants, or provide an area to remove shoes so contaminants don't enter the living environment.

Use only sealed combustion appliances, where outside air is supplied directly into the combustion chamber and flue gases are exhausted directly outdoors. From an IAQ perspective, electric ranges are preferable.

Ventilate

Once you have eliminated and isolated potential air quality concerns, the single most important strategy for indoor air quality is proper ventilation. Especially in new homes that have fewer air leaks, mechanical ventilation (fans) is an essential tool to improve indoor air.

To promote good airflow, provide either continuous or interment mechanical ventilation. Improving ventilation is a great strategy for both new construction and existing homes. Tips include: Install new or replace existing exhaust fans with high efficient QUIET fans to ensure occupants use the fans often to remove stale air and moisture.

Consider a whole-house system for both exhaust and supply air in new construction or major remodels.

Install passive air vents in every bedroom – devices installed high in the wall of the room that extend from the inside through the building envelope to the outside – these vents allow for continuous air circulation. Natural ventilation is a good idea in older homes, or well-designed new homes.

Washington State has a ventilation code that represents the minimum ventilation requirements for new homes, but that doesn't help provide solutions for existing homes.

Indoor air quality can be complicated, so it's best to consult experts to ensure a healthy and safe indoor environment.

Consult the NW EcoBuilding Green Pages for specialists in your area (www.ecobuilding.org), also, consult home performance specialists, such as Energy Auditors, that can provide assistance and references (www.homeperformancewashington.org).

Photo by Cate O'dahl

Builders should block off your forced air vents during construction to eliminate dirty ducts for new occupants. Pictured is an example of poor site protection – exposed ducts during sanding and other finish work allow contaminants into the heating system.

Resources

For the builder or serious remodeler, check out, Joe Lstiburek's Builder's Guide. These climate-specific guides provide guidance on design and construction strategies that reduce moisture and indoor air quality issues following construction.

If you are in an existing home, and cannot alter the structure you are in, pay particular attention to proper ventilation to improve your air quality.

The US Environmental Protection Agency and US Department of Energy website have good information on improving indoor air, see www.epa.gov/indoorairplus and www1.eere.energy.gov.

To reduce the occurrence of volatile organic compounds that may exacerbate respiratory illness or other health problems. Use low VOC paints, caulks, adhesive, and finishes. Many products are readily available, even at your local retailer.

Providers specializing in 'green" building products can be found through the Northwest EcoBuilding Guild's Green Pages, on line at www.ecobuilding.org. Also, consider low-toxic cleaning supplies to help improve your indoor air.

Solutions for improving indoor air quality are readily available, some are easy to employ, while others may require specialists, time, and money.

The important message here is that improving your indoor air quality, improves your health, and there is no substitution for good health.

■ ***Cate O'dahl is Green Building Specialist and Green Real Estate instructor for ESP Services.***

IMPACT: *LID helps reduce stormwater effects*

Continued from page 16

as allowing the natural seep of clean water at natural temperatures through the topsoil layer back to streams in a manner that mimics pre-developed conditions.

Science supports the effectiveness of Low Impact Development techniques and as more projects use these techniques, both the construction industry and regulators will become more comfortable with installing them in their projects.

One major impediment in Kitsap County and around our region has been the comfort level of public and private sector engineers and their understanding these new techniques. As LID "gain" in popularity, we've seen civil engineers gain technical knowledge and begin to understand how to integrate these techniques into their projects, then becoming some of the strongest supporters.

The Home Builders Association in Kitsap County, through its foundation, received two grants to advance LID. The first, from the State Department of Ecology, was to develop Low Impact Development standards for adoption by local government.

Working with the County, Cities, Tribe, Health District, Fire Districts, engineers and other stakeholders, industry, regulators, and the public have been educated about LID during the process of producing the Kitsap County Low Impact Development Guidance Manual.

The resulting guide has been adopted by Kitsap County and the cities of Bremerton, Bainbridge Island, and Poulsbo already, with the City of Port Orchard expected to adopt later this fall. The second grant was a Public Involvement & Education grant from the Puget Sound Action Team (now Puget Sound Partnership). This project was to retrofit the Home Builders Association office site into a Low Impact Development Showcase.

The HBA Low Impact Development Showcase Project has had thousands of citizens, public officials, and industry professionals tour the site to learn more about Low Impact Development techniques and their use.

A video of the December 2007 storm, which represented a nearly 900-year event, also helped change some skeptics to enthusiasts as it demonstrated how effective LID can be to manage stormwater. It can be viewed at www.KitsapLID.org. Everyone can help reduce stormwater impacts. Even if new development produced no increase in pollutants in our waterways, we have an existing problem with the water quality in the Puget Sound.

But there is something that homeowner and business owner can do. It has been demonstrated that if a rain garden was constructed in your yard and sized at ten to twenty percent of the amount of your impervious surface (an impermeable or water-resistant surface that does not allow rainwater or surface water to infiltrate into the soil) – it would naturally treat and infiltrate about ninety-five percent of the annual rainfall that falls on your property.

WSU Extension Service is working in twelve Western Washington counties to provide technical assistance to homeowners who would like to construct their own rain garden.

Stewardship Partners, one of the sponsors of this publication, is also a resource on rain gardens.

As thousands of us take this small step, the combined effect will be to significantly reduce the pollutants that reach our streams and waterways today. (See Rain Garden Article for more information,)

Stormwater management for development projects is the single highest mitigation cost. Under the WA State Department of Ecology's new 2005 Stormwater Manual regulations, new developments using traditional stormwater techniques will see the detention ponds increase in size three- or four-fold, as well as requiring other additional water quality strategies.

Photo by Stewardship Partners

City of Puyallup Rain Garden Project, 2009. New rain garden recently installed is one component of low impact development. New plantings have to be watered to establish the plants initially.

The use of low impact development techniques provides the opportunity not only to infiltrate rain back into our aquifers, improve stream habitat and water quality, but to also reduce the costs required to comply with stormwater mitigation. But there are limitations on the use of these infiltration techniques.

Their use is limited by high ground water levels, underlying soils with very low permeability, and use on or near slopes at risk of slides due to the underlying soil conditions.

Harvesting rainwater may be limited by surface water rights issues (see companion article, Know Your Water Rights), and some of the techniques will likely remain niche techniques. The use of pervious pavements, bioretention cells, and the newly approved tree credit will likely be the most utilized techniques.

If Low Impact Development is so wonderful, should it be required? There are widely differing opinions on the answer. The Pollution Control Hearing Board ruled last year that large cities and counties in Western Washington must require it "where feasible," and that smaller cities and counties must identify and remove obstacles to its use.

There are now two Department of Ecology Stakeholder Committees that have begun to address these issues. It's my opinion that Low Impact Development provides an opportunity as a market-based environmental solution that works. I believe that it will become the stormwater mitigation tool of choice by the industry.

If we are to protect the habitat of our streams and improve the water quality of the Puget Sound, Low Impact Development techniques are tools that benefit both the environment and new development.

■ ***Art Castle is the Executive Vice President of the Home Builders Association of Kitsap County and Secretary of the Kitsap Home Builders Foundation. He also serves on the Department of Ecology LID Implementation Committee.***

Water conservation makes cents

There are many reasons to conserve water.

Conserving water you use for food preparation, cleaning, watering your landscape, or showering can reduce your water bill.

Likewise, the quantity of out-going water can also affect your water bill: reducing sewer flows can defer the need for new treatment capacity, thereby minimizing increases in wastewater fees.

If your home is on a septic system, reducing water use can extend the life of your system. Most of our local water supplies are pumped from groundwater, which also feeds area lakes, rivers, and streams. Population growth places increasing burdens on these aquifers.

By minimizing the amount of water we withdraw, we leave more in place for salmon, other creatures, and other uses.

Conserving water is easier than ever. It starts in the bathroom: more water is used in the bathroom than any other room in the home, representing over 50% of indoor water use.

There are now many new technologies for bathroom water functions that provide comparable performance while using less water.

Take toilets for example: initially, in the 1990s, when low flow toilets were first introduced, manufacturers produced models that often required two flushes to remove the waste, giving water conservation a bad name.

Today, manufacturers are producing new high-efficiency toilets (HETs), which use 20% less than even the new standard 1.6 gallon per flush (gpf) toilets.

Improved low-flow toilets make clogging and double-flushing a thing of the past. With performance issues managed, any new high-efficiency toilet that replaces older models will provide immediate savings on your water bill.

Here are three toilet technologies worth considering:

Pressure-assist – these toilets use water pressure to produce a powerful flush. They offer superior performance, but do make a little more noise than traditional toilets

Dual-flush – these toilets offer the user a choice between a small flush for mostly liquid waste and a regular flush for solid waste. Look for those designed with extra large traps that make clogging nearly impossible to get the high performance you are looking for.

Gravity-flush – this standard toilet technology offers high-quality models engineered to work well while using less water.

When shopping for a water-saving toilet, look for the WaterSense seal from the U.S. EPA or check the Maximum Performance test score for the model, at http://www.allianceforwaterefficiency.org/Maximum_Performance_(MaP)_Testing.aspx to be sure that the model you choose is a top performer.

Other water saving ideas for the home:

Check for leaks and fix them, in your faucets, toilets, and general plumbing – they can account for 13.7% of overall water use for an average in new homes.

Replace old flapper valves in standard toilets. Flappers tend to wear out after 3-5 years, and are the number one cause of toilet leaks.

Install a water-saving showerhead and limit your shower time.

■ ***Lisa Dennis-Perez, LOTT Alliance, 360-528-5719.***


Nisqually Watershed
Rain Garden Installations RG
Chloe Clark Elementary School (DuPont)
Roy Elmenentary School
Yelm High School
University of Washington Pack Forest – two locations
Pierce County Libary at Eatonville
Columbia Crest Elementary School (Ashford)
Nisqually National Wildlife Refuge
Nisqually Indian Reservation
Ft Lewis
Nisqually-Mashel State Park (undeveloped)
UW Pack Forest
State Forest
Gifford-Pinchot National Forest
Mount Rainier National Park
Other Public/Private Ownership
N
W
E
S
Miles
Data Derived From: Mount Rainier National Park, US Army Fort Lewis, US Fish and Wildlife Service, US Forest Service, US Geological Survey, UW Pack Forest, WA Department of Ecology, WA Department of Natural Resources, WA Department of Transportation, WA Parks and Recreation Commission
NISQUALLY
Nisqually Indian Tribe

DON'T WASTE YOUR WORK

Reduce, Reuse, Recycle Instead!

THURSTON COUNTY
WASHINGTON
SINCE 1852

Thurston County Solid Waste

Construction and demolition debris make up more than 23 percent of the garbage generated in Thurston County. Recycling and reusing materials will protect your financial bottom line and the environment!

Give New Life to Construction and Demolition Debris

REUSE BUILDING MATERIALS

Two local stores specialize in the sale of used building materials such as lumber, cabinetry, plumbing and electrical fixtures, furniture, doors, windows, flooring and more. Your donations of these items are tax deductible.

Olympia Salvage

113 State Ave. in Olympia
(360) 705-1300
www.olympiasalvage.org
Also offers deconstruction and partial salvage services to help reduce your overall project costs.

ReStore

415 Olympia Ave. in Olympia
(360) 956-3456
www.spshabitat.org
Operated by South Puget Sound Habitat for Humanity. All proceeds fund affordable housing projects.

WHERE DO I TAKE MY....?

Our database, www.WhereDoITakeMy.org, lists all the low-cost and free reuse and recycling opportunities in Thurston County.

JOB SITE RECYCLING

Recycling is much less expensive than landfilling. Contract with a hauling company to provide job-site bins. Make sure to tell the hauler that you want the materals recycled and ask for a destination receipt.

MATERIALS EXCHANGE WEBSITES

Check out these eay-to-use websites to sell or give away items. Keep an eye out for things you need and save a bundle compared to retail costs.

- www.2good2toss.com
- seattle.craigslist.org/
- www.govlink.org/hazwaste/business/imex

(360) 357-2491 www.ThurstonSolidWaste.org www.WhereDoITakeMy.org