Appendix B

Public Education and Outreach on Stormwater Impacts

CITY OF BEND

A Newsletter for Bend Citizens

PUBLISHED BY THE CITY OF BEND

JULY 2016

CONTENTS:

ANNUAL WATER QUALITY REPORT

Want to know where our water comes from, and what lab tests on our drinking water show? The City's Annual Water Quality Report is available online at www.bendoregon.gov/waterreport. Call 541-317-3000 x2 to receive a paper version, or request a copy online at www.bendoregon.gov/reportrequest.

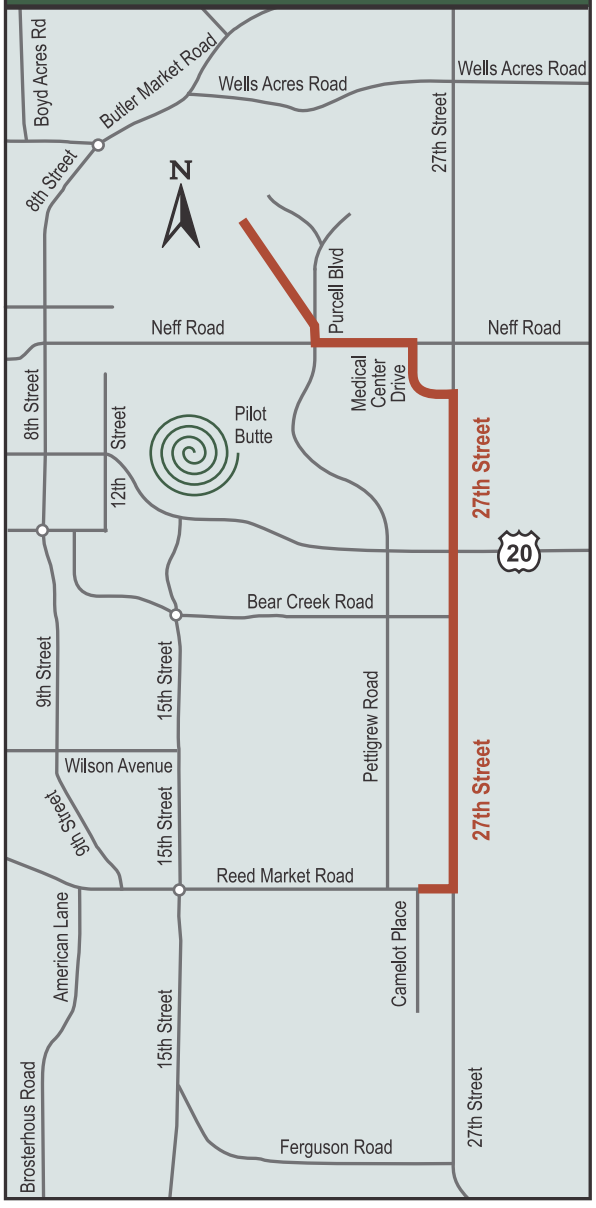
27TH STREET SEWER WORK KICK OFF

This month, the City kicks off the 27th Street sewer line project, a nearly two-year construction project that will temporarily change the way people use 27th Street from Neff Road to Reed Market Road. The City will install approximately two miles of sewer main under 27th Street and repave the entire stretch of road.

During construction, traffic along 27th Street north of Bear Creek Road will be reduced to one lane of traffic going each direction. The segment south of Bear Creek Road will be reduced to one lane of traffic, southbound only. The project will progress in segments, and each segment will have impacts on different neighborhoods, businesses and services.

The sewer line is a much-needed project that will relieve sewer capacity issues throughout the City and create the availability of sewer service to currently unsewered properties. Learn more at www.bendoregon.gov/sei.

27TH STREET SEWER LINE PROJECT MAP



CITY OF BEND

UTILITY RATE INCREASES

Ratepayers can expect to see changes in their bills starting in August 2016. Each year, the City reviews its revenue needs to pay for your water, sewer and stormwater utilities. Rates are based on those revenues needs.

Increases are typical to cover inflation on capital improvement projects, ongoing operations and maintenance, and additional state and federal regulations. Bend's utilities expect general inflationary costs at 2 percent for water and 3 percent for stormwater utilities this year. The City is also building major sewer lines which creates a need for a 6 percent revenue increase for sewer.

Increases affect ratepayers' bills differently because of rate structure changes implemented in 2015. All customers now pay a base charge and a volume charge for both the sewer and water usage. Sewer volume is based on average winter water consumption. To improve equity among ratepayers, commercial businesses that discharge wastewater that is tougher to treat, such as breweries, pay a higher charge than residential customers.

DESCHUTES RIVER CLEANUP: STREAM STEWARDSHIP DAY

Stream Stewardship Day is an opportunity for the community to remove trash, pull weeds and restore the Deschutes River. The Upper Deschutes Watershed Council and the City of Bend invite volunteers of all ages to join the annual Deschutes River cleanup on Saturday, August 6, starting at 10 a.m. at Riverbend Park. Information: Kolleen Miller at kmiller@restorethedeschutes.org.

FLAMMABLE VEGETATION TIPS

Along with summer comes dry vegetation and a high fire danger. The Code Enforcement Department would like to remind residents that it is the responsibility of every property owner or manager to reduce flammable weeds, grass, vines, brush and other vegetation on their property. If flammable vegetation is within the adjacent right-of-way, it is the owner's responsibility to remove it. Reducing flammable vegetation can confine fires to an individual property and prevent fire from spreading. Cutting or removing vegetation as close to the ground as reasonably possible will reduce risks. Contact Julie Craig at 541-388-5527 or visit www.bendoregon.gov/veg for more information.

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CITY OF BEND

A Newsletter for Bend Citizens

PUBLISHED BY THE CITY OF BEND

AUGUST 2016

CONTENTS:

SOUTH THIRD STREET PEDESTRIAN IMPROVEMENT PROJECT

The City of Bend will be improving South Third Street between Wilson Avenue and Powers Road to enhance accessibility for everyone and improve Bend's overall transportation system.

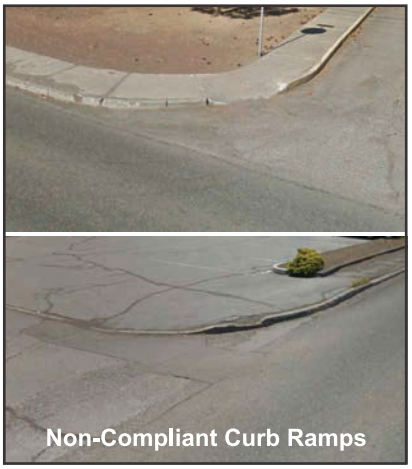
Construction will begin in the fall, halt during the winter months, and resume in March, 2017. Construction hours will be from 5 a.m. to 2 p.m. Overall project completion is anticipated in July, 2017.

Construction work will be limited to one side of the road at a time while that direction of travel will be reduced to a single traffic lane during active construction hours. Expect congestion and consider using alternative routes. Be aware of pedestrians and cyclists.

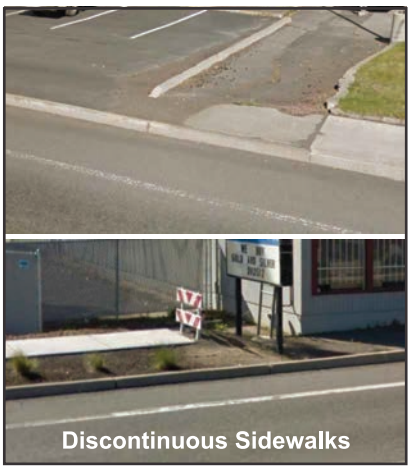
The project will provide a continuous pedestrian corridor along South Third Street. It will:

- Bring curb ramps, sidewalks, and bus stops into compliance with the Americans with Disabilities Act (ADA)
- Enhance safety and walkability
- Improve bike lanes
- Replace sub-standard infrastructure

Please check **www.bendoregon.gov/thirdstreetsidewalks** for updates.



Non-Compliant Curb Ramps



Discontinuous Sidewalks

WATER LEAK DETECTION

Locating and fixing water leaks is an important focus for the City of Bend to prevent water waste. The City's Utility Department regularly inspects for and repairs leaks throughout its water distribution system. Staff use a combination of acoustic listening devices to identify underground leaks and electronic

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CITY COUNCIL

The Bend City Council meets the first and third Wednesdays of each month. For upcoming meeting dates, agendas and more information, visit www.bendoregon.gov.

CITY OF BEND

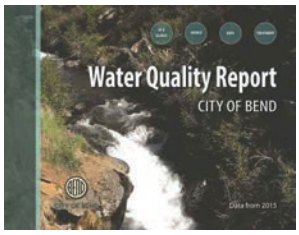
(Leak Detection... continued)

correlators to pinpoint their exact location. Once a leak location is identified, repair crews dig, isolate the leak and make the repair. These efforts help keep the City's leakage rate of 3.8 percent well below the Oregon Water Resources Department goal of 15 percent or, if feasible, 10 percent or less. Staff have identified and repaired 18 system leaks so far in 2016.

The City also monitors customer water use records using new technology that can detect potential leaks on its customers' side of the water meters. Monthly reports documenting constant water consumption are reviewed to identify potential customer leaks. Those customer accounts that are verified as likely having leaks are contacted by Finance Department or Utility Department personnel in an effort to identify where the leak is occurring and to help resolve the issue. This will save both water and money.

CURIOUS ABOUT THE QUALITY OF BEND'S DRINKING WATER?

Drinking water quality is a national concern these days, and the City is proud to announce the release of the City's Annual Water Quality Report which once again shows what high quality, safe and reliable drinking water Bend's customers have.



In 2015, the City of Bend's drinking water met or surpassed the over 130 drinking water quality standards set by the Oregon Health Authority and the U.S. EPA. In fact, Bend is proud to say that it has never violated a maximum contaminant level standard established by the EPA.

Bend's Annual Water Quality Report is at **www.bendoregon.gov/waterreport**. To receive a paper version of the report please call 541-317-3000, x2.

NEW PARKING CITATIONS

The City of Bend is issuing new parking citations to comply with Oregon Revised Statutes. The language in the citations and the process by which the city will collect overdue parking citation fines have changed.

The new citations include an arraignment date for those interested in contesting a ticket. The new citation language will also initiate a new process for residents and visitors who receive parking citations. Also, unpaid parking citations will now be processed by Bend Municipal Court.

It is the City's hope that the changes will result in a more clear process for those who receive citations. Revenue from fines collected and the sale of parking permits pay for management of the City's downtown parking district, which includes the parking garage.

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CITY OF BEND

A Newsletter for Bend Citizens

PUBLISHED BY THE CITY OF BEND

NOVEMBER 2016

CONTENTS:

CITY COUNCIL

The Bend City Council meets the first and third Wednesdays of each month. For upcoming meeting dates, agendas and more information, visit www.bendoregon.gov.

WINTER ROAD MAINTENANCE

Did you know the average snowfall in Bend is 34 inches each winter?

The Streets Department maintains 840 lane miles. When it snows, it's not possible to remove all the snow simultaneously from all streets. So here's what to expect:

When 2 inches of snow accumulates, City crews and equipment prioritize plowing a connected network of high-volume streets primarily for emergency service operations – major roads such as Third Street, 27th Street, Mt. Washington Drive and Reed Market Road. Then crews focus on routes to medical facilities, schools, major employment centers and places that need special attention such as steep hills or curves. **After 6 inches of snow accumulates**, the City may call private contractors to plow residential streets if necessary.

If the weather **forecast calls for icy conditions**, crews apply magnesium chloride ahead of time to prevent ice buildup. On the newest roundabouts, materials are still curing so deicer is not applied during the first winter season. In these roundabouts, crushed rock is applied for traction, so use extra caution. On hills, intersections, curves, corners and other problem areas, the City spreads crushed rock for traction.

There are many factors that affect the City's snow and ice operations, including how hard it's snowing, how wet the snow is, the time of day and duration of the storm. It's our goal to keep traffic flowing in a safe and orderly fashion. Drive with patience and give yourself extra time when it snows.

For more information on our Snow and Ice Control Plan, visit www.bendoregon.gov/streets.

CITY OF BEND

"URBAN DROOL" PREVENTION

Have you ever wondered how the City prevents and minimizes pollutants (aka "urban drool") from getting to the Deschutes River or our underground drinking water supplies?

Each year, the City prepares a detailed report for the Oregon Department of Environmental Quality outlining our pollution prevention activities, which include public education, illicit discharge detection and elimination, construction activities, City maintenance work and underground drinking water protections and more.

Ten years' worth of annual reports, including the most recent, from July 1, 2015 through June 30, 2016, can be found at **www.bendoregon.gov/stormannualreport**. Contact Wendy Edde, Stormwater Program Manager at 541-317-3018 for more information.

Remember: ***Only rain in the storm drain!***

DID YOU KNOW...

City Code requires businesses and residents to clear snow from sidewalks within six hours of a snowfall? That ensures that Bend residents can access sidewalks and bus stops even in the winter.

SANTA EXPRESS

Annually, the Santa Express collects an average of 3,000 pounds of food for The Salvation Army, which provides food during the holidays to hundreds of Bend and Central Oregon families.

Fire trucks will travel through Bend neighborhoods December 5-8, with volunteers (and Santa himself!) helping to collect food, clothing and toys. All the toys go to kids who may otherwise go without. Donations can also be dropped off at locations around town.

Santa Express driving routes and drop locations: **www.bendoregon.gov/santaexpress**.

Anything helps - one can of food or a small toy. The Salvation Army reminds everyone that there's a need for gifts for teenage kids as well.

The Santa Express is a collaboration of the Bend Firefighters Association and Bend Fire and Rescue to help The Salvation Army collect non-perishable food items, clothing and toys for needy families in Bend and Central Oregon.

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CITY OF BEND

A Newsletter for Bend Citizens

PUBLISHED BY THE CITY OF BEND

JANUARY 2017

CONTENTS:

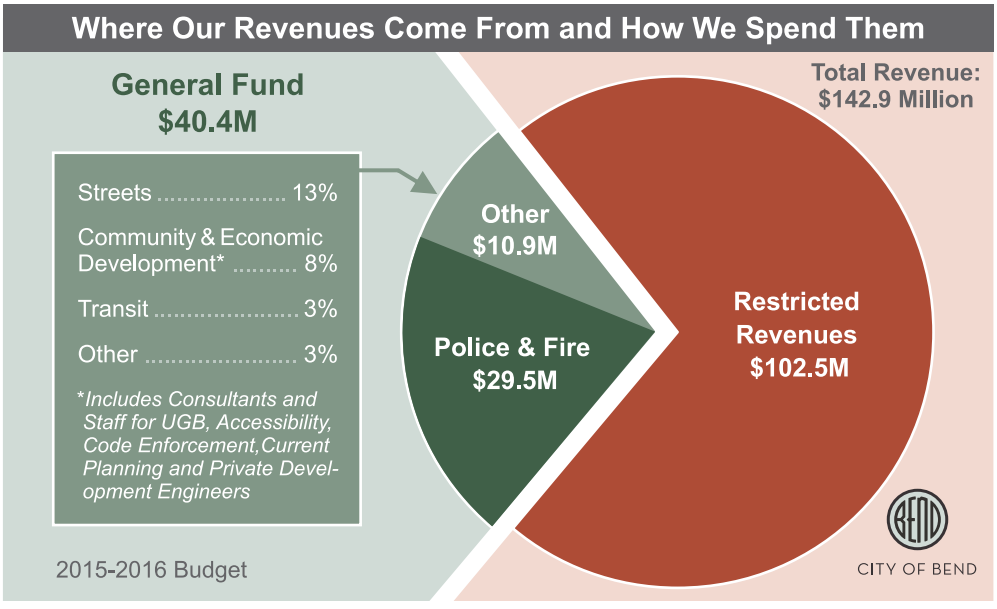
HOW THE CITY BUDGET WORKS

The City provides many crucial programs and services to the citizens of Bend, including: police, fire and emergency medical services, sewer, water, street maintenance, planning, building inspections, and the administrative support needed to make it all happen. These services are paid for primarily through taxes, fees and charges.

More than 2/3 of the annual revenue the City receives is restricted for a specific purpose. For example, money from the monthly utility bills (water, sewer, storm-water) you pay must be used to maintain and operate those systems. Revenue received from system development charges (also known as impact fees) that a builder or developer pays when acquiring a permit for new construction can only be used to build projects that are needed for growth associated with the project; those funds can't be used for maintenance.

The other approximately 1/3 of the annual revenue makes up what's called the General Fund. A significant portion of the General Fund comes from property taxes. The City Council has the most discretion over spending in the General Fund. Over 2/3 of the General Fund is dedicated to police and fire services.

The new City Council will develop its goals this spring, which will be incorporated into the budget process for the next biennial budget that will be adopted in June 2017.



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CITY COUNCIL

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CITY OF BEND

(How the City Budget Works, continued)

Property taxes make up the largest revenue source in the General Fund. But in the 1990s, state Measures 5 and 50 established limits on Oregon's property taxes. The City's permanent tax rate of $2.80 per $1,000 of taxable assessed property value cannot be increased. Also, the taxable assessed value upon which that rate is applied can go up no more than 3 percent per year.

For each dollar you pay in property taxes, about 21 cents goes to the City of Bend to pay for City services. But there are other separate taxing districts that provide other services such as schools, parks, health and human services and library services.

Each property tax dollar you spend is allocated to the various taxing districts within the city limits, and is divided into many segments as illustrated by this chart. More information: **www.bendoregon.gov/budget**

BEND IS A BIKE FRIENDLY COMMUNITY

The League of American Bicyclists recently named the City of Bend as a Bicycle Friendly Community. Bend's efforts to build a safe, biking-friendly community include a:

THE LEAGUE OF AMERICAN BICYCLISTS — BICYCLE FRIENDLY COMMUNITY

- Collaborative, intergovernmental approach
- Comprehensive Plan for sustainable, compact urban development, over sprawl
- New bike facilities, such as the Colorado Avenue trail undercrossing, more than 10 miles of new bike lanes, buffered bike lanes and parking protected bike lanes
- Plan to build Neighborhood Greenways on existing residential streets so that everyone can walk and bike without being on busy roads

Bend is one of only 73 cities in the country with this designation.

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CITY OF BEND

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MARCH 2017

CONTENTS:

MULTI-FAMILY HOUSING HELPS ADDRESS HOUSING NEEDS

As the seventh-fastest growing metro area in the U.S., Bend needs to accommodate a greater number and variety of housing that accommodates all income levels.

The recently-approved Urban Growth Boundary (UGB) growth plan includes a Housing Needs Analysis that identifies types of housing that would meet our growing needs. Currently, about 21 percent of Bend's housing is multi-family (duplexes, triplexes and apartments). The analysis says Bend needs 35 percent of our supply to be multi-family. Info: **www.bendoregon.gov/BendUGB**.

The City is responding to the changes in this dynamic community and moving that direction. Since 2014, Bend has seen an increase in the number of multi-family housing units. In 2016 alone, developers built more than 290 multi-family units.

This will improve access to housing. Additional multi-family developments help make housing more available and less expensive. Even at market rate, new multi-family developments help increase availability, which drives down costs and creates more affordable accommodations.

Bend's Affordable Housing Program also plays an important role in increasing availability. Affordable housing is defined as housing for families at or below 80 percent of the median household income - which is $59,400 in Bend. The City's nationally-recognized program encourages developers to invest in building affordable housing. Info: **www.bendoregon.gov/affordablehousing**.

FUN FILM CONTEST FOR KIDS WHO CARE ABOUT CLEAN WATER

As part of the City's Clean Water Works water quality improvement program, the City is inviting all 5th through 12th grade students to submit short entries in a video contest. The Utility Department is looking for 30-second spots themed "Clean Water Works." The videos should the effects of pollutants

(continued on back)

Come See Us at the Earth Day Fair!

Come fill your water bottle with some of the City's award-winning water and visit with staff at the City of Bend booth at The Environmental Center's 2017 Earth Day Fair. The fair takes place Saturday, April 22, 2017, immediately after the parade, which begins at 11:30 a.m. The City booth will be on Kansas Avenue.

CITY OF BEND

(Fun Film Contest for Kids Who Care About Clean Water, continued)

and how to reduce them in our storm drains and waters.

Cash prizes await! And, for the budding videographer, this is a unique opportunity: the grand prize winner will have the opportunity to work in-studio with Zolo Media to help turn their winning entry into a professional public service announcement. The final product will get recognized at the BendFilm Festival.

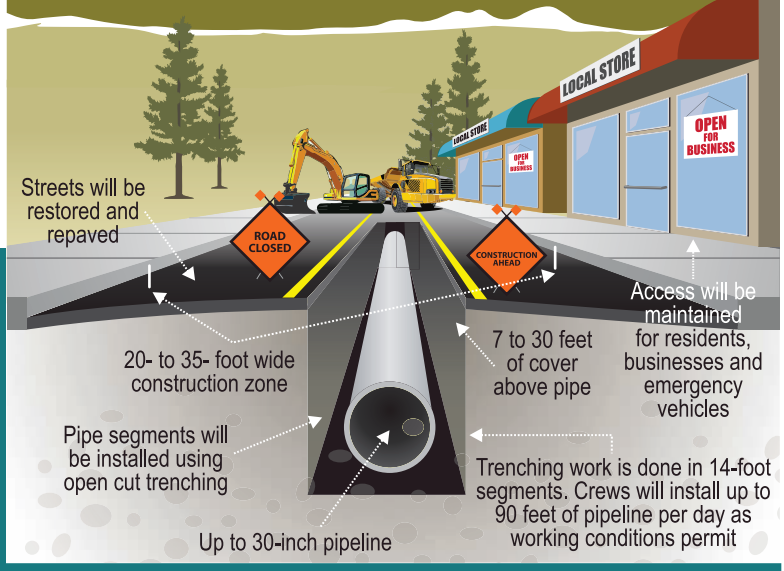
This public-private-non-profit partnership is a terrific opportunity for students interested in film or television. Contest details and a downloadable kid's activity guide are available by clicking on the kid's page of the City's Clean Water Works program: **www.bendoregon.gov/cleanwaterworks**. Entries are due by April 29.

27TH STREET SEWER LINE UPDATE

The ongoing construction of the 27th Street Sewer Line has been focused most recently around the Neff Road area. The project is part of the multi-phased Southeast Interceptor, an underground 30-inch gravity sewer line that will convey wastewater to the Water Reclamation Facility. The pipeline relieves capacity issues around Bend. By building a gravity pipeline, the City can decommission up to 24 sewer pump stations, which saves energy and provides long-term reliability in this essential service.

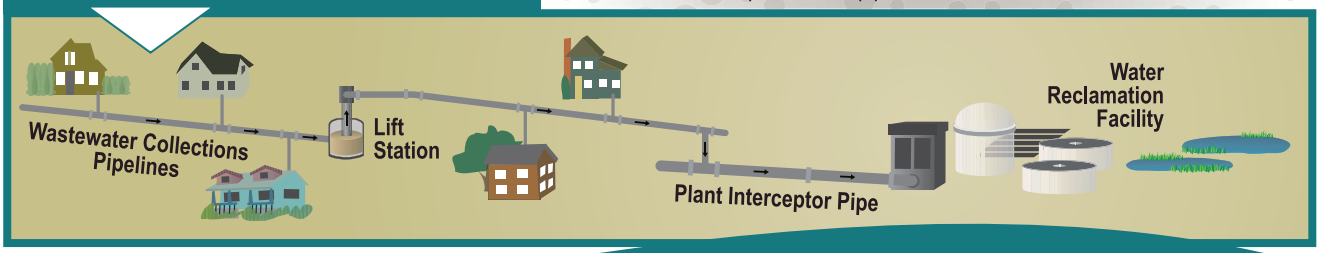
The City of Bend protects drinking water sources, public health and the environment by conveying and treating wastewater. The Southeast Interceptor sewer line is expected to be in service in early 2018, with completion of roadway paving in July 2018.

Here's what happens during construction:



Where does the sewage go after it leaves my home or business?

To protect public health and the environment, sewage travels through a network of buried pipelines and pumps (the sewer collection system) to the water reclamation facility northeast of Bend. It is cleaned before being returned to the environment.



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(Spring Into Savings – Water Is Not All You Save, continued)

Water conservation staff will conduct regular surveys throughout the 2017 growing season to help identify water wasted through irrigation overspray and runoff. Although the amount of water that ends up on the street may seem minimal, it adds up to serious waste, can wash debris or pollutants into storm drains and can pose safety risks to pedestrians and bicyclists.

If you have an irrigation system that irrigates the street, now is the time to consider water efficient alternatives.

THE CITY STRIVES TO PROTECT THE DESCHUTES RIVER

The Deschutes River in Bend is federally listed for sediment and turbidity - pollutants of concern. Excess sediment in the river can harm fish and wildlife by burying spawning areas, clogging gills and making water cloudy so fry cannot find food.

Much of the Deschutes River sediment is related to bank erosion due to river level fluctuations, but additional sediments, such as construction or landscaping soils and debris, or traction sand on the roads, can also run off of streets during rain storms and end up in the river.

The City recent hired a Stormwater Utility Program Compliance Specialist to help inspect construction sites to better control sediment. The City is also improving its sweeper program and boosting sediment prevention education.

Recently, several local construction and engineering-related businesses joined City staff in earning a Certified Erosion and Sediment Control Lead certification to become proficient in preventing soil sediments from moving off construction sites. All construction sites within Bend are required to keep sediments on site.

CELEBRATE DESCHUTES COUNTY HERITAGE IN MAY

May is National Preservation Month. The Deschutes County Historical Society, Deschutes County Historic Landmarks Commission, Redmond and Bend Landmarks Commissions, the Tower Theatre Foundation, the Deschutes Land Trust and other volunteers partner each year to celebrate the many ways that historic preservation enhances our quality of life.

There are many ways to celebrate our area's heritage. Visit **www.deschuteshistory.org** for a complete list of events taking place all month.

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CITY OF BEND

A Newsletter for Bend Citizens

PUBLISHED BY THE CITY OF BEND

JUNE 2017

CONTENTS:

CITY COUNCIL GOALS

The Bend City Council 2017-2019 goals that help shape the proposed two-year budget are:

- Implement a growth plan that is consistent with community goals for the economy, environment and affordability
- Move people and products around Bend efficiently, safely and reliably
- Increase affordable housing options
- Keep residents safe with innovative and cost-effective public safety services
- Modernize and professionalize how City government operates

More detailed objectives that support the goals can be found at **www.bendoregon.gov/citycouncil**.

These goals represent a renewed focus on essential core services: public safety, investment in infrastructure such as roads and sewer systems and community and economic development.

Council goals help drive decisions about how to invest discretionary funding. The entire 2017-2019 budget, which gets adopted in June, can be found at **www.bendoregon.gov/budget**.

STREET FUNDING

Efforts continue to improve road conditions and build new transportation facilities to help reduce congestion, improve safety and provide more choices for users. This is reflected in the proposed 2017-2019 budget with:

- *Approximately $5.7 million of annual funding for street preservation.* Through a multi-pronged strategy, additional one-time funding has been reallocated to improve street conditions during the next biennium.
- *$10 million for Empire Avenue and $10 million for the Murphy Road corridor in the five-year Transportation Capital Improvement Program*. The budget allows for the design of a roundabout at Purcell Boulevard and Empire Avenue and improvements to the Purcell Canal Bridge and the Purcell intersection at Butler Market Road. The budget also includes Citywide Safety projects such as pedestrian crossings on Third Street and improving sections of 14th Street.

eNews

Stay informed and get City news, information, Weekly Road and Traffic Reports and more, delivered right to your inbox. Sign up for eNews at **www.bendoregon.gov/enews**.

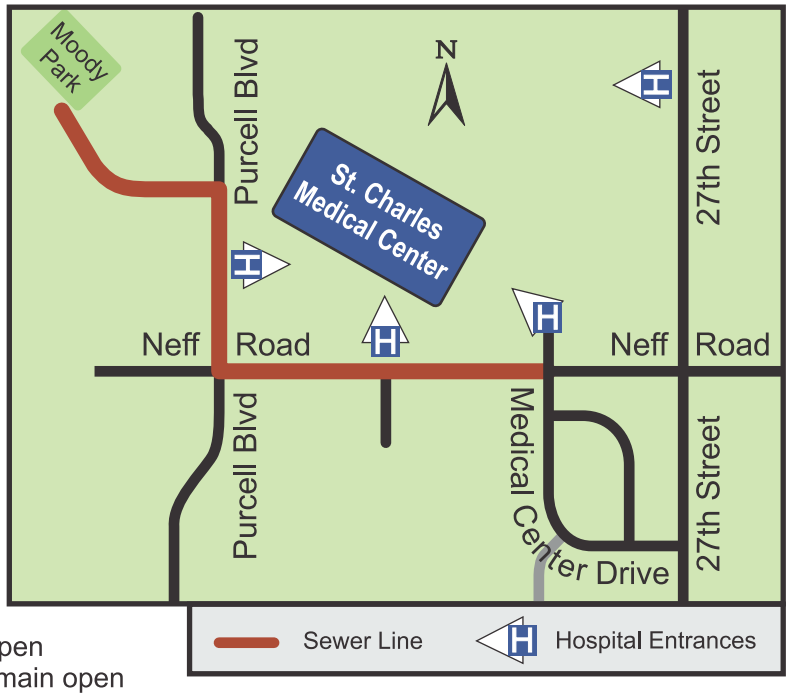
CITY OF BEND

NEFF / PURCELL SEWER LINE SEGMENT

Construction of the Neff Road and Purcell Boulevard segment of the Southeast Interceptor, a multi-phased sewer line project, is expected to begin in July and last through April 2018. Construction of this segment will be completed in phases to reduce impact on area residents and local traffic.

This segment runs under Neff Road from Medical Center Drive to Purcell Boulevard, under Purcell Boulevard to the north and then west to Moody Park.

Questions? Contact Ron Hand at rhand @dowl.com or Jessica MacClanahan, jmacclanahan@bendoregon.gov. More info: www.bendoregon.gov/SEI.



The pipe project relieves capacity issues in the southwest, southeast, northeast and central areas in Bend, allows the City to decommission up to 24 sewer pump stations and creates availability of gravity sewer service to a significant number of unsewered properties. During construction:

- Traffic detours will be posted
- Follow H signs to get to the hospital
- Access to all businesses will remain open
- Access for emergency vehicles will remain open

CLEAN WATER WORKS

The City of Bend Clean Water Works program recognizes businesses and organizations that help protect our underground and surface water quality.

In turn, the business partners offer discounts to area residents and visitors using the Clean Water Works discount card. Print your discount card from the "DISCOUNTS + PARTNERS" link at www.bendoregon.gov/cleanwaterworks.

Seventeen organizations are participating. This year's campaign targeted food service, carpet cleaners, construction contractors, commercial car washes, clean water volunteers, landscape professionals, pressure washers and recreational vehicle dealers.

Results from prior campaigns showed an increase in concern for water pollution prevention and better understanding of our stormwater system. Partners also said the program made their employees think about the importance of protecting water quality.

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Proper Disposal of RV Wastes
Protecting Oregon's Treasures

Recreational Vehicle Waste Disposal Stations are readily available. Please use them and these tips to protect human health, our waters, and your pocketbook!

WHAT TO DO / WHAT NOT TO DO

- Do not dump to a storm drain.
- Wastewater must be held in a watertight and sanitary container, and dumped ONLY in a designated wastewater sump, a flush toilet, or a holding tank dump station.
- Do not drain wastewater onto the ground or into an open container.
- Do not dump into pit toilets or sealed vault toilets.
- Close blackwater tank valves and dump when it is equal to or more than half full. Dumping when less than half full can cause improper system operation.
- Use the graywater tank to help clear the hose after flushing the blackwater tank.

It's the Law

It is illegal to dump RV waste to streets and storm drains. Improper disposal can result in fines and traffic violations.

Oregon Law: "No person shall operate a recreational vehicle which is equipped with a plumbing, sink or toilet fixture upon any public way while the disposal system is unsealed or uncapped unless said disposal system is being discharged into or connected with a sewage disposal system approved by the State Board of Health." ORS 815.260

WHAT TO USE / WHAT NOT TO USE

- Use a tank flushing device (not a potable water hose) each time after dumping your holding tank.
- Use only treatments or deodorizers recommended by the manufacturer.
- Do not use bleach to treat or "sweeten" a tank; bleach damages valves, seals, and gaskets.
- Products such as formaldehyde also harm waste disposal systems.
- Products labeled "biodegradable" are not necessarily safe for the environment or humans.
- Choose environmentally safe products in holding tanks, such as enzyme or bacterial-based products. Follow directions carefully, and dump your holding tanks often to reduce the need for tank treatments and deodorizers.

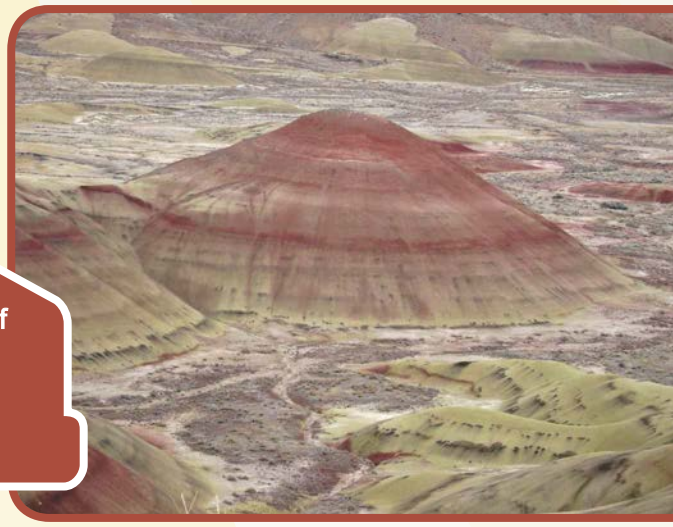
PLACES FOR RV WASTE DISPOSAL

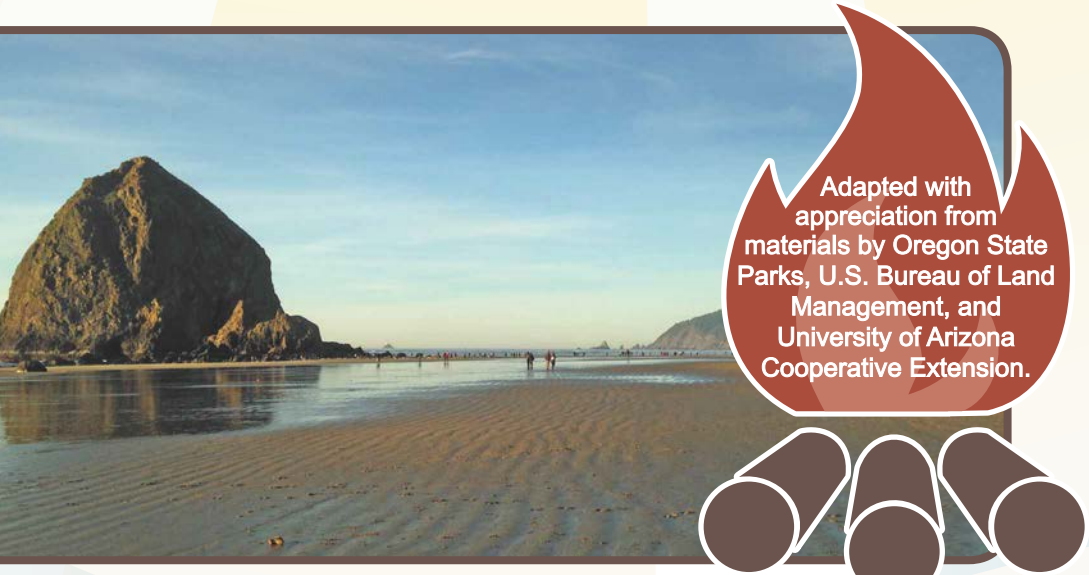
- 27 Oregon State Parks
- 3 Oregon Department of Transportation (ODOT) rest areas
- Private RV parks
- Many service station truck stops
- Several municipal water reclamation facilities (sewage treatment plants)

FIND SPECIFIC RV DISPOSAL STATIONS

- ODOT Trip Check
  www.tripcheck.com/Pages/RArv.asp
- RV Dump Stations
  www.rvdumps.com/oregon/
- Sanidumps
  www.sanidumps.com/sanidumps_usa.php?id=51
- Oregon State Parks offices and materials
  www.library.state.or.us/repository/2010/201012091601164/2007.pdf
- Local Oregon Automobile Club (AAA) offices and Chamber of Commerce Visitor Centers may also be of assistance.

Proper disposal costs are free or nominal.





Adapted with appreciation from materials by Oregon State Parks, U.S. Bureau of Land Management, and University of Arizona Cooperative Extension.

BEND
UTILITY DEPARTMENT
62975 Boyd Acres Road
Bend, Oregon, 97701

541-317-3000
FAX: 541-317-3046

www.bendoregon.gov/cleanwaterworks

CLEAN WATER WORKS
BEND
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Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, or electronic, please contact 541-317-3000 opt. 2 or email utilities@bendoregon.gov.

Landscape Maintenance
For Healthy Waters and Happy Customers

The work you do is important. It can uplift peoples moods, invigorate their beings, even improve their health. Working in this field, it is obvious that you are in touch with the earth, with nature, and with people. Extending that care to protecting our life-giving waters is only natural.

Did you know that pesticides, herbicides and fertilizers, large debris, even soils can all pollute our streams, rivers and our underground drinking water supplies?

They increase the sediment deposits in our streams and rivers, clogging fish gills and disturbing oxygen levels in the water.

Yard debris such as grass, leaves, pine needles, and soils that are in the road can plug storm drains.

Pesticides & Fertilizers Best Management Practices

- Minimize chemical use. Use possible mechanical and biological controls where appropriate.
- Purchase only the amount of pesticides and fertilizer that you need for your site.
- Use pesticides, herbicides and fertilizers according to the manufacturer's recommendations. Read labels carefully; follow all instructions. Apply spot treatments.
- Use slow-release fertilizers to prevent wash off; consider using organic products.
- Do not apply pesticides, herbicides or fertilizers under windy conditions or when rain is predicted within the next 48 hours.
- Sweep up overblown product.
- Dispose unused material as hazardous waste.
- Store fertilizers and other chemicals under cover to protect from wind and rain.

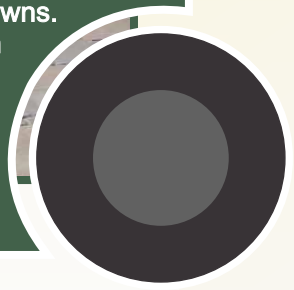
Water-Front Landscaping Best Management Practices

- Use a buffer strip of native plants between the waterway and the yard to filter out pollutants.
- Do not burn near the water's edge.
- Consider planting trees and shade plants near water's edge to help keep the water cool.

Fortunately there are simple steps that you can do to help protect both human and natural health.

Landscape Maintenance Best Management Practices

- Use all reasonable measures to reduce pollutants from entering storm drains (e.g., litter, fertilizers, etc.).
- Never stockpile landscaping material (e.g. dirt, bark dust, sand and gravels) in the roadway.
  - Properly compost or dispose of debris daily; or place in the yard waste container (provided by your local garbage company) or haul to the landfill.
  - Inspect and clean the landscaped storm drainage facilities (e.g., rain gardens, bio-retention, swales) as needed (inspect at least twice a year) to ensure they operate as originally designed.
  - Do not blow trash, yard debris, soil, or dust into streets or gutters.
  - Mow lawns high–aim for 3 inches to promote a healthier lawn with less need for fertilizer.
  - Consider using a mulcher lawn mower to provide natural food sources for lawns.
  - Make sure slopes are planted with dense ground covering plants to prevent erosion.
    - No irrigation overspray or runoff.



Compost yard debris

Sweep up excess fertilizer

Pull noxious weeds

Don't blow or dump yard debris in the roadway

Don't let landscape water runoff into the roadway

Consider becoming an Ecobiz certified landscaper.
Visit www.ecobiz.org to learn more.

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www.bendoregon.gov/cleanwaterworks

CLEAN WATER WORKS
We work for clean water

Looking to Hire a Landscape Maintenance Service?

CLEAN WATER WORKS
We work for clean water

When interviewing, ask your landscape maintenance contractor to commit to using these best management practices (BMPs) to help protect our waters, our environment, and those you love!

Healthy Waters

Healthy Families

Healthy Plants

Properly compost or dispose of debris at the end of each work shift.

Landscape chemicals and debris can pollute our streams, rivers and our underground drinking water supplies.

Avoid runoff.

Inspect and safely clean the onsite landscape storm drainage facilities (e.g., rain gardens, bio-retention, swales) to ensure they operate as originally designed.

Do not blow or sweep trash, yard debris, soils, chemicals or dust into streets or gutters. Collect it and properly dispose.

Mow high–aim for 3 inches.

Purchase the least amount of landscape chemicals needed for your site.

Check local rules! Never stockpile landscaping material (e.g., dirt, bark dust, sand and gravels) in the roadway unless your municipality allows it.

Adjust sprinklers to minimize irrigation overspray.

Store fertilizers and other chemicals under cover.

Use integrated pest management practices.*

Keep pollutants (e.g., litter, fertilizers, soils, mulch, etc.) from entering storm drains.

Roots hold soils in place. Plant slopes with dense ground covering plants to prevent erosion.

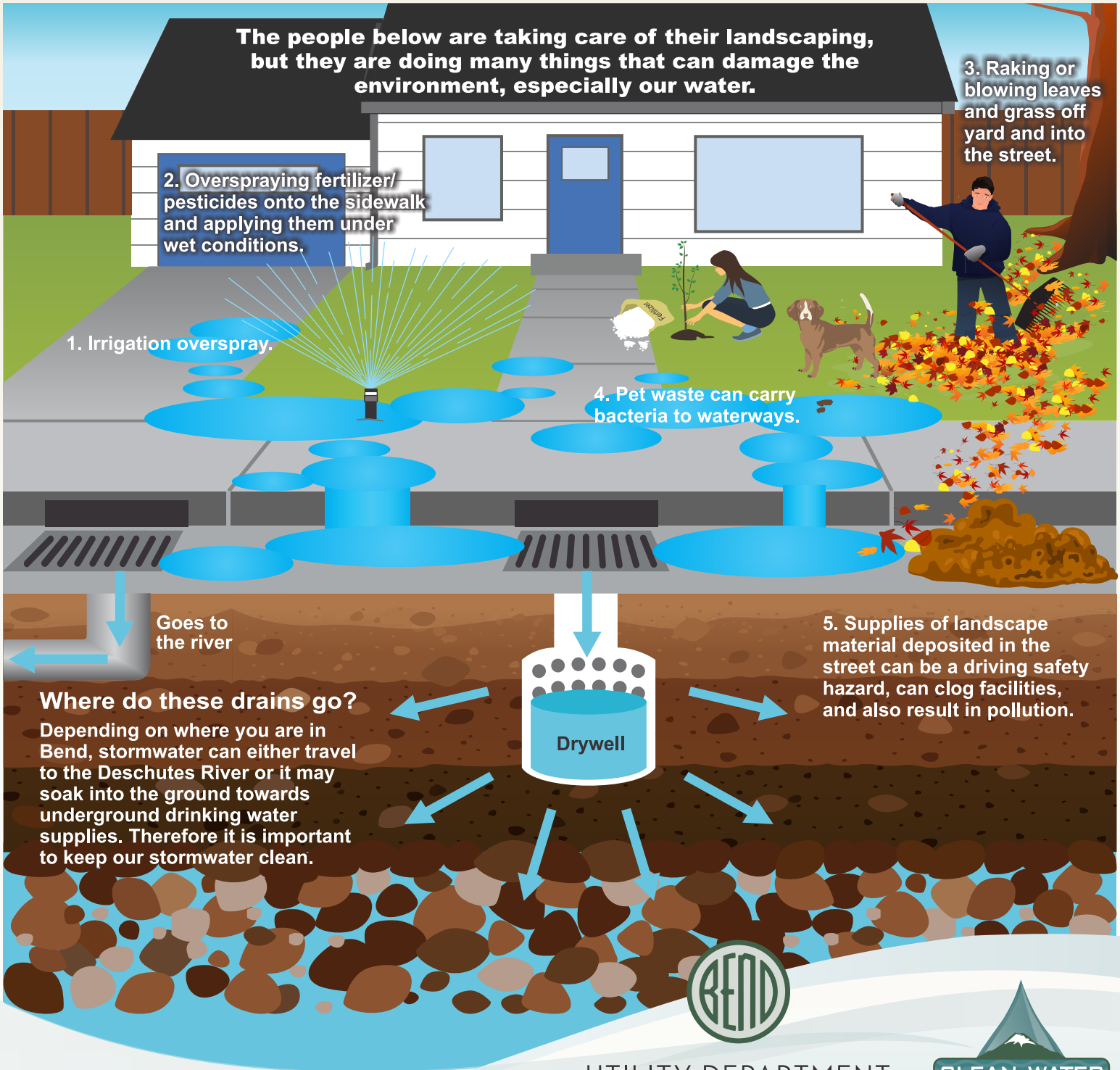
*See http://ecobiz.org/wp-content/uploads/LANDSCAPE.pdf

Why Bother with Best Management Practices?

Best Management Practices (BMPs) are designed to protect both our river and underground drinking water quality, and prevent clogging of stormwater facilities. While it may not seem like much, implementing BMPs can really make a positive difference to help protect our waters, properties, and public health.

Do not apply pesticides, herbicides or fertilizers under windy conditions, or when rain, snow, sleet or hail is predicted within the next 48 hours.

SUN	MON	TUE	WED	THU	FRI	SAT
✔	✔	✘	✘	✘	✘	✔



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CLEAN WATER WORKS
We work for clean water

Pressure Washing and Surface Cleaning for Clean Water

Pollutants of Concern: Oil, Sediment, Metals and Phosphates (Soap)

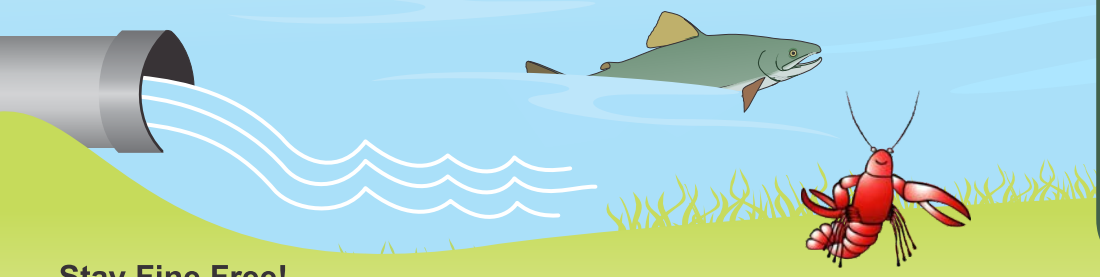
What Is the Problem?

Although convenient for cleaning surfaces and equipment, pressure washing runoff can release oil, soap, chemicals, metals, sediment and grime that are harmful to nature into the storm drain system. In Bend most storm drains have minimal treatment and drain directly toward the groundwater we all drink or the Deschutes River.

- Sediment clouds the water, hurts aquatic plant growth and clogs fish gills.
- Even biodegradable soaps rob water of life-giving oxygen.
- Household hazardous wastes, like pesticides, paints, solvents, and auto fluids that runoff from driveways and other outside surfaces can poison aquatic life. Animals and people can become sick or die after consuming polluted water or fish.

What Can You Do as a Bend Resident? Plan Before You Spray.

- Use dry cleanup methods first (sweep, blow, vacuum). Dispose of debris in the trash.
- Soak up oil and fluids using absorbents (cat litter, sawdust, sand) and dry-cleanup methods before washing. This, too, can go in the trash.
- Direct pressure washing runoff into a lawn or landscaped areas away from the storm drain system. Do not allow runoff to enter the stormwater system.



Stay Fine Free!

Polluted discharges from any property that enter a storm drain system are considered an illicit discharge violation.

Additional Resources

Illicit Discharge Minimization Best Management Practices Manual
www.bendoregon.gov/idmanual

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What to Know Before You Power Wash

CLEAN WATER WORKS
We work for clean water

Power washing releases oil, soap, chemicals, metals, sediment and grime that are harmful to people, pets, wildlife and water. Don't just "wash it away." Plan ahead before you start.

- Be sure you know how to operate your pressure washer safely. Use protective gear.
- Soak up oil and fluids using absorbents like cat litter, sawdust or sand.
- Sweep up and dispose of loose debris in the trash.
- Never direct wash water or debris to a gutter or storm drain.

- Direct runoff to a lawn or landscaped area away from the storm drain system.
- Use a wet vacuum, containment pad, or small sump pump to collect wash water in the lowest spot and pump to landscaping or a container for later disposal.

Protect our drinking waters, rivers and streams.

BEND

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UTILITY DEPARTMENT

March 22, 2017

62975 BOYD ACRES RD.
BEND, OR 97701
541-317-3000 opt. 2
Relay Users Dial 7-1-1
541-317-3046 fax
bendoregon.gov

RE: Clean Water Works Partnership Opportunity

Dear Pressure Washer Rental or Sales Business:

The City of Bend Stormwater Utility would like to partner with you to help keep our waters clean. If you appreciate clean water *and* business enhancement, please consider this voluntary opportunity. The City of Bend is undertaking an exciting incentive-based watershed campaign entitled Clean Water Works. Please see our website at: bendoregon.gov/cleanwaterworks. Here you can see that we have both educational and partnership aspects to the campaign.

We are seeking to support recreational vehicles businesses that are working to keep our waters clean. We have selected Recreational Vehicles Sales and Service businesses within the City of Bend as potential Clean Water Works Partners. Should you choose to participate, the City would like to reward you by providing the following promotional materials:

➢**Promotion** on our "Discounts and Partners" page on our website (bendoregon.gov/cleanwaterworkspartners) and by other electronic media means (e.g., mention on Facebook, Twitter, or radio advertisements). We will actively encourage people to visit this page beginning from April through December, 2017 and likely beyond. The campaign will include: TV, radio, print, events and social media.

➢**Decal—**The City will provide you a Clean Water Works window decal (see image at right) to help advertise your business as one that cares about Clean Water!

➢**Discount Card**—The City will list your business and the discount of *your* choosing (e.g., $1 off or 5% off) on our website "Discount and Partner" page, and if you respond by April 9, 2017 we will list your business and discount on the back of our discount cards on a first come/first served basis that we will print and distribute at outreach events throughout the 2017 campaign and mention your business in a Clean Water Works partner radio advertisement. The discount card will also be available on line for your customers to print. (See back for an example discount card layout.)

- **Employee Giveaways**—The City will provide you and your employees (should you wish) Clean Water Works Partner logo-ed products for your enjoyment.

- **Display Holder Promotion(s)** for your waiting room(s) with a Clean Water Works Partner outreach sheet promoting your participation as a company that cares about clean water to your customers.

The partnership works like this—if you meet the following basic steps for your business category, just fill out the attached certification form and you can take part. The criteria for your business category is as follows:

- ✓ You have registered for a Bend Business license (and if you are receiving this letter, then you already have!),
- ☐ You agree to label your businesses onsite catch basins with a pollution-prevention message—good news, the City can provide a free "do not dump" storm drain marker for your use if your drains are not already marked.
- ☐ You agree to share the attached Pressure Washer fact sheet with your staff.
- ☐ You agree to share the attached Pressure Washer fact sheet with your customers, by attaching a City provided fact sheet to customer receipts (we can provide pads of fact sheets to facilitate this) –And/OR—You agree to place educational equipment tags on your pressure washers for rent / sale.
- ☐ You agree to honor the discount that you specify through at least December 31, 2017.

Just review the fact sheet, complete the short partnership form and email it to me at wedde@bendoregon.gov or fax it to 541-317-3046. You may also mail it to my attention at: 62975 Boyd Acres Road, Bend, OR 97701. Please contact me directly at 541-317-3018 should you have any questions. And remember, if you contact me by April 9, 2017, we will do our best to include your business name on the back of the Discount card, and a mention of your business on our spring partner radio/television commercials on a first come first served basis.

Remember, this is a voluntary program and a means to appreciate your interest and efforts in keeping our river and drinking waters clean! Should you have any questions or requests, please do not hesitate to contact me at the phone number or email above.

We look forward to working with you.

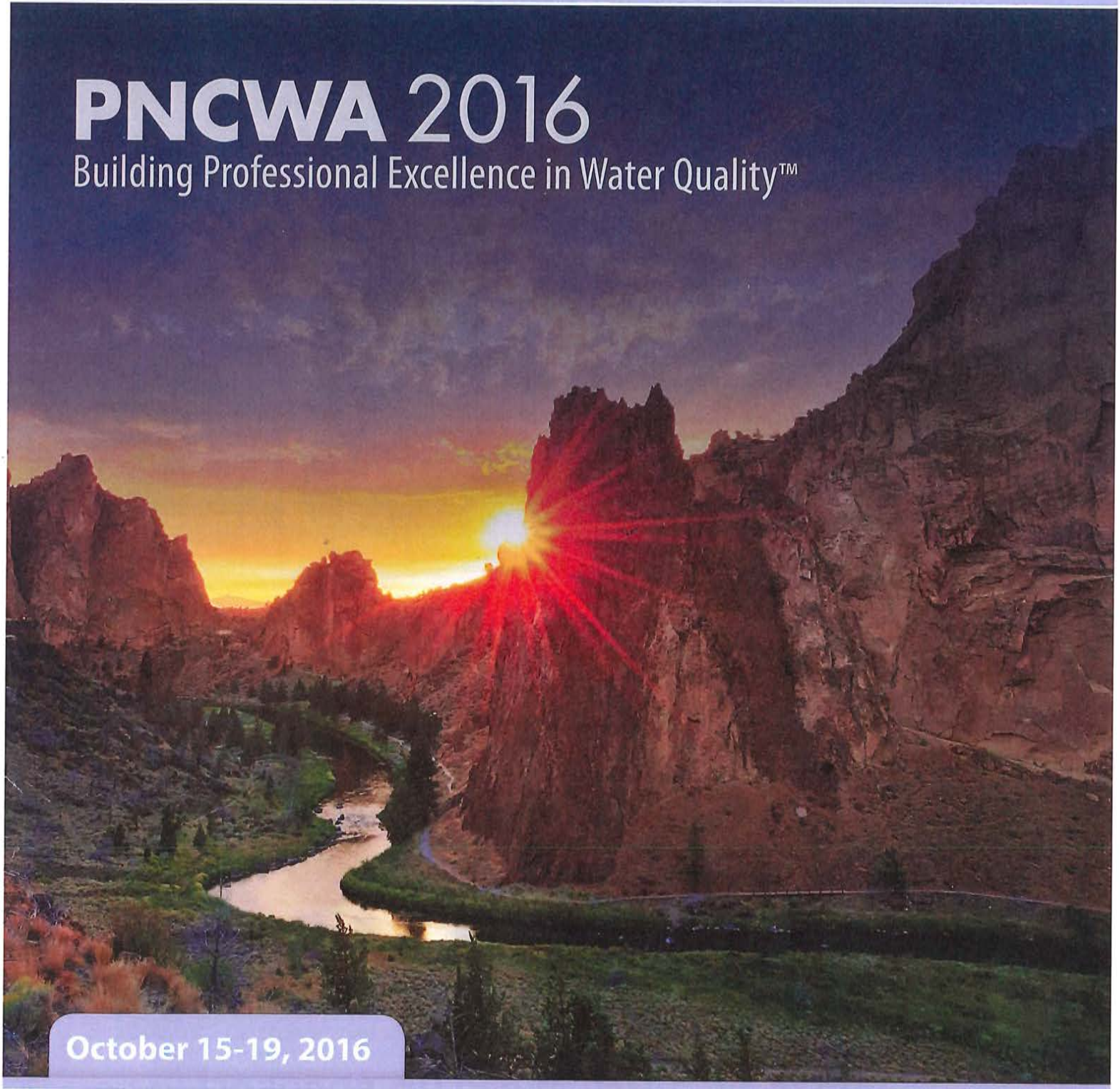
Sincerely,

Wendy Edde, CSM
Stormwater Program Manager
City of Bend Utility Department
Att: Pressure Washer (Residential) Fact Sheet, Clean Water Works Partnership form

Annual Conference & Exhibition
Riverhouse on the Deschutes
Bend, Oregon

PNCWA 2016

Building Professional Excellence in Water Quality™



October 15-19, 2016

Pacific Northwest Clean Water Association
PNCWA

wef
member association

Pre-conference Workshops

Attendance only with separate registration—not included in regular conference registration

Build a Rain Garden

Sunday, October 16 — **8:30 AM–4:30 PM**
Cost (*lunch included*): **$120 Members, $145 Nonmembers**
CEUs: **0.6 (requested)**

Sponsored by: PNCWA Stormwater Committee
Moderator: Jadene Stensland, *Clean Water Services*
Speakers: Wendy Edde, *City of Bend, OR*
Tony Gilbertson, *Clean Water Services*
Keri Handaly, *City of Gresham, OR*
Kim Reid, *formerly EPA Region 4*
Cari Simson, *Urban Systems Design*
Jadene Stensland, *Clean Water Services*

You've seen them as part of new residential or commercial development: attractively planted swales. But these vegetated depressions are more than just eye candy; they are vital pieces of green infrastructure that slow down and treat stormwater runoff from impervious surfaces and improve water quality in streams and groundwater. In this hands-on workshop we will spend the morning learning about creative opportunities in site selection, design basics, stakeholder involvement, anticipated benefits, regulatory compliance and maintenance concerns from experience. After lunch (provided), we will travel to a prepared site to move some soil and install the plants. Plan to get dirty!

More development means increased runoff from rain landing on roofs, driveways and sidewalks. This runoff carries pollutants such as heavy metals, fertilizer, oil, pesticides and pet waste into storm drains and thus into streams. Rain gardens minimize runoff flowing to or from impervious surfaces, thereby enabling pollutants to be absorbed by native plants and reducing flooding by limiting the amount of water transported directly to streams during rain storms. This replenishes ground water while helping diminish flooding in local streams. Rain gardens can cut down pollution within streams by up to 30 percent. As an added bonus, a rain garden planted with natives attracts birds, butterflies and bees.

This workshop is for design professionals, regulators, contractors or anyone with an interest in enhancing the environment, and will cover the following topics and questions:

- Why build a rain garden? You can solve drainage problems, improve water quality and meet regulatory requirements.
- Where to build? Will water infiltrate or mostly be detained and discharge?
- How to design? Materials, labor and costs. What kind of water quality improvements can be expected?
- How to get your rain garden built? Site visit and work party (tools to be provided).
- Whew! It's built! Now what? Maintenance and troubleshooting.

Best Practices in Emerging Instrumentation Technologies

Sunday, October 16 — **9:00 AM–4:30 PM**
Cost (*lunch included*): **$120 Members, $145 Nonmembers**
CEUs: **0.6 (requested)**

Sponsored by: PNCWA Plant Operations and Maintenance Committee
Moderators: Joel Borchers, *Clean Water Services*
David Gordon, *FCS Group*
Speakers: Anthony Benavidez, *CH2M*
Dan Hanthorn, *ZAPS*
Adrienne Menniti, *Clean Water Services*
Alvin Smith, *HACH*
Rob Smith, *Xylem*
Mark Walter, *Oak Lodge Sanitary District*

Emerging instrumentation technology is transforming wastewater operations. Without proper processes, procedures, and decision making, however, even the best technology may fall flat at your plant. The goal of this pre-conference workshop is to enable operators as well as managers to realize the full potential of new instrumentation technology to better serve customers and meet strategic goals. Participants will leave with a better understanding of emerging instrumentation technologies and the skills to apply these new tools to improve decision making.

There are three focus areas for this workshop:

How to be on the bleeding edge without bleeding?

New technology may have the ability to solve pressing operational challenges. But being one of the first of your peers to integrate the new technology is risky. This session will focus on methods and case studies for being one of the first to apply new technologies. Participants will learn best practices for reducing risk and realizing potential.

Integrating emerging instrumentation technology in decision making

Improved instrumentation should not result in a data-rich but knowledge-poor environment. This section will focus on utilizing new instrumentation technology to improve decision making. It will focus on real-world scenarios and highlight the importance of information sharing through operations and management.

Trends in emerging technology

What is next in instrumentation technology? How can an organization best embrace the next generation of instrumentation technology? Speakers will highlight upcoming technologies and industry trends with the goal of educating participants on what these new technologies may mean for their operations.

Facility Tours

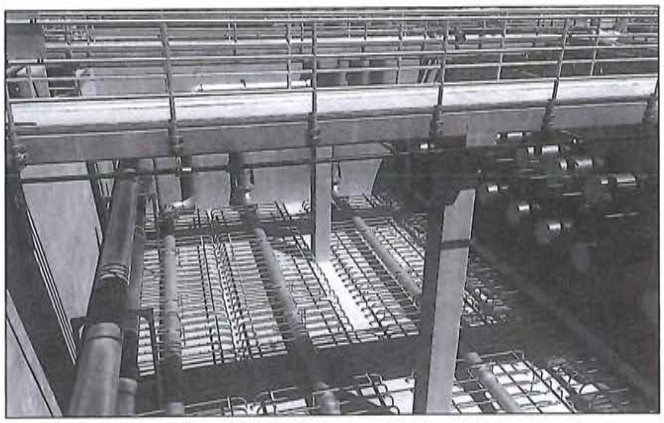
City of Bend Water Reclamation Facility Tour

Monday, October 17 **1:15 PM–3:45 PM**

The City of Bend's Water Reclamation Facility (WRF) is a conventional activated sludge plant built in 1980, with an average daily capacity of 6.0 million gallons. Presently, the City experiences an average flow of 5.5 million gallons per day. The water reclamation system is comprised of approximately 455 miles of sanitary sewer lines, 336 pump stations and serves over 27,000 customers. The WRF produces Class A recycled water, which is provided to the Pronghorn signature golf courses.

Currently, the WRF is under construction for a $60 M major expansion to meet 2030 Facility Plan requirements. Completed upgrades to the facility include a new primary clarifier, primary sludge pumping improvements, a new aeration basin and secondary treatment process, new turbo blowers, and upgraded SCADA infrastructure. Components of the project still under construction include the UV disinfection system, yard piping, solids handling and headworks improvements.

This tour will focus on a new process implementation that features an integrated fixed-film activated sludge (IFAS) process. IFAS offers the unique opportunity to provide a construction-free phasing approach for future capacity. Once this initial modification to the aeration basins is complete, the amount of IFAS media included in the reactors will determine the associated capacity of the WRF. This construction-free phasing approach allows for a "pay as you go" funding opportunity. After the initial construction phase, future capacity can be incorporated into the facility by simply purchasing additional media. IFAS offers the nitrification benefits inherent to biofilm reactors, with increased stability and improved performance during peak influent loading. This tour will also feature information about Bend's biosolids program, and the unique path taken to obtain Class A material.

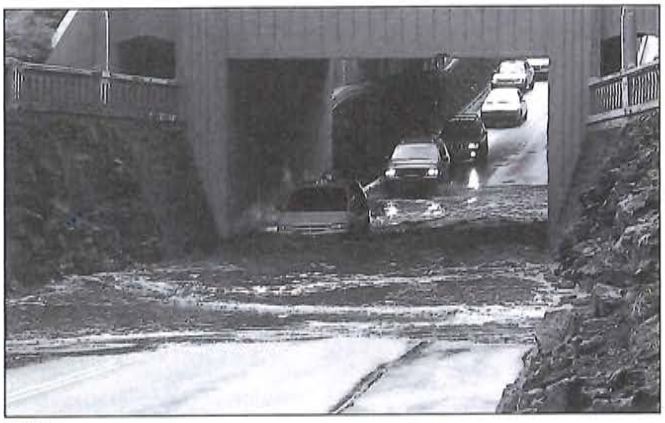


Aeration basin 4 ready for IFAS media

City of Bend Stormwater Tour

Tuesday, October 18 **1:15 PM–3:45 PM**

This tour will feature three intriguing projects that utilize low impact development (LID) to handle stormwater runoff. The first stop on this tour will be a volunteer created and maintained community garden that was developed in part to help solve localized flooding issues in a creative, useful, cost-effective manner. The second site will feature an extensive project to upgrade the Third Street underpass. This project addressed historic 50-year old flooding issues as well as replaced four critical deep stormwater drill holes, helping protect groundwater quality. The project features multiple LID techniques throughout the 56-acre drainage basin and includes a constructed stormwater pump station and infiltration basin. The third stop on this tour will feature the Bend Parks and Recreation District administration building green roof and parking lot stormwater system located at picturesque Riverbend Park.



2007 storm

Bend Parks and Recreation admin building green roof

City of Bend Colorado Lift Station and Deschutes Brewery Pretreatment Tour

Tuesday, October 18 **1:15 PM–3:45 PM**

Colorado Lift Station construction

The City of Bend is constructing the Colorado Lift Station at the north end of McKay Park along the banks of the Deschutes River. This new pump station provides improved redundancy and increased capacity for wastewater conveyance on Bend's west side. The $10.6M construction project was identified and prioritized through the City's optimized Collection System Master Plan update in 2013. The 3.9 mgd (firm capacity) pump station features dry pit immersible pumps, self-cleaning wet well, a standby engine-driven pump, a 5,660 feet long dual 12-inch forcemains, including a portion suspended from Colorado Street Bridge. The pump station design includes liquid and vapor phase odor control facilities, engine generator, site and architectural design to suit public park visibility and neighborhood context. The project is being constructed in coordination with ongoing McKay Park, Deschutes River Trail, and Bend Whitewater Park construction, and residential condominium development along the pipeline corridor. The pump station will start up in Fall 2016. The design engineer, construction manager and City of Bend Utilities staff will participate in the tour.

Deschutes Brewery is the largest craft brewer in Bend and discharges an average of 65,000 gallons per day to the City sewer. As Bend's brewing industry has grown, management of brewery waste within the wastewater system has received significant attention including modification of the City's "high strength" waste charges, efficiencies in brewing practices including water conservation, side-streaming and segregation of wastes, and recycling of spent grain. Collaboration has resulted in sharing of best practices within the Bend craft brewing community and the City's Industrial Pretreatment Program. This tour will review on-site liquid waste management facilities, liquid storage and loadout facilities, control systems, and discussion of how buildout of the Deschutes Brewery facility will be accommodated by the City's collection system. This will also include an overview of how Bend's Extra Strength Charge program was developed and implemented to help properly fund treatment of high strength wastewater.

The tour will start at Deschutes Brewery and then walk down to the pump station site. Portions of the tour may not be accessible.

Redmond Water Pollution Control Facility

Wednesday, October 19 **8:00 AM–10:30 AM**

The City of Redmond operates a 2.99 MGD (design) Water Pollution Control Facility (WPCF). The WPCF currently serves a population of 28,000, and over 9,000 customers. The wastewater division has 137 miles of sewer mains and 13 sewage lift stations. The WPCF utilizes an oxidation ditch process, which produces Class C Recycled Water. The City operates an irrigation site, farming 146 acres of orchard grass, utilizing recycled water and biosolids as a soil amendment. New process control improvements to WAS systems will be covered along with the implementation of real-time monitoring of influent and effluent through the use of a new technology that has the ability to monitor multiple process parameters through one probe.

Redmond WPCF

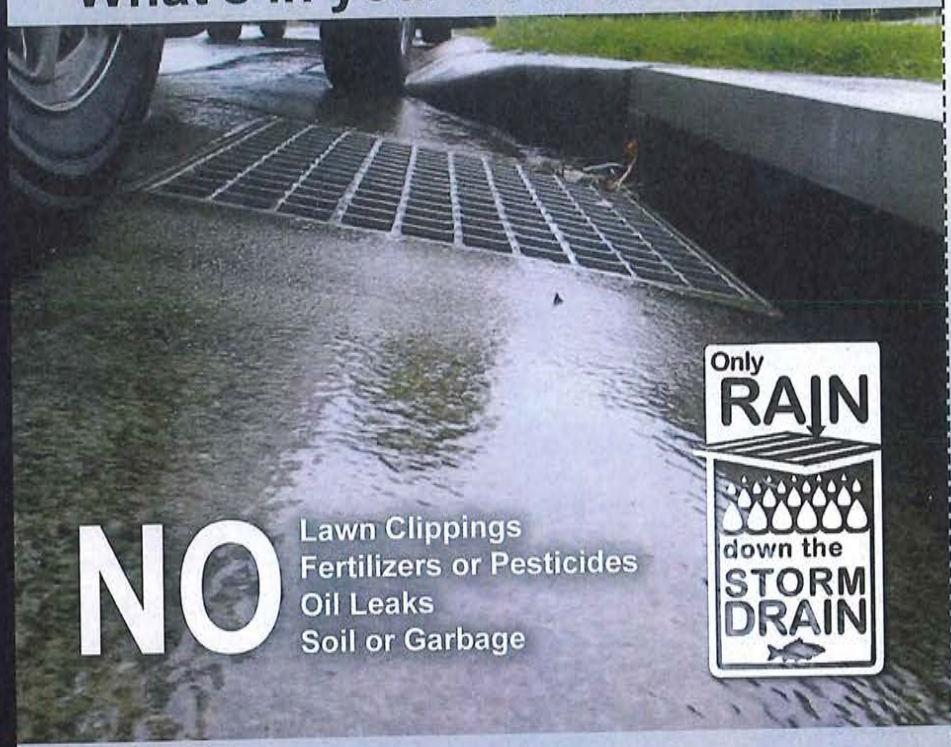
Tour FAQs

No preregistration required
First-come, first served

- No additional cost to conference attendees
- CEUs available based on tour presentation time

Closed-toe shoes required

What's in your STORM DRAIN?



NO
Lawn Clippings
Fertilizers or Pesticides
Oil Leaks
Soil or Garbage

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If you love rides, games, food & animals, get ready to...

"GO HOG WILD!"

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AUGUST 2nd - 6TH

DAVIS SHOWS NW
Brings you
"WRISTBAND DAY"
Everyday At The FAIR!
That's Right... Ride All The Rides You Can For Just

$29

PER PERSON, PER DAY

DON'T MISS IT!
Starting Aug 2nd
prices increase to $36 each

2017 Deschutes County FAIR & RODEO • Jam Packed Fun!

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NOW THROUGH AUGUST 1

PRE-SALE WRISTANDS ARE AVAILABLE AT ALL CENTRAL OREGON BI-MART LOCATIONS

PURCHASE YOUR FAIR ADMISSION PASSES AT THESE LOCATIONS:

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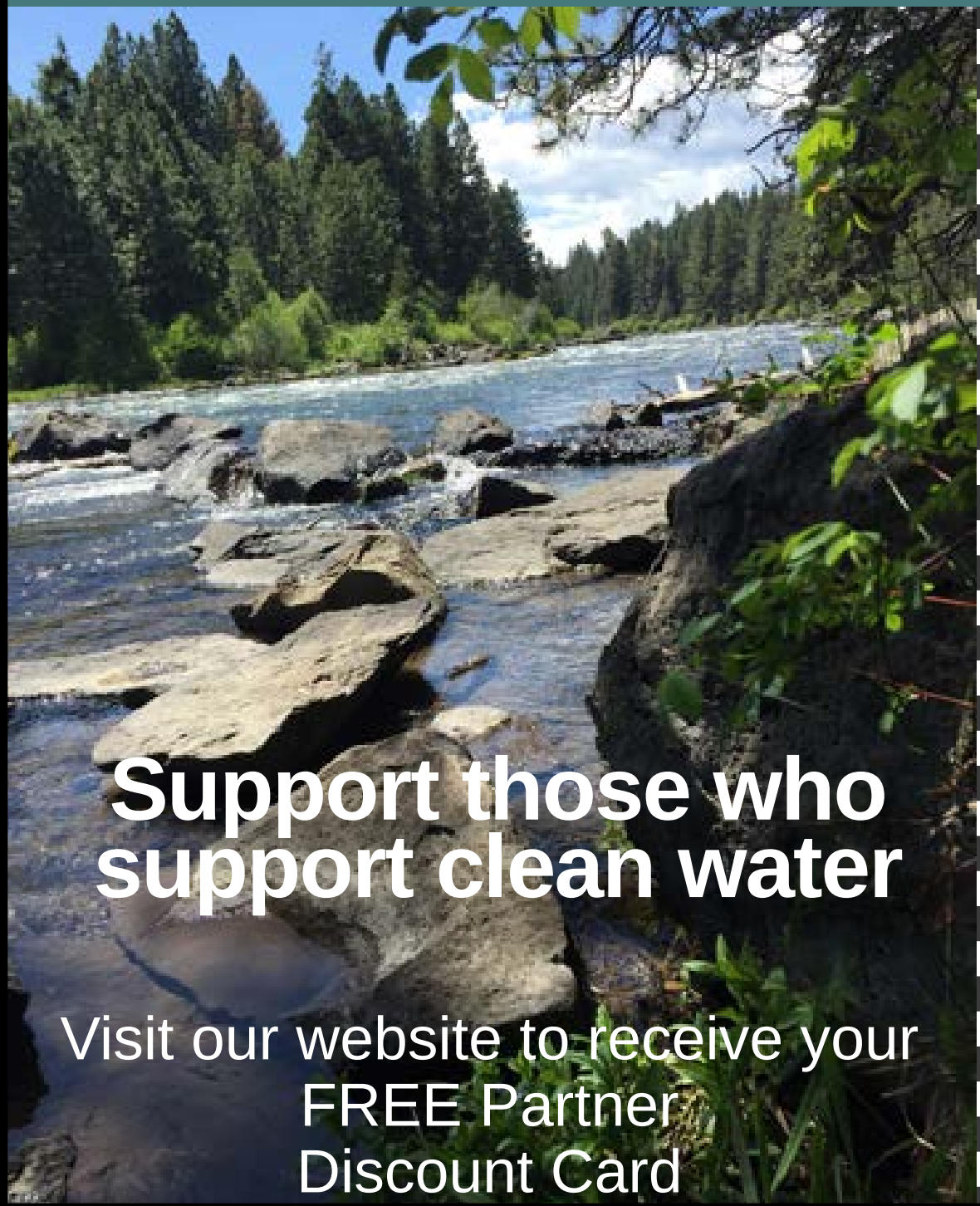
BI-Mart Stores,
the Deschutes County Fair
and Expo Office
in Redmond and the
Ticket Mill
in The Old Mill District,
Bend. For more info
call 541-548-2711
or expo.deschutes.org.

The Source Weekly – The Green Issue April 2017

Love your river?



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We work for clean water

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the environmental center

City of Bend and The Environmental Center
Our Water System: A Journey Through Bend

Annual Activity Report
May 24, 2017

Contents

Overview

"Our Water System: A Journey Through Bend" is a classroom and field-based education program designed to educate middle and high school students about Bend's water sources, distribution, wastewater and stormwater management systems, and water conservation. Each lesson and corresponding field trip educates students about the system, as well as how to make choices that reduce their environmental impact at school and at home.

"Water, Water Everywhere" is an in-class lesson geared to intermediate (3rd - 5th) elementary students. Students learn where water comes from, and learn ways to conserve water in and out of the home.

Summary statistics for the 2016-2017 school year:

Our Water System: A Journey Through Bend	Contract goals for 2016-2017 school year	Actual data for 2016-2017 school year
Total contacts	2,000	1,996
Number of presentations	75	49
Number of classes	15	19

Water, Water Everywhere	Contract goals for 2016-2017 school year	Actual data for 2016-2017 school year
Total contacts	500	604
Number of presentations	20	23
Number of classes	20	23

Program Promotion

- The Environmental Center's website: The water education program is listed with our youth education programs: https://envirocenter.org/programs/youth-education/school-programs/classroom-lessons/

- School visits: Jess Ludmer visited the science department at Mountain View High School and Pacific Crest Middle School. Materials and contacts were made with the following schools: Pilot Butte Middle School, Cascade Middle School, High Desert Middle School, Westside Village Magnet, and REALMS.

- Teachers Night Out: The water education program was shared with teachers who stopped by The Environmental Center's booth at the High Desert Museum's Teachers Night Out on September 22nd, 2017.

- Living the Green Newsletter: Lauren Williams, Membership and Communications Manager, highlighted the program in an electronic newsletter.

- Discover Nature Festival: The water education program was shared with those who stopped by The Environmental Center's booth at the Children's Forest of Central Oregon's Discover Nature Festival on September 24th, 2017.

- KPOV : Jess Ludmer was interviewed for "The Point," by Linda Spring. Jess gave program highlights and information for sign up.

Program Marketing Materials

The following documents were used to market the water education program this year. The following documents were shared with middle and high school teachers at face-to-face events. Updates to the documents included correlating Next Generation Science Standards and Common Core standards. This critical change provides justification and incentive for participating teachers.

Our Water System: A Journey through Bend

The Environmental Center, in partnership with the City of Bend, presents a series about water in Bend; where it comes from and where it goes along its cycle through the city. Lessons are free and correlate to NGSS standards.

the environmental center

Classroom presentations

Watersheds and Water Users

Students take a virtual tour of the watershed, learn about Bend's dual source water system, identify ways they connect with water, learn how our community uses water as well as the impacts that result.

Ins and Outs of Water:

Students tour their school grounds to explore how water gets into and out of our schools. They will research water and sewer lines on city maps to gain an understanding of the city infrastructure needed to provide and manage water, including customer pre-treatment and reclamation systems.

Sewer Studies

Students learn what happens to wastewater once it leaves our schools, homes, and businesses and enters the City's sewage system. They learn what can and cannot go down drains and toilets. Lastly, they learn how water is treated at the reclamation facility before it is released back into the environment.

Be Water Wise

Students generate reasons and methods to conserve water based on what they learned during the series. Students explore a personal commitment to conservation based off of their beliefs and interests.

Field trips

From Mountains to Homes

Take a half day to visit the Bridge Creek Intake and Outback Water Filtration Facility to experience our water sources, the system of pipelines that bring water into the City, and see filtration firsthand.

Wastewaters New Life

Take a second half day to visit the Wastewater Reclamation Facility and adjacent Hatfield Ponds. Students will tour the facility, observe the cleaning process, learn about the hidden organisms that clean water, and see where the cleaned water releases into natural systems.

Stormwater QUEST

Students solve a puzzle as they visit locations along the Deschutes River, including Farewell Bend and River Bend Parks. As they travel along the quest, they will learn about Stormwater and City infrastructure which minimize the impact of Stormwater pollution.

For inquiries and scheduling contact:

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www.envirocenter.org

NGSS and Common Core Alignment

Watersheds and Water Users

MS-ESS2-4. Develop a model to describe cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

RI.6.7and RST.6 –8.7. Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

Ins and Outs of Water

MS-ESS3-1. Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

RI.6.7and RST.6 –8.7. Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

Sewer Studies

MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

RI.6.7and RST.6 –8.7. Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

Be Water Wise

MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

Deliverables

List of schools and delivered presentations:

School /teacher	Lesson
Central Oregon Homeschool Group Sarah Valenzuela	• Stormwater Quest
St. Francis of Assisi Catholic School Stephanie Naegele, 3rd Erika Pakalnis, 4th	• Ins and Outs of Water • Sewer Studies • Be Water Wise • Stormwater Quest • Outback Water Filtration Facility tour
Marshall High School Katie Lyons, 11th	• Watersheds and Water Users • Ins and Outs of Water • Sewer Studies • Be Water Wise • Wastewaters New Life
Mountain View High School Julie McCabe, 11th	• Pre-test and pre-lesson • Watersheds and water users • Ins and outs of water • Sewer studies • Be Water Wise • Wastewaters New Life • Post test
New Leaf Academy Kelli Anderson, 5th - 11th	• Watersheds and Water users • Wastewaters New Life & Hatfield Ponds w/ Audubon Society • Ins and outs of water • Be Water Wise • Outback Filtration Facility Tour and Intake Facility • Stormwater Quest
Pacific Crest Middle School Jane Ward, 6th Jane Shein, 6th Sarah Durfee, 6th	• Pre test • Watersheds and Water users • Ins and outs of water • Outback Water Filtration Facility • Wastewaters New Life • Be Water Wise • Stormwater Quest • Post test
Americorps Team Presentation	• Be Water Wise
USFS Volunteers Karen Gentry	• Ins and Outs of Water

Amity Creek Elementary School Wendy Pierce	• Water, Water Everywhere
Lava Ridge Elementary School Laurie Perez, 3rd Allison Barrett, 3rd Michele Gottschalk, 3rd Jennifer Ketner, 3rd	• Water, Water Everywhere
Pine Ridge Elementary School Becky Crawford, 3rd Erika Nyden, 3rd	• Water, Water Everywhere
Ponderosa Elementary School Angela Szymanski, 3rd Becca Swain, 3rd Maddi Swan, 3rd	• Water, Water Everywhere
RE Jewell Elementary School Jane Williams, 5th Kristel Masterson, 5th Nanda Giglio-Webb, 5th	• Water, Water Everywhere
Seven Peaks School Tracy Jenson, 3rd Amanda Gylling, 2nd	• Water, Water Everywhere
Silver Rail Elementary Ona Larsell, 4th Tyler Miller, 4th Bobbi Maclaughlin, 4th	• Water, Water Everywhere
WE Miller Elementary Erin Kerr, 4th	• Water, Water Everywhere
Bear Creek Elementary Jen Temple, 5th Kristen Carter, 5th Maria Schwab, 5th Larissa Herzog, 5th	• Water, Water Everywhere

Curriculum Summary

Curriculum Google Drive:
The current lesson plans, marketing materials and photos are available via a Google Drive that has been shared with Mary Packebush and the participating teachers. Use this link to access the drive:
https://drive.google.com/drive/folders/0By3auy3oW9PUV2ZWOXpKSVdaQnM?usp=sharing

Water Filtration Facility Tour
Tour the Outback Treatment site to learn how water is treated before reaching our taps.

Wastewaters New Life
Visit the Wastewater Reclamation Facility and adjacent Hatfield Ponds to observe the cleaning process, learn about the microorganisms that do the work, and see where treated water is released back to the natural world at Hatfield Ponds, a rich wildlife habitat.

Watersheds and Water Users
In this lesson, students take a virtual tour of the watershed, learn about Bend's dual-source water system, identify ways they connect with water, and learn the various ways that our community uses water.

Ins and Outs of Water
Students participate in a tour of the school grounds to learn how water gets into and out of our schools, including customer pre-treatment and sewer systems. They look at water and sewer lines on city maps to gain an understanding of the city infrastructure needed to provide and manage water.

Sewer Studies
Students learn what happens to wastewater once it leaves our schools, homes and businesses and enters the City's sewage system. They learn what can and cannot go down the drains and toilets, as well as how water is treated at the Water Reclamation Facility before being released back into the environment.

Stormwater QUEST
Students and parent chaperones solve a puzzle as they visit locations along the Deschutes River in Farewell Bend and Riverbend parks to learn about Stormwater and City infrastructure that minimize the impact of Stormwater on the Deschutes River.

Be Water Wise
Students generate reasons to conserve water based on what they learned during the series and identify and commit to conservation methods both inside and outside the home.

Performance Measures for "Our Water System: A Journey Through Bend"

Students contacted

Total student contacts (this does not count adult chaperones): 1,961

Central Oregon Homeschool Group
- 20 student contacts
- 20 individual students

St. Francis of Assisi Catholic School
- 95 student contacts

- 25 individual students

Marshall High School
- 125 student contacts
- 25 individual students

Mountain View High School
- 481 student contacts
- 114 individual students

New Leaf Academy
- 90 student contacts
- 15 individual students

Pacific Crest Middle School
- 1,128 student contacts
- 100 total students

Americorps Team
- 12 student contacts
- 12 total students

USFS Volunteers
- 35 student contacts
- 35 total students

Presentations provided

Total Presentations delivered: 49
- Central Oregon Homeschool: 1
- St. Francis School: 5
- Marshall High School: 5
- Mountain View High School: 5
- New Leaf Academy: 6
- Pacific Crest Middle School: 24
- Americorps: 1
- USFS Volunteers: 1

Classes reached

- Number of classes reached: 19

Performance Measures for "Water, Water Everywhere"

Students contacted

Total student contacts: 604

Amit Creek Elementary School
- 33 student contacts
- 33 individual students

Bear Creek Elementary School
- 120 student contacts
- 120 individual students

Lava Ridge Elementary School
- 100 student contacts
- 100 individual students

Pine Ridge Elementary School
- 44 student contacts
- 44 individual students

Ponderosa Elementary School
- 75 student contacts
- 75 individual students

RE Jewell Elementary School
- 89 student contacts
- 89 individual students

Seven Peaks School
- 45 student contacts
- 45 individual students

Silver Rail Elementary School
- 66 student contacts
- 66 individual students

WE Miller Elementary School
- 32 student contacts
- 32 individual students

Presentations provided

Total Presentations delivered: 23

Classes reached

- Number of classes reached: 23

Materials distributed:

Indoor conservation brochure	324
Outdoor conservation brochure	324
Goody bags (funnels, grease lids, grease scrapers, notepads, raindrop toy, stickers)	130
Stylus pens	200
Highlighters	200
Stormwater Student workbook:	150
Sewer dos and don'ts brochure	324

% of students involved in the program who can trace the water path from source to treatment.

- On the pretest, 41% of survey respondents could identify the two sources of Bend's dual-source water system. On the post test, the percentage increased to 92%.

- On the pre-test 86% of survey respondents could correctly summarize the process by which city water gets to our taps. This increased to 92% on the post test.

- On the pre-test, 67% of survey respondents accurately identified that a City utility bill includes sewage treatment, Stormwater treatment, pre-customer water treatment and yard irrigation water. This response increased to 79% on the post-test.

- On the pretest, 77% of respondents accurately identified that wastewater goes down a drain or toilet goes to the water reclamation facility via sewer pipes. By the post test, accurate responses increased to 90%.

- On the pretest, 52% of respondents accurately noted that biosolids are recycled as compost on crops. Correct responses increased to 76% on the post test.

% of students who identify with one or more conservation strategy.

- On the pre-test, 61% of survey respondents could identify that water conservation is important for the City of Bend because it prolongs current water supplies, reduces energy consumption and saves money for customers. This increased to 69% on the post test.

- Student's added classic conservation strategies to an open ended survey question. Strategies included: take shorter showers, turn off the faucet while

brushing teeth, utilizing a low-flow showerhead/faucet or installing an aerator, reusing water or ice to water plants, eating foods that require less water to produce (including less beef), utilizing a rain barrel, checking for leaks, and installing efficient washing machines and dishwashers.

Evaluation of the program:

Teacher feedback of "Our Water System: A Journey Through Bend"

Teachers who participated were sent an evaluative survey upon completion of the program. The following is a summary of teacher feedback received.

- All teachers who responded noted that the presenter's interactions with students, knowledge of content, ability to present clearly, and ease of scheduling were highly effective.
- All teachers who responded noted that the appropriateness, quality, connections to classroom material, and general effectiveness were effective to highly effective.
- All teachers who responded noted that they would schedule the series again.
- Water Wise was rated as the most effective lesson, receiving all "highly effective" ratings, whereas the other three lessons received "effective" to "highly effective" ratings.
- One teacher suggested the following addition to the curriculum: "It would be great to see some time and content that deals with current local problems the city is dealing with, such as the current sewer system and its limitations with population growth."

Successes:

- The program reached more classes than expected. The contract set a goal of 15 classes but we reached 18 classes.
- All 6th grade students at Pacific Crest Middle School participated in the program. The material, content, and field trips were appropriate for this age group. The cooperating teachers are interested in incorporating the lessons again next year.
- Pacific Crest Middle School used the PNWCWA grant to pay for subs and busses for their trips to the WFF, WRF, and Stormwater Quest.
- The addition of a "Water, Water Everywhere" lesson, delivered to intermediate

elementary school students, allowed us to reach an additional 600 students.

- The program was modified for the homeschool group and delivered at The Environmental Center. The participating families were pleased with the program, and enjoyed the UIC model and Enviroscape model.

- The Outback staff responded well to feedback from Pacific Crest Middle School. The tours were appropriate for 6th grade and above, the content may be too advanced for younger grades.

- Using Survey Monkey allowed us to receive over 300 responses for the pre and post tests. Survey Monkey was also used to gather feedback from participating teachers.

- The addition of highlighters and stylus pens were a huge hit. Especially with students at Pacific Crest, who use their iPads daily and benefit from the use of the pen.

- Please keep the following documents available for future lessons:
  - City Edition: History of Surface Rights in Bend. https://www.youtube.com/watch?v=JKJV-QPBCmk
  - Bend's Wastewater history: http://bendoregon.gov/modules/showdocument.aspx?documentid=15999
  - Residential Sewer Pipe awareness brochure: http://www.bend.or.us/modules/showdocument.aspx?documentid=6785
  - Water Reclamation Facility Virtual Tour: http://www.bend.or.us/index.aspx?page=201
  - Introduction to Wastewater treatment http://www.bend.or.us/index.aspx?page=201
  - Water conservation brochures: indoors and outdoors

Challenges:

- Due to the time of year of the program, Pacific Crest Middle School was unable to access Hatfield Ponds or the Intake Facility. Discussing a later program might open up more opportunities for field trips.

- We were unable to make contact with Pilot Butte Middle School, who had received the program last year. After repeated phone calls and emails, we moved to marketing the material with high school science departments.

Suggestions for next year, improvements:

- We continue to receive interest from upper elementary classrooms to take part in "Our Water System." If allowances were made to visit the WRF, we may be able to reach more students. We often find it's easier to schedule the program with elementary teachers because they do not have conflicting periods to contend with, or short bussing schedules.

- Water conservation kits would be successful as a parting gift for finishing the program. All students learned about low-flow showerheads and aerators, and many were interested in purchasing them, but offering them for free could be a great incentive. Another great addition to the kits would be a dish scraper, grease can lid, and a shower timer. We saw less enthusiasm with the motor oil funnel.

- Many schools still prefer a mini-series that could include a pre lesson, field trip and a follow up lesson. This may be more appropriate and popular when advertising the program. Scheduling four lessons proved difficult. A suggestion would be to combine the "Watersheds and Water Users" lesson with "Ins and Outs," and "Sewer Studies" with "Water Wise."

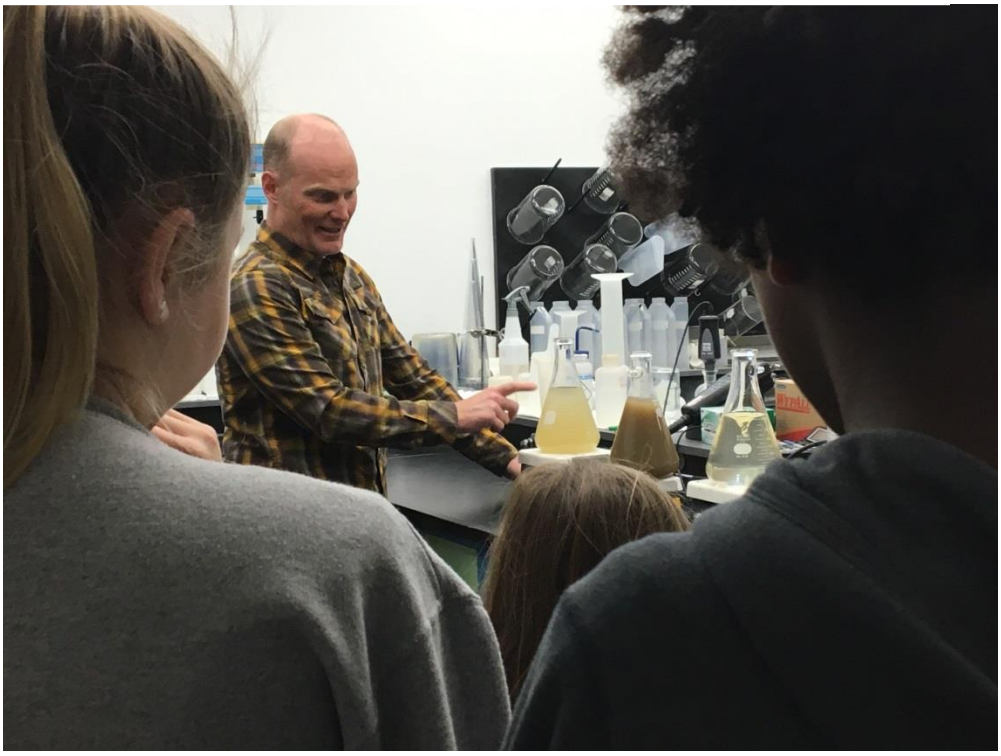
- Interested teachers, including those who have already hosted the program in their classrooms, could be trained to deliver the lessons themselves (with support from TEC staff) to expand our reach and increase student contacts. Trained teachers could deliver the in-class lessons and the contracted educator could support them by coordinating and delivering the field trips to WRF and WFF.

Photo Gallery (additional photos can be found on Google Drive):

New Leaf Academy students search for the Red-winged Blackbird as Sherrie Pierce, East Cascades Audubon Society, informs them of their markings.

New Leaf Academy students enjoy the clarity and coolness of Bridge Creek.

Sherrie Pierce helps students identify birds at Hatfield Ponds.



Students predict which sample represents wastewater entering the plant. Once again, they're foiled (it's the first).

Rod Mingus explains feed pumps at the Water Filtration Facility to St. Francis students.

St. Francis students examine the cross-section of a filter.