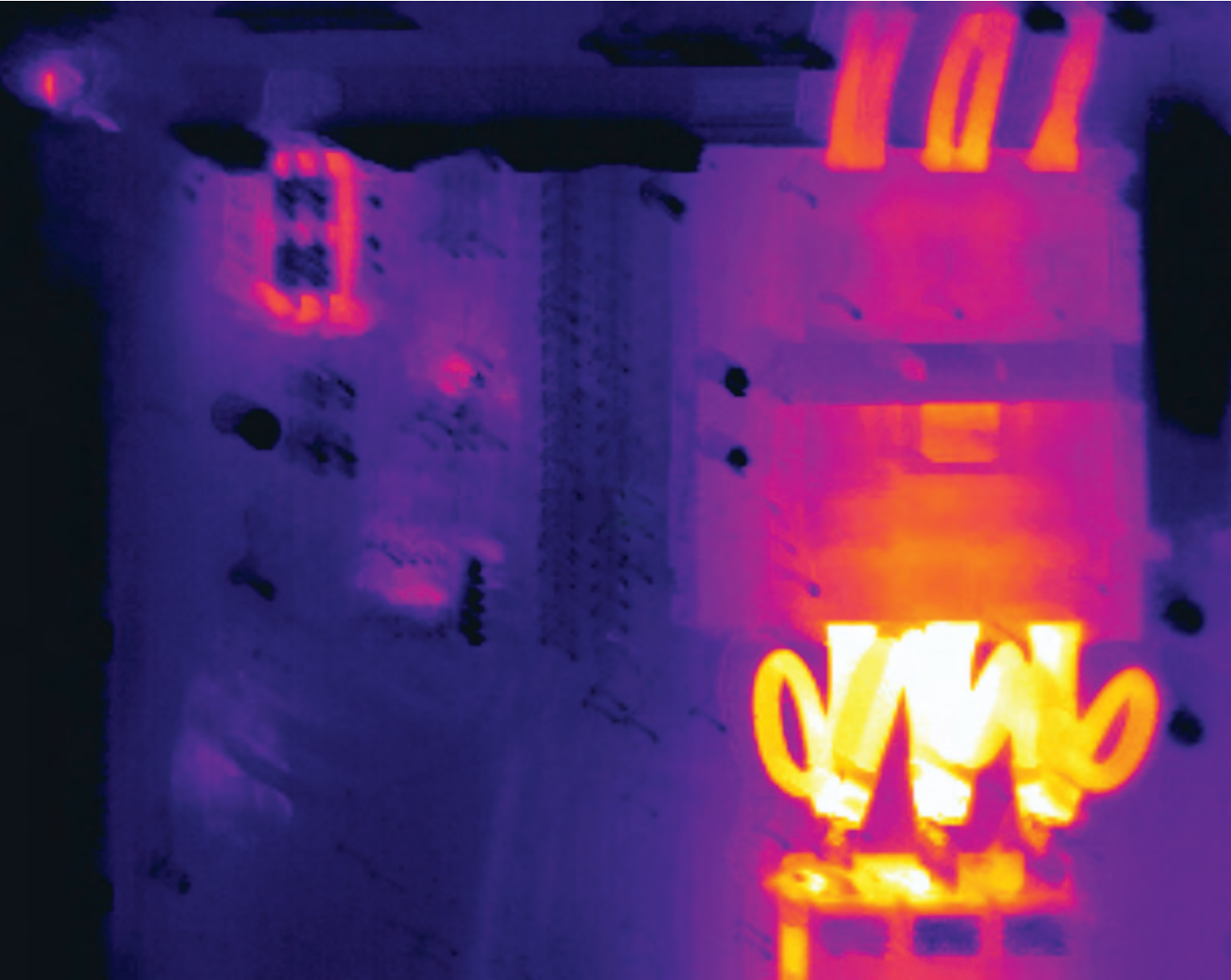


Pacific Northwest Clean Water Association

PNCWA

Newsletter
Fall 2011



**FEATURE
FOCUS: ASSET
MANAGEMENT**

Starts on page 13

**PNCWA2011
CONFERENCE
HIGHLIGHTS**

Page 8

**PNCWA OFFICE
NEW CONTACT INFO**

Page 28



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PNCWA 2011 Conference Committee

We're days away from another excellent PNCWA Annual Conference. The people in this photo met last December to kick off this year's conference. Many others have joined in since then to once again provide the top-notch training/networking/social event that attendees have come to expect. Thanks to all who have contributed!

From left to right: Shawn Redmond (LOTT), Joe Kernkamp (APSCO, Inc.), Kay Hust (Salmon Creek WWTP), Doug Berschauer (CH2M HILL), Andy O'Neill (RCAC), Susan Gierga (Murray, Smith & Associates), Court Harris (CH2M HILL), Preston Van Meter (Kennedy/Jenks), Nan Cluss (PNCWA)

TABLE OF CONTENTS

ASSET MANAGEMENT INTRODUCTION	13	CITY OF VANCOUVER, WA AND VEOLIA WATER SUSTAINABILITY PARTNERSHIP	22
MANAGING OUR ASSETS: HOW DOES KING COUNTY'S WASTEWATER TREATMENT DIVISION USE THE LATEST TECHNOLOGY TO MANAGE ITS ASSETS?	14	WERF HELPS GRESHAM WITH STRATEGIC ASSET MANAGEMENT (SAM)	24
MAINTENANCE PROGRAM OPTIMIZATION AT SPU	16	PNCWA NEWSLETTER SUBMISSION GUIDELINES	29
RISK VERSUS CRITICALITY: CONCEPTS AND APPROACHES	20		

DEPARTMENTS

From the President	5	Committee Focus-Safety	29
Committee Focus-Collection Systems	7	Committee Focus-Membership	30
PNCWA Annual Conference	8	Committee Focus-Public Education	31
Committee Focus-Scholarship	10	Key Volunteers-Contacts	32
From the Office	28		

COVER PHOTO: THERMAL IMAGING PHOTO, CONTROL PANEL. THERMAL IMAGING IS A KEY TECHNOLOGY FOR EVALUATING AND PREDICTING FAILURES IN INDUSTRIAL EQUIPMENT. THE COVER PHOTO SHOWS A CONTROL PANEL THAT HAS SOME UNUSUALLY HOT LEADS, WHICH INDICATE THAT THE LUGS MAY NEED TO BE TIGHTENED. THIS IS NON-INTRUSIVE, I.E., NO NEED TO OVER-TIGHTEN LUGS, TO IDENTIFY POTENTIAL PROBLEMS. PHOTO COURTESY MARC YARLOTT, PNCWA ASSET MANAGEMENT COMMITTEE CHAIRPERSON.

MISSION STATEMENT

Pacific Northwest Clean Water Association (PNCWA) is dedicated to preserving and enhancing the water quality in the states of Idaho, Oregon and Washington. We promote the professional development of our members, the dissemination of information to the public, and the advancement of science and technology needed to protect public health and the environment.

VISION STATEMENT

The Pacific Northwest Clean Water Association will ensure clean, sustainable watersheds for future generations.

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Strategic Planning



PNCWA President
Andy O'Neill
Rural Community
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In a recent newsletter I wrote about a conversation with someone who is also on a nonprofit board of directors who asked how PNCWA went about long-range planning, and I outlined the main points of the current Strategic Plan. The PNCWA Board members often discuss the goals of the Strategic Plan and, slowly but surely, we are working toward implementation. Recently it was suggested that the Board should communicate the Plan to our members, so I'll take the opportunity to do that here.

The PNCWA Strategic Plan has three main goals that were developed in 2010 based on the PNCWA mission statement. Here are the goals and condensed action items. Each action item has (or will have) tasks, timelines and metrics for success.

STRATEGIC PLAN - GOAL 1

To provide information both internally to our members and externally to stakeholders including the public, policy makers, the media, universities, regulatory agencies, and other NGOs

- Finalize utility membership
- Website work, committee pages, access levels; other electronic media
- Develop partnering plan for outside agencies & organizations
- Create bumper sticker decals (competition)

STRATEGIC PLAN – GOAL 2

To develop and maintain PNCWA as the Pacific Northwest's leading resource for the development of wastewater professionals

- Improve section support and interactions including leadership training, website tool kit, O&M newsletter section and Section Exchange
- Invigorate the Young Professionals Committee and create a mentoring program
- Define committee expectations or sunset as appropriate
- Hold one networking social event in each state per year

STRATEGIC PLAN – GOAL 3

To promote the development of science and technology that serves to protect the water environment

- Include a research track at conference
- Contribute to WERF (Water Environment Research Foundation)
- Student Chapters: student competitions, mentoring, service projects, scholarship information
- Increase scholarship funding

Although PNCWA staff handles the daily nuts and bolts of running the organization, it is important to remember that at the core PNCWA is a volunteer organization. We all are busier than ever in our jobs, but I hope the personal value of being a part of forward movement within our chosen profession will encourage you to take the time to get involved in one or more of the action items above.

Company Name	Website	Page	Company Name	Website	Page
APSCO	apsco-inc.com	2	Jacobs Engineering Group	jacobs.com	26
APSCO	apsco-inc.com	36	J-U-B Engineers	jub.com	6
Black & Veatch	bv.com	10	Kennedy/Jenks Consultants	kennedyjenks.com	10
Brown and Caldwell	browncaldwell.com	9	Murray, Smith & Associates	msa-ep.com	28
Carollo Engineers	carollo.com	11	Parametrix	parametrix.com	13
EDI (Environmental Dynamics)	wastewater.com	35	PNCWA Job Board	pncwa.org	33
ENECON	enecon.com	28	PNCWA Scholarship	pncwa.org	28
Energy Smart Industrial	energysmartindustrial.com	34	Tetra Tech	tetrattech.com	33
GE Water & Process Technologies	ge.com/water	7	Treatment Equipment Co.	treatmentequipment.com	12
HDR	hdrinc.com	30	Treatment Equipment Co.	treatmentequipment.com	27
Hoffman/Lamson	hoffmanrevolution.com	34	Trojan Technologies	trojanuv.com	4
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To contribute an article, contact Sheri Wantland, 503.681.5111 or wantlands@cleanwaterservices.org. Submission guidelines are on pg. 29. Newsletter articles reflect the author's opinions and not necessarily those of the PNCWA Board of Directors or Water Environment Federation. The PNCWA newsletter is published quarterly, © 2011 Pacific Northwest Clean Water Association. Change of address inquiries should be directed to the PNCWA office.

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Pacific Northwest Clean Water Association

WEFTEC11 Reception



A gathering place for all Pacific Northwest attendees - at the center of it all!

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Where: **Platinum Ballroom, Salons F&G**
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Using the Power of GIS to Enhance Wastewater Recordkeeping

By Jeremy Coles, PNCWA Collection Systems Committee

Several problems face most wastewater systems and we all ask ourselves:

- How to keep maps and databases up to date, reliable and useful to personnel in the field and in the office?
- How to make tracking infrastructure simple enough that it will get done?
- How to capture and retain all of the information stored in the minds of employees before they retire or move on?
- How to make our system information reliable, up-to-date and usable by everyone?

Software can solve most of these problems and more. Here in Rexburg, Idaho we are working with a program called Spatial IM developed and marketed by Gateway Mapping, Inc. This software works with your existing GIS mapping system to link all of the information about certain structures to the map. It is very simple to use and flexible enough to work in any system.

An operator in the field or an administrator in the office can click on a structure (manhole, line segment, valve, lift station, etc.) on the map and view or enter information about that structure. It's very easy to keep and retrieve up-to-date maintenance records, and data entry that is easy is more accurate, as well. Digital files can be linked to a structure on the map along with the data fields.

For example, a segment of main line could have construction drawings, CCTV video, photos and billing information for customers connected to that section, all linked and accessible by clicking the segment on the map.

By integrating records and mapping, you can keep a history of each structure that is easily accessed and useful in building your O&M program because the software tells you the past and what needs to be done in the future. A map that shows all cleaning done last year in pink and all the cleaning due this year in blue makes it easy for maintenance crews to know what to do and when, while giving administrators a way to track and evaluate productivity.

In today's regulated world, this software allows us to quickly and accurately provide easy to understand records to a regulating authority. In seconds, reports can be generated that include any necessary information and maps that make the reports easy to read and interpret.

Spatial IM is one of many software programs that integrate GIS and recordkeeping. The key to a successful program, large or small, is to put all pertinent information in one place where it is easy to use and update. The technology is available to help.

You may contact Jeremy Coles at jermeyc@rexburg.org.

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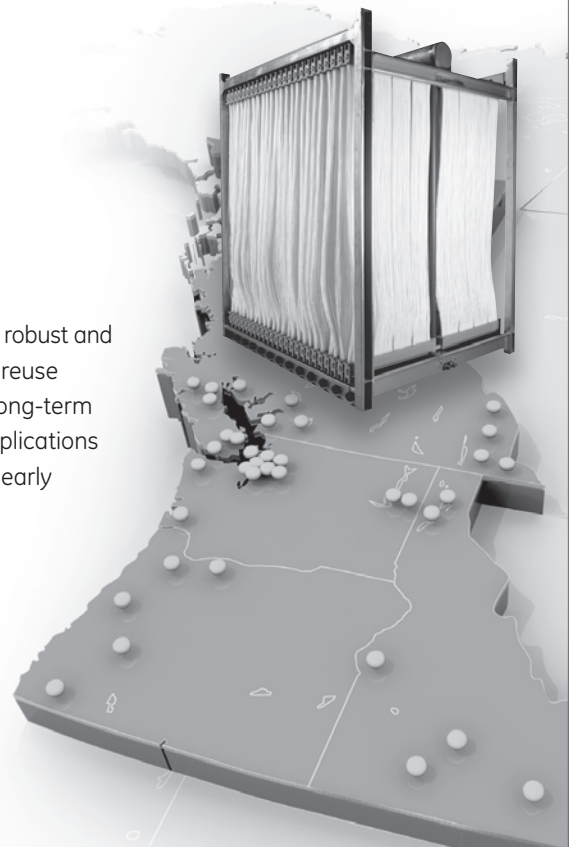
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GE Water & Process Technologies, Portland: 503.471.1453 • APSCO Inc., Kirkland and Corvallis: 800.791.6195

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Plant Operations Personnel—

This is a great opportunity to check in with your existing vendors to ask that question that comes up but never gets asked. Have a problem? They might have an easy answer. Also be thinking ahead to what your next steps for technology advances may be. This show is the place to see what companies are offering solutions that may be just the right fit.

Consultants—See the latest equipment unveiled and become more familiar with possible new solutions for you to incorporate in your plans. Use this forum to ask questions of multiple companies offering the same type of product. Meet the people that might be support on your next big project.

The PNCWA Board of Directors and the 2011 Annual Conference Committee urge you to support the vendors by visiting the Exhibit Floor. The exhibitors are an integral part of the PNCWA community!

Support our Vendors!

Annual Conference & Exhibition
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Just days away from PNCWA2011!

This year's annual conference starts in just a few days (Sept. 18–21). Don't miss the opportunity to join your fellow professionals to get the latest and greatest training available in the Pacific Northwest to help you excel in your every day responsibilities. Onsite registration is available for the main conference and for the following Sunday pre-conference workshops:

- Green Stormwater Infrastructures (includes a tour)
- Inventorying and Reducing Your Organization's Carbon Footprint
- Nutrient Removal in Practice
- Optimizing the Performance and Capacity of Your Secondary Clarifier

On Monday during Opening Session we will hear industry perspectives from seasoned professional Dr. David Jenkins (Professor Emeritus, University of California, Berkeley) followed by young professional John McGettigan (AECOM; WEF 2010 Outstanding Young Water Environment Professional). A poster session will follow in the afternoon. Monday evening entertainment includes a comedian and a karaoke night for all who want to wind down after a long day of training.

Bonus session on SSOs

The PNCWA Collection Systems Committee is offering a special session on Tuesday focusing on SSOs.

3:00–3:45 WEF's Washington, DC Update

Bob Matthews, CDM

As Chair of WEF's Government Affairs Committee (GAC), Bob Matthews will present an update and review of possible wastewater related Federal legislation, a review of current EPA wastewater related draft regulatory programs (such as updates to the MS4 stormwater regulation and a proposed wastewater wet weather management regulation), an update to current GAC activities, and a special report from EPA SSO/Wet Weather Workshop.

3:45–4:30 Portland, Oregon's SSO Reporting: Lessons from Training for Proper Reporting

Matt Marine, Maintenance Planner/ Scheduler, City of Portland
John McGregor, Manager of the Spill Protection & Citizen Response Section, City of Portland

Oregon DEQ is modifying the way they enforce Sanitary Sewer Overflow (SSO) reporting. In response, the City of Portland is training their staff in the process to follow in reporting SSOs. The target audience for this training is for those who may receive initial reports of sewage releases, for those who may be in the field and observe SSOs, and for the field crews responding to the reported releases. The training is designed to provide guidance on how the SSOs should be reported, the proper channels through which they should be reported, and templates to follow so that the information received is consistent in every reported sewage release. This session will present an overview of the training that is being given to Portland staff from several city departments and the procedures that are being followed to report any SSOs that are observed or discovered.

4:30–5:15 Reporting SSOs in the Pacific Northwest: The Member States' Perspectives on Reporting Requirements

Representatives of public wastewater and regulatory agencies from Washington, Oregon, and Idaho will convey the perspectives and processes of the regulated and regulating agencies in reporting SSOs. Panel members will present recent changes in permit requirements and reporting methodologies along with an analysis of what causes SSOs, how big they are, and where they end up. A Q&A session will follow the presentations.

Panel Members:

Wastewater Agency Representatives

*Matt Criblez, Environmental Compliance Manager,
Bureau of Environmental Services, City of Portland*
*Rick Butler, South Treatment Plant Process Control Supervisor,
King County, WA*

Regulatory Agency Representatives

*Mark Henley, Facility Engineer,
Washington Dept. of Ecology (Northwest District)*
*Sonja Biorn-Hansen,
Lead Policy/Technical Specialist, WQ Permitting, Oregon DEQ*
A.J. Maupin, Idaho DEQ
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Support our Future Water Professionals: Silent Auction Items Needed for PNCWA Scholarships

2011 Scholarship Donors:

January–August

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\$500—Doug Allie

With tuition increases and industry knowledge leaving with retirees, your student support is more important than ever. Help bring the next generation of wastewater talent through the door by donating silent auction items for the PNCWA Scholarship Fund at this year's PNCWA2011 Annual Conference. Last year, members donated \$8000 through silent auction and monetary donations.

When? Donors need to bring auction items to the conference registration area by 9 a.m. on Monday, September 19. Your name will be posted prominently on the auction tables. The auction will take place Monday afternoon. Check conference signage for more details.

How? We need both auction donors and buyers. Sample auction items include one of a kind items, theme baskets, vacation rentals, sporting event tickets, or smaller items that you would want such as tools. This year we would also love to auction items made by the artists among us. Volunteers will help answer questions and make sure winning bidders receive their prizes.

How else? Donate directly to the scholarship fund. All of our donors will be celebrated at the conference. Donors who contribute \$500 or more will be specially recognized through thank you signs at the conference. This year, we will also have a Lifetime Giving chart showing the total to date contributed by individuals and corporations.

If you have any questions about donations or volunteering at the silent auction, please contact Steve James at (208) 762-8787 or sjames@jub.com. Learn more about the scholarship program at www.pncwa.org.

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WEFMAIL (WEF Member Association Information Letter)

By WEF Directors Douglas Allie and Max Hildebrand

One of the Water Environment Federation (WEF) goals is to provide water quality professionals (scientists, engineers, regulators, academics, plant managers and operators) with valuable resources and provide the latest in water quality news. All you need to know about WEF's annual conference is at www.weftec.org, and you can see the other options and venues WEF offers for training and professional development, including utility management, sustainability, residuals and biosolids, and odors and air pollutants at www.wef.org.

WEF offers comprehensive online training materials through the Distance Learning: Water Quality Training Program <http://training.wef.org>. Courses thoroughly cover operation, design, and engineering with topics ranging from wastewater fundamentals to emerging topics in the industry. Whether participants want an introduction to wastewater treatment, a refresher course in

wastewater operations, or education on new, intellectually stimulating topics, this WEF program provides something for everyone through both fundamental and accelerated courses available to anyone with an internet connection.

In other news, the House of Delegates Operator Outreach Workgroup (OOW) is recommending that WEF provide an online repository for Member Association operator training and development resources, and support and coordinate regional operator training. We have also recommended that the Board of Trustees adopt Operator Certification and Training Position Statements that include mandatory certification, readily available and affordable continuing education, reciprocity or standardized certification, professional recognition and an official title for certified operators, as well as succession planning, recruitment and retention of wastewater professionals.



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Highlights

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- DOE Permit
- UV Disinfection
- Contract Operations: 1 day/week
- Public Design-Bid-Construct
- Greenfield Construction: 8 Months, No Change Orders

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BOD	356 mg/l	< 3 mg/l
TSS	217 mg/l	< 2 mg/l
TKN/TN	75 mg/l	< 5 mg/l



Constructed Cost Breakout

MBR Equipment Cost	\$ 490K
MBR Facility Construction	\$ 1.17M
Total Constructed Cost	\$ 1.66M

- Operations Building
- Concrete Basins
- Installation of MBR Equipment
- Influent Pump Station
- Odor Control
- Autosamplers and Flow Metering Manhole
- Power Generator/Transformer
- All Site Work (water, sewer, grading, paving, fencing, etc)
- Temporary Erosion Control

CONTRACTOR ITEM	BID
Trench Safety Excavation Provisions	\$ 1,000
Mobilization and Demolition (NTE 7.5%)	\$ 165,149
Traffic Control	\$ 1,000
RV Dump Facility	\$ 33,627
MBR Facility	\$1,171,993
Campground Sewer Facilities	\$ 380,385
Campground Water Facilities	\$ 148,253
Campground Electrical Facilities	\$ 465,366
Asphalt Surface Restoration	\$ 45,320
Tree Removal	\$ 3,000
Total	\$2,415,093



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Asset Management Introduction

By Marc W. Yarlott, PE, PNCWA Asset Management Committee Chair

Here in the Pacific Northwest, Asset Management is being implemented by a variety of PNCWA members with success. This newsletter is dedicated to bringing a few of the success stories to you for consideration on how some or all of these strategies might be helpful to your organization.

The objective of Asset Management, as defined by the *International Infrastructure Management Manual (IIMM)*, is “To provide agreed level of service in the most cost effective manner for present and future customers.” In the economy we find ourselves struggling with in 2011, the meaning of “cost effective” has become even more important. Revenues are reduced for nearly everyone, which means that “cost effective” implies very careful prioritization. Frank McDonald, the Seattle Public Utilities (SPU) Asset Manager and co-authors bring out this point in his article outlining how SPU is leveraging existing data to focus their underground maintenance program on the right assets, i.e., the ones that really need work done on them.

The City of Vancouver and Veolia Water North America have teamed up and taken the principles of Asset Management and maximizing “cost effective” in a bit of a different direction. They have replaced perfectly functional equipment with more efficient equipment in a novel approach to selecting priorities in capital replacement. When matched with a 70% grant from the local utility, this capital investment has a payback of less than 24 months in energy savings.

The City of Gresham has provided an overview of where they are going with a city-wide initiative to implement the principles of Asset Management. In 2010/2011 they completed their first city-wide Asset Management Plan (AMP). Congratulations, to them! For those of you looking for more information on what it takes to follow this path, their article outlines progress and steps taken to achieve this very significant goal.

The King County Wastewater Treatment Division’s focus on Asset Management uses Maintenance Best Practices (MBP) and Reliability Centered Maintenance (RCM) to develop the most effective maintenance plan for an asset and to minimize the probability of failure.

The theme across these articles is on prioritizing to invest capital and manpower in the “right” or most effective place. As you will see in each article there are different approaches and tools to determine the priorities. Since developing priorities based on criticality is difficult, I was happy for the article on principles of criticality, risk and prioritization from a friend and mentor in Asset Management, Terry Nelson. In my work with Veolia Water, I have been using and training the concepts outlined successfully for several years and I encourage any reader struggling with where to start on a path to Asset Management to check out this article.

Finally, Bob Isaacson and the Safety Committee put together a great article on security and protecting the assets that we manage. Unfortunately, vandalism and theft have begun to have a significant impact on our industry as the materials that our facilities are built with become more valuable. Finding ways to secure these facilities is key to maintaining the usefulness of the assets we manage.

Thanks to all of the contributors for their work on this issue of the PNCWA Newsletter. As Chairperson of the PNCWA Asset Management Committee, I can tell you that there are many projects going on to leverage Asset Management principles here in the Pacific Northwest. Keep an eye out for Asset Management ideas and stories that you can apply at your project and please feel free to contact the contributors or me for more information on Asset Management. Check out my Asset Management Scrapbook at <http://ydesign72705.blogspot.com/>.

You may contact Marc at Marc.Yarlott@veoliawater.com.

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Managing our Assets: How does King County's Wastewater Treatment Division use the latest technology to manage its assets?

By David Jurgens and Dean Newton, King County Wastewater Treatment Division

Over the last several years, the King County Wastewater Treatment Division (WTD) has been putting increasing emphasis on asset management. Managing assets has always been part of the division's business. Since the early days of the utility, WTD has actively monitored assets and prepared condition assessments. Today, with more rigid government oversight, environmental regulations and safety standards, as well as the ever increasing cost of assets, the subject has gained new attention and initiated the use of new tools and technologies within the utility.

WTD has millions of dollars invested in pumps, valves, motors and control gear—which should not be surprising to those familiar with the operations of a large wastewater utility. Thanks to the skills of WTD's maintenance and operations staff, most of this equipment provides the necessary level of reliability, enabling us to meet our mission of protecting public health and enhancing the environment. The nature of wastewater's 24/7 business also means that much of the equipment is well-used, older, and is becoming more of a challenge to maintain.

Because of the demands on equipment, there is a great need to optimize asset use and keep the treatment plants and pump stations running as efficiently and effectively as possible. A few years ago, the utility launched new Maintenance Best Practices (MBP) standards—aimed at enabling employees to become more efficient in maintaining facilities. MBP helped employees establish a comprehensive asset inventory, prioritize maintenance work and track it through a work order system. More recently, WTD began to develop Reliability Centered Maintenance (RCM)—a systematic and structured process used to develop the most effective maintenance plan for an asset and to minimize the probability of failure. It allows our utility to measure existing performance in a variety of different ways – in an effort to improve performance, predict failures, and maximize use of our assets while ensuring safety and compliance.

These asset management tools will also help the utility address the challenge of an evolving workforce and maintaining experienced staff

levels. Twenty percent of current staff are eligible to retire in the next five years, and 42 percent are eligible by 2020. Many of those employees are experts in our equipment and systems. Both RCM and MBP will make it possible to capture the valuable knowledge of our experienced staff and make it available to train new employees.

To maximize asset management, our utility must first know what we own, where it is located, understand its function and condition, and estimate its remaining useful life and value. This requires WTD to itemize our existing assets, assess their condition and life span, and determine values and replacement costs.

All of this information is used to “optimize our assets” by evaluating repair vs. replacement costs as part of a well-informed cost/benefit analysis. The process also helps us determine if the need for a piece of equipment still exists. There may be new, more efficient technologies we can explore to enhance function and performance along the way.

The task before WTD is to “scrub” the existing databases, to make sure they reflect accurate condition of our equipment, and accurately document past maintenance practices. This effort is being undertaken by staff across the division, and requires thousands of assets to be located and entered into the asset database.

There is a great need to optimize asset use and keep the treatment plants and pump stations running as efficiently and effectively as possible.

While on the surface this effort appears deceptively simple, it has become a large effort that often brings surprises. WTD staff found assets in the field that had no record in the database or incorrect information, and identified assets that were no longer needed.

Once assets are accurately entered into the database, they can be effectively tracked, analyzed, managed and optimized using new tools

and programs. This technology provides a lot of benefits and allows us to:

- Selectively maintain assets according to the importance of their function
- Use predictive analyses methods such as ultrasound, vibration, and infrared as forecasting tools
- Conduct accurate life-cycle evaluations
- Minimize spare parts in our inventory system
- Accurately track maintenance, repair and replacement costs
- Find the equipment and systems that fail frequently (sometimes referred to as “bad actors”) and implement strategies to proactively address them. This is particularly beneficial in cases where one small part is causing the failure and requires complete rebuilds of an assembly to fix.
- Optimize worker’s craft time
- Conduct a comprehensive and accurate analysis of not just a system or assembly, but the parts and pieces that make up that system

These outputs allow WTD to take a proactive stance in planning the lion’s share of our available maintenance hours—resulting in fewer reactive, unplanned failures.

Dave Jurgens, the RCM engineer at WTD’s South Treatment Plant in Renton WA, is seeing results already: Maintenance costs are going down, work hours on jobs are decreasing, the backlog of work orders is decreasing, and there is more logic behind planning and executing daily activities for WTD’s maintenance staff.

WTD is also applying new data analysis techniques to existing measurement methods and using newer technologies to perform equipment “failure analysis.” While sections of WTD have been conducting vibration analysis for the past 20 years, new tools and methods will improve the collection and analysis of data, allowing us to make better informed decisions. The new techniques will also allow WTD to better predict failure and maintenance needs rather than relying on

“run-time” or reactive measures to keep equipment in service.

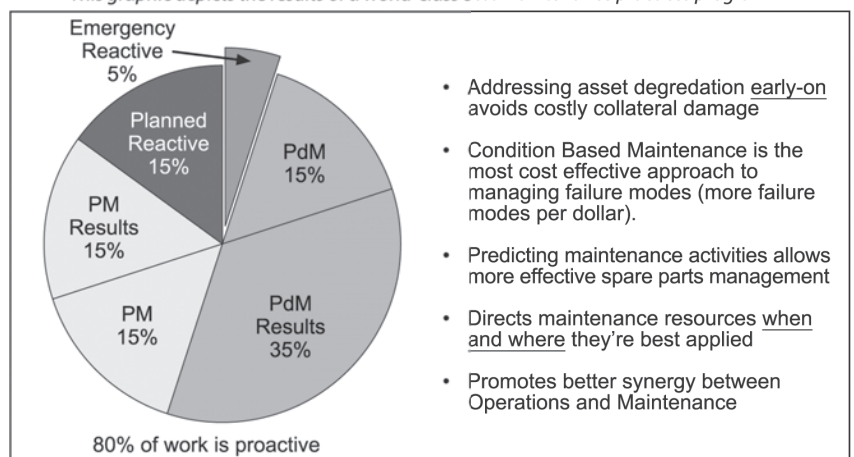
While our talented maintenance teams have been keeping equipment running at times and against sometimes tough odds, (for example, our West Point Treatment Plant in Seattle is still using grit pumps installed in 1963), our new tools allow us to optimally schedule maintenance needs, more accurately predict and avoid key equipment failure, make the best financial decisions on rebuild vs. replace, increase time between rebuilds, and capture and utilize the knowledge we have in our employees.

As WTD’s asset management program develops, it will leverage our highly-skilled work force by employing the most effective maintenance strategies, which will help our utility continue to be the efficient and innovative organization our ratepayers have come to know and respect.

You may contact Dave Jurgens at David.Jurgens@kingcounty.gov.

Example of an Optimized Maintenance Program:

This graphic depicts the results of a world-class best maintenance practices program



- Addressing asset degradation early-on avoids costly collateral damage
- Condition Based Maintenance is the most cost effective approach to managing failure modes (more failure modes per dollar).
- Predicting maintenance activities allows more effective spare parts management
- Directs maintenance resources when and where they’re best applied
- Promotes better synergy between Operations and Maintenance

PM = Preventative Maintenance, PdM = Predictive Maintenance

Maintenance Program Optimization at SPU

Asset management can be defined as the process of optimizing investments to ensure sustainable and cost effective service delivery that is aligned with customer and regulatory expectations. This article will highlight how Seattle Public Utility's Drainage and Wastewater group (SPU) is applying this concept to gravity pipe maintenance. The anticipated benefits of this program include:

- Focusing limited resources on the “right” assets
- Achieving cost effective SSO reduction
- Increasing crew productivity
- Extending the useful life of assets
- Enhancing compliance with state and federal regulations
- Moving from being “data rich” to “knowledge rich”

In the future, SPU may consider applying a similar approach to other asset classes.

MAINTENANCE OPTIMIZATION PROGRAM DRIVERS

The number and severity of Sanitary Sewer Overflows (SSOs) is a key performance indicator for all collection systems in the United States. Maintenance-related blockages (roots, grease, debris, etc.) in gravity pipes account for 60–90% of SSOs nationwide. A gravity pipe cleaning program is meant to reduce the risk of maintenance-related blockages and restore hydraulic capacity along a pipe.

Within each system, individual pipes are subjected to unique conditions (including but not limited to upstream conditions, structural defects, slope, depth, groundwater level, adjacent vegetation, and adjacent FOG contributors) which may impact how often a particular pipe needs to be cleaned to reduce the risk of an SSO. Defining the appropriate cleaning frequency for each pipe is critical for cost effective management of gravity pipe assets. If a pipe is cleaned too often, not only is it an inefficient use of resources, it can also damage the pipe and lead to premature structural failure. If a pipe is not cleaned often enough, there is an elevated risk of experiencing a maintenance-related SSO. In addition to the costs associated with a single SSO event (health, environmental, customer service, fines, cost to respond, etc.), a consistent pattern of SSOs can result in costly regulatory intervention.

The United States Environmental Protection Agency (USEPA) continues to increase its strategic focus on SSO reduction. Regional EPA regulators (including EPA Region 10) are also ramping up their tactics in support of the national

strategy. From a national perspective, potential Capacity, Management, Operations and Maintenance (CMOM) regulations came and went 10 years ago, but as part of the proposed SSO Rule listening sessions that EPA hosted in 2010, it appears several SSO reduction initiatives, including CMOM as a potential permit requirement, are back in play. The SSO Rule under consideration includes: clarifying EPA's authority to permit satellite collection systems, clarifying SSO definitions and reporting requirements, adding CMOM as a permit requirement, and dealing with peak flow issues. In addition to the SSO Rule, the EPA continues to perform audits across the country that often lead to administrative orders or consent decrees focusing on SSO reduction.

SPU'S MAINTENANCE OPTIMIZATION STRATEGY

With this backdrop, and as part of SPU's continual improvement strategies, SPU embarked on a comprehensive CMOM project in 2010 to develop and implement a 6-year Roadmap primarily aimed at reducing the frequency and severity of SSOs. SPU is very similar to most utilities in the country in that the primary cause of SSOs is maintenance-related blockages (roots, grease, debris, etc.). Fortunately, these SSOs are relatively inexpensive to reduce compared to more costly capital intensive SSO causes such as capacity limitations and structural failures. Out of the dozens of initiatives that are included in the Roadmap, two are the focus of the remainder of this article: gravity pipe cleaning optimization and risk-based dynamic scheduling. While these two initiatives may sound complicated, at the core they both support two simple concepts: clean the right pipe at the right time and balance risk and location while dispatching work. These concepts support cost effective SSO risk reduction and increased cleaning crew productivity.

INITIATIVE 1: CLEANING OPTIMIZATION

SPU initiated the cleaning optimization initiative with a design phase that focused on business processes and decisions, as well as workflow and data management. During this phase, the design team determined that there were two primary types of decisions that would support cleaning optimization. The first type of decision relates to cleaning frequency optimization. Cleaning frequency optimization asks the basic question (from a particular pipe's point of view): “Am I being cleaned too often? Not often enough? Or am I being cleaned at the right frequency?” The second type of decision relates to whether the next date that a pipe is scheduled to be cleaned is appropriate (i.e., if a pipe is CCTV'd and found to have a 50% root blockage but isn't scheduled to be cleaned for another 12 months, does it need to be cleaned sooner rather than later).

By Frank McDonald, SPU Drainage and Wastewater Asset Manager; John Evans, HDR Utility Management Services Northwest Area Manager; and David Spencer, HDR Asset Management Technical Lead

In order to answer these two fundamental questions, a decision making process and a tool to support the process were designed. The decision making process/tool depends on two primary data sources: CCTV and cleaning data. For CCTV data, SPU uses NASSCO's PACP standard. The PACP standard includes identifying maintenance related issues such as roots and grease and also their severity in terms of the percentage of a pipe that is being blocked by the maintenance issue. For cleaning data, SPU collects whether cleaning crews remove roots, grease, debris and/or other findings as well as the severity of the findings (light, medium, and heavy). Both CCTV and cleaning data are collected in "code-based" format (instead of text based comments) and are collected for each unique pipe (from maintenance structure to maintenance structure). The format and the accuracy of the data are paramount to ensuring good decisions are easy to make. As new data points are collected through ongoing CCTV and cleaning activities, the data is processed through an algorithm. The algorithm makes recommendations, based on SPU's risk-based business logic, to increase or decrease the maintenance frequency and whether to "bump up" the

next scheduled cleaning date to remove a blockage. A planning and scheduling support staff person then reviews the algorithm's recommendation along with historical data to determine whether to accept or reject the recommendation. Accepted recommendations are then reflected in the Maximo CMMS. The tool also stores a history of recommendations that includes whether they were accepted or rejected along with associated comments.

An example of such a decision in the tool is included in Figure 1. The upper portion of the interface identifies specific recommendations identified by the tool. The bottom portion of the interface displays the history for a selected, individual pipe. In this particular instance, a pipe is scheduled to be cleaned next on 9/1/2014. CCTV was conducted on 2/21/2011 which indicates that the pipe has several maintenance-related blockages including a root ball that is blocking 60% of the pipe. Based on the business logic defined by SPU, the system is recommending that this pipe be cleaned immediately rather than waiting 3.5 years for the next scheduled cleaning. Recommendations are accepted, rejected, or modified by the end user by right clicking on a particular recommendation.

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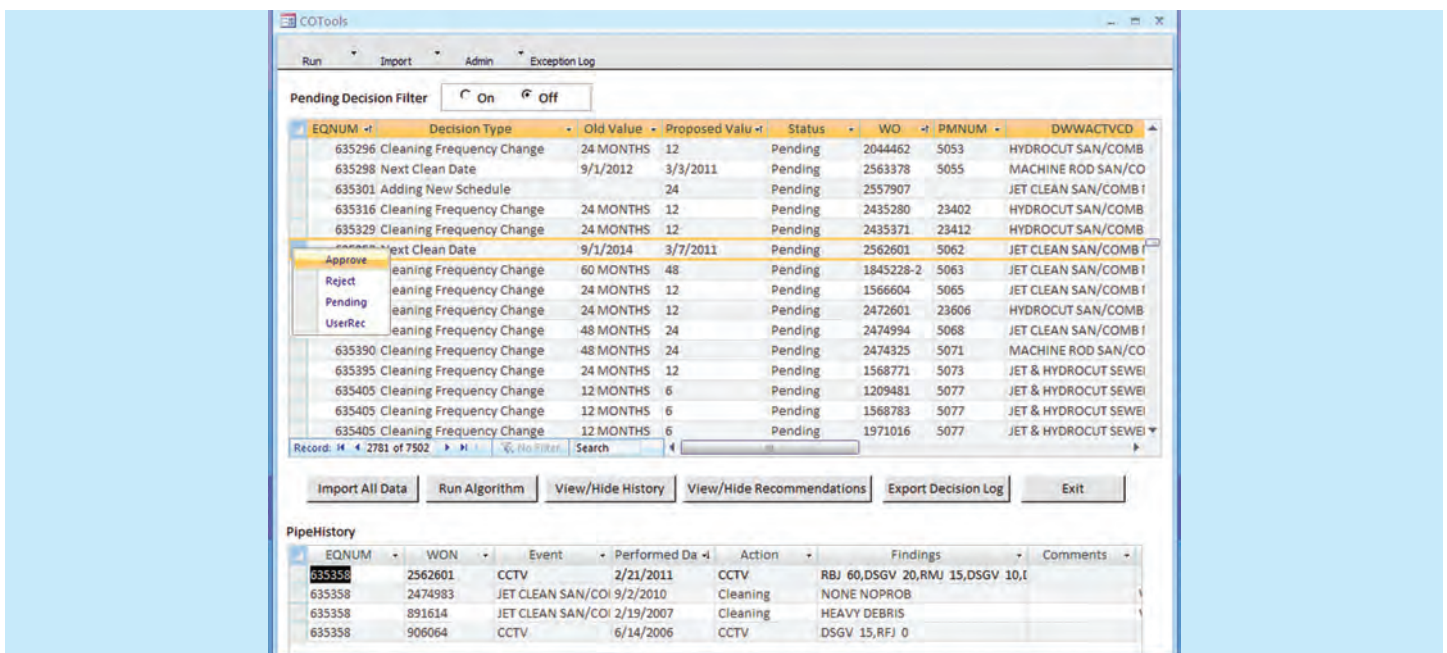


Figure 1

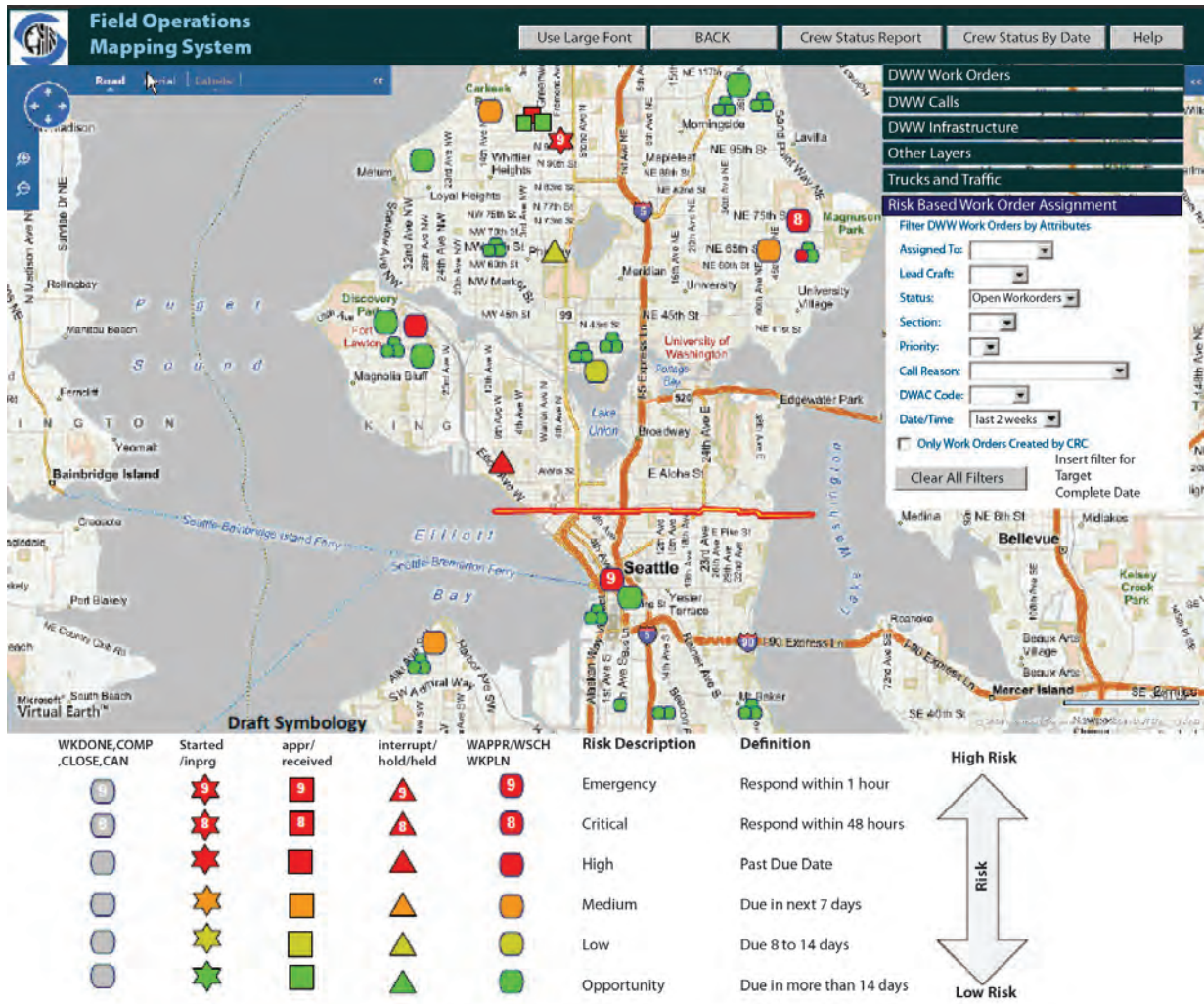


Figure 2

San Diego SSO History

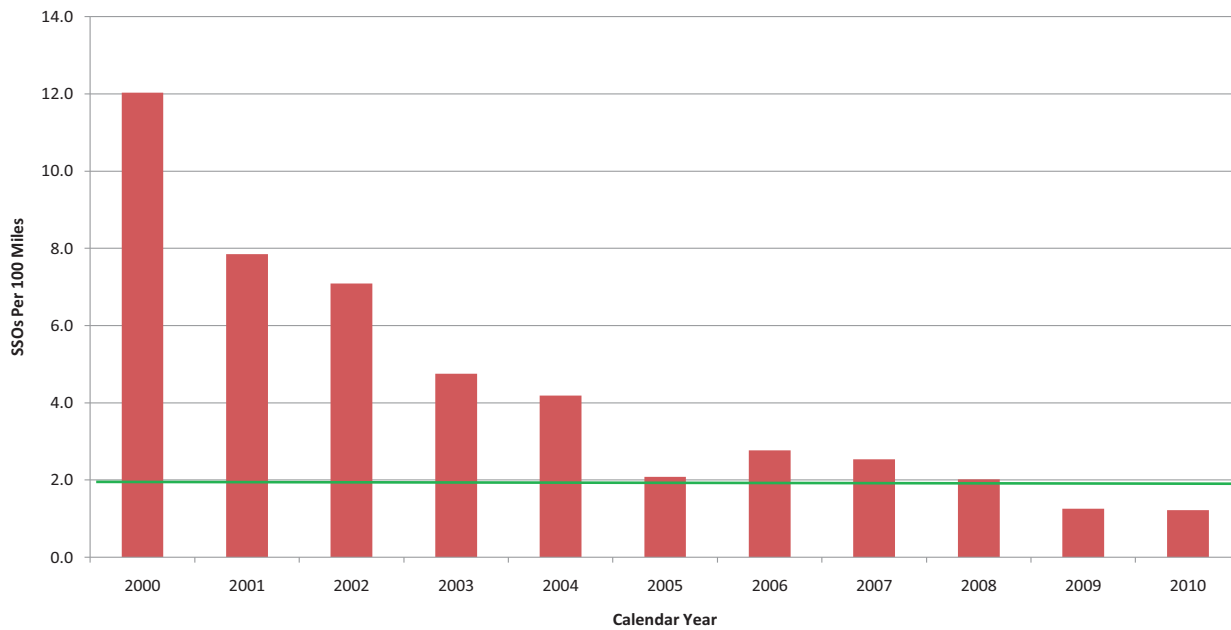


Figure 3

CCWRD SSO History

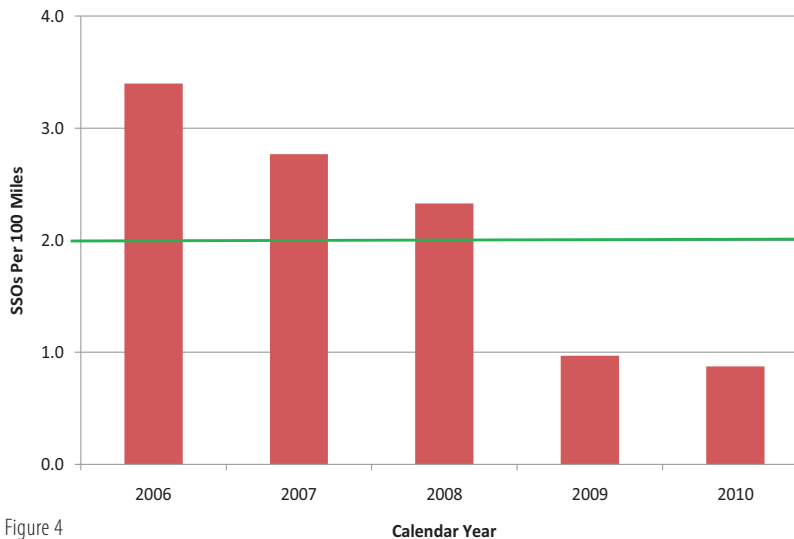


Figure 4

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INITIATIVE 2: RISK-BASED DYNAMIC SCHEDULING

The second related CMOM initiative SPU is undertaking is the development of a risk-based, dynamic scheduling program. As individual pipe cleaning schedules are optimized, it can become exceedingly difficult to prioritize and group cleaning work orders to reduce risk and crew drive time. The purpose of the risk-based dynamic scheduling approach is to compensate for this by efficiently displaying the priority and location of each outstanding work order. This supports work packaging that focuses limited resources on the right pipe while limiting drive time and increasing crew productivity.

Work order risk is calculated using the concept of an acceptable maintenance window. This concept states that there is a certain window of time around a scheduled due date that, as long as the cleaning occurs within the window, the risk associated with experiencing an SSO is acceptable. This is similar to having the oil changed in your car—you can change it a little early, or a little late, but as long as it's changed around the appropriate mileage since the last oil change, your car should be fine. The size of maintenance windows vary based on the PM frequency. For example, a once per month frequency would have a smaller window of time than a once every two year frequency. As a work order approaches the end of its acceptable maintenance window, the risk of an SSO increases and the corresponding color of the work order changes from green to yellow to orange and finally to red when the work order is past its acceptable maintenance window.

Figure 2 shows the conceptual interface of the tool that SPU will use for risk-based dynamic scheduling. Each symbol represents a unique work order (by status) that is ready to be executed. Risk is symbolized by color where red symbols are high priority, orange symbols are medium priority, yellow symbols are low priority, and green symbols are opportunity work. When work is grouped for a particular crew on a particular day, the planner/scheduler starts by selecting the highest priority work order and then selects work in the same

geographic area that may be of any priority. This process is repeated for each crew. In this way, crews are focused on the highest priority work while drive time is minimized, thus enhancing productivity. Implementation of the acceptable maintenance window has an additional benefit of expanding the number of work orders typically available for assignment. This allows for additional opportunities for grouping work in tighter geographic areas, thus improving productivity.

NEXT STEPS AND ANTICIPATED BENEFITS OF THE PROGRAM

Two examples of where a similar approach has supported significant SSO reduction include the City of San Diego and Clark County Water Reclamation District in Las Vegas. The two graphs show SSO reduction results that were supported by a similar approach. SPU performed an initial frequency optimization approach in 2008 and experienced a 30% reduction in SSOs. The full frequency optimization process was launched in July 2011 and additional reductions are expected. The risk-based dynamic scheduling approach will be implemented later in 2011. SPU is also designing a similar approach to support optimizing its catch-basin inspection and pumping program that is required by its permit. This would support a move from the current requirement of annual catch-basin inspections, to a more optimized, risk-based approach.

In addition to supporting SPU's goals associated with SSO reduction, extending the useful lives of its pipeline assets, and crew productivity, these two CMOM Roadmap initiatives support one of SPU's Strategic Business Plan Key Initiatives—to transition from being “data rich to knowledge rich.” Both are practical and relatively low-cost to implement—especially considering all of the data (which is usually the expensive part) is already being collected. They simply support SPU in taking the fullest advantage of the data it already collects to make sure that it's cleaning the right pipe at the right time.

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Risk versus Criticality: Concepts and Approaches

By Terry Nelson, Uberlytics LLC

Risk and Criticality are often used as interchangeable terms. However, there are key differences between them in concept and application. Risk is a powerful concept for decision making because it can monetize outcomes. Criticality, and particularly Relative Criticality, is a powerful concept for managing and reducing risk within selected systems or business processes. The following review explores the difference between risk and criticality and how application of criticality to existing systems can focus priorities for the application of capital and manpower to reduce risk outcomes.

What are risk and criticality? Risk is a state of uncertainty where some possible outcomes involve a loss, catastrophe, or other undesirable result. Measurement of risk is a summation of the quantified probabilities and the quantified losses. In simpler terms, risk is an understanding of how likely and what level of negative consequences are to occur in a given situation. We may think of, for example, a quantifiable

amount of risk associated with being injured in a vehicle accident during a trip or period of travel: potential negative outcome associated with an activity.

Criticality is a measure of the potential for actualizing risk that a component or element inherently carries or imposes in context with an activity or process. Criticality is centered on modes and means by which an item or component can fail and lead to negative outcomes. In the example of accident and injury during travel, criticality focuses on the role and functions of the vehicle and other components or elements involving travel such as the criticality of tires in respect to safely traveling in an automobile.

Risk and criticality share many common factors including quantification of probability of occurrence, and impacts of outcome. The most important distinction is that risk is focused on events, while criticality is focused on system components.

How are analysis and management different for criticality versus risk? When evaluating and managing from a risk perspective, the starting point is

asking what kinds of events can happen to or within a system and how the system will be affected by and respond to those events. The risk perspective is one that moves from general systemic functions toward more specific areas of impact. Risk analysis is a design support tool because it reveals weaknesses or vulnerabilities in existing systems that can then be strengthened through design changes.

When evaluating from a criticality perspective, the starting point is asking how a system is affected by failure or loss of individual system components. The criticality perspective is one that looks from the specific components towards the effect on the larger system functions. Because criticality reveals the components and aspects of the system that warrant first/most resources by prioritizing system elements, criticality analysis is the most valuable support tool to use when maintenance funds are limited.

Which should I choose to manage: risk or criticality? All systems benefit from both risk and criticality analysis and management, as all systems have vulnerabilities and weaknesses (implying risk analysis and management) as well as existing structures, processes, and components that deliver functions. An engineering department responsible for ensuring the system delivers the functions necessary for the business would take a risk based approach. However, a maintenance department tasked with continuing to deliver the functions of an operating system should take a criticality approach. The difference is not given by the system but by responsibility for the system.

How will criticality analysis and management improve my system? Criticality analysis, if done well, reveals many of the same weaknesses and vulnerabilities as risk analysis; however

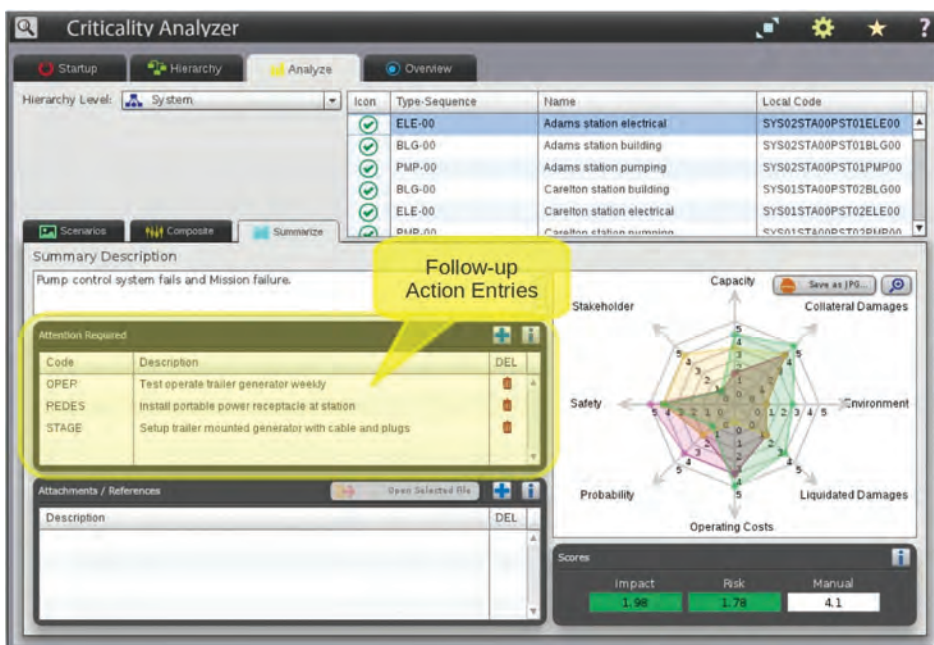


Figure 1. Capture Staff Ideas (Criticality Analyzer, Uberlytics LLC 2011)

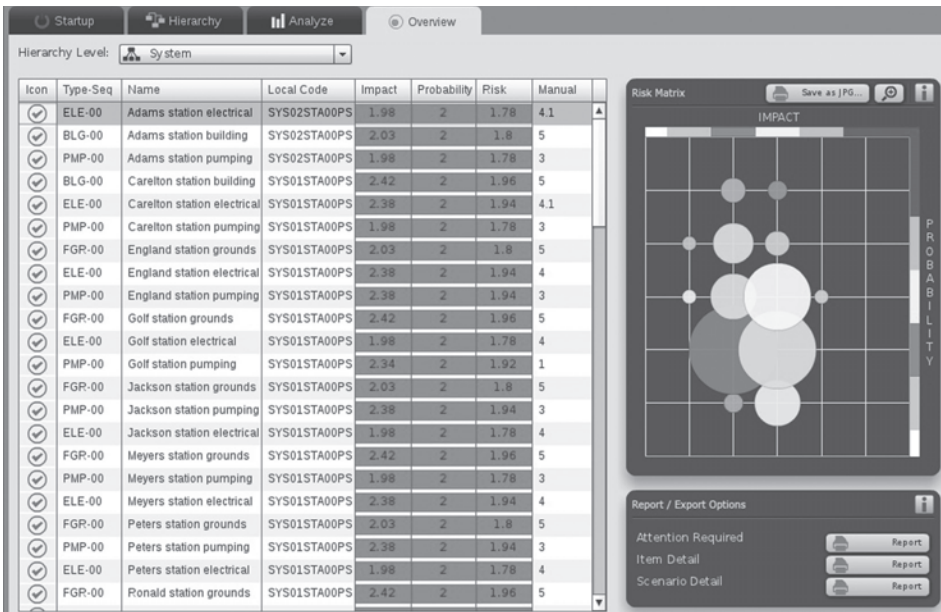


Figure 2. Relative Rank of Criticality (Criticality Analyzer, Uberlytics LLC 2011)

criticality pinpoints the system and/or component and often stimulates discussion on ways to resolve discovered issues. These discoveries should be captured and used to drive capital and improvement programs to focus on high leverage changes that reduce risk. Facilitated criticality analysis is a process that brings together the experiences of a cross section of staff and is an ideal opportunity to capture their knowledge and experience. For example, the process should capture ideas for operational changes or potential redesigns as shown in the highlighted section of Figure 1.

How can criticality help leverage priorities to reduce risk? In times of limited financial resources, backlog and prioritization are primary concerns and management issues for maintenance departments everywhere. Criticality analysis results in a specific listing of system components in the prioritized order that resources and efforts should be applied to maximize functional reliability and reduce risk. Figure 2, above, is an example of both prioritized listing and graphical representation of relatively ranked components of a system based on criticality. This ranked list drives a wide range of maintenance functions, from simple work order prioritizing to stocking of critical spares and everything in between. A comprehensive and unambiguous ranked listing of system components by criticality is the most important and valuable product of

criticality analysis. Interactive listings and matrices such as those included in Criticality Analyzer as shown in Figure 2 are of even more value.

Why Should I Evaluate and Include Multiple Failure Scenarios? Because the criticality analysis process considers failure of a component or unit within a larger system, and because there are always multiple dimensions of criticality, there are often multiple worst-case-scenarios for any given item under analysis. For example, a pumping system may fail to pump or may rupture. Pumping failure may have dire operational consequences but minimal safety consequences. On the other hand, rupture may have safety consequences but limited operational consequences. In practice, it is surprising how often the worst-case failure for system elements is

actually represented by several “corners of the box” scenarios.

Even if just for brainstorming and documentation of thought processes, capturing, evaluating, and comparing multiple failure scenarios is an important and valuable aid in accurate criticality analysis. To facilitate multiple failure scenarios, the software tool or spreadsheet used should support entry and manipulation of multiple failure scenarios and aid in finding the best overall representation of failure impacts as shown in Figure 3.

Conclusion: In recent years water and wastewater industries have continued to face increasingly tighter budgets and resources. Regardless of management styles, goals, or processes used, every organization needs to apply their limited capital and resources to true priorities. Resources invested in appropriate ways may be at least partially wasted if they don’t go to the most critical systems. A thorough and comprehensive understanding of criticality within our systems enables us to make the right choices and maximize return on our efforts and investments. Perhaps best of all, criticality analysis need not be a major investment in time or money like many programs and tools. With good processes and tools, capable facilitators, and a knowledgeable staff, comprehensive and accurate results can be achieved quickly and cost effectively.

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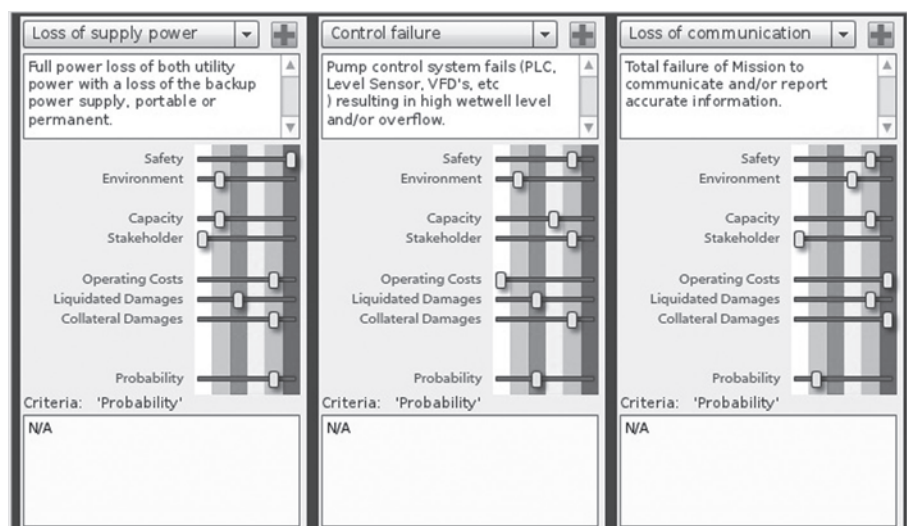


Figure 3. Multiple Failure Scenarios (Criticality Analyzer, Uberlytics, LLC 2011)

City of Vancouver, WA and Veolia Water Sustainability Partnership

By Frank Dick, City of Vancouver and Aaron Kraft, Veolia Water NA



Marine Park WWTF blower



Westside WWTF blower

The City of Vancouver, WA took an unusual route in selecting two capital replacement projects by basing the decision on projected energy savings rather than asset replacement. On paper this makes common sense but it's far from typical in the wastewater industry and offers very helpful insights to wastewater managers looking for sustainably-innovative capital project selection. And, they're on track to recover their investment within 18 months.

The objective of Asset Management, as defined by the International Infrastructure Management Manual (IIMM), is "To provide agreed level of service in the most cost effective manner for present and future customers." Although "level of service" is open-ended, it implies the acceptable frequency of occurrence of failure in an asset or system of assets for the "present and future customers." In an ideal world we would poll customers on their definition of failure, but in reality those who manage assets define failure, particularly in the water industry.

The simplest definition of failure is when an asset completely stops operating, and this has been the basis for many maintenance programs where the focus is on reviving equipment until it is completely worn out. Another way to define failure is to consider an asset's performance whereby an asset that doesn't adequately meet its design intent or original specification is considered functionally failed even when it is still operating.

But the most advanced definition of failure draws on a very broad analysis, ideally the triple bottom line (3BL) analysis of

sustainability otherwise known as "people, planet and profit." Under 3BL analysis, "level of service" as defined by the IIMM expands beyond whether equipment runs or is functional to include how it meets the definition of "people, planet and profit" as well. In Vancouver, a triple bottom line definition of failure delivered a triple win for the people, the planet, and the utility's profitability.

The City of Vancouver and Veolia Water North America partnered to replace two blowers at the City's Westside and Marine Park WWTFs. The team determined that a 300 hp air foil turbo blower could effectively replace an existing, well-functioning 400 hp centrifugal blower that was installed in 1995 at their Westside facility. For even greater efficiency, the operating process was changed to run the new blower as the lead and sized for up to 90% of operating scenarios, while the original three remaining centrifugal blowers are available to supplement air demands as necessary.

At the Marine Park WWTF the optimal operational scenario was to replace an existing 250 hp centrifugal blower with a 300 hp air foil turbo blower in lead position, whereby the new blower is estimated to provide up to 95% of the necessary air supply on its own, only calling for a second blower based on seasonal process demands. The air foil turbo blower was selected because it has a demonstrated energy savings up to 40% compared to conventional technologies, such as the centrifugal blower.

Additional savings include dramatically reduced maintenance labor and supply costs, lower emissions, power savings, zero oil changes and simple filter replacements. The blower offers a significant space and installation cost savings with a compact blower package design, lower noise pollution and a virtually vibration-free working environment. On the financial side, the air foil turbo blower is recognized for energy credit and rebates by energy efficiency accreditation agencies and power utilities.

Wastewater plants are typically among the top five energy consumers within any city, and wastewater treatment consumes approximately 1.5% of total electric power in the United States. After labor, electricity is the largest operating cost at most wastewater treatment plants, typically 25 to 40% of total operating costs. Modern wastewater plants rely on high energy-demanding aerobic processes or secondary treatment, often from 30 to 60% of the usage, that are excellent targets for shorter payback energy projects.

	Energy Loss	WWTP Energy Demand (Hp)	Reduced WWTP Energy Demand (Hp)
End Use		100	60
Transmission	5%	105	63
Shaft-electrical	5%	111	66
Boiler-shaft	75%	443	266
Fuel-boiler	10%	493	295
Change in input energy			197

Table 1

Because electrical grids are nearing capacity, there are financial incentives and often regulatory requirements for power companies to conserve energy instead of building new power plants. To demonstrate the savings from the perspective of a power utility, generation of electricity from a natural gas fired steam turbine produces energy losses that accumulate back from the point of use (see Table 1).

Energy efficiency can save five times as much in raw input energy, as a reduction in 40 units of energy results in nearly 200 on the utility's inputs side. For electricity utilities, energy conservation is the most valuable "source" of energy which is why they are willing to contribute to energy savings investments in customer facilities and many incentive programs are available. Here in the Northwest the Bonneville Power Administration managed by the federal government has funding to identify significant savings programs and provide grants to its customers. The Vancouver blower project qualified for a 70% grant from Clark Public Utilities, significantly improving the payback period and helping to keep capital investment returns under 24 months for both projects.

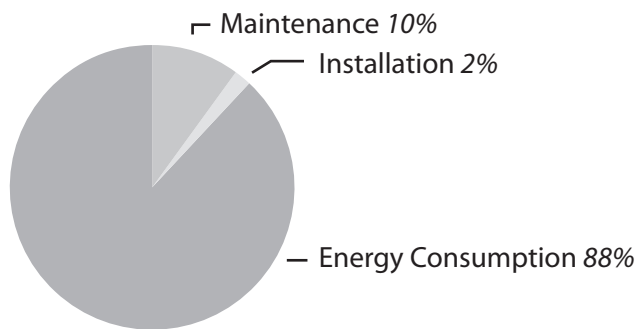
In addition to adding high efficiency blowers, key design features include:

- Investing in one blower unit that covers 80% or so of the operating range within its turn down capacity.

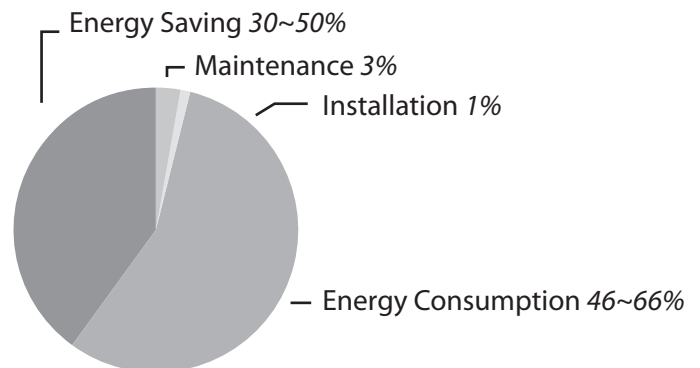
- Running the new blower as the lead unit to maximize run time at peak efficiency using the additional existing units as only backup covering 20%.
- Installing a fine bubble diffusion system.
- Implementing an advanced control strategies (feedback loop) that controls the amount of air delivered to match the demand, without overfeeding air.

In the current economic environment and for the near future, there are limited resources to invest in capital improvements. Nevertheless, most wastewater plants in the Northwest and even their latest capacity upgrades are at or nearing the end of their design life cycles of 30-40 years. The relationship between energy and water treatment is clear and yet energy sources are nearing peak capacities with many constraints on developing new sources. These factors combine to make implementation of the Asset Management objective of maximizing Levels of Service for both current and future customers more important than ever. The triple bottom line approach utilized in Vancouver shows that oftentimes, expanding the definition of failure can yield unexpectedly positive results.

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PD Blower Operating Costs



NX Series Operating Costs

WERF helps Gresham with Strategic Asset Management (SAM)

By Alan Johnston, P.E., Senior Engineer, City of Gresham WSD

Beginning in July 2005, the City of Gresham, OR Wastewater Services Division (WSD) actively implemented “best practices” including comprehensive asset management tactics. WSD operates the collection and conveyance system while contractor Veolia Water operates the wastewater treatment plant (WWTP). The WWTP has an enterprise asset management and computerized maintenance management system (CMMS) and uses reliability centered maintenance (RCM) techniques to evaluate condition assessment and operational performance of the assets at the WWTP. On the collection side, the City uses an asset management software program (ICOMMM) and NASSCO Pipeline Assessment Certification Program (PACP) protocols. In 2008, the

City pursued assistance from Water Environment Research Foundation (WERF) for an independent peer-review to help evaluate their ongoing asset management programs to see if they were on the right implementation path and to identify the incremental steps toward a longer-term roadmap or blueprint for a sustainable asset management program.

The City asked WERF to evaluate the 3 years of progress since July 1, 2005 when it partnered with Veolia Water to provide asset management support services including Oracle WAM software for WWTP and pump station assets and asset based information and analysis. This software was to implement an asset based work order system and provide asset level life cycle costing to the City, which would then be used

to evaluate repair versus replace decisions and ultimately develop an asset management plan for the WWTP. The WERF/Gresham Peer Review Project (GPRP) was to provide a framework for the City to improve and execute a long term asset management program, first division wide and ultimately City wide. WERF convened a project committee of experts in the field of Strategic Asset Management (SAM) that met periodically to interview City staff and identify areas that may need improvement. The City also completed WERF’S SAM-GAP analysis tool that identified areas of improvement needed for a robust asset management program.

Many WERF research items used since 2008 have been invaluable to Gresham’s Asset Management Program, including those shown below.

<i>WERF Research Item</i>	<i>Before GPRP</i>	<i>After GPRP</i>
Gresham Peer Review Project (2008)	Not Used	2008–present
SAM-GAP Analysis Tool	Not Used	2008–present
SIMPLE Website and Simple-Tools	Not Used	2008–present
Implementing Asset Management, A Practical Guide	Not Used	2008–present
Condition Assessment Strategies and Protocols for Water and Wastewater Utility Assets	Not Used	2009–present
Remaining Asset Life: A State of the Art Review	Not Available	2010–present

Areas needing improvement were clearly identified and work items were listed and prioritized based on staff availability and need as a result of the GPRP and other WERF research items. It has been quite difficult for the City to implement AM techniques with existing staff since 2005 but the WSD continues to make improvements each year and

to implement those things necessary to move the program forward.

The GPRP delivered a list of key recommendations from the peer review team that the WSD immediately attempted to implement in 2009. The research results raised the visibility of asset management at the City and

brought together staff from all areas of the City in approximately quarterly meetings to discuss SAM and the current direction of the City. Summarized below is a list of the main 'high' priority action items implemented that have greatly helped the City move forward with best of class SAM practices.

Continued on page 26

<i>GPRP Related Action Item</i>	<i>Before GPRP</i>	<i>After GPRP</i>
Monthly WSD Asset Management Meeting	Not Used	2008–present
Quarterly City wide AM Meetings	Not Used	2008–present
Implemented collection system asset based work order CMMS (Red Zone, ICOMMM software)	Not Used	2011–present
Asset type based failure coding in all WWTP work orders	Not Used	2010–present
Reliability Centered Maintenance reports for most critical systems and processes	0%	5 systems
Condition Assessments of all assets - WWTP	0%	100% coverage
Condition Assessments of all assets - Collection	100% (no CMMS)	100% (in CMMS)
Condition Assessment Protocols by 1-5 ranking	25% of assets	100% of assets
Asset Criticality ranking in CMMS - WWTP	10% of assets	100% of assets
Asset Criticality Ranking in GIS	0%	100% of assets
Asset age, condition and replacement value in CMMS	0%	100% of assets
Condition based asset remaining life - WWTP	0%	100% of assets

Continued from previous page

The direct and indirect impacts of the GPRP have been tremendous for the City. The research allowed staff the opportunity to discuss the impacts of SAM on the City and closely identify the current practice. The GPRP itself was one of the most creative approaches to raise awareness of the need for SAM, and without this research the City might not be where they are today with SAM. In addition to the processes mentioned above, the City worked hard since 2008 to prepare its first annual Asset Management Plan (AMP) for the FY 2010/11. All items identified in the GPRP tie directly to this plan and are the culmination of all the SAM work up to this point. The AMP summarizes the condition, install date, age, effective remaining life and asset replacement date of each asset, and much more.

This City's SAM program required additional investment in systems and processes that would allow staff to more closely manage these assets. These systems developed, implemented and optimized since the 2008 GPRP include:

- Completion of an Asset Registry
- Development of an advanced computerized maintenance management system (CMMS) for the WWTP (Oracle WAM) and collection System (Red Zone ICOMMM)

- Investment in collection system GIS systems
- Implementation of asset categorizing systems
- Implementation of condition monitoring processes and procedures
- Determining condition based Asset Remaining Effective Economic Life (CREEL)
- Prioritization of asset predictive and preventative maintenance practices
- Methodologies for asset Lowest Life Cycle Cost analysis
- Prioritizing Replacement and Refurbishment strategies
- Optimizing O&M and Capital Investment
- Completing long term investment plans and incorporating them into a sustainable rate model
- Complete an annual Asset Management Plan

This first Asset Management Plan (AMP) produced for the assets related to the wastewater public infrastructure, including the collection and treatment system with a replacement value over \$200 million, summarizes the divisional assets and identifies the long range investment plan. The AMP identifies and quantifies the City assets, identifies their age and condition, and documents the 7-year

risk based Repair, Replacement or Renewal Investment Plan for them.

The Asset Renewal Plan, the heart of the SAM program, correlates the need for reinvestment with the required

level of service and available funding. Ultimately, it is imperative that the investment is needed and occurs at the most cost effective time in the life of the asset. By understanding the life cycle costs associated with each asset, the WSD can ensure that we are doing the right thing with ratepayer revenue. We have completed a 7-year asset Investment Plan through 2018/19 for the WWTP that will guide staff in future project implementation. It is important to note that the WWTP is a complex system and asset investment needs change routinely. What seemed to be in reasonable condition may suddenly need large capital investment, and it can be difficult to predict asset failure years in advance.

Smaller asset R&R projects are managed by the WWTP O&M staff and are contractually funded through an R&R CIP. This fund is used as needed throughout the FY for projects over \$5,000 and of small to medium complexity. Larger, more complex or costly R&R projects are identified in the Asset R&R Plan, managed by the City engineering staff and funded through a new asset R&R CIP.

Implementing the SAM program and the recommendations of the GPRP has allowed the City to understand and identify all the assets within the WSD. Prior to 2008, we could not have easily identified asset install date, age, condition, criticality, life cycle cost, etc. Information now allows staff to manage the assets better and understand future financial requirements. All in all, the WERF GPRP project and the WERF SAM Tools have greatly helped the City achieve its goals of implementing a best in class Strategic Asset Management Program.

You may contact Alan Johnson at alan.johnston@greshamoregon.gov.

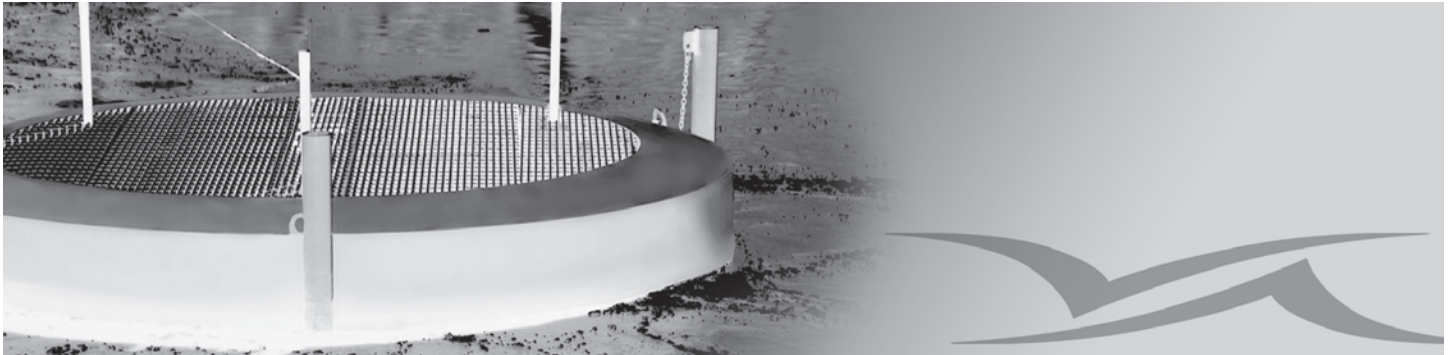
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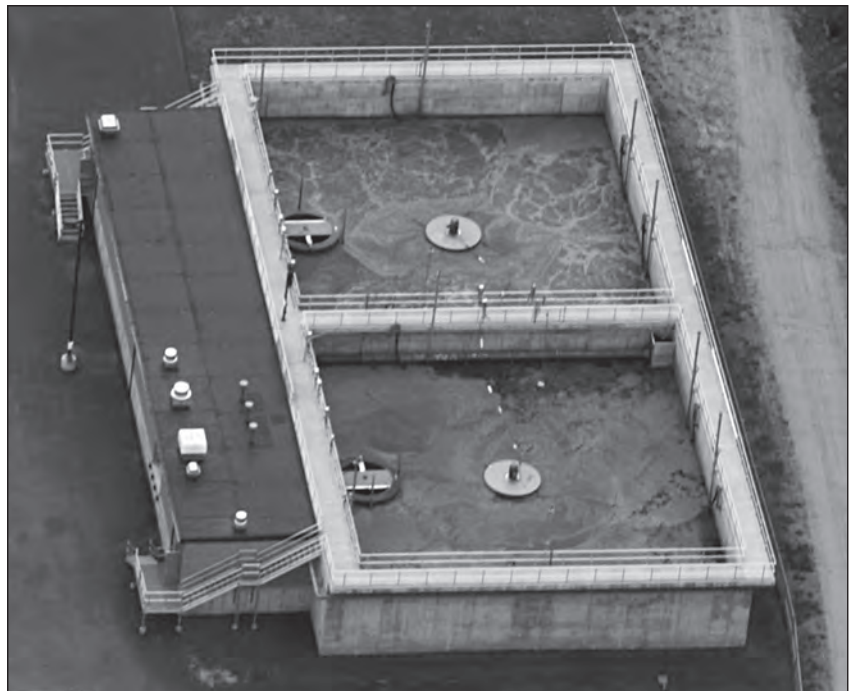
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PNCWA New Office Contact Info



By Nan Cluss, PNCWA Manager

We moved the PNCWA office over the summer and that means a new mailing address. E-mail addresses, phone/fax numbers remain the same.

Please update your PNCWA contact info and pass it on to your accounting department also:

Nan Cluss

PACIFIC NORTHWEST CLEAN WATER ASSOCIATION

PNCWA

PO Box 100

Ph: 1.208.455.8381

nancluss@pncwa.org

Hansen ID 83334

Fax: 1.208.455.8382

mikerainey@pncwa.org

We are looking forward to serving all PNCWA members from this new office location!

PNCWA ENVIRONMENTAL STEWARDSHIP SCHOLARSHIPS

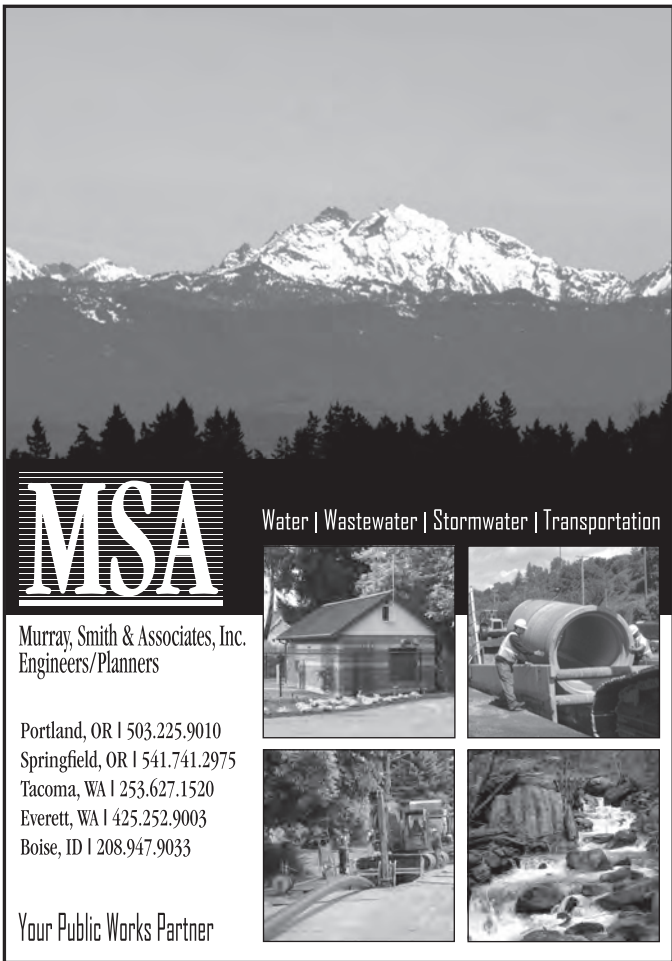
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Asset Management and Security

By Bob Isaacson, PNCWA Safety Committee



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Outdoor floodlight

How do you keep facility assets in good condition and also safe from all the bad things that can happen? Although we tend to think about asset management in terms of life-cycle planning, inventory of assets, acceptable use, and such, we need to expand that to include security. Critical infrastructure is in our hands and it is our responsibility to assure it remains useful during its life and in times of difficulty. Most of us are near waterways and we think of flooding as our main threat, but is it really?

Asset Management defines an asset as “anything that has value to an organization.” We recognize that without the pipes and treatment facilities, the waste we humans produce would foul our waterways in a very short time. Just look at a Third World country with virtually no waste treatment facilities to see the consequences of ignoring our water. If we value our waterways, it is up to each and every one of us to do what we can to manage and protect the facilities we operate. Even if we live and work in a small town that is an unlikely terrorist target, we could take a hit from rowdies out to have some “fun.”

Securing our assets could be a simple alarm system on outside doors, or tying it in to turn on all outside floodlights and sound a loud siren. After all, many of our facilities are not close enough to housing and neighbors to hear an alarm. Another tool is a motion-detector security camera system that when it picks up motion, does a pan-tilt-zoom with real-time video plus recording and sends a page or text message with an internet link that allows the person receiving the alarm to log in and see what is

happening real-time remotely. The monitor lights up only for suspect motion (not animal movement, for instance) so it will get the attention of anyone monitoring the video feed. These types of systems are not terribly expensive, and can pay for themselves with just one or two halted break-ins.

Another form of asset management could be setting a procedure to hand-check every outside door and gate in the plant when we leave. Or, calling our insurance company to request a security evaluation. When I was in charge of security at Freightliner, every day for a year I looked at a broken, lying-down fence; only after someone drove off in a brand new tractor and we had a security audit did it register that we were wide open. And remember to shut off all internal electric automatic gate openers when you shut down the facility—that’s how they got out.

How about your spare parts, tools and motorized equipment? Remove the keys when done for the night or weekend, and lock up the tools. Do you have an inventory of spare parts? Check outside and motion-sensor lights in the summer when you never see them on. Consider connecting the motion-sensor to floodlights mounted high to give off a LOT of light when there is motion.

If a flood washed away your entire facility, could you list and show the equipment and parts you had on hand? Just as we need to protect what is ours at home, we need to secure our facilities as best we can. Many items at the plant have a much higher value than what you have at home. You wouldn’t want to buy a new blower because a vandal stuck something into the intake, so make it less inviting or easy to do mischief. By securing our assets, we’ll continue to have a place to work and will ensure those assets are available and useful to the people we serve.

*You may contact Bob Isaacson at BIsaacson@co.clackamas.or.us.
He is the risk and loss control analyst for Water Environment Services.*

PNCWA Newsletter Submission Guidelines

Upcoming focus topics:

*2011 Q4 Energy & Energy Recovery—
deadline November 15*

*2012 Q1 Threats to Water Quality—
deadline February 15*

The PNCWA quarterly newsletter is built on articles contributed by PNCWA members. Each issue has a focus topic selected by the PNCWA Board and refined by the Editorial Advisory Group to address technical, community-based, case study and regulatory themes. If you have a story idea or an article to submit, please use the following guidelines.

- 200 to 500 words (longer articles may be accepted, space permitting)
- No overt marketing, but it’s fine to talk about your company’s achievements
- High resolution color photos or graphics, if possible
- Provide author email for readers to contact

Please submit articles to Sheri Wantland at wantlands@cleanwaterservices.org

Welcome to new members of PNCWA!

The people listed below have become members of PNCWA since our last issue. The list represents both WEF/PNCWA new members and transfers from other Member Associations to PNCWA as well as new PNCWA-only members. Welcome to all of you. Let us know how we can best serve your needs and interests and how you would like to be involved.

Bryan Asplund, Midway Sewer District
 Candice Au-Yeung, CH2M HILL
 Donald Ballantyne, Degenkolb Engineers
 John Banks, Rogue Valley Sewer Services
 Leann Barnett, LOTT Clean Water Alliance
 Michael Barnett,
 Douglas County Sewer District
 Ron Basinger, City of Sumner
 Anthony Benavidez, CH2M HILL
 Iris Benson, City of Corvallis
 Jeffrey Blaine, City of Albany
 Bradley Bogus, Tetra Tech
 John Boyd, City of Jerome
 Richard Boyle, Clean Water Services
 Brian Burke, King County
 Gary Caroll, Idaho DEQ
 Cam Clark, CDM
 Amber Clayton, City of Portland
 Sumerall Clinton, Pierce County
 Royce Davis, City of Kuna
 Wade Denny, Rogue Valley Sewer Services

Heather Dimke, City of Salem
 John Dix, Lake Stevens Sewer District
 Kiana Eller, AECOM
 Debra Ferguson, i.water services, inc.
 Brian Fletcher, Kitsap County
 Cruz Flores, City of Cannon Beach
 Beryl Fredrickson, AECOM
 Dan Galvin
 Michael Gauch
 Steve George,
 Douglas County Sewer District
 Ken Gortsema, City of Grangeville
 Amber Hall,
 Hayden Area Regional Sewer Board
 Steve Hatke, City of Richland
 Kirby Hubbs, Midway Sewer District
 Eron Jacobson, Brown and Caldwell
 Colleen Jenkins,
 Portland Environmental Services
 Kevin Jump, City of Rathdrum
 Bryant Kuechle, The Langdon Group

Michelle Lebaron, AECOM
 Shayne Lester, City of Aberdeen
 Carl Lundin, CDM
 Stephen Lusch,
 Roseburg Urban Sanitary Authority
 John McMillin, King County
 Cale McPherson, CDM
 Jerry Mellinger,
 Oak Lodge Sanitary District
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 Joe Morrow, H D Fowler Company
 Brenton Morrow,
 Rogue Valley Sewer Services
 Rich Munson,
 Lake Whatcom Water & Sewer District
 Greg Nanney, City of Centralia
 James Nurmi,
 Oregon Health and Science University
 Marvin O'Bannon, Midway Sewer District
 Craig Pack, City of Newberg
 Matt Pease, Staheli Trenchless Consultants

Suzanne Potts, King County
 Jon Randall, Clean Water Services
 Cameron Redden, Veolia Water NA
 Ryan Rehder, University of Idaho
 Nela Rice, CH2M HILL
 Christopher Roth, Pierce County
 Terry Sackett, Rogue Valley Sewer Services
 Troy Sanders, City of Newberg
 Daniel Scarpine,
 Aquarius Environmental LLC
 Adam Schuyler, BHC Consultants
 Leila Sermek, Stantec Consulting
 Seth Sode, Treatment Equipment Company
 Donnie Stallman, University of Washington
 CJ Strain, Blue Water Technologies Inc
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 Chris Waarvick, City of Yakima
 David Williams, IMCO
 Bruce Wundrack, Veolia Water NA
 Danny Ybarra, Odell Sanitary District

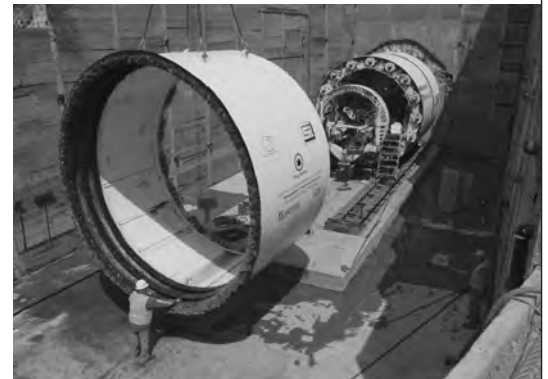
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- Receive a general overview of WWMD and available resources
- Hear case studies from two WEF Member Associations that are successfully implementing the program in

their states. Find out what's working for them!

- Learn how to meet your public education and outreach goals

Space is limited. Reserve your Webinar seat now at: <https://www1.gotomeeting.com/register/632586720>

After registering you will receive a confirmation email containing information about joining the Webinar. System Requirements: PC-based attendees need Windows® 7, Vista, XP or 2003 Server; Macintosh®-based attendees need Mac OS® X 10.5 or newer.

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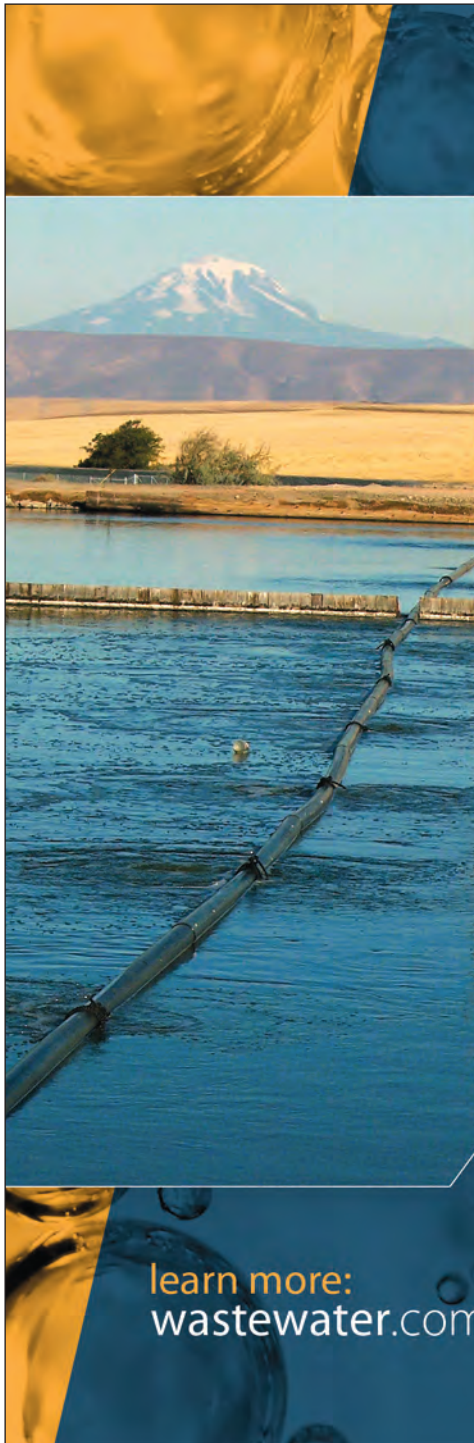
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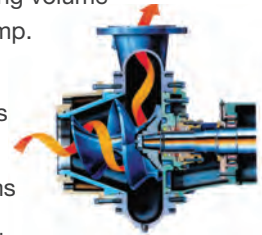
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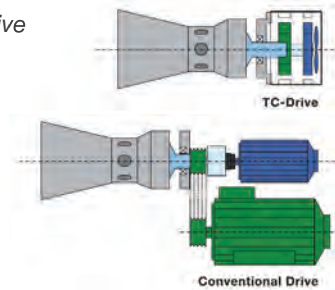


Sewer lines or pump stations constantly clogging? JWC's new pre-fab **Muffin Monster® Manhole** makes it easy to install the industry's most powerful grinder anywhere you need it. www.jwce.com

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